



**Part I: Project Information**

**GEF ID**

10680

**Project Type**

FSP

**Type of Trust Fund**

LDCF

**CBIT/NGI**

CBIT No

NGI No

**Project Title**

Promotion of climate adaptation technology and business model innovations and entrepreneurship in Sierra Leone

**Countries**

Sierra Leone

**Agency(ies)**

UNIDO

**Other Executing Partner(s)**

Small and Medium Enterprise Development Agency (SMEDA)

**Executing Partner Type**

Beneficiaries

**GEF Focal Area**

Climate Change

**Sector**

Climate Change Adaptation Sector

**Taxonomy**

**Rio Markers**

**Climate Change Mitigation**

No Contribution 0

**Climate Change Adaptation**

Principal Objective 2

**Biodiversity**

No Contribution 0

**Land Degradation**

No Contribution 0

**Submission Date**

9/21/2022

**Expected Implementation Start**

4/1/2023

**Expected Completion Date**

4/1/2029

**Duration**

72In Months

**Agency Fee(\$)**

848,580.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

<b>Objectives/Programs</b>	<b>Focal Area Outcomes</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
CCA-1	Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation	LDC F	8,932,420.00	26,987,500.00
<b>Total Project Cost(\$)</b>			<b>8,932,420.00</b>	<b>26,987,500.00</b>

## **B. Project description summary**

### **Project Objective**

Reducing vulnerability and increasing resilience of vulnerable populations by supporting MSME\*-driven innovation, transfer and large-scale deployment of adaptation technologies, products and services (TPS) in the water, agriculture and energy sectors in Sierra Leone

<b>Project Component</b>	<b>Financing Type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>GEF Project Financing (\$)</b>	<b>Confirmed Co- Financing( \$)</b>
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing(\$)
1. Strengthening institutional and policy frameworks and Coordination mechanisms supporting adaptation MSMEs? to develop and deploy their technologies, products and services into the water, agriculture and energy sectors	Technical Assistance	<p>1.1: An integrated mechanism with strong linkages to national adaptation planning processes is developed to support and engage adaptation MSMEs in delivering their mandates with gender mainstreaming.</p> <p>1.2: Business environment for climate adaptation innovation is improved</p>	<p>1.1.1: The Directorate of Climate Change, SMEDA and support institutions in water, agriculture and energy sectors capacitated through improved tools, planning instruments (technology roadmaps and climate smart investment plans) and trained to support and engage adaptation MSMEs in their operations, through three (3) specialised education and training courses on climate change and climate change adaptation TPS for 60 stakeholders (at least 40% women participation and 20% youth participation)</p> <p>1.1.2: Inter-ministerial coordination mechanism established to promote the integration of adaptation and resilience through engaging adaptation MSMEs in the water, agriculture</p>	LDC F	767,000.00	2,236,285.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
			<p>and energy sectors alongside the establishment of an Adaptation Innovation Platform to implement national strategies and involving relevant stakeholders (at least 40% women and 20% youth)</p>			
			<p>1.1.3: Climate data collection to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance</p>			
			<p>1.2.1: At least four (4) policy and regulatory recommendations to improve the climate adaptation business environment developed with a gender perspective (with at least 40% women and 20% youth participation)</p>			
			<p>1.2.2: Two (2) national fora held for 70 national and subnational policymakers to raise awareness on climate adaptation</p>			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
			<p>innovation TPS, entrepreneurship, and sustainable and innovative financial mechanisms (with at least 40% of women and 20% of youth participation)</p>			
			<p>1.2.3: Technology show-casing laboratory at EPA office in Bo strengthened for climate adaptation and resilience technology innovations</p>			
			<p>1.2.4: Four (4) adaptation clusters are created and nurtured in Sierra Leone (with at least 40% of women and 20% of youth participation)</p>			



Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
2. Growth and scale-up support for adaptation MSMEs in water, agriculture and energy sectors	Investment	<p>2.1 Adaptation MSMEs grow their businesses and operations</p> <p>2.2: Adaptation MSMEs secure funding to grow and scale-up their operations and projects</p>	<p>2.1.1: 150 MSMEs, entrepreneurs, start-ups are trained on climate adaptation topics to increase their capacities to understand climate risks and vulnerabilities and to identify business opportunities for climate change adaptation during the Pre-Accelerator Programme (with at least 40% women and 20% youth led enterprises))</p> <p>2.1.2: Four (4) existing business development accelerators are trained to run the annual cycles of climate change adaptation-oriented technology innovation and entrepreneurship competition-based accelerators</p> <p>2.1.3: 150 MSMEs, entrepreneurs and start-ups with high-impact innovative climate adaptation-oriented TPS are trained and</p>	LDC F	3,575,000.00	12,098,500.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing(\$)
			<p>coached through the Incubator/Accelerator Programme to overcome the technological valley of Death (with at least 40% women and 20% youth led enterprises)</p>			
			<p>2.1.4: Business replication, expansion and partnership services provided to help regional and global adaptation MSMEs establish climate resilient business operations in Sierra Leone</p>			
			<p>2.2.1: 50 successful MSMEs, entrepreneurs and start-ups are trained and coached through the Advanced Acceleration Programme to receive early-growth financing and overcome the Commercialization Valley of Death (with a target to receive 40% women-led and 20% youth-led applications)</p>			
			<p>2.2.2: 20 MSMEs, entrepreneurs and</p>			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing(\$)
			<p>start-ups receive investment facilitation support in the Post- Acceleration Programme for projects that deliver climate adaptation technologies and solutions at scale (with a target to receive 40% women-led and 20% youth-led applications)</p>			
			<p>2.2.3: The Climate Adaptation Venture Fund is established and operationalized to financially support at least 20 climate change adaptation enterprises (with a target to receive 40% women-led and 20% youth-led applications) and to de-risk and leverage public/private investment</p>			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
3. Vulnerable groups access financing to acquire climate resilience and adaptation technologies, products and services in the water, agriculture and energy sectors	Technical Assistance	<p>3.1: Demand and accessibility to financing for adaptation services increased amongst vulnerable groups</p> <p>3.2: FSPs provide lending to vulnerable groups to acquire adaptation technologies, products and services</p>	<p>3.1.1 At least 50 roadshows are carried out to connect adaptation MSMEs to aggregator platforms, associations and cooperatives to raise awareness of the resilience and adaptation benefits of their technologies, products and services amongst vulnerable groups and communities in rural areas (40% of women and 20% for youth participation)</p> <p>3.1.2 Methodologies and guidebooks for assessing and quantifying adaptation and resilience benefits of projects developed and widely disseminated</p> <p>3.1.3: Four (4) training sessions highlighting the actual and potentially additional positive financial, economic and social impacts of climate adaptation TPS to SMEDA and FSPs will be</p>	LDC F	3,465,000.00	8,749,065.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing(\$)
			held (at least 40% women and 20% youth participants)			
			3.2.1: FSPs and MFIs supported to develop and improve de-risking and climate-adaptive guarantee instruments for lending to vulnerable groups			
			3.2.2: Innovative financial products and services adapted to the needs of the most vulnerable populations are made available through partner financial services providers, selected on a competitive basis			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing (\$)	Confirmed Co-Financing (\$)
4. Project Monitoring and Learning	Technical Assistance	4.1: Regular project monitoring and documentation for learning and knowledge sharing	<p>4.1.1: Regular project monitoring and data collection to track progress</p> <p>4.1.2: Knowledge materials and documentation on best-practices developed and disseminated widely</p> <p>4.1.3. Capacity enhancements of the Project Executing Entity to ensure long-term sustainability, retention of institutional knowledge and ability to engage funding partners in a more harmonized and consistent manner</p>	LDC F	510,000.00	2,318,531.00
5. Project Evaluation	Technical Assistance	5.1: Project evaluation	<p>5.1.1: Mid-term Evaluation</p> <p>5.1.2: Terminal Evaluation</p>	LDC F	190,067.00	300,000.00
<b>Sub Total (\$)</b>					<b>8,507,067.00</b>	<b>25,702,381.00</b>
<b>Project Management Cost (PMC)</b>						
LDCF					425,353.00	1,285,119.00

**Project Management Cost (PMC)**

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<b>Sub Total(\$)</b>	<b>425,353.00</b>	<b>1,285,119.00</b>
<b>Total Project Cost(\$)</b>	<b>8,932,420.00</b>	<b>26,987,500.00</b>

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**Please provide justification**

**C. Sources of Co-financing for the Project by name and by type**

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
GEF Agency	UNIDO	Grant	Investment mobilized	140,000.00
GEF Agency	UNIDO	In-kind	Recurrent expenditures	510,000.00
Recipient Country Government	SMEDA	Grant	Investment mobilized	2,000,000.00
Recipient Country Government	SMEDA	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	Environment Protection Agency (EPA)	Grant	Investment mobilized	1,000,000.00
Recipient Country Government	Environment Protection Agency (EPA)	In-kind	Recurrent expenditures	4,000,000.00
Private Sector	African Enterprise Challenge Fund (AECF)	Grant	Investment mobilized	6,000,000.00
Private Sector	African Enterprise Challenge Fund (AECF)	In-kind	Recurrent expenditures	500,000.00
Other	Private Finance Advisory Network (PFAN)	In-kind	Recurrent expenditures	10,000,000.00
Private Sector	ColdHubs	Equity	Investment mobilized	300,000.00
Private Sector	ESOKO	Equity	Investment mobilized	437,500.00
Private Sector	Easy Solar	Equity	Investment mobilized	300,000.00



Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Private Sector	Climate KIC	In-kind	Recurrent expenditures	800,000.00
<b>Total Co-Financing(\$)</b>				<b>26,987,500.00</b>

**Describe how any "Investment Mobilized" was identified**

PIF: Recipient Government -Investment mobilized was identified in close consultation with the recipient government agencies mentioned in the above table. Private Sector AECF ? is expected to work with MSMEs supported by the project and help them mobilize additional funding in form of catalytic grant and early-stage seed funding investments through their extensive networks. In particular, AECF will help MSMEs supported by the project in leveraging matching capital to expand and grow their businesses and hence reach out to more beneficiaries. PFAN (REEEP) ? will work with MSMEs supported by the project and provide them with investment facilitation services so that they can leverage investments to expand their projects (grants, debt, equity) from their global, regional and national private financing networks. Furthermore, PFAN (REEEP) has equally a focus on adaptation. This can be seen in their regular call for adaptation proposals (<https://pfan.net/pfanadaptation-call/>). Thus, the project will enable a select group of MSMEs to take part in the PFAN (REEEP) adaptation-focused workshops and mentoring programs. PFAN (REEEP) can provide business and investment support. - Equity Bank/Raw Bank ? is potentially providing long-term funding to incubated/accelerated MSMEs and can therefore provide matching capital - MSMEs ? are also expected to raise additional equity funding into their businesses and projects - The Climate Resilience and Adaptation Finance, Technology Transfer Facility (CRAFT) was foreseen to provide co-finance. PPG: During the PPG stage carried out between May 2021 and April 2022, most of the identified contributions at PIF stage were validated and additional contributions from other partners were identified, as identified in the co-finance table. The contributions from the (i) Recipient Government: EPA; (ii) Private Sector: AECF and PFAN were validated and increased. New contributions from the Private Sector ? Climate-KIC, MSMEs that will implement pilot adaptation business (ColdHubs, ESOKO and EasySolar) ? were identified at the PPG stage for supporting the operationalization of the Sierra Leone Adaptation Incubator/Accelerator and for building awareness and making available information on adaptation technologies, services and products to the country?s vulnerable population. The following provides some detail on how the provided co-finance will be used in the project: Climate-KIC: Will use its methodologies/resources ? namely developed methodology for adaptation incubation/acceleration, the tool that they are developing for the identification of the climate change risks and vulnerabilities, the gender toolkit ? to support the implementation of the activities that they are responsible for. Climate-KIC will be responsible for the following activities within the project: Activity 1.1.1.1, Activity 1.1.2.1, 1.2.2.1, 2.1.1.1, 2.1.1.2, 2.1.1.6, 2.1.2.2, and 2.1.3.3. Easy Solar, ESOKO and ColdHubs: These companies are the ones responsible for the implementation of the pilot project under Output 2.1.2. They will receive some support for the implementation their technologies/products/business models in Sierra Leone from the LDCF (~1/2 or 1/3 of the total cost of the project), as specified in their co-finance letters. PFAN: Through

its co-finance will support: (i) The implementation of some of the activities of the Incubator/Accelerator; (ii) Investor Connect activities; and (iii) some of the MSMEs that will go through the Incubator/Accelerator by providing further growth acceleration services.

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

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
UNIDO	LDCF	Sierra Leone	Climate Change	NA	8,932,420	848,580	9,781,000.00
<b>Total Grant Resources(\$)</b>					<b>8,932,420.00</b>	<b>848,580.00</b>	<b>9,781,000.00</b>

**E. Non Grant Instrument**

NON-GRANT INSTRUMENT at CEO Endorsement

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Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

**F. Project Preparation Grant (PPG)**

PPG Required **true**

**PPG Amount (\$)**

200,000

**PPG Agency Fee (\$)**

19,000

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
UNIDO	LDC F	Sierra Leone	Climate Change	NA	200,000	19,000	<b>219,000.00</b>
<b>Total Project Costs(\$)</b>					<b>200,000.00</b>	<b>19,000.00</b>	<b>219,000.00</b>

## Meta Information - LDCF

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LDCF true

SCCF-B (Window B) on technology transfer false

SCCF-A (Window-A) on climate Change adaptation false

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Is this project LDCF SCCF challenge program?

false

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

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

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

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

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This Project has an urban focus. true

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

Agriculture	40.00%
Natural resources management	30.00%
Climate information services	10.00%
Coastal zone management	0.00%
Water resources management	20.00%
Disaster risk management	0.00%
Other infrastructure	0.00%
Health	0.00%
Other (Please specify:)	0.00%
Total	100%

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

Sea level rise false

Change in mean temperature false

Increased climatic variability true

Natural hazards false

Land degradation true

Coastal and/or Coral reef degradation false

Groundwater quality/quantity false

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## Core Indicators - LDCF

### CORE INDICATOR 1

Total

Male

Female

% for Women

Total number of direct beneficiaries

131,000

78,600

52,400

40.00%

### CORE INDICATOR 2

Area of land managed for climate resilience (ha)

26,000.00

### CORE INDICATOR 3

Total no. of policies/plans that will mainstream climate resilience

4

### CORE INDICATOR 4

Male

Female

% for Women

Total number of people trained

6,252

3,751

2,501

40.00%

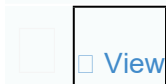
To calculate the core indicators, please refer to Results Guidance

## OBJECTIVE 1

Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaption

### OUTCOME 1.1

Technologies and innovative solutions piloted or deployed to reduce climate-related risks and / or enhance resilience



### OUTCOME 1.2

Innovative financial instruments and investment models enabled or introduced to enhance climate resilience

[View](#)

## OBJECTIVE 2

Mainstream climate change adaption and resilience for systemic impact

### OUTCOME 2.1

Strengthened cross-sectoral mechanisms to mainstream climate adaption and resilience

[View](#)

### OUTCOME 2.2

Adaptation considerations mainstreamed into investments

[View](#)

### OUTCOME 2.3

Institutional and human capacities strengthened to identify and implement adaptation measures

[View](#)

## OBJECTIVE 3

Foster enabling conditions for effective and integrated climate change adaption

### OUTCOME 3.1

Climate-resilient planning enabled by stronger climate information decision-support services, and other relevant analysis, as a support to NAP process and/or for enabling activities in response to COP guidance





[View](#)

## OUTCOME 3.2

Increased ability of country to access and/or manage climate finance or other relevant, largescale, pragmatic investment, as a support to NAP process and/or for enabling activities in response to COP guidance



[View](#)

## OUTCOME 3.3

Institutional and human capacities strengthened to identify and implement adaptation measures as a support to NAP process and/or for enabling activities in response to COP guidance



[View](#)

## Part II. Project Justification

### 1a. Project Description

#### describe any changes in alignment with the project design with the original pif

1. During the PPG phase the set-up of the project was further detailed based on the findings from the consultations to better adapt the project components to the situation in the country and its priorities. Although the structure and nature of the current project does not have significant changes if compared with the project design at PIF level, the table below describes the differences between the Request for CEO Endorsement (herein after called RCE) document and the approved PIF, with regards to the name of the activities and differenced in the stated indicators..

Table 1: Comparison of the Project Description Summary (Table B) between the original description at PIF stage and this RCE document

1.1 National policies and institutions in water, agriculture and energy sectors support and engage adaptation MSMEs in delivering their mandates with gender mainstreaming	1.1: An integrated mechanism with strong linkages to national adaptation planning processes is developed to support and engage adaptation MSMEs in delivering their mandates with gender mainstreaming.
1.1.1 The Directorate of Climate Change, SMEDA and support institutions in water, agriculture and energy sectors capacitated through improved tools, planning instruments (technology roadmaps and climate smart investment plans) and training to support and engage adaptation MSMEs in their operations	1.1.1: The Directorate of Climate Change, SMEDA and support institutions in water, agriculture and energy sectors capacitated through improved tools, planning instruments (technology roadmaps and climate smart investment plans) and trained to support and engage adaptation MSMEs in their operations, through three (3) specialised education and training courses on climate change and climate change adaptation TPS for 60 stakeholders (at least 40% women participation and 20% youth participation)
1.1.5 Climate data collection to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance	1.1.3: Climate data collection to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance
1.1.3 Inter-ministerial coordination mechanism established to promote the integration of adaptation and resilience through engaging adaptation MSMEs in the water, agriculture and energy sectors	1.1.2: Inter-ministerial coordination mechanism established to promote the integration of adaptation and resilience through engaging adaptation MSMEs in the water, agriculture and energy sectors alongside the establishment of an Adaptation Innovation Platform to implement national strategies and involving relevant stakeholders (at least 40% women and 20% youth)
	1.2: Business environment for climate adaptation innovation is improved

<p>1.1.2 Relevant policies and strategies, related to water, energy and agriculture are updated and incentives established, in a gender responsive manner, to promote the role of adaptation MSMEs in the respective sectors</p>	<p>1.2.1: At least four (4) policy and regulatory recommendations to improve the climate adaptation business environment developed with a gender perspective (with at least 40% women and 20% youth participation)</p> <p>1.2.2: Two (2) national fora held for 70 national and subnational policymakers to raise awareness on climate adaptation innovation TPS, entrepreneurship, and sustainable and innovative financial mechanisms (with at least 40% of women and 20% of youth participation)</p>
<p>1.1.4 Technology show-casing and testing labs for climate adaptation and resilience technology innovations established</p>	<p>1.2.3: Technology show-casing laboratory at EPA office in BO strengthened for climate adaptation and resilience technology innovations</p>
<p>2.1.1 Adaptation innovation ecosystem development workshops and events organized</p>	<p>1.2.4: Four (4) adaptation clusters are created and nurtured in Sierra Leone (with at least 40% of women and 20% of youth participation)</p>
	<p>2.1.1: 150 MSMEs, entrepreneurs, start-ups are trained on climate adaptation topics to increase their capacities to understand climate risks and vulnerabilities and to identify business opportunities for climate change adaptation during the Pre-Accelerator Programme (with at least 40% women and 20% youth led enterprises))</p>
<p>2.1.2 Existing business development accelerators and incubators are trained to apply climate adaptation and resilience specific curriculum and run 6 business accelerators for adaptation MSMEs in water, agriculture and energy sectors</p>	<p>2.1.2: Four (4) existing business development accelerators are trained to run the annual cycles of climate change adaptation-oriented technology innovation and entrepreneurship competition-based accelerators.</p> <p>At RCE stage this indicator was adapted to the reality on the ground and thus reduced to support only 4 existing incubators/accelerators as only a reduced number of incubators/accelerators exist in Sierra Leone.</p>

<p>2.1.3 At least 200 high-impact adaptation MSMEs are trained and coached through competition-based business accelerators to grow their businesses and operations</p>	<p>2.1.3: 150 high-impact adaptation MSMEs are trained and coached through the Incubator/Accelerator Programme to overcome the Technological valley of Death (with at least 40% women and 20% youth led enterprises)</p> <p>This number of MSMEs to be targeted has been reduced to take into account the feedback collected during consultations at the PPG stage, where all consulted stakeholders stated that the initial number of MSMEs to be engaged in the SL Adaptation Incubator/Accelerator programmes to be high. Therefore the number of targeted MSMEs has been reduced, also to further emphasize on specific support that has been requested through the consultations regarding: (i) building the capacity of existent MSMEs on entrepreneurs and business related subject as well as on adaptation and adaptation TPS to identify the MSMEs to be targeted by the SL Adaptation Incubator/Accelerator programme; (ii) the need of the programmes of the SL Adaptation Incubator/Accelerator to adapt to the different needs of the supported MSME, and thus provide tailor made programmes for each MSMEs; (iii) providing seed funding to different companies in all the programmes (for testing of adaptation TPSs concepts, prototypes, up to support scale-up/market growth) thus fostering the creation of adaptation TPS adapted to the needs of the country. This more focused approach will also enable the project to additionally support strengthening national key stakeholders and as such build a stronger baseline for further interventions in Sierra Leone.</p>
<p>2.2.1 More than 80 successful adaptation MSMEs in the water, agriculture and energy sectors receive tailored business growth support services and result-based seed funding to expand and scaleup their business operations (making special efforts to reach out to female-led entrepreneurs to achieve fair share of female-led and/or gender balanced MSMEs)</p>	<p>2.2.1: 50 successful MSMEs, entrepreneurs and start-ups are trained and coached through the Advanced Acceleration Programme to receive early-growth financing and overcome the Commercialization Valley of Death (with a target to receive 40% women-led and 20% youth-led applications).</p> <p>The reasons for the reduction on the targeted number of MSMEs to be support in the Advanced Acceleration Programme is the one provided for output 2.1.3.</p>
<p>2.2.2 At least 30 high impact and replicable projects by adaptation MSMEs involving the deployment of innovative adaptation technologies, products and services in water, agriculture and energy sectors receive tailored investment facilitation support services and secure funding</p>	<p>2.2.2: 20 MSMEs entrepreneurs and start-ups receive investment facilitation support in the Post-Acceleration Programme for projects that deliver climate adaptation technologies and solutions at scale (with a target to receive 40% women-led and 20% youth-led applications)</p> <p>The reasons for the reduction on the targeted number of MSMEs to be support in the Post- Acceleration Programme is the one provided for output 2.1.3.</p>

	<p>2.2.3: The Climate Adaptation Venture Fund is established and operationalized to financially support at least 20 climate change adaptation enterprises (with a target to receive 40% women-led and 20% youth-led applications) and to de-risk and leverage public/ private investment.</p> <p>Having into account that the MSMEs to be supported will be MSMEs involved in the Adaptation Incubator/Accelerator Programmes, and that in Output 2.1.4, not only the project will support the pairing of companies but also supporting financially the implementation of pilot adaptation TPS, this number was reduced to 20.</p>
Output 2.1.4: Business replication, expansion and partnership services provided to help regional and global adaptation MSMEs establish climate resilient business operations in Sierra Leone	This output at PIF stage was to just pair regional and international companies with local entrepreneurs. As per discussions held with the national stakeholders during the PPG stage, and to demonstrate what adaptation TPS are, three (3) adaptation TPS business proposals identified to be supported by the project as pilots. These demonstrate different types of adaptation TPS and business models, that can be used with those.
2.2.3 SMEDA and existing FSPs trained to strengthen and roll out their MSME financing schemes that have a focus on adaptation	
3.1.1. Adaptation MSMEs participate in annual roadshows and are connected to aggregator platforms and cooperatives to raise awareness of the resilience and adaptation benefits of their technologies, products and services amongst vulnerable groups and communities in rural areas	3.1.1 At least 50 roadshows are carried out to connect adaptation MSMEs to aggregator platforms, associations and cooperatives to raise awareness of the resilience and adaptation benefits of their technologies, products and services amongst vulnerable groups and communities in rural areas (40% of women and 20% for youth participation)
3.1.3 Financial service providers (FSPs) and MFIs trained to assess and capture resilience and adaptation benefits of projects in their portfolios and pipelines	3.1.3: Four (4) training sessions highlighting the actual and potentially additional positive financial, economic and social impacts of climate adaptation TPS to SMEDA and FSPs will be held (at least 40% women and 20% youth participants)
3.2.2 FSPs and MFIs selected on a competitive basis to establish and operate revolving funds that support the acquisition of climate adaptation technologies, products and services by the most vulnerable populations (to reach at least 250,000 beneficiaries)	3.2.2 Innovative financial products and services adapted to the needs of the most vulnerable populations are made available through partner financial services providers, selected on a competitive basis
	4.1.3. Capacity enhancements of the Project Executing Entity to ensure long-term sustainability, retention of institutional knowledge and ability to engage funding partners in a more harmonized and consistent manner

Table 2 Comparison of the budget allocation to Components between the original PIF and the RCE document:

Budget allocation at PIF (original)	Budget allocation at RCE (current document)
PC1: GEF: USD 757,000.00 Co-finance: USD 1,187,335.00	PC1: GEF: USD 767,000.00 Co-finance: USD 2,236,285.00
PC2: GEF: USD 3,200,000 Co-finance: USD 10,001,500.00	PC2: GEF: USD 3,575,000.00 Co-finance: USD 12,098,500.00
PC3: GEF: USD 4,150,000.00 Co-finance: USD 7,073,939.00	PC3: GEF: USD 3,465,000.00 Co-finance: USD 8,749,065.00
PC4: GEF: USD 310,000.00 Co-finance: USD 1,328,235.00	PC4: GEF: USD 510,000.00 Co-finance: USD 2,318,531.00
PC5: GEF: USD 90,067.00 Co-finance: USD 300,000.00	PC5: GEF: USD 190,067.00 Co-finance: USD 300,000.00

**1a. Project Description.** Elaborate on: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description); 2) the baseline scenario and any associated baseline projects; 3) the proposed alternative scenario with a brief description of expected outcomes and components of the project; 4) alignment with GEF focal area and/or Impact Program strategies; 5) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing; 6) global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF); and 7) innovativeness, sustainability and potential for scaling up.

## **1) THE GLOBAL ENVIRONMENTAL AND/OR ADAPTATION PROBLEMS, ROOT CAUSES AND BARRIERS THAT NEED TO BE ADDRESSED (SYSTEMS DESCRIPTION);**

### **1.1 Country Context**

2. The Republic of Sierra Leone is a small low-income country on the West African coast on the Atlantic Ocean shore, with 7.98 million inhabitants (50.1% women, 49.9% men)[1]1 with the majority living in rural areas (58%). Freetown is the capital city and the most populated one, in addition to being a major port city with a large deep-water harbour. 60% of the population is living below the international poverty line (US\$1.90/day) and 10.8% of the population is living in extreme poverty (people living on less than US\$1.90/day), making it one of the poorest countries in Sub-Saharan Africa. Poverty is frequent in rural areas where 72.4% of the population is poor, while in Freetown the rate is at 18.5%. The population of Sierra Leone is young (62% is under 24 years old) and there is high unemployment among low and semi-skilled youth driven by the fact that they were not able to complete their education due to the civil war (almost half of the population is illiterate).

3. In terms of Gross Domestic Product (GDP), Sierra Leone generated 3.86 billion USD in 2020[2]2. The country experienced 11 years of civil war, the fall of the iron ore prices and the two-years of Ebola crisis (2014-2016), in addition to political instability all of which resulted in severe

socio-economic repercussions. However, Sierra Leone's economy has been recovering slowly since the civil war, with GDP growing at 3.4% on average per year between 2002-2019[3]3. The GDP per capita in Sierra Leone reached US\$484 (at current US\$) in 2020[4]4. In terms of Human Development Index (HDI), it ranks 182 out of 189 countries and territories around the world, and its HDI value (0.452) is below the average of the low human development group value (0.513) and below the Sub-Saharan Africa (SSA) average value (0.547)[5]5. In the West African context, Sierra Leone's HDI is similar to Burundi and Guinea which have HDIs ranked 185 and 178, respectively5.

4. The economy is heavily dependent on natural resources and has been mainly driven by agriculture (including agriculture, forestry and the fishery sectors). In 2019, agriculture represented 55% of the GDP, while the service sector represented 37% and the industry sector 7%[6]6. In spite of agriculture being a main contributor to the local economy, the Government of Sierra Leone's Comprehensive Food Insecurity and Vulnerability Analysis reports that in 2020 57% of the population (4.7 million people) was food insecure[7]7, with 70% of the food insecure people living in rural areas.

5. Although the economy was showing signs of recovery, the COVID-19 pandemic has had a negative impact that is expected to jeopardize the gains achieved up to 2019 ? mainly due to a contraction of the service sector (tourism and trade) and the dampening of the manufacturing and construction, due to the necessary flight and containment restrictions[8]8.

6. The country is divided in four (4) different geographical regions: (i) coastal Guinean mangroves; (ii) the wooded hill country; (iii) an upland plateau and (iv) the eastern mountains. The country is divided into 4 regions (Northern, Eastern, Southern and Freetown/Western) that are divided in 16 districts. Sierra Leone's climate is hot and humid with two typical seasons: a rainy season in the summer (May to November) and a dry season in the winter (December to April) (additional information on the climate follows below in Section 1.2.)

7. The coastal area registers the highest rainfall with 3,000-5,000 mm per year and decreases toward inland, registering between 2,000-2,500 mm at the eastern boarder[9]9. In terms of surface water, the country has five (5) main rivers: Little Scarcies, Rokel, Jong, Sewa and Moa rivers that flow from Northeast to Southwest. In addition, there are six (6) smaller drainage basins: Great Scarcies, Lokko, Rokel Estuary, Western, Robbi/Thauka and Sherbro Water Resources Areas. Surface run water is highly seasonal and reflects the seasonal distribution of rainfall.

## **1.2 Climate risk and vulnerability assessment, and validation of the findings**

8. The present Project Document outlines a detailed Climate Risk and Vulnerability Assessment (CRVA) conducted for Sierra Leone, which is included in the Baseline Report (Annex P).

9. The developed CRVA takes an innovative approach for baseline analysis since it applies existing methodologies and models, as well as captures new collected information and valuable insights from

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local stakeholders. When assessing vulnerability and climate change risks, it is important to take local experiences into account through individual or group interviews with the aim of obtaining local knowledge and information about the concerning sectors that have proved most vulnerable to the climate impacts in the past. In some cases, this will be obvious from evidence of damage on buildings, water shortage, low crop yield, but in other cases, the evidence may have been lost through destruction or demolition of affected properties. Studies such as the one presented in the World Bank (WB) Group's Climate Change Knowledge Portal (CCKP)[10]10 have investigated future changes in the climate of Sierra Leone under different emission scenarios. However, local data is of extreme value to incorporate a deeper level of local stakeholder's opinions, beliefs and perceptions in the analysis and thus, the CRVA also involved an extensive stakeholders' consultation process. In this assessment, the information retrieved from different sources (Global Hotspot Explorer[11]11 (GHE) from the GEF-UNIDO Integrated Solutions for Water, Energy and Land (ISWEL) Project[12]12, CCKP, and ThinkHazard[13]13) is completed with information gathered from the stakeholder's consultation on the ground as well as from secondary data (data collected from existing sources such as: news, review articles, papers, others).

10. Vulnerability is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity (IPCC 2014). Adaptation to climate change and risks takes place in a dynamic social, economic, technological, biophysical, and political context that varies over time, location, and sector. This complex mix of conditions determines the capacity of systems to adapt. Thus, through an assessment of the adaptive capacity we were able to identify the vulnerable regions and vulnerable groups of Sierra Leone that will be targeted by this proposed Adaptation project.

11. The tools used in the methodology described previously are included in Table 3 below. The data collected was then analysed in order to identify the geographical areas to be targeted by the Adaptation Project.

Table 3 Tools used to identify vulnerable locations and vulnerable groups in Sierra Leone

Tool	Description
Global Hotspot Explorer	The GHE is a GEF product developed under the project called Integrated Solutions for Water, Energy and Land[14]14. The ISWEL project was developed by the International Institute for Applied Systems Analysis (IIASA) (together with input from UNIDO, GEF and the Project Steering Committee). The GHE is a visualisation tool that is based on a model that combines data from a range of climate, hydrological and integrated assessment models to calculate indicators for scenarios of socioeconomic and climate change for the Water, Energy and Land sectors. It is a multi-risk assessment tool that allows spatial analysis of climate change indicators affecting the three sectors under 3 different climate change scenarios ? 1?C, 1.5?C and 3?C.



Stakeholders? consultation	An online questionnaire was conducted to learn and be informed about risks and hazards experienced or known by selected stakeholders in Sierra Leone. This local knowledge is also very important to learn about their perception of climate change hazards as it might differ from the outcome of tools or models publicly available.
WB Climate Change Knowledge Portal (CCKP)[15] <sup>15</sup>	This WB CCKP provides an online tool for access to comprehensive global, regional, and country data related to climate change and development.
ThinkHazard[16] <sup>16</sup>	ThinkHazard provides a general view of the hazards, for a given location, that should be considered in project design and implementation to promote disaster and climate resilience. The tool highlights the likelihood of different natural hazards affecting project areas (very low, low, medium and high), provides guidance on how to reduce the impact of these hazards, and where to find more information. The hazard levels provided are based on published hazard data, provided by a range of private, academic and public organizations.
Secondary data	Data collected from existing sources such as: news, review articles, statistical databases (e.g., indexes), papers, etc.

12. Section 1.2 presents an assessment of: 1.2.1 Climate Baseline, 1.2.2 Climate Future, 1.2.3 Climate-related hazards in Sierra Leone, 1.2.4 Identification of the locations that are more prone to climate impacts and risks in Sierra Leone, 1.2.5 Climate change impacts on the Water, Energy and Food (WEF) sectors, 1.2.6 Analysis of adaptive capacity and assessment of vulnerable segments of the population, 1.2.7 Conclusions of the CRVA.

### 1.2.1 Climate Baseline:

13. Sierra Leone has a tropical climate classified as A in the Köppen-Geiger Climate Classification[17]<sup>17</sup> (shown in Figure 1): tropical monsoon climate (Am category) near the coast and in the country's southern region; and tropical savanna climate (As/Aw category) in the centre and North-Northeast part of the country. The climate is predominantly hot and humid with two typical seasons: a rainy season in the summer (May to November) and a dry season in the winter (December to April), the latter dominated by winds from the northeast (the North-east trades) from the Sahara Desert. These seasons may have variations in their commencement and duration, and they are characterised by different temperatures and rainfall patterns. The average annual temperature range is 25°C -27°C with slightly lower temperatures (22°C - 25°C) during the wet season. In relation to humidity, it can reach 93% in the rainy season near the coast and decrease to 47% inland as the rainfall declines. As Sierra Leone is close to the equator, there is little variation in the day length.

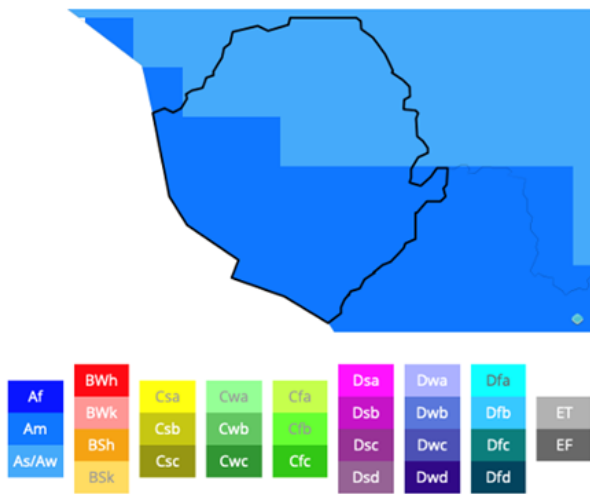
14. The precipitation in the country during the rainy season is controlled by the tropical rain belt (Inter-Tropical Convergence Zone ? ITCZ), that oscillates between the Northern and Southern tropics over the year. The country has an annual precipitation of 2,746 mm, with rainfall the highest rainfall registered along the coast (3,000-5,000 mm/year) decreasing when moving inland (registering between 2,000-2,500 mm at the eastern boarder)[18]<sup>18</sup>. As shown in Figure 1, and corroborated by the Sierra

Leone National Adaptation Plan (NAP) 2021, the average monthly precipitation peaks in July/August with an average of 27 rainy days a month. Table 4 shows the historical information of the climate variables and Figure 1 the average monthly temperature and rainfall for Sierra Leone (1991-2020).

Table 4: Summary of Climate Variables[19]<sup>19</sup>

Climate variables	1991-2020
Mean Annual Temperature [20] <sup>20</sup>	26.55°C
Mean Annual Rainfall[21] <sup>21</sup>	2,746 mm
Mean Maximum Annual Temperature	31.84°C
Mean Minimum Annual Temperature	21.45°C

Köppen-Geiger Climate Classification, 1991-2020



Monthly Climatology of Mean-Temperature and Precipitation in Sierra Leone from 1991-2020

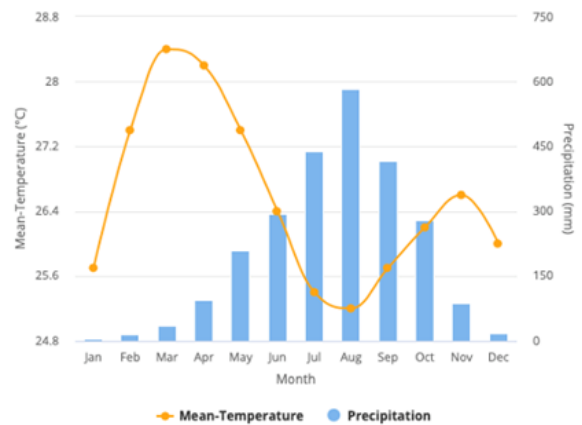


Figure 1: Sierra Leone Climate classification and monthly climatology between 1991-2020[22]<sup>22</sup>

15. It is important to refer that although standard weather data was collected in the country, prior to 2005 there were no automatic weather stations in Sierra Leone. The Sierra Leone NAP 2021 refers that there are cases of water scarcity due to the delayed onset of the monsoon's rains, and when heavy rain arrived there has been extensive flooding.

### Temperature

16. Since 1960, mean average temperature in Sierra Leone has increased 0.8°C, on an average of 0.18°C per decade, with more increased positive anomalies registered since the late 1980's (calculated using 1961-1990 as a base period), as depicted in Figure 2. This is also demonstrated in Figure 3, where the mean temperature in recent years (period between 1991-2020) is higher than the ones registered for the periods between 1901-1930 and 1961-1990.

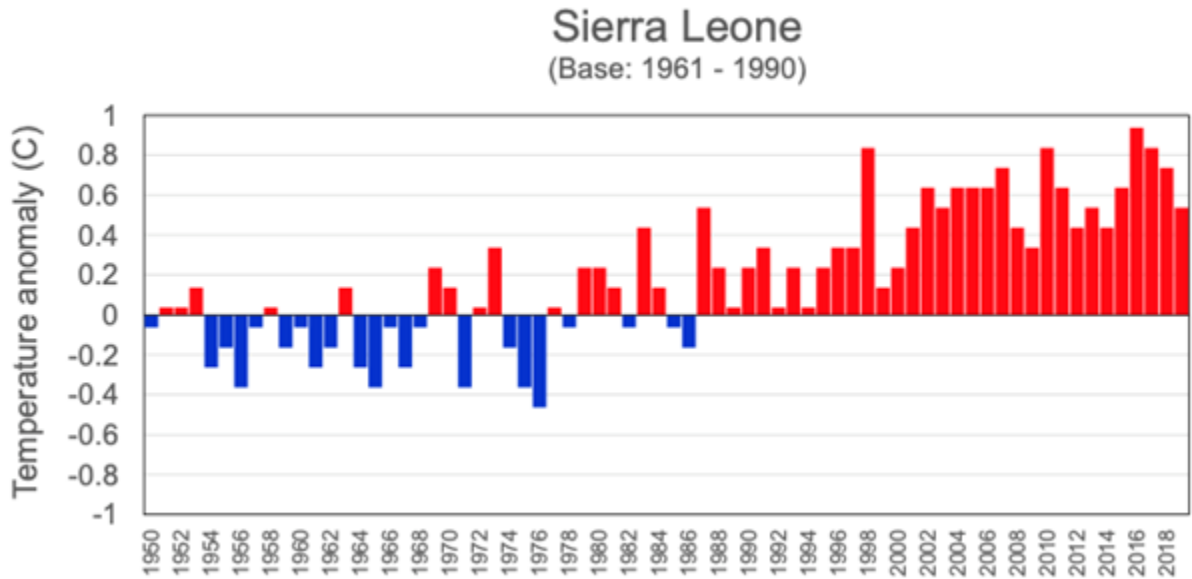


Figure 2: Sierra Leone Annual temperature anomalies increase since 1950-2019 in relation to the 1961-1990 mean[23]<sup>23</sup>

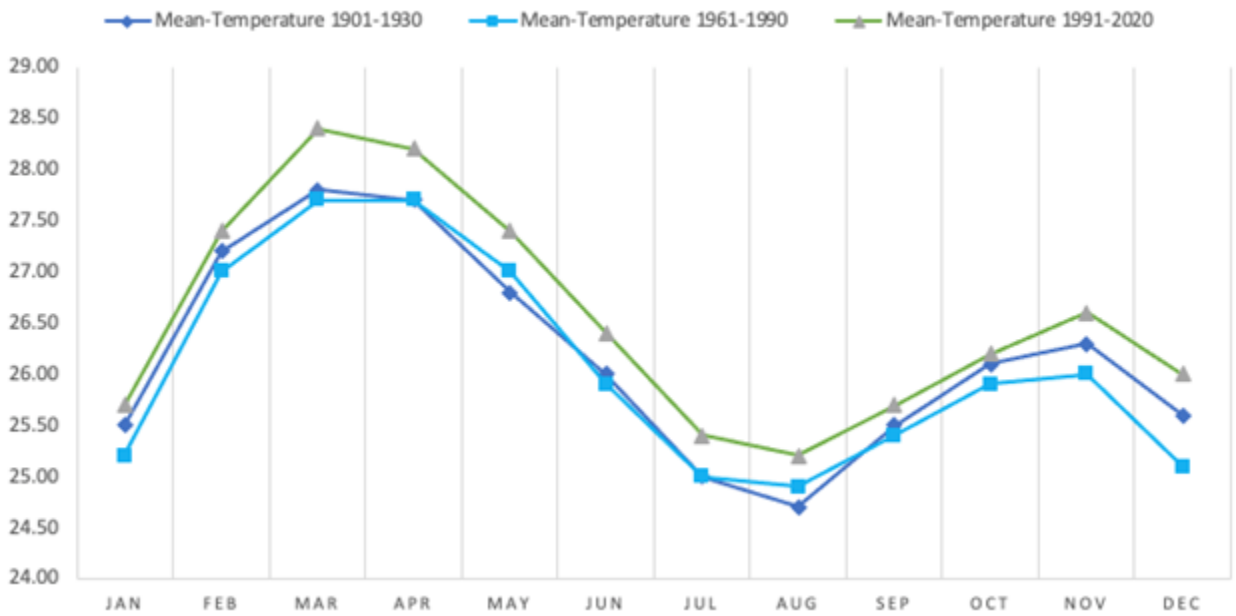


Figure 3: Average mean temperature variation between Different periods[24]<sup>24</sup>

17. According to the analysis carried out in the Sierra Leone NAP 2021, between 1981 and 2019, there was evidence of:

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A decrease in the diurnal temperature range (decreased difference between the maximum and minimum temperatures).

The annual percentage of cold nights and annual percentage of cold days presents a decreasing trend over the last 40 years.

Increased trends are evident in the frequency of days with maximum temperatures above the median, as well as in the indices of warm nights and warm days. These changes are found in all temperatures: annual daily mean temperature, the annual coldest daily minimum temperature, and the annual warmest daily temperature.

### **Precipitation**

18. As referred in the Sierra Leone NAP 2021, the overall rainfall has decreased since 1960. The 1960's and late 1970's were particularly wet, in opposition to 1970's and 1980's that were very dry[25]25. In addition, the precipitation has become more erratic in the last 50 years, with delays in the start of the rainy season being witnessed recently. Stronger winds and more frequent rain/storms are now felt in the pre-monsoon period (between April and June). In addition, calmer and dryer weather appears now to be associated with the September ? November period, which was formally characterised by frequent thunder and lightning and short but heavy rainfall.

19. In terms of geography, although the seasonal cycle of precipitation is similar, the rainfall varies a lot depending on the particular location in the country. The highest precipitation is found in the coastal area and the lowest precipitation in the eastern area.

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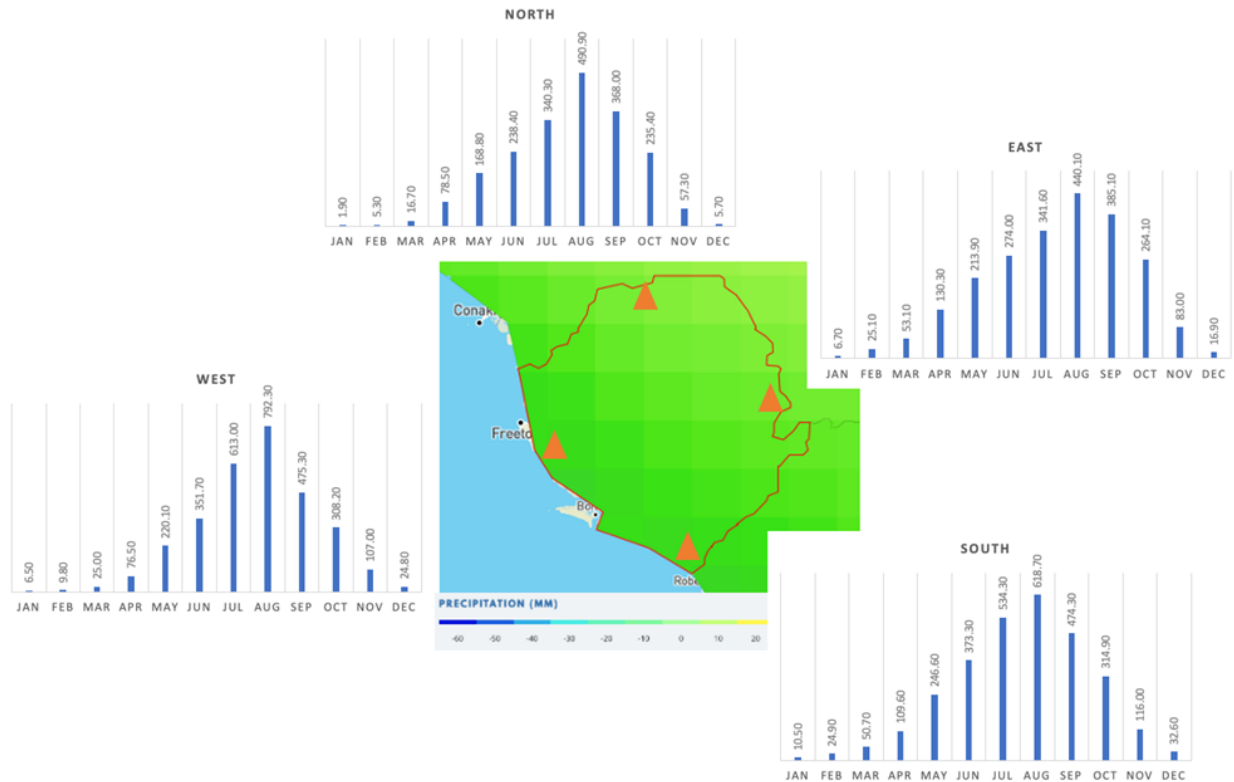


Figure 4: Monthly climatology of precipitation registered in Sierra Leone between 1991-2020[26]<sup>26</sup>

### 1.2.2 Climate Future

20. The projected climate change future shown in this document is based on the information available on the WB CCKP26, also used in Sierra Leone Revised Nationally Determined Contributions (NDC) of 2021[27]27 and in line with the projections included in the Sierra Leone NAP of 2021[28]28, which is based on the CMIP5[29]29 (Coupled Model Intercomparison Project - Phase 5) data ensemble, built of the database for the global climate change projections presented in the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). The climate futures are thus presented for four (4) Representative Concentration Pathways (RCP2.6, RCP4.5, RCP 6.0 and RCP8.5) selected and defined by their total relative force (cumulative measure of GHG emissions from all sources) pathway and level by 2099. While the RCP2.6 represents the very strong mitigation scenario, and thus, the low emission one, the RCP8.5 represents the business-as-usual scenario, and thus, the high emission scenario. RCP4.5 and RCP6.0 are intermediate emission scenarios, the first called medium-low emission scenario and the second medium-high emission scenario.

21. Recently in February 2022, the IPCC released the second part of its Sixth Assessment Report, *Climate Change 2022: Impacts, Adaptation and Vulnerability*, where it is further recognised

the interdependence of climate, ecosystems and biodiversity, and human societies and integrates knowledge more strongly across the natural, ecological, social and economic sciences than earlier IPCC assessments. The assessment of climate change impacts and risks as well as adaptation is set against concurrently unfolding non-climatic global trends e.g., biodiversity loss, overall unsustainable consumption of natural resources, land and ecosystem degradation, rapid urbanisation, human demographic shifts, social and economic inequalities and a pandemic. The report also pays special attention to **risk**, which provides a framework for understanding the increasingly severe, interconnected and often irreversible impacts of climate change on ecosystems, biodiversity, and human systems; differing impacts across regions, sectors and communities; and how to best reduce adverse consequences for current and future generations. This report identifies 127 key risks. Approaches to analysing and assessing vulnerability have evolved since previous IPCC assessments. Vulnerability is widely understood to differ within communities and across societies, regions and countries, also changing through time. **Adaptation** plays a key role in reducing exposure and vulnerability to climate change. Adaptation is often organized around resilience as bouncing back and returning to a previous state after a disturbance. More broadly the term describes not just the ability to maintain essential function, identity and structure, but also the capacity for transformation. This report recognises the value of diverse forms of knowledge such as scientific, as well as local knowledge in understanding and evaluating climate adaptation processes and actions to reduce risks from human-induced climate change. This report has a particular focus on transformation and system transitions in energy; land, ocean, coastal and freshwater ecosystems; urban, rural and infrastructure; and industry and society.[30]<sup>30</sup>

22. Table 5 summarises the projected changes for essential climate variables under both the low (RCP2.6) and high (RCP8.5) emission scenarios over four (4) different time periods and Figure 5 show the historical and projected increase in temperature and annual rainfall under the four (4) emission scenarios (RCP2.6, RCP4.5, RCP 6.0 and RCP8.5) until 2099. As it can be seen, annual mean temperature in Sierra Leone is expected to rise by 1.69°C (1.16°C to 2.89°C) in 2040-2059 and by 3.42°C (2.22°C to 5.43°C) by 2080-2099 (both under the RCP8.5) when compared to the registered values between 1986-2005. Annual precipitation is expected to rise by 4.87 mm (-399.98 mm to 438.92 mm) in 2040-2059 and by 78.18 mm (-716.54 mm to 761.77 mm) in 2080-2099 (both under the RCP8.5) when compared to the registered values between 1986-2005.

Table 5: Projected changes in temperature and precipitation in the low and high emission scenarios (Ensemble)[31]<sup>31</sup>

		Registered	Projected Changes							
			Low emission scenario (RCP2.6)				High emission scenario (RCP8.5)			
		1986-2005	2020-2039	2040-2059	2060-2079	2080-2099	2020-2039	2040-2059	2060-2079	2080-2099
Annual Temperature Anomaly (°C)	Range	26.18	0.37 to 1.55	0.43 to 2.14	0.43 to 2.22	0.45 to 2.44	0.64 to 1.55	1.16 to 2.89	1.66 to 4.08	2.22 to 5.43
	Mean		0.76	0.99	1.02	0.98	0.95	1.69	2.54	3.42
	%		2.9%	3.8%	3.9%	3.8%	3.6%	6.4%	9.7%	13.1%
Annual Precipitation Anomaly (mm)	Range	2,439.45	-	-	-	-	-	-	-	-
			404.17 to 391.71	439.87 to 428.84	451.75 to 397.37	501.68 to 313.37	361.89 to 339.30	399.97 to 438.93	514.35 to 592.62	716.54 to 761.77
	mm		-53.41	-11.68	-36.84	-4.99	-12.13	4.87	68.59	78.18
	%		-2.2%	-0.5%	-1.5%	-0.2%	-0.5%	0.2%	2.8%	3.2%

Note: the range is the 10<sup>th</sup>-90<sup>th</sup> percentile, the mean the 50<sup>th</sup> percentile and the %, is the % of change in relation to the registered values in the period 1986-2005.

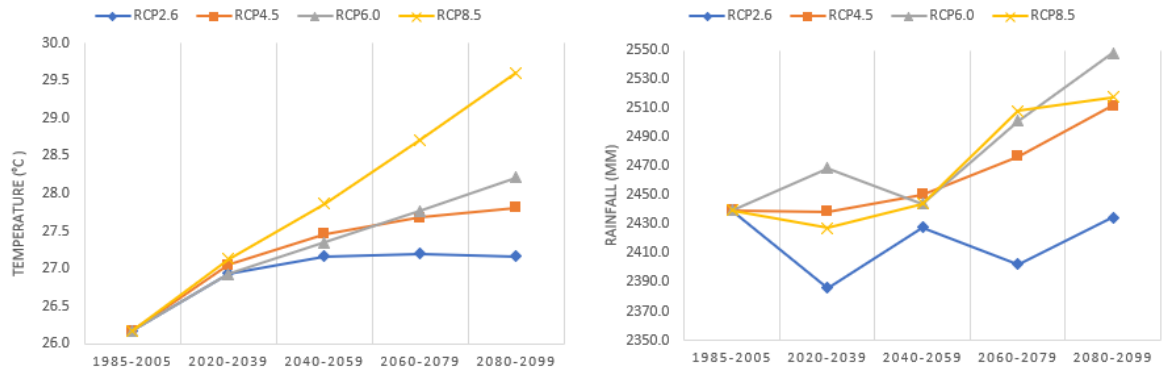


Figure 5: Projected changes in temperature (left) and in rainfall (right) in the four emission scenarios (Ensemble)31

## Temperature

23. Across all four emission scenarios, temperatures are expected to continue to rise in Sierra Leone through the end of the century (Figure 5). Under the high emission scenario (RCP8.5), average temperatures will rise rapidly by mid-century onwards. In the medium-high (RCP6.0) and medium-low (RCP4.5) emission scenarios temperatures are expected to rise in Sierra Leone but not so significantly. In terms of geography, the highest temperature increases are expected to occur in the Northern part of the country[32]32.

24. The Heat Index 35 (Figure 6) ? total count of the number of days per year where the daily mean heat index rises above 35°C[33]33 ? is expected to increase with time in most of the emission scenarios. Within the RCP8.5 (Ensemble), the Heat Index 35 is expected to increase significantly, rising 216 days (2 days to 322 days) in 2080-2099 compared with the values of 1986-2005. Hot days (with  $T_{max} > 35^{\circ}\text{C}$ ) and hot nights (tropical nights with  $T_{min} > 20^{\circ}\text{C}$ ) are also expected to rise to 165 days and 75 days in 2080-2099, respectively, in the RCP8.5 compared to 1986-2005. This increase in hot days and hot nights is expected to occur faster along the coast than inland[34]34. In the high-emission scenario the highest rise in temperature is expected for the period between November and May. Rising heat and more frequent and extreme and intense extreme heat conditions will impact human and animal health, agriculture, water resources and ecosystems.

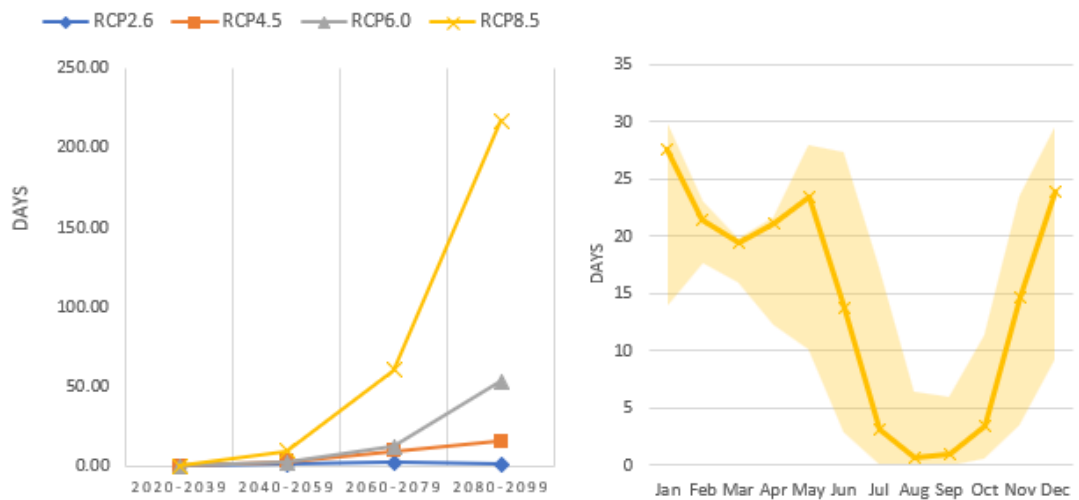


Figure 6: Projected changes in Heat Index 35 (left) in the four emission scenarios and projected change in hot days ( $T_{max} > 35^{\circ}\text{C}$ ) for 2080-2099 in the RCP8.5 (Ensemble)[35]35

## Precipitation



25. As referred, Sierra Leone meteorological network and observations records are scarce and thus posing a challenge in the rainfall projections. According to the projections shown in Table 5 and Figure 5:

Although not significant, there is a slight increase in annual precipitation across all scenarios in comparison to registered values in the 1986-2005 period. Annual precipitation is expected to vary over time and scenarios too, between a decrease of 2.2% (projected under the RCP2.6 scenario for 2020-2039) and an increase of 4.4% (projected under the RCP6.0 scenario for 2080-2099). The highest increases are in general expected for the period 2040-2059 onwards. According to the WB CCKP projections under the Ensemble CMIP5 model, precipitation is expected to increase between 3% (RCP2.6) and 5% (RCP6.0) in 2099 when compared to 1985-2005 mean values.

Erratic precipitation change:

Showing for the near future (2020-2039) an increase in rainfall for some scenarios (e.g., rainfall is expected to rise by 1.2% in the RCP6.0) and decreases for the other scenarios (e.g., rainfall is expected to decrease in the RCP2.6, RCP4.5 and RCP8.5 by 2.2%, 0.02% and 0.5%, respectively).

In the RCP2.6 and RCP6.0 annual precipitation increases and decreases over the years.

26. In terms of monthly precipitation (Figure 7), the changes in rainfall are projected to occur along Sierra Leone coast and Southern region, decreasing then towards the Northeast. Seasonally, more rainfall is expected to fall between the months of June/July to November/December, aggravating the rain intensity during the rainy season, thus increasing the occurrence of extreme weather events. This, in turn, is also expected to translate into longer lasting dry spells. Most pronounced expected impacts will be felt in the country's water balance and by the likely increase of floods.

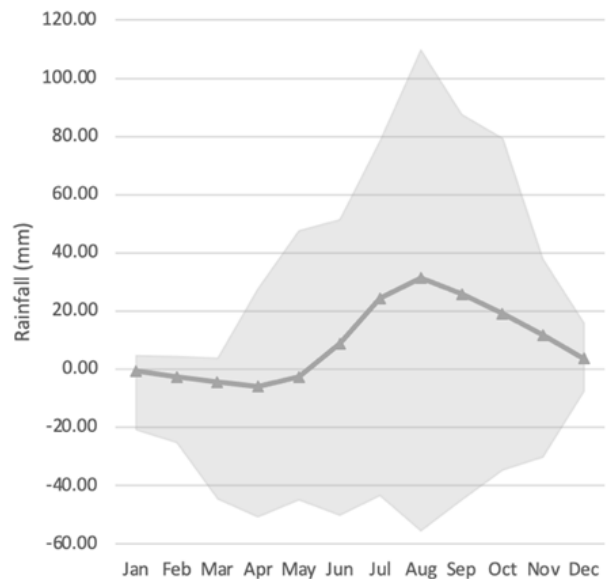
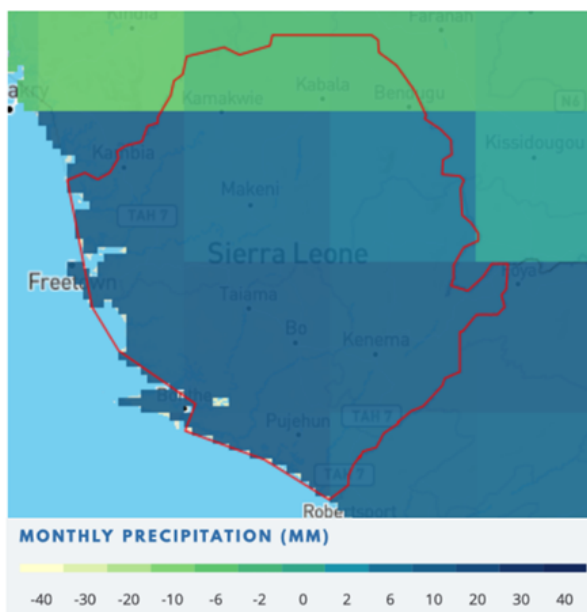


Figure 7: Projected changes in monthly precipitation in Sierra Leone in (mm) for 2080-2099 under the RCP6.0 compared to 1986-2005 (Ensemble) [36]<sup>36</sup>

### 1.2.3 Climate-related hazards in Sierra Leone:

27. Sierra Leone is ranked 157 out of 181 in the Notre Dame Global Adaptation Index (ND-GAIN) in terms of vulnerability to climate change with high vulnerability and low readiness[37]<sup>37</sup>. Sierra Leone is at risk for many natural disasters, including floods (river, urban and coastal), landslides (these ones intensified by the results of land use change due to human activity), extreme heat and wildfires. Vulnerability to these hazards is exacerbated by deforestation, extreme poverty, structural weaknesses in the economy, civil conflict, disease outbreaks (Ebola and COVID) and lack of capacity for growth and development[38]<sup>38</sup>. In fact, landslides are often a product of land use decisions that associated with a weather event ? such as intense precipitation ? in locationlocations of loose soil can lead to that specific hazard. Deforestation is a result of the human overexploitation of wood resources for wood production and/or tree abatement to be used as fuel for heating and cooking purposes. High rates of deforestation increase soil erosion and this soil, in the case of heavy / intense precipitation events, can be dislocated leading to a landslides. This was the case of the event registered in 14<sup>th</sup> of August 2017 in Freetown, where 500 lives were lost in a severe flooding event and landslide that occurred in the city, following 3 days of intense and consecutive rain[39]<sup>39</sup>. In fact this was recognised by several of the consulted stakeholders that referred *?Flooding in Freetown on the 14<sup>th</sup> of August 2017 that was caused by heavy rain with which 500 lives were lost?; ?In the Eastern part of Freetown, climate change is seriously affecting the communities in terms of water shortages as a result of people cutting down the vegetation on the Peninsular tops and destroying the water catchments areas thereby lowering water levels in the water tables.?*

28. Several natural hazards have already been experienced by the population ? strong winds, thunderstorms, landslides, heat waves, floods and seasonal droughts. Between 1990-2018 as shown in Table 6 and Figure 8 epidemic events have occurred most frequently (53% occurrence), although these were not the ones that affected more people. In fact, Sierra Leone is exposed to various diseases influenced by climatic and environmental factors that may be enhanced by climate change such as, the cholera outbreaks associated with heavy rainfall. Floods have been the extreme weather events that have affected most of the people in Sierra Leone (90% of the people affected by hazard) and also the ones that occur most frequently (second position after epidemics). According to the Sierra Leone NAP 2021, the most vulnerable areas in Sierra Leone are Kroo Bay, Susan?s Bay, Granville Brook, Lumley area in Western Area, Port Loko and Kambia Districts, the Newton catchment area, Pujehun and Bo areas, Kenema and Moyamba Districts, and coastal beaches of the Western Area Peninsula[40]<sup>40</sup>. More recently, in August 2017 flooding and mudslides in Freetown killed more than 500 people.

Table 6:Key natural hazards statistics between 1990-2018[41]<sup>41</sup>

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Natural Hazards 1985-2018	Average annual occurrence	% of occurrence	Number of people affected
Floods	8.00	26.7%	245,507
Storm	3.00	10.0%	10,003
Landslide	2.00	6.7%	11,921
Wildfire	1.00	3.3%	2,257
Epidemic	16.00	53.3%	50,580
<b>Total population affected:</b>			<b>320,268</b>

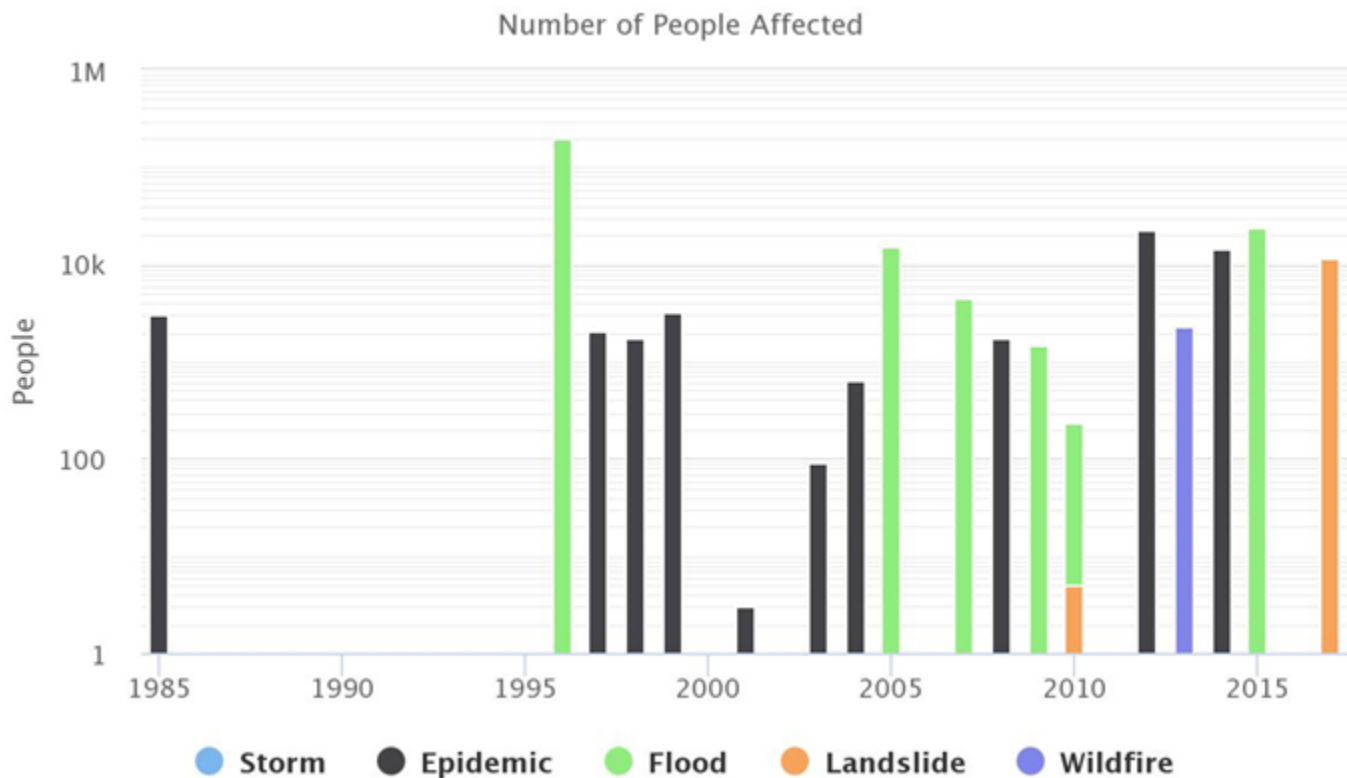


Figure 8: Key natural hazards statistic 1985- 2018[42]<sup>42</sup>

29. According to the Sierra Leone NAP 2021[43]43, it is very likely that climate change will magnify natural disasters? severity in terms of intensity and frequency in Sierra Leone. Climate variability and climate change-induced extreme weather events will continue to affect the incidence of existing socio-natural hazards in the country.

30. Sea level rise is projected to threaten low-lying coastal areas of Sierra Leone (e.g., Kroo Bay and Moa Wharf are already experiencing some of these impacts[44]44). Sea level has been rising in Sierra Leone (Figure 9) and is expected to continue to rise during the 21st century between 0.4 m in the low emission scenario to 0.7 m in the high emission scenario by 209944. Increased coastal flood events,

coastal erosion, reduction in freshwater quality, population displacement, loss of property, reduction in groundwater resources, and reduced agricultural potential for coastal areas (e.g., mangroves) are expected impacts and some of them are already being felt by the population (see Figure 10). Floods during the rainy season due to heavy precipitation and from storm surges along the coast are projected to increase. Natural hazard events will take a toll on agricultural production, infrastructure, people's homes, public health and biodiversity along the coast.

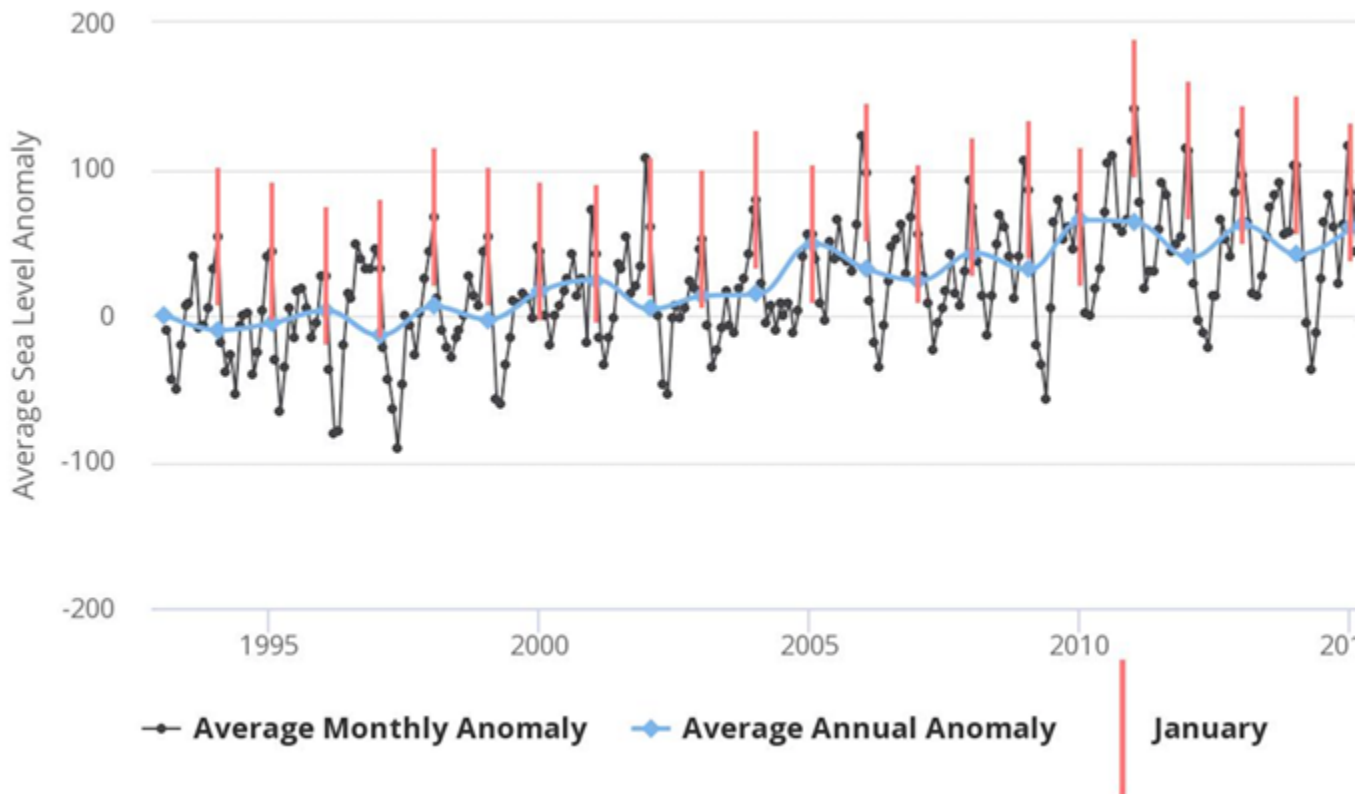


Figure 9: Historical Sea level for coastal areas of Sierra Leone (1993-2015) ? observed anomalies relative to mean of 1993-2015<sup>[45]</sup><sup>45</sup>

31. Increased risks of flooding will lead to damaged water infrastructure and increased health risks such as increased propagation of water-borne diseases. In fact, currently heavy rains have increased the likelihood of the outbreak of communicable diseases and in the North and West Regions, more intense dry seasons (with increased temperatures) have been linked to water quality and disease outbreaks. The last major cholera epidemic outbreak, registered in 2012, caused 300 deaths and affected more than 20,000 people. In addition, the deficient health system of the country (which is understaffed, unavailable and unaffordable) revealed by the Ebola crises and now by COVID-19, will be further stressed by climate change impacts.

32. Table 7 shows Sierra Leone overall vulnerability to natural disasters across the country (Freetown/Western, Northern, Eastern and Southern) according to worldwide climate change models

and according to stakeholders' observation / experience and national studies/analysis. As it can be seen, Sierra Leone is very prone to the impacts of natural disasters, especially floods (river, urban and coastal), landslides/mudslides, extreme heat, and wildfires. Although climate change models point out water scarcity/drought as a 'Very Low' risk for Sierra Leone, the feedback collected from the stakeholders identify it as one of the climate change impacts being felt throughout Sierra Leone (see Table 8 **Error! Reference source not found.** and Figure 10), and thus the risk level classification was increased to 'Low' on Table 7 to take the experience of the local population into account. In addition, river and urban flood in Freetown were classified by ThinkHazard as 'Very Low' and 'Low', respectively, and their classification was changed to 'High', taking into account the number and severity of these events in that area of Sierra Leone as well as the WB Sierra Leone Multi-Sector Review Risk: Freetown City Hazard and Risk Assessment carried out on the city of Freetown by the WB[46]46. It is important to refer that this CRVA adopts an innovative approach since it actually uses methodologies and models that already exist and adds to that data, new information and local knowledge of experience on the ground, incorporating in the analysis a deeper level of local stakeholders' opinions, beliefs and perceptions.

33. As it can be seen in Figure 11, although several people referred that these events have taken place all over the country, Freetown/Westerns and Northern and Southern regions were the ones where more people have witnessed the occurrence of climate events (these are all coastal areas). This is also aligned with the findings of ThinkHazard, reported in Table 7. It is important to refer that deforestation, inappropriate planning and construction have also been appointed as reasons for the occurrence and severity of the registered extreme weather events.

34. Further the increase and severity of precipitation over the years is likely to increase the frequency of diseases outbreaks (such as cholera and diarrhoeas) as well as the frequency of floods and landslides all over the country. Storms, and in particular, thunderstorms and strong winds, that are already a recurrent climate change hazard affecting the country in the pre-monsoon season, often damage people's homes, agriculture, disrupt communications and transportation as well as cause coastal erosion. Sea level rise together with increased heavy rains may exacerbate these events causing more frequent flooding, especially in coastal areas. The increase in flooding, rainfall patterns and drought in a country already plagued by Ebola and now COVID, may lead to increase the likelihood of waterborne diseases, especially the ones related with unsafe drinking water.

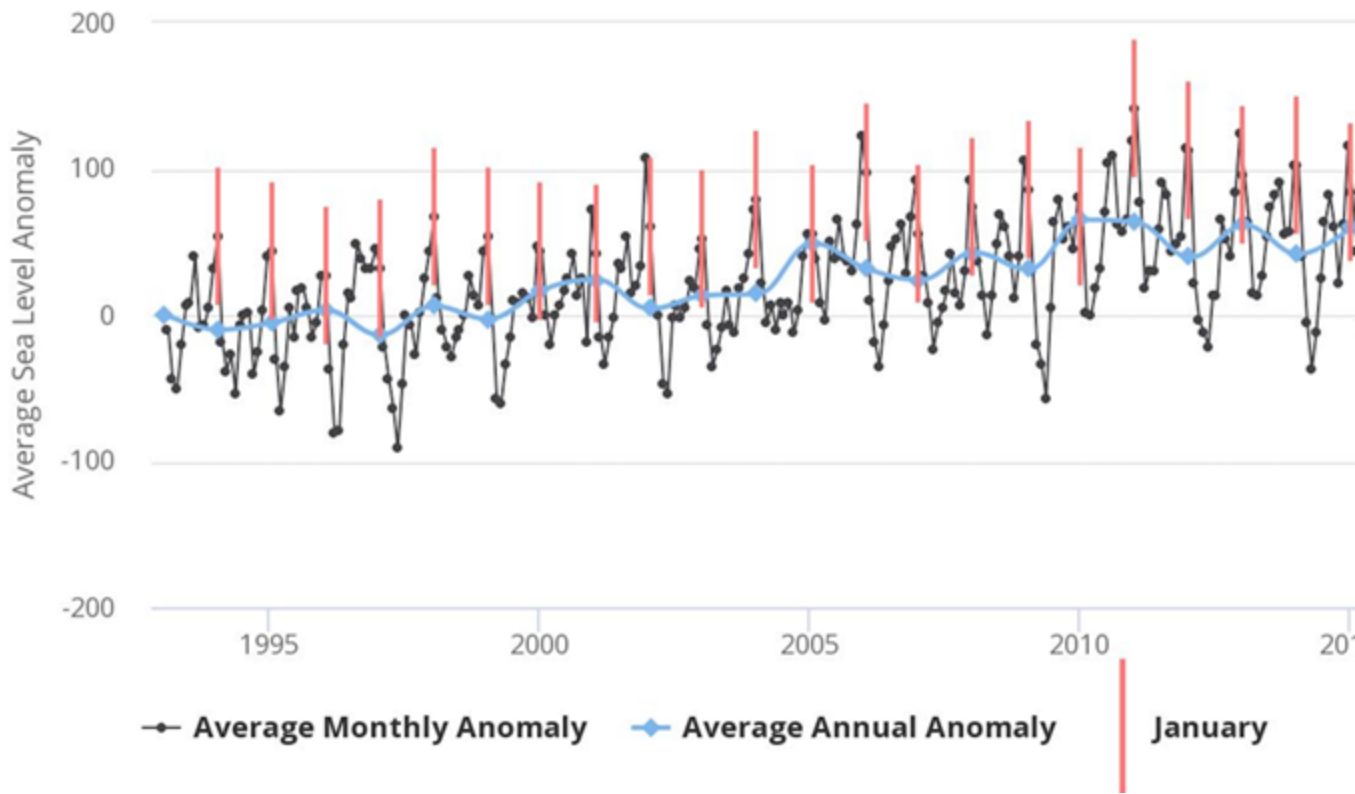


Figure 10: Hazards / impacts of Climate change experienced or witnessed by the consulted stakeholders

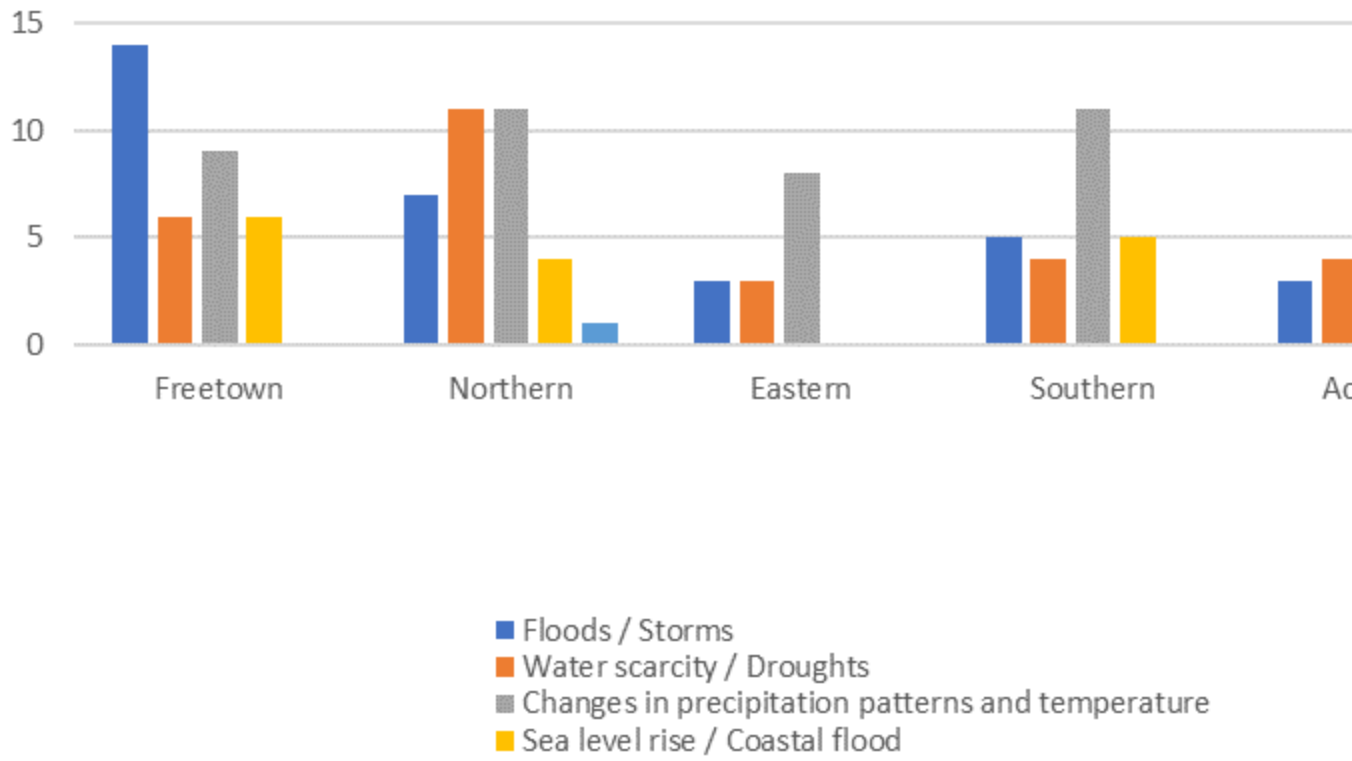


Figure 11: Number of times an event was specifically mentioned in each region of Sierra Leone

Table 7: Climate change overall vulnerability: Hazard level[47]<sup>47</sup>

Natural Hazard	Freetown****	Northern	Eastern	Southern	Overall
River flood*	<p><b>High**</b></p> <p>Potentially damaging and life-threatening river floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level</p>	<p><b>High</b> (Kambia, Port Loko, Tonkolili &amp; Bombali)</p> <p><b>Low</b> (Koinadugu)</p> <p>Potentially damaging and life-threatening river floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level</p>	<p><b>High</b> (Kenema, Kailahun)</p> <p><b>Low</b> (Kono)</p> <p>Potentially damaging and life-threatening river floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level.</p>	<p><b>High</b></p> <p>Potentially damaging and life-threatening river floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level.</p>	<b>High</b>



Natural Hazard	Freetown****	Northern	Eastern	Southern	Overall
Urban flood	<p>High**</p> <p>It is considered overall high as potentially damaging and life-threatening urban floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level.</p> <p>It is estimated that until 2050 flooding will annually on average: kill 9 people, affect 3,000 people and will cost US\$2.5 billion in terms of direct loss to building.</p>	<p>High (Tonkolili)</p> <p>Medium (Port Loko)</p> <p>Low (Bombali, Koinadugu)</p> <p>Very Low (Kambia)</p> <p>Although this vary across the region, it is considered overall high as potentially damaging and life-threatening urban floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level.</p>	<p>High (Kailahun)</p> <p>Medium (Kenema, Kono)</p> <p>Although this vary across the region, it is considered overall high as potentially damaging and life-threatening urban floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level.</p>	<p>High (Bonthe)</p> <p>Medium (Bo, Pejehun)</p> <p>Low (Moyamba)</p> <p>Although this vary across the region, it is considered overall high as potentially damaging and life-threatening urban floods are expected to occur at least once in the next 10 years.</p> <p>This hazard may remain similar in the long-term considering only climate change. However, changes in the environment and land use may influence future hazard level.</p>	High

Natural Hazard	Freetown****	Northern	Eastern	Southern	Overall
Coastal flood / sea level rise	<p><b>High</b></p> <p>Potentially damaging waves are expected to flood the coast at least once in the next 10 years.</p> <p>This hazard is already high and is supposed to remain similar in the long-term. It is estimated that until 2050 sea level rise will affect, on average, 296 people annually and will cost around US\$1.4 billion in terms of direct loss to building.</p>	<p><b>High (Kambia &amp; Port Loko)</b></p> <p>Potentially damaging waves are expected to flood the coast at least once in the next 10 years.</p> <p>This hazard is already high and is supposed to remain similar in the long-term.</p>	-	<p><b>High (Moyamba)</b></p> <p><b>Medium (Bonthe, Pejehun)</b></p> <p>Potentially damaging waves are expected to flood the coast at least once in the next 10 years.</p> <p>This hazard is already high and is supposed to remain similar in the long-term</p>	<b>High</b>

Natural Hazard	Freetown****	Northern	Eastern	Southern	Overall
Landslide	<p><b>High</b></p> <p>This area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes that make localized landslides a frequent hazard phenomenon.</p> <p>climate change is likely to alter slope and bedrock stability through changes in precipitation and/or temperature. It is difficult to determine future locations and timing of large rock avalanches, as these depend on local geological conditions and other non-climatic factors (e.g., human intervention).</p> <p>It is estimated that until 2050 landslides will annually on average: kill 11 people, affect 140 people, and cost US\$355 thousand in terms of direct loss to building.</p>	<p><b>Low</b></p> <p>This area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes that make localized landslides an uncommon hazard phenomenon.</p> <p>climate change is likely to alter slope and bedrock stability through changes in precipitation and/or temperature. It is difficult to determine future locations and timing of large rock avalanches, as these depend on local geological conditions and other non-climatic factors (e.g., human intervention)</p>	<p><b>Low</b></p> <p>This area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes that make localized landslides an uncommon hazard phenomenon.</p> <p>climate change is likely to alter slope and bedrock stability through changes in precipitation and/or temperature. It is difficult to determine future locations and timing of large rock avalanches, as these depend on local geological conditions and other non-climatic factors (e.g., human intervention)</p>	<p><b>Low</b> (Moyamba, Bo)</p> <p><b>Very Low</b> (Bonthé, Pejehun)</p> <p>This area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes that make localized landslides an uncommon hazard phenomenon.</p> <p>climate change is likely to alter slope and bedrock stability through changes in precipitation and/or temperature. It is difficult to determine future locations and timing of large rock avalanches, as these depend on local geological conditions and other non-climatic factors (e.g., human intervention)</p>	<b>Low</b>

Natural Hazard	Freetown****	Northern	Eastern	Southern	Overall
Extreme Heat	<p><b>High**</b></p> <p>There is a high chance that at least one period of prolonged exposure to extreme heat, resulting in heat stress, will occur in the next five years.</p> <p>Continued greenhouse gases (GHG) emissions will cause further warming, and consequently more frequent hot temperature extremes over most land areas during the next fifty years. In this area the temperature increase in the next 50 years will be slightly higher than the worldwide average.</p>	<p><b>High</b></p> <p>Prolonged exposure to extreme heat, resulting in heat stress, is expected to occur at least once in the next five years. Continued GHG emissions will cause further warming, and consequently more frequent hot temperature extremes over most land areas during the next fifty years. In this area the temperature increase in the next 50 years will be slightly higher than the worldwide average.</p>	<p><b>Medium</b></p> <p>There is more than a 25% chance that at least one period of prolonged exposure to extreme heat, resulting in heat stress, will occur in the next five years.</p> <p>Continued GHG emissions will cause further warming, and consequently more frequent hot temperature extremes over most land areas during the next fifty years. In this area the temperature increase in the next 50 years will be slightly higher than the worldwide average.</p>	<p><b>Medium</b></p> <p>There is more than a 25% chance that at least one period of prolonged exposure to extreme heat, resulting in heat stress, will occur in the next five years.</p> <p>Continued GHG emissions will cause further warming, and consequently more frequent hot temperature extremes over most land areas during the next fifty years. In this area the temperature increase in the next 50 years will be slightly higher than the worldwide average.</p>	<p><b>High</b></p>

Natural Hazard	Freetown****	Northern	Eastern	Southern	Overall
Water scarcity / drought	<p>Low**</p> <p>Model projections are inconsistent in their estimates of change in drought hazard, which influences water scarcity. It may increase in the future because of climate change. Effects of drought and water scarcity (water shortages) are already being felt by the Sierra Leone stakeholders</p>	<p>Low**</p> <p>Model projections are inconsistent in their estimates of change in drought hazard, which influences water scarcity. The WB CCKP expects that drought may affect the Northern region of Sierra Leone. This may increase in the future because of climate change. Effects of drought are already being felt by the Sierra Leone stakeholders</p>	<p>Low**</p> <p>Model projections are inconsistent in their estimates of change in drought hazard, which influences water scarcity. The WB CCKP expects that drought may affect the Eastern region of Sierra Leone. This may increase in the future because of climate change. Effects of drought are already being felt by the Sierra Leone stakeholders</p>	<p>Low**</p> <p>Model projections are inconsistent in their estimates of change in drought hazard, which influences water scarcity. The WB CCKP expects that drought may affect the southern region of Sierra Leone. This may increase in the future because of climate change. Effects of drought are already being felt by the Sierra Leone stakeholders</p>	Low

Notes: Information in brackets indicate specific locations within a region to which the hazard is associated.

\* Surface flood hazard in urban and rural areas is not included in this hazard classification, and may also be possible in this location

\*\*Own assessment based on local information, studies and the scenarios analysis of temperature and precipitation, different from the analysis displayed in the ThinkHazard tool

\*\*\* Regarding the wildfires it is important to refer that damage can not only occur due to direct flame and radiation exposure but may also include ember storm and low-level surface fire. In extreme fire weather events, strong winds and winds born debris may weaken the integrity of infrastructure.

\*\*\*\* Vulnerability assessment of Freetown takes into account the WB Sierra Leone Multi-Sector Review Risk: Freetown City Hazard and Risk Assessment,

<https://documents1.worldbank.org/curated/en/151281549319565369/pdf/130797-v2-Final-Report-Volume-2-of-5-Freetown-City-Hazard-and-Risk.pdf>

Table 8: Climate Change impacts / phenomena experienced by Sierra Leone stakeholders

Climate change Hazard	Freetown/Western	Northern	Eastern	Southern	Sierra Leone (in general)
<b>Floods, Storms</b>	<p><i>?Flooding in Freetown on the 14<sup>th</sup> of August 2017 that was caused by heavy rain with which 500 lives were lost?.</i></p> <p><i>?Flash flooding during rainy seasons?</i></p> <p><i>?Flooding over the past five years has increased significantly and each year the affected are increasing. This flooding mostly takes place in the western area of Freetown.?</i></p>	<p><i>?Deforestation (Timber Logging) is taken place in Koinadugu, Falaba, and Kambia Districts where we do operate. This has led to a decrease in honey production, flooding during the rains, and drought during the dry season?</i></p>	<p><i>?Flash flooding during rainy seasons?</i></p> <p><i>?In Kailahun annual crop loss due to extended flooding.?</i></p>	<p><i>?Flash flooding during rainy seasons?</i></p> <p><i>?Gbondapi town, where a number of public and private owned structures were partially inundated by sea surges; river flooding and heavy storm conditions?</i></p> <p><i>?Motomeh Tree planting area - Massive flooding a few years back due to forest depletion?</i></p> <p><i>?Moyamba District- Drought, Flooding, High Temperature in the dry season?</i></p>	<p><i>?There has been recent landslides, flooding and drought in all the regions across the country resulting in loss of life, property and disruption of livelihoods?</i></p>

<p><b>Changes in precipitation and temperature</b></p>	<p><i>?The country experiences erratic rainfall and this is affecting production levels?</i></p>	<p><i>?Makeni: Increased temperature and rainfall. Longer dry season and shorter but wetter rainy season.? ?The country experiences erratic rainfall and this is affecting production levels? ?Second cropping failure of maize in Tonkolili resulting from low rainfall.?</i></p>	<p><i>?Variation in weather condition, which lead to low yields, erratic rains, erosion of soil nutrient, outbreak of disease (fall army worm)?</i></p>	<p><i>?Bo region is experiencing changing temperature and precipitation patterns. Huge rise in temperature patterns, with extreme heat during the dry season, observed to be extended beyond April, which should mark the end of the dry season. With precipitation arriving late but with high intensity of heavy fall, causing floods. These phenomena have posed challenges in crop production and food supply to the farming community in this locality.? ?Variation in weather condition, which lead to low yields, erratic rains, erosion of soil nutrient, outbreak of disease (fall army worm)?</i></p>	<p><i>?The country experiences erratic rainfall and this is affecting production levels? ?At times raining season does change, sometimes it does not rain normally, there is flooding all rivers overflow, roads are affected and some settlements.? ?Lower levels of rains and delayed arrival of rainy seasons affecting the yield and harvesting patterns.? ?Crop loss due to delayed rains all-over? ?The country is experiencing reduced annual precipitation which affects crop yields in a country that depends solely on rain-fed agriculture.? ?The country is experiencing reduced annual precipitation</i></p>
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				<p><i>which affects crop yields in a country that depends solely on rain-fed agriculture. I have also observed that significant part of the rural population is depending on cassava as their staple food rather rice which tell me local rice production is dwindling and its price is unaffordable for many. I have also observed that the seasons for our local fruits are becoming shorter.?</i></p>
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<p><b>Landslides / mudslide</b></p>	<p><i>?Variation in high temperatures as just experience in the past dry season due to high insolation from the sun as there is no vegetation cover to act as sun brake. Loose soil gathered at the peninsula tops are easily washed away by the rains resulting to erosion, flooding and landslides as it recently occurred in Regent in 2014 and other areas?.</i></p> <p><i>?The 2018 Mudslide in (Regent) Freetown?</i></p> <p><i>?Frequent flooding during the rainy season in Freetown, particularly in slum areas along the coast.?</i></p> <p><i>?IMAT area mudslide flooding due to deforestation and poor land laws that allowed people to build homes within the greenbelt forest areas.?</i></p>	<p><i>Western region, IMAT area mudslide flooding due to deforestation and poor land laws that allowed people to build homes within the greenbelt forest areas.</i></p>			<p><i>?There has been recent landslides, flooding and drought in all the regions across the country resulting in loss of life, property and disruption of livelihoods?</i></p>
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<p><b>Water scarcity/drought</b></p>	<p><i>?In the Eastern part of Freetown, climate change is seriously affecting the communities in terms of water shortages as a result of people cutting down the vegetation on the Peninsular tops and destroying the water catchments areas thereby lowering water levels in the water tables.?</i></p> <p><i>?Freetown Peninsular - Forest cover fading out causing water shortages at the Guma dam?</i></p> <p><i>?Adonkeh Dam - Newton area is drying up due to forest cover cutting?</i></p>	<p><i>?Impacts of dryness as a result of climate change leading to water loss which can be linked to drought leading to poor agricultural yield in areas of North and North-western Sierra Leone.?</i></p> <p><i>?Drought in Port Loko, Koinadugu?</i></p> <p><i>?Loss of cattle reared in Kabala due to drought?</i></p> <p><i>?During last year planting season, we were unable to access sufficient water for our rice cultivated due to the reduce of water in the hydro dam to support the farm in Makali Kunike Barina Chiefdom, Tonkolili District.?</i></p> <p><i>?Water Pumping station in Kambia almost dried up and no tap water supply due to depletion of forest catchment.?</i></p> <p><i>?Drought in the dry season due to deforestation</i></p>	<p><i>?Drought in the city of Kenema?</i></p>	<p><i>?Moyamba District- Drought, Flooding, High Temperature in the dry season?</i></p>	<p><i>?There has been recent landslides, flooding and drought in all the regions across the country resulting in loss of life, property and disruption of livelihoods?</i></p> <p><i>?Impact of climate change affecting water: water wells getting dry or lowering of water tables in wells nationwide?</i></p> <p><i>?Drop of water levels in all of the hydro locations across the country?</i></p>
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		<i>(Timber Logging) in Koinadugu, Falaba, and Kambia?</i>			
<b>Sea Level rise / Coastal flood</b>	<p><i>?Aberdeen Creek - Mangroves cutting exposed the area to more fatal flooding.?</i></p> <p><i>?Flooding has been a recent problem for riverine communities in Sierra Leone. During flooding, huge amount of wastes/garbage are carried into rivers and sea which are hazardous to aquatic environments including the biota they support. These flood waste materials (debris) cause stress to the living organisms in the rivers and its environment. Flooding possess threat to infrastructures fringing the coastline and or river communities.?</i></p>	<p><i>?Yeliboya Island is now always flooding due to sea level rising impacting fish catch?</i></p> <p><i>?Swamp lands?</i></p>			<p><i>?Water sources getting polluted as a result of flooding in the coastal area.?</i></p>

<p><b>Water contamination</b></p>	<p><i>?Contamination of water wells in Freetown as a result of pollutions from surface runoff due to flooding.?</i></p>	<p><i>?Water pollution is another hazard that mostly affects coastal communities and their adjacent water bodies. Depletion of dissolved oxygen in water is a phenomenon that often leads to the damage of aquatic ecosystem. The introduction of organic waste or discharge of sewage loaded with organic effluents from coastal pit latrines through flooded runoff water into the aquatic environment, especially in sheltered bays such as the estuaries and depending on the duration of the pollution episode, amount of waste, size of the water body and the prevailing ambient temperature, leads to depletion of dissolved oxygen and also water born related public health illnesses.?</i></p>			
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<p><b>Soil and coastal erosions</b></p>	<p><i>?Soil and coastal erosions leading to siltation problems are another major threat to coastal and riverine communities (Freetown, North and South). When the integrity of coastline or riverbanks with vegetation is weakened due to hydrotropism, geotechnical hazard such as rock falls; landslides are imminent along coastline with high cliffs leading to the destruction of coastal/riverine vegetation as the case maybe.?</i></p>	<p><i>?Soil and coastal erosions leading to siltation problems are another major threat to coastal and riverine communities (Freetown, North and South). When the integrity of coastline or riverbanks with vegetation is weakened due to hydrotropism, geotechnical hazard such as rock falls; landslides are imminent along coastline with high cliffs leading to the destruction of coastal/riverine vegetations as the case maybe.?</i></p>	
<p><b>Increased temperature</b></p>	<p>?Increased temperature is another major climate change induced impact on fisheries sector and other aquatic resources; since direct heat of sun on the surfaces of marine and river waters cause fish to migrate to places with suitable temperature thus reducing their populations and causing their eventual extinction locally.?</p>		<p><i>?Moyamba District- Drought, Flooding, High Temperature in the dry season?</i></p>

<p><b>Extreme event of wind and precipitation</b></p>	<p><i>Aberdeen creek- Undermining of foundations by rain and rising water table</i></p> <p><i>?Destruction of piers, jetties and fish landing site?</i></p> <p><i>?Bad weather causes accident in the sea?</i></p> <p><i>?Destruction of biological resources such as the estuaries, sand bar, mangroves, beaches etc?</i></p>	<p><i>Destruction of piers, jetties and fish landing site</i></p> <p><i>?Bad weather causes accident in the sea?</i></p> <p><i>?Destruction of biological resources such as the estuaries, sand bar, mangroves, beaches etc?</i></p>	<p><i>?Konacredee, Yaliboya etc. Destruction of Housing&amp; Public Buildings, flooding of low-lying structures collapse due to high winds. Undermining of foundations by rain and rising water table.?</i></p> <p><i>?Excessive heat under zinc roofs settles?</i></p>
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35. The multi-sector risk (MSR) assessment shown in Figure 12, provides an indication of the locations where two or more WEF sectors surpass a tolerable level of risk. In fact, a moderate MSR is only identified when at least two sectors each have at least two indicators above the moderate threshold (i.e., 4 indicators at moderate risk). When looking into the multi-risk assessment, under all emission scenarios, Sierra Leone shows moderate to high MSR, aggravated with increased temperature change. Under the 1.5°C scenario, the MSR aggravates from Northeast towards the coast showing higher risks for central and coastal Sierra Leone. With increased emissions (3°C) higher risks are identified for Northern and Eastern Sierra Leone, with the districts of Kambia, Kenere and Bombali showing the highest MSR. It is important to refer that these areas are already areas with identified land degradation hotspots and thus more prone to the impacts caused by increased rainfall and temperatures.

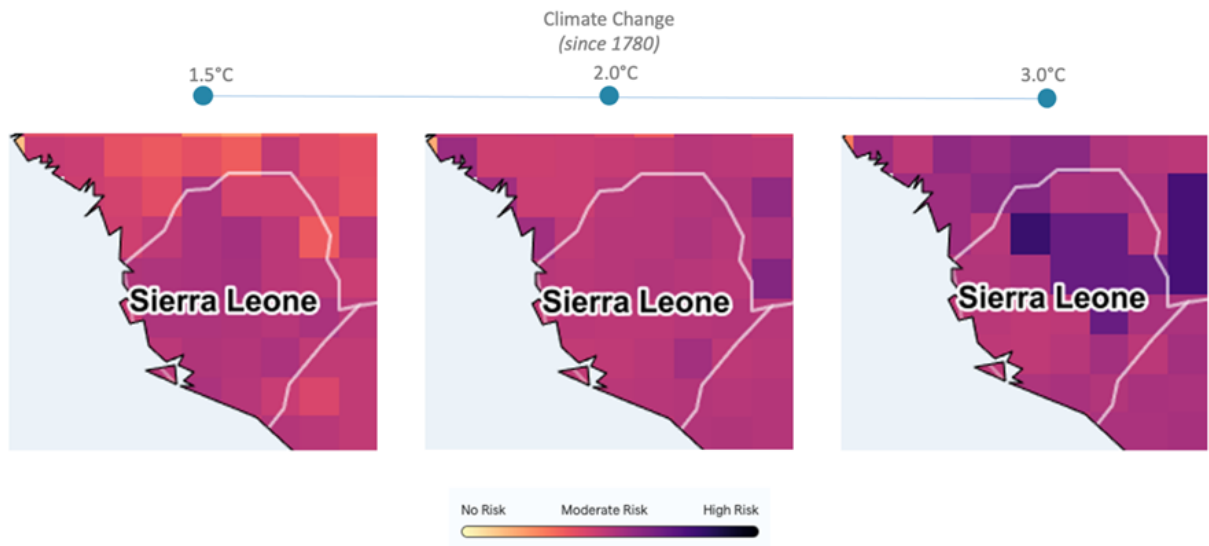


Figure 12: Multisector risk analysis for Sierra Leone under the SSP2[48]<sup>48</sup> in the three climate change emission scenarios (1.5°C, 2.0°C and 3.0°C)

#### 1.2.4 Identification of locations that are more vulnerable to climate change impacts and risks in Sierra Leone:

36. From the above sections (Climate baseline, Climate future and Climate-related hazards in Sierra Leone) it can be concluded that several climate risks will result from increased temperatures, increased intensity and variability of precipitation, sea level rise, floods and droughts. If the current trend of increased number of heat waves and intense rains continues, Sierra Leone will likely experience more flooding leading to soil erosion, less productive agricultural land, destruction of roads and other infrastructure and all these impacts will have significant consequences on the environment, society, food security, and the wider economy.

37. In the case of Sierra Leone, results from the CRVA show that, although there might be some differences between the tools mentioned above, climate stressors will not be evenly distributed within the country's territory, and thus, some locations will experience more severe climate risks than others:

Increased precipitation and flood events: According to CCKP, more rainfall amounts are expected to be received throughout Sierra Leone since the intensity of rainfall extremes is projected to increase, with the highest increase in precipitation projected for the coastal area of the country (Freetown, Northern and Southern) by 2100 and under the RCP8.5 scenario. Also, according to ThinkHazard, the entire country is highly vulnerable to river flooding events, and this has been further stressed by the stakeholder consultation.

Sea level rise: According to CCKP, sea level is expected to continue to rise. It is expected to increase 1 m by 2100 under RCP8.5 in the coastal area of Sierra Leone (Freetown/Western, Northern and Southern), which will lead to coastal flooding. The coastal areas of Sierra Leone, are the ones identified by ThinkHazard as the ones highly susceptible to this climate change effect.

Increased heat and extreme heat conditions: According to CCKP, ThinkHazard and the stakeholders' consultation results, these warmer conditions are already being experienced, and will continue to be experienced, throughout the entire country. Mean temperature is projected to substantially increase in the future independent of the scenario, with a stronger increase under the high emission scenario. Not only mean temperatures are projected to increase but also extremes. Therefore, the number of cold days and nights is projected to decrease, and the number of hot days and nights is projected to increase.

Decrease in rainfall events and seasonality: Rains are likely to be less uniformly distributed in the future, as dry spells in the rainy season are projected to substantially increase. Results from CCKP by 2100 under RCP8.5 scenario show that this situation will be registered throughout the country, with no major differences between the regions. Results from the seasonality map developed under the ISWEL project and from stakeholders' consultations also emphasize this risk throughout the country, with the Northern and Freetown/Western area being more affected by seasonality. Stakeholders reported that they are feeling the impacts of drought already throughout Sierra Leone. Climate change is expected to exacerbate water security issues throughout Sierra Leone in areas that are already under water stress. Increased energy demand is also expected to contribute to increased water demand and water security issues.

38. Furthermore, the Multi-sector Risk Map developed by IIASA under the ISWEL project shows how Sierra Leone is vulnerable to the effects of climate change in the WEF sectors.

39. Results of this assessment show that the entire country is susceptible to climate change impacts. The areas more susceptible to climate change MSR are located in the Northern and Eastern part of Sierra Leone, but the areas which are prone to more climate change risks (including sea level rise) are the coastal areas (including Freetown/Western, Northern and Southern regions) as depicted in Figure 13 below.



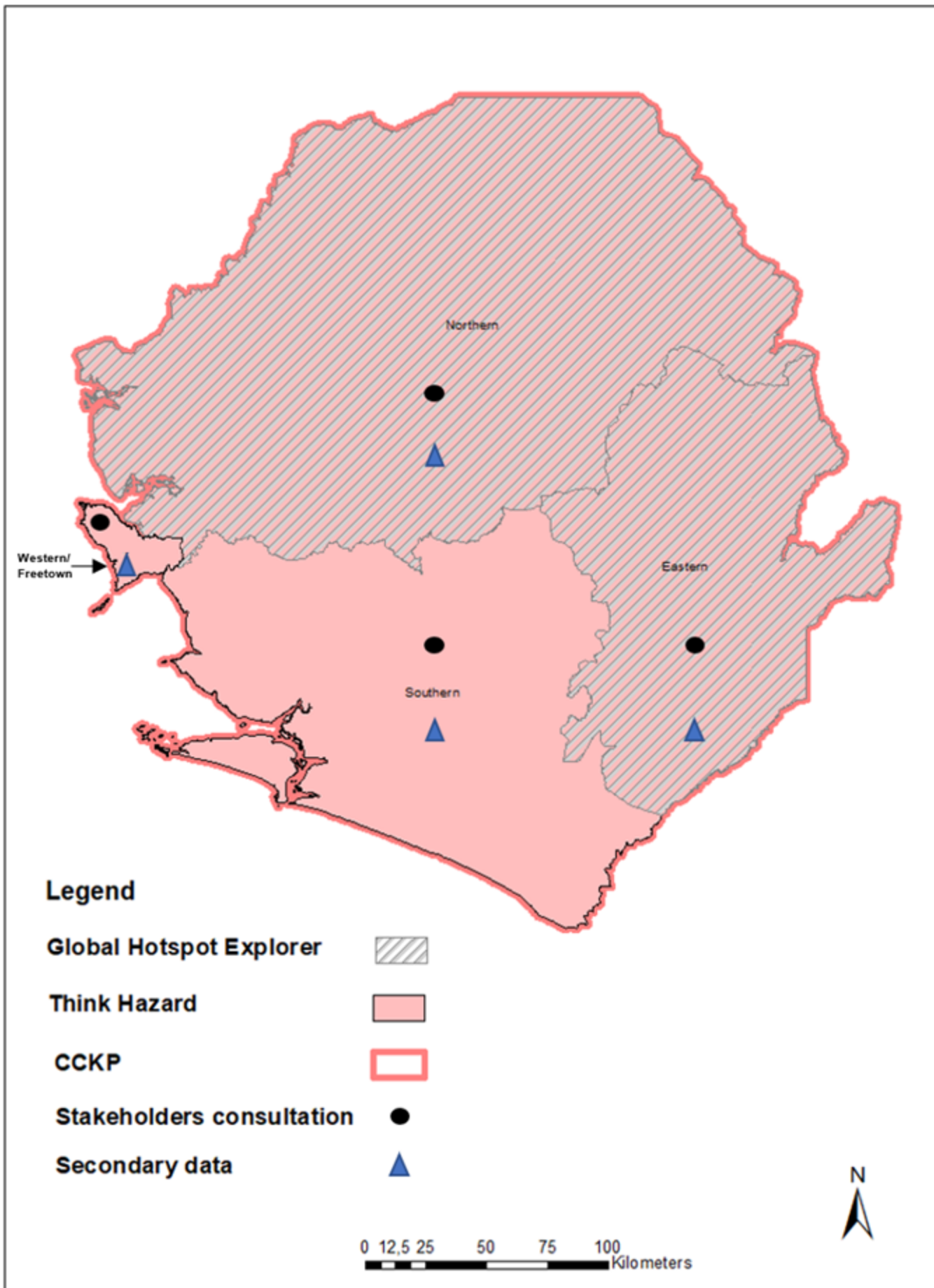


Figure 13: Map with OF THE areas IDENTIFIED by the different tools as THE ONES PRONE TO FACING the higheST risks to Climate Change impacts

40. See below an analysis of these climate change impacts in the WEF sector.

### 1.2.5 Climate change Impacts on the Water Energy and Food sectors:

#### Water Sector

41.

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*?Yes! Erratic rainfall has affected the capacity of the Bumbuna Hydroelectric Power (Bumbuna Dam) storage capacity. Environmental degradation along the Western Area Peninsula and around the country has affected both the quantity and quality of the Guma Valley Water Supply Company. Furthermore, erratic rainfall patterns have affected crop yield, processing and transportation across the country.? (Sierra Leone stakeholder)*

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Water security is ?the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies. It is determined by many factors, including the hydrological environment, the institutional and governance environment, the socio-economic context, the geopolitical environment, and the future environment and uncertainties, particularly of climate change?[49]49.

42. Water availability and quality are highly vulnerable to climate change impacts in Sierra Leone. Water is used for several purposes: domestic (drinking, cooking, hygiene), agriculture (irrigation), industrial (beverages production, cooling and waste disposal) and electricity production (hydropower). 80% of the country?s rural population obtains its water from surface waters. Also, the migration of the population to the country?s capital, has increased pressure on urban water resources.

43. The rainfall patterns variability and rainfall extreme events have already created water supply and quality issues in the country. Some examples are[50]50:

Mano River stream flow decreased 30% between 1971-1989 with impact for Sierra Leone population that depend on this surface water resource.

Streams and ponds have dried up during severe droughts which are likely to become more frequent with time.

Surface water has been contaminated due to mudslides and floods in urban areas (e.g., Freetown).

There have been water shortages in 40% of the protected water points across Sierra Leone in the dry season.

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44.

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*?Impact of climate change affecting water: water wells getting dry or lowering of water tables in wells nationwide.?*

*(Sierra Leone stakeholder)*

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However, the shifting rainfall patterns not only increase the water scarcity in the country, but also translate into heavy rain threatening vulnerable and flood disaster prone areas, especially in Freetown. Recent statements of the Freetown City Council (FCC) addressing a Flood Risk Warning, further underline the timely relevance of the topic. Water routing, water storage, planning and other management options should take into account rainfall unpredictability and variability.

45. In addition, current and projected periods of drought are decreasing the amount of water that is available in the country ? there is a of 20% (in most of the Sierra Leone territory) to 30% (Northern and Eastern regions) probability that by 2050 severe drought will occur, as shown in Figure 14. This alone will introduce changes in the water balance and in the availability of this resource. In addition, sea level rise is causing saltwater intrusion and reduced freshwater groundwater reserves. In fact, some stakeholders referred that population in coastal Sierra Leone are spending more time in fetching drinking water as they must collect that more towards the interior area of the country[51]51. Coastal erosion is already a significant challenge in the country, with areas such as Konakridee, Lakka, Hamilton and Plantain Island already witnessing coastline shifting about 4-6 meters per year[52]52. It is estimated that 26.4 km<sup>2</sup> will be lost to the sea if no action is taken and that by 2050, 1881 buildings will be affected by sea level rise with costs amounting to US\$46.8 million[53]53.

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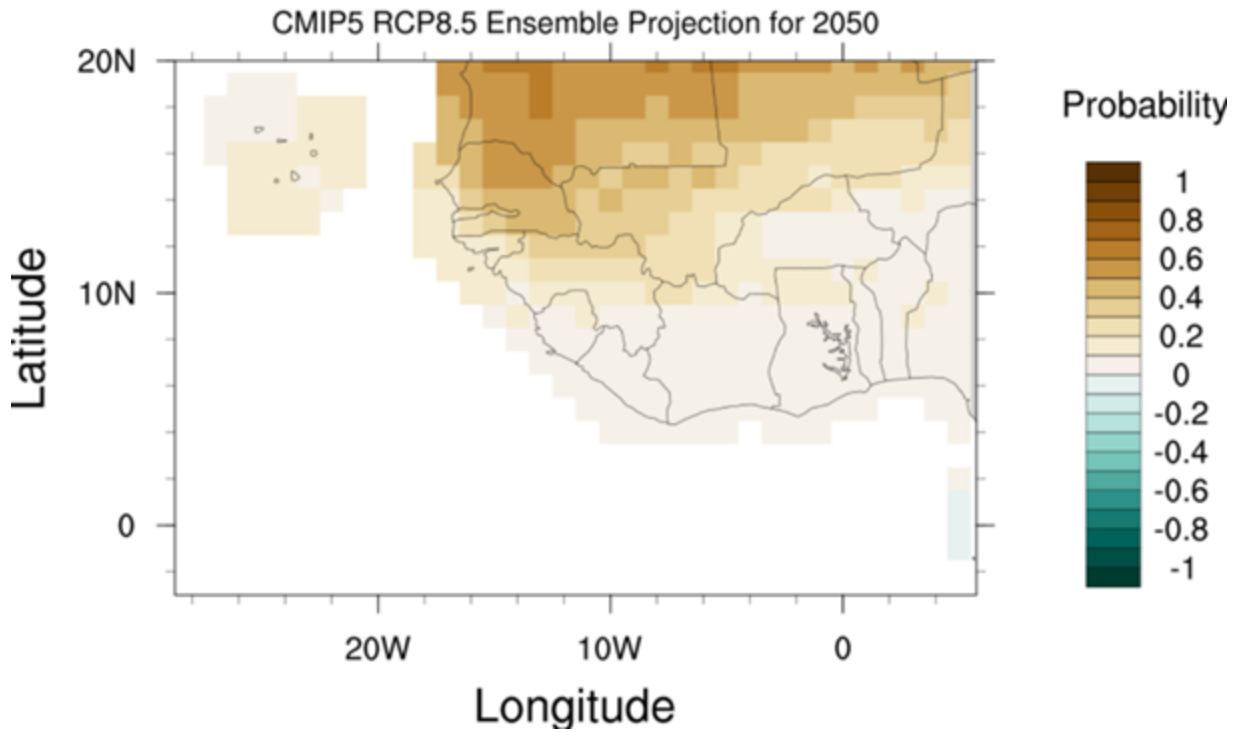


Figure 14: Change in annual likelihood of severe drought in the high emission scenario (RCP8.5) for 2050[54]<sup>54</sup>

46. In terms of water and wastewater infrastructure, there is a large percentage of the population that lack access to clean water and sanitation facilities and the existent infrastructure is sensitive to storm surge, sea level rise and flooding. Climate change hazards are already being felt in the country and are expected to occur more frequently and with higher intensity in the future. Wastewater collection and treatment facilities, as their operation often depends on gravity flow, are often situated at the lowest point possible and thus are easily inundated by floods and water level rise[55]<sup>55</sup>. Table 9 summarises the potential climate stressors and risks in the water sector.

Table 9: Summary of the potential climate stressors and risks in the water sector under different RCPs scenarios for 2080-2099

Climate-related impact drivers	Vulnerability areas from the CRVA	Impact intensity under varying RCPs for 2080- 2099				Climate Risks	
		RCP 2.6	RCP 4.5	RCP 6.0	RCP 8.5		
Increased temperature	Western / Freetown	Light Orange	Orange	Orange	Dark Orange	Surface Water	1) Increased water demand for cooling needs 2) Impact on the potential carrying capacity of
	Northern	Light Orange	Orange	Orange	Dark Orange		

	Eastern						moisture with a potential increase of heavy rainfalls 3) Reduced aquatic biodiversity and productivity 4) Increased water pumping in regions of intense agriculture due to high temperatures
	Southern						
Increased frequency of intense precipitation and floods	Western / Freetown						1) Increased sedimentation and erosion 2) Reduced water quality (open sewage and rubbish can contaminate water sources and increment sedimentation) and thus, availability 3) Flood disruptions in transportation systems and damaging of available water infrastructure
	Northern						
	Eastern						
	Southern						
Decreased dry season precipitation	Western / Freetown						1) Reduced water quantity and quality (in areas where groundwater contamination is occurring) in shallow wells and springs due to increased rates of evaporation
	Northern						
	Eastern						
	Southern						
Sea Level Rise	Western / Freetown			NA			1) Increased sedimentation and erosion 2) Reduced water quality (open sewage and rubbish can contaminate water sources and increment sedimentation) and thus, availability 3) Flood disruptions in transportation systems and damaging of available water infrastructure
	Northern			NA			
	Eastern	-	-	NA	-		
	Southern			NA			
Increased temperature	Western/ Freetown					Ground-water	1) Increased water demand for cooling needs 2) Increased evapotranspiration resulting in crop loss 3) Reduced water quantity in shallow wells
	Northern						
	Eastern						

	Southern					and springs due to increased rates of evaporation. 4) Increased water pumping in regions of intense agriculture due to high temperatures
Increased frequency of intense precipitation and floods	Western / Freetown					1) Reduced water quality (in areas where groundwater contamination is occurring)
	Northern					
	Eastern					
	Southern					
Decreased dry season precipitation	Western / Freetown					1) Reduced water availability in some areas due to draughts
	Northern					
	Eastern					
	Southern					
Sea Level Rise	Western / Freetown			NA		1) Reduced water quality (in areas where groundwater contamination is occurring) 2) Reduced water availability in some areas due to draughts 3) Potential disruption of groundwater collection and transport infrastructure
	Northern			NA		
	Eastern	-	-	NA	-	
	Southern			NA		

**Note:**

NA ? RCP6.0 scenario not provided on the CCKP for sea level rise



Mean Temperature: This index refers to the average of the maximum and minimum temperatures of a year, taking the mean average of the coldest month of the year and averaging it with the mean average of the hottest month of the year.



Mean Drought Index: This index represents changes in the mean of 12-month cumulative water balance and is a measure of the given water deficit in a specific location, accounting for contributions of temperature-dependent evapotranspiration and providing insight into increasing or decreasing pressure on water resources. Brown/Yellow areas are more likely to experience severe drought compared to the baseline period (Reference period: 1986-2005). Meanwhile, Green areas are less likely to experience severe drought.



Days with Rainfall >20 mm: Raising temperatures bring along a change in the potential carrying capacity of moisture in the air. With ~7% increase of theoretical water holding with every degree Celsius, the potential for heavy rainfall is increasing. Looking at the changes in the number of days with at least 20mm of daily rainfall helps to estimate how likely the impacts are of heavy rainfall. Water routing, and thus storage and other management options, are often very different if the input comes in form of many weak or a series of heavy rainfall events. 20mm is one of the thresholds used and represents very heavy precipitation.



Projected Sea Level rise (SLR): indicates future, model-derived relative Sea Surface Height (SSH) for three different RCPs: 2.6, 4.5, 8.5.

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### Energy Sector

47. Sierra Leone has one of the lowest electrification access rates in the world, with only 26% of the population with access to electricity. Thus, energy sector challenges in the country are primarily related to increasing access to modern and clean cooking and electricity services. The sector is linked to climate change. On one hand, global energy production is a strong contributor to the climate change drivers (through GHG emissions). On the other hand, it is exposed to climate variability and change as this may impact energy supply (for example, by damaging transmission and distribution infrastructure causing disruption in operations and transmission / distribution) and energy demand (as increase in temperature coupled with the growing population, will result in higher power needs for cooling).

48. A crucial component able to accelerate the country's path toward a sustainable energy will be the evolution of fuelwood consumption, which currently is an important driver of deforestation and land degradation in the country. Fuelwood is the dominant source of energy for cooking in Sierra Leone.

49. The rising temperatures will affect the demand for electricity, for heating and/or cooling, and thus the energy needs of the country. Cooling Degree Days show the relation between the daily heat and cooling demand typically sourced by active cooling (air conditioning) or evaporative process. The analysis of the expected change in cooling degree days provides an indication into the potential for extended seasons of power demand or periods in which cooling demand might increase. In the case of Sierra Leone, as daily temperatures are expected to increase, the need for cooling is also projected to increase throughout the year (Figure 15). Also, the cooling demand increases with the level of emissions. The low emission scenario (RCP2.6) shows lower cooling demand while higher emission scenarios (RCP8.5) shows higher cooling demand, when compared with the reference period 1986-2005. The Warm Spell Duration Index presents the number of days in a sequence of six (6) in which the daily maximum temperature is greater than the 90th percentile of the daily maximum temperature. As shown in Figure 16, warm spells are projected to sharply increase in the second half of the century.

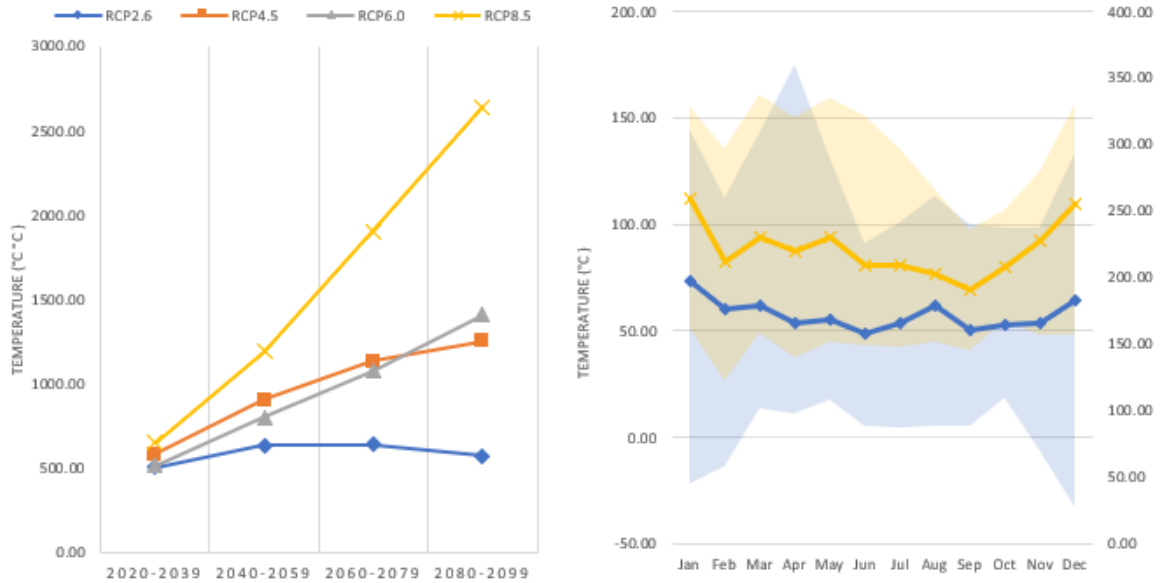


Figure 15: Projected change in cooling degree days in comparison with the reference year 1886-2005 (Ensemble): (left) in the different emission scenarios until 2099 and (right) throughout the year for RCP2.6 and RCP8.5 (mean and range) for 2080-2099[56]<sup>56</sup>

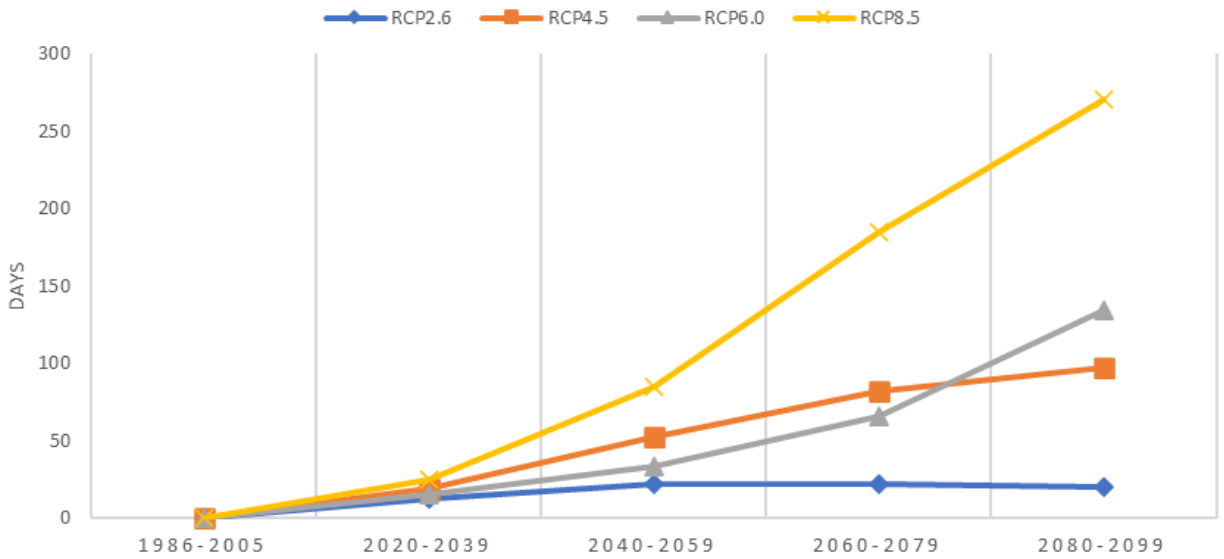


Figure 16: Warm Spell Duration Index in Sierra Leone for the period 1986-2099 compared to reference year 1986-2005[57]<sup>57</sup>

50.

*?Drop of water levels in all of the hydro locations across the country.? (Sierra Leone stakeholder)*



Hydropower supplies 60-70% of Sierra Leone energy needs. Rainfall patterns changes have already impacted energy supply in the country. On one hand, there has been a decrease in rainfall since 1970's, and thus stream flow has decreased impacting the available resource for energy production and supply[58]<sup>58</sup>. On the other, the significant variability and recent less predictability of precipitation levels is making hydropower energy generation more difficult to manage. Furthermore, the increased number of extreme events and its increased severity can impact energy generation and transmission infrastructure, as it may lead to its destruction, causing blackouts and loss of energy access in a country with already poor electricity infrastructure coverage.

51. On the production side, water is required not only for hydroelectricity production but for cooling of power plants. If there is not enough water, then cooling is restricted and thus production might need to be slowed. In some places, there are regulations preventing power plants from causing an increase in the temperature of returned water above specific thresholds dangerous for local fish and plants. These thresholds are more quickly reached if stream flows are low during dry conditions. In a few regions, too much moisture can also be an issue as water might need to be removed.

52. As warmer air has a higher capacity to carry moisture in the form of water vapor, future climate raises the likelihood for strong rainfall events and the increase of extremes events. The 10-year return period rainfall episodes, such as the 5-day cumulative rainfall, is a good measure of these extremes. In Sierra Leone, as shown in Figure 17, the maximum expected amount of rainfall in a 10-year period is projected to increase, which can lead to flooding that can result in power production disruption (e.g., distribution networks can be disturbed by excessive rainfall and flooding).

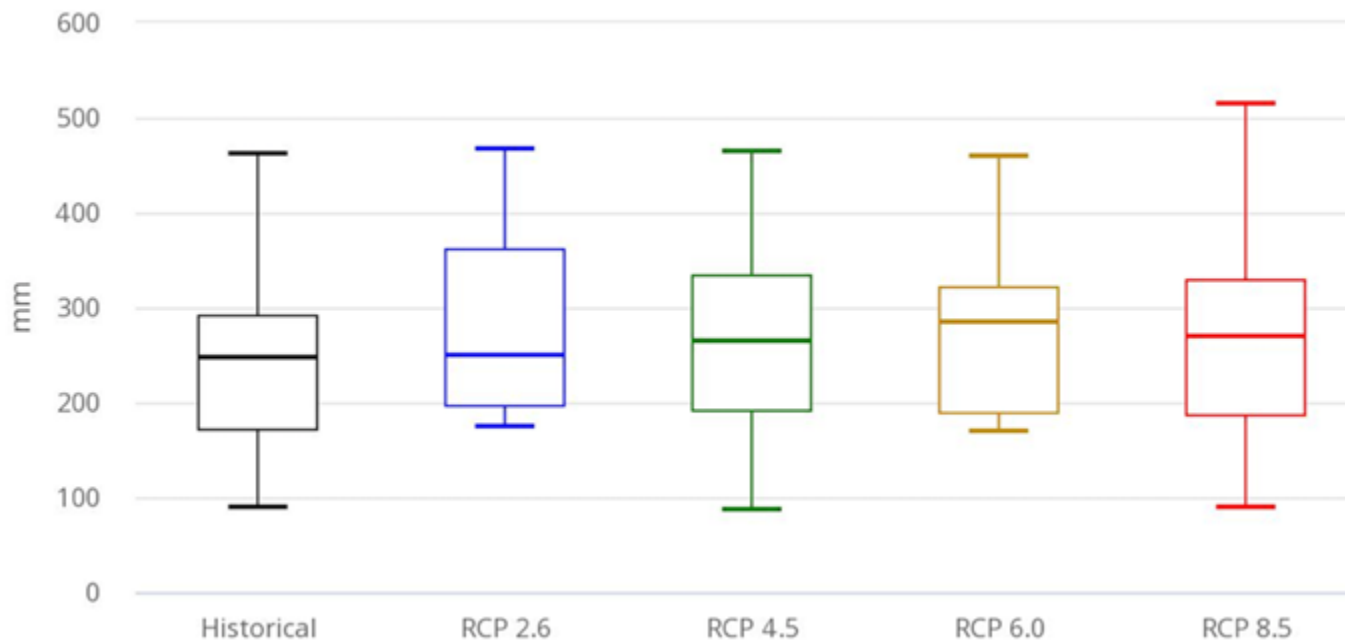


Figure 17: 5-day precipitation: 10-yr return level in Sierra Leone for the period 2040-2059<sup>[59]</sup>

53. Taking into account the low electricity access rate of the country, there is a need for climate change policy to consider access to energy that can withstand climate change future risks. These challenges are expected to be aggravated by population growth, climate change, deforestation, natural disasters, and uncoordinated urban planning. Table 10 summarises the potential climate stressors and risks in the energy sector.

Table 10: Summary of the potential climate stressors and risks in the energy sector under different RCPs scenarios for 2080-2099

Climate-related impact drivers	Vulnerability areas from the CRVA	Impact intensity under varying RCPs for 2080-2099				Climate Risks
		RCP 2.6	RCP 4.5	RCP 6.0	RCP 8.5	
Increased temperature	Western / Freetown	Light Orange	Orange	Dark Orange	Dark Orange	1) Demand for cooling increases (as it puts pressure on the power plants regarding electricity generation)
	Northern	Light Orange	Orange	Dark Orange	Dark Orange	
	Eastern	Light Orange	Orange	Dark Orange	Dark Orange	
	Southern	Light Orange	Orange	Dark Orange	Dark Orange	
Increased frequency of intense precipitation and floods	Western / Freetown	Dark Blue	Blue	Dark Blue	Light Blue	1) Hydropower generation could be affected by floods 2) Hydropower potential will probably increase with increased precipitation 3) Disruption in transportation lines for fuel could be affected by floods 4) Electricity infrastructure system could be affected by floods
	Northern	Dark Blue	Light Blue	Dark Blue	Light Blue	
	Eastern	Dark Blue	Blue	Dark Blue	Light Blue	
	Southern	Dark Blue	Dark Blue	Dark Blue	Light Blue	
Decreased dry season precipitation	Western / Freetown	Light Green	Light Green	Light Green	Light Green	1) Hydropower generation could be affected by droughts 2) Power plants production might be reduced due to water scarcity for cooling needs
	Northern	Light Green	Yellow	Yellow	Light Green	
	Eastern	Light Green	Light Green	Light Green	Light Green	
	Southern	Light Green	Light Green	Light Green	Light Green	
Sea Level Rise	Western / Freetown	Magenta	Magenta	NA	Purple	1) Hydropower generation could be affected/destroyed by coastal flooding due to sea level rise
	Northern	Magenta	Magenta	NA	Purple	
	Eastern	-	-	NA	-	



**Note:**

NA ? RCP6.0 scenario not provided on the CCKP for sea level rise



Mean Temperature: This index refers to the average of the maximum and minimum temperatures of a year, taking the mean average of the coldest month of the year and averaging it with the mean average of the hottest month of the year.



Mean Drought Index: This index represents changes in the mean of 12-month cumulative water balance and is a measure of the given water deficit in a specific location, accounting for contributions of temperature-dependent evapotranspiration and providing insight into increasing or decreasing pressure on water resources. Brown/Yellow areas are more likely to experience severe drought compared to the baseline period (Reference period: 1986-2005). Meanwhile, Green areas are less likely to experience severe drought.



Days with Rainfall >20 mm: Raising temperatures bring along a change in the potential carrying capacity of moisture in the air. With ~7% increase of theoretical water holding with every degree Celsius, the potential for heavy rainfall is increasing. Looking at the changes in the number of days with at least 20mm of daily rainfall helps to estimate how likely the impacts are of heavy rainfall. Water routing, and thus storage and other management options, are often very different if the input comes in form of many weak or a series of heavy rainfall events. 20mm is one of the thresholds used and represents very heavy precipitation.



Projected Sea Level rise (SLR): indicates future, model-derived relative Sea Surface Height (SSH) for three different RCPs: 2.6, 4.5, 8.5.

**Food Sector (including agriculture and fisheries)**

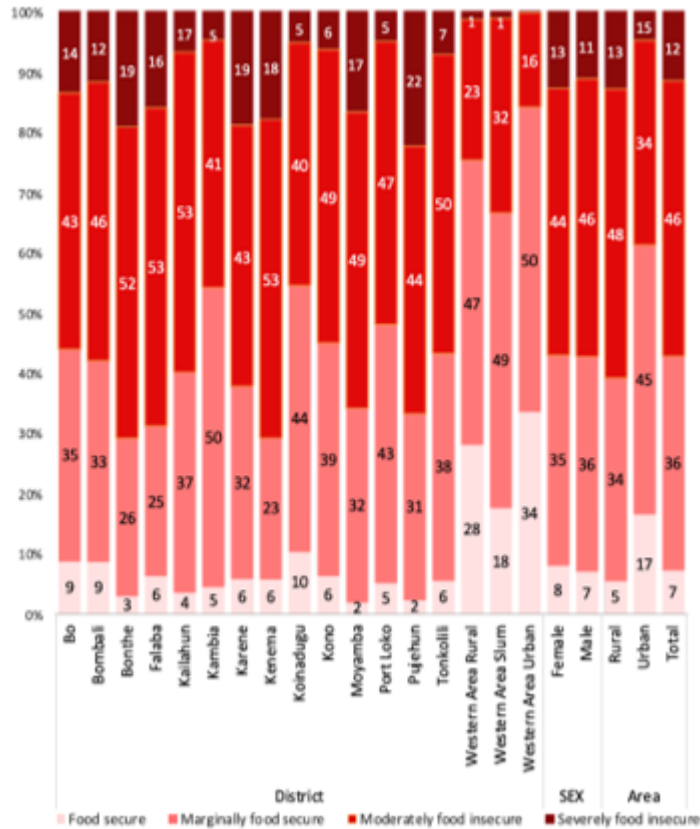


Figure 18: Food insecurity comparison by districts

According to the 2020 State of Food Security in Sierra Leone Report [60]60, food insecurity and stock vulnerability have been worsened over the past 10 years, affecting 57% of Sierra Leone's population (4.7 million people), with 12% (963 thousand people) being severely food insecure. In rural areas these numbers are even worse, as by the end of 2020, 61% of the rural population was food insecure [61]61. Additionally, the severity of food insecurity has deepened as the number of people facing severe hunger has tripled between 2010-2020. This has been aggravated by the COVID pandemic and its economic fallout that exacerbated the access to basic amenities and living conditions. Apart from the macroeconomic shocks, other potential drivers for food insecurity in Sierra Leone were identified by the Comprehensive Food Security and Vulnerability Analysis in 2020 [62]62. These are related to above mentioned climate impacts, such as the erratic rainfall patterns observed during 2018 and 2019 on agriculture production. In fact, the erratic rainfall/ flooding has shown a profound impact on already low productivity levels (by contributing to poor germination of seeds, die off of seedlings and

waterlogging of fields and crops), further reducing yields, and consequently reducing food availability and depleting household food stock[63]63.

55. Agriculture crop yield reduction is a consequence of changes in precipitation patterns and temperature, the limitation of water supply, increased crop loss and failure due to increase in average temperatures, droughts and flood. Particularly with regards to the occurrence of drought, model projections are inconsistent in their estimates of change in drought, which influences water scarcity. However, some stakeholders have indicated during consultations that effects of drought are already being felt. Harsher and more wide-spread droughts will lead to a strain on communities and farmers that need fresh water for irrigation. The WB CCKP expects that drought may affect the Northern region of Sierra Leone. Stakeholders consulted during PPG have also referred the loss of cattle due to drought.

56. Food production (agriculture and fisheries) is the largest sector in the Sierra Leone economy, accounting for 59% of the GDP in 2016, with 80% of the rural householders engaged in production and sale of food stock and 31% involved in the production and sale of cash crops[64]64. In urban areas, this is much lower with 29% of the households engaged in growing and selling food crops and 12% engaged in cash crops[65]65. Major sources of income in urban areas are petty trading and formal trading, which are activities carried out by 50% and 35% of the urban households, respectively.

57. In terms of agriculture subsectors contribution to the GDP, crops represent 70% of the agricultural output while fisheries contribute 14%, forestry 11% and livestock only 4%[66]66.

### *Agriculture*

58. Agriculture is an important livelihood, primary food source and large component of the economy. Current climatic conditions are ideal for the production of the primary crops: rice, sugar cane, banana, coconut, citrus, cocoa, pineapple, yam and cassava. With regional climate modelling projections demonstrating increased temperatures (approx. +1.7°C for RCP4.5 and 2.3°C for RCP8.5) and rainfall changes from -5% to 5% with high variability, it is expected that agriculture practices and production will be impacted, and thus there is need for adaptation. For instance, rice being the staple food crop in Sierra Leone and being grown mainly in smallholder farming under rain-fed conditions, agriculture and farmers' livelihoods are especially vulnerable to changes in precipitation. This is compounded by the persistent rural poverty and farmers without crop insurance or the resources to invest in irrigation and other agricultural technologies. These climate change impacts are also likely to increase water requirements for crops, competition for water resources, as well as incidence of pest and disease outbreaks.

59. The increased occurrence of warm spells is going to increase crop water requirement and therefore play a key role in crop and livestock production by reducing water availability in water

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limited areas. With the expected increase in rainfall events, which will potentially lead to flooding, rain fed agriculture is at risk of crop and livestock losses and could significantly affect food security.

60. As climate change will increase temperatures and severity of heat waves, it is expected that it will negatively impact crop yield production. Warm conditions of the day are important for crop growth cycles, but there are upper heat thresholds beyond which crop productivity is reduced or stalled[67]67. This change has implications for agriculture crops and livestock as well as to human health.

61.

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*?The country is experiencing reduced annual precipitation which affects crop yields in a country that depends solely on rain-fed agriculture. I have also observed that significant part of the rural population is depending on cassava as their staple food rather rice which tell me local rice production is dwindling and its price is unaffordable for many. I have also observed that the seasons for our local fruits are becoming shorter.? (Sierra Leone stakeholder)*

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The other fundamental climatic condition for rain-fed agriculture and livestock productivity is precipitation. In fact, a gain or a decrease over the coming decades could determine if certain crops or farm practices remain viable, and if reduced water availability might require a shift to more drought resistant crops or if farmers are required to shift investments to irrigation. As referred, precipitation will vary a lot depending on the considered emission scenario in Sierra Leone. Although it is not expected to increase a lot with time, its unpredictability and intensity is in fact projected to rise. This will certainly continue to damage crops, flood fields and streams in Sierra Leone will lead to soil leaching and erosion.

62.

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*?The crop cycles are shifting across Sierra Leone - we hear this first-hand from our Sales Agents and Customers, as this affects the repayment rates and expectations.? (Sierra Leone stakeholder)*

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Furthermore, the Comprehensive Food Security and Vulnerability Analysis for Sierra Leone 2020[68]68, indicates that rainfall variability has had an impact on 2020 agricultural season, as the country experienced a timely onset of the seasonal rains in late March and most part of the country received 120%-140% of the average rainfall. This prompted farmers to start preparing the land for the planting season in May. However, from July onwards Sierra Leone received below average rainfall, and this impacted negatively the 2020 harvest.

63. With the expected increase of extreme rainfall events, which will potentially lead to flooding and drought due to the variability of the precipitation and the increase in temperatures, rain fed agriculture is at risk of crop and livestock losses. Since most part of the population is dependent on agriculture, this could significantly affect food security (food shortages, hunger and malnutrition). In addition, water shortages can also lead to loss of food production and increase the needs to import and/or experience food shortages. These impacts are even more pronounced for the vulnerable groups such as women, youth, and the disabled, particularly the ones living in rural areas.

64. In addition to the previous, post-harvest losses are also a matter of concern in Sierra Leone and also contribute to food insecurity alongside other factors. Improper storage facilities contribute to the extremely high post-harvest losses and insect infestations. Most farmers (68%) store food in baskets and bags and around 30% use open space for storage. This also compels the farmers to sell their surplus quickly rather than store them to sell when commodity prices increase or when their access to food is reduced. In addition, also improper storage of seeds results in reduced germination, and this decreases the potential future production<sup>68</sup>. Post-harvest losses can in fact be exacerbated by climate change impacts due to the occurrence of higher temperatures and floods and giving rise to new diseases and pests<sup>[69]<sup>69</sup></sup>.

### *Fisheries*

65. Studies show that the country has a diverse and valuable array of fish stocks in both marine and inland environment which are exploited through fishing and a limited number of aquaculture systems. It is a very important sector as it contributes to food security and export earnings. Fisheries is estimated to provide employment and a source of livelihood for 500,000 people<sup>[70]<sup>70</sup></sup>, mainly living in coastal Sierra Leone. Fish is the most important source of animal protein for most of the population, supplying 80% of the country's animal protein<sup>[71]<sup>71</sup></sup>.

66. Changes in rainfall patterns will cause variations in river flows and will lead to disturbances in flood patterns including extent, timing, and duration as well as periods of low rain in other areas. Flash floods may wash eggs and fry out of their normal habitats thereby increasing chances that they will die from starvation or predation. In aquaculture systems the risks include losing fish from ponds during floods, invasion of ponds by unwanted species, and ponds damage resulting from infilling and washing away of walls. However, it should be noted that heavier rainfall may increase the areas suitable for aquaculture ponds that rely on rainwater, thereby favouring the social and economic sustainability in such regions. Drought events may lead to water stress, such as shortages and quality deterioration that have negative effects on inland fisheries and aquaculture production<sup>[72]<sup>72</sup></sup>.

67. Climate Change impacts are already being felt on coastal communities, fisheries, and coastal environments, which for Sierra Leone are very important ecosystems both for livelihood support as well as other activities, such as tourism. As explained, fishing is central in the coastal economy, being the source of income for fishers, fish processors and fish trades, with a large secondary economy, that include boat building, wood cutting, fish, transportation, basket weaving, selling fishing gear and trading<sup>[73]<sup>73</sup></sup>.

68. Sierra Leone's coast is particularly vulnerable climate change, due to the extent of mangrove forest loss, the exposure of coastal population to the effects of sea-level rise and winds and high poverty levels. Rising sea levels create not only stress on the physical coastline, but also on coastal ecosystems. Saltwater intrusions can contaminate freshwater aquifers, with impacts on municipal and

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agricultural water supplies as well as natural ecosystems. With the increase in global temperatures, sea level will continue to rise, and this will happen because of the substantial lag to reaching an equilibrium. The magnitude of the rise will depend strongly on the carbon emissions and future global warming, with expected increase in speed depending on the rate of glacier and ice sheet melting.

69. With sea level rising in the coast of Sierra Leone, storm surges threaten the stability of the shores along the coast, especially where sand banks and dune systems are exposed to open ocean. Other parts of the coast are protected by mangrove swamp and forest, but these natural barriers to erosion are also being destroyed by changes in lifestyle and severe pollution caused by mining, deposition of plastics and sewage released from land areas.

70. The health of coastal communities is expected to be severely affected by higher water tables and contamination of drinking water by saline intrusion and lack of sanitation. Many of these challenges can be addressed by physical adaptation strategies but the threats of climate change are more insidious and include risks to the marine fish stocks of Sierra Leone, which possesses one of the richest fisheries in the world. In fact, rising sea temperature makes fish stocks to migrate toward colder waters away from equatorial latitudes and contributing to shrinking fish sizes. It also influences the abundance, migratory patterns, and mortality rates of wild fish stocks. The assessment carried out by Lam et al.[\[74\]](#)[74](#) on the climate change impacts on fisheries in West Africa estimate that under the high-emission scenario by 2050 Sierra Leone is expected to suffer substantial reduction in fish of over 50%, which will worsen food security issue for the country, as a big share of the population in Sierra Leone are undernourishment conditions (see Table 11). The article refers that by 2050 under the high-range emission scenario, as fish landing will be much lower than projected demand, Sierra Leone is expected to lose an average of 7.6% of the protein they consumed in the 2000s, aggravating the undernourishment situation in the country. Furthermore, the country is also projected to suffer from severe socio-economic impacts, as fishery-related jobs are projected to be less than half of what they were in the 2000s (Figure 19), indirectly impacting food security by reducing the purchasing power of people to buy both fish and other foods with higher calories (as it is known that the consumption of non-staple food (like fish) increases rapidly with income), leading to possible socio-political problems.

71. Aquaculture is seen as a possible solution to reduce the risks and uncertainties of fish captures and could be a solution to fill in the gap between fish supply and demand. Apart from the fact that aquaculture is underdeveloped in the country, even if it is assumed to grow up fast, Lam et al., do not expect it to be enough to fill in the gap between fish supply and demand.



Table 11: Current fish landings, projected landings, percentage change in landings over current level and prevalence of undernourishment in Sierra Leone under two Climate change scenarios[75]<sup>75</sup>

Current landings in the 2000?s (t)	Low-range GHG emissions scenarios (constant 2000)		High-range GHG emissions scenario		Prevalence of undernourishment in total population (2000-2002) (%)
	Projected landings in 2050?s (t)	Potential percentage in catch over current level (2000s)	Projected landings in 2050?s (t)	Potential percentage in catch over current level (2000s)	
59,307	51,000	-14%	27,723	-53.3%	51%

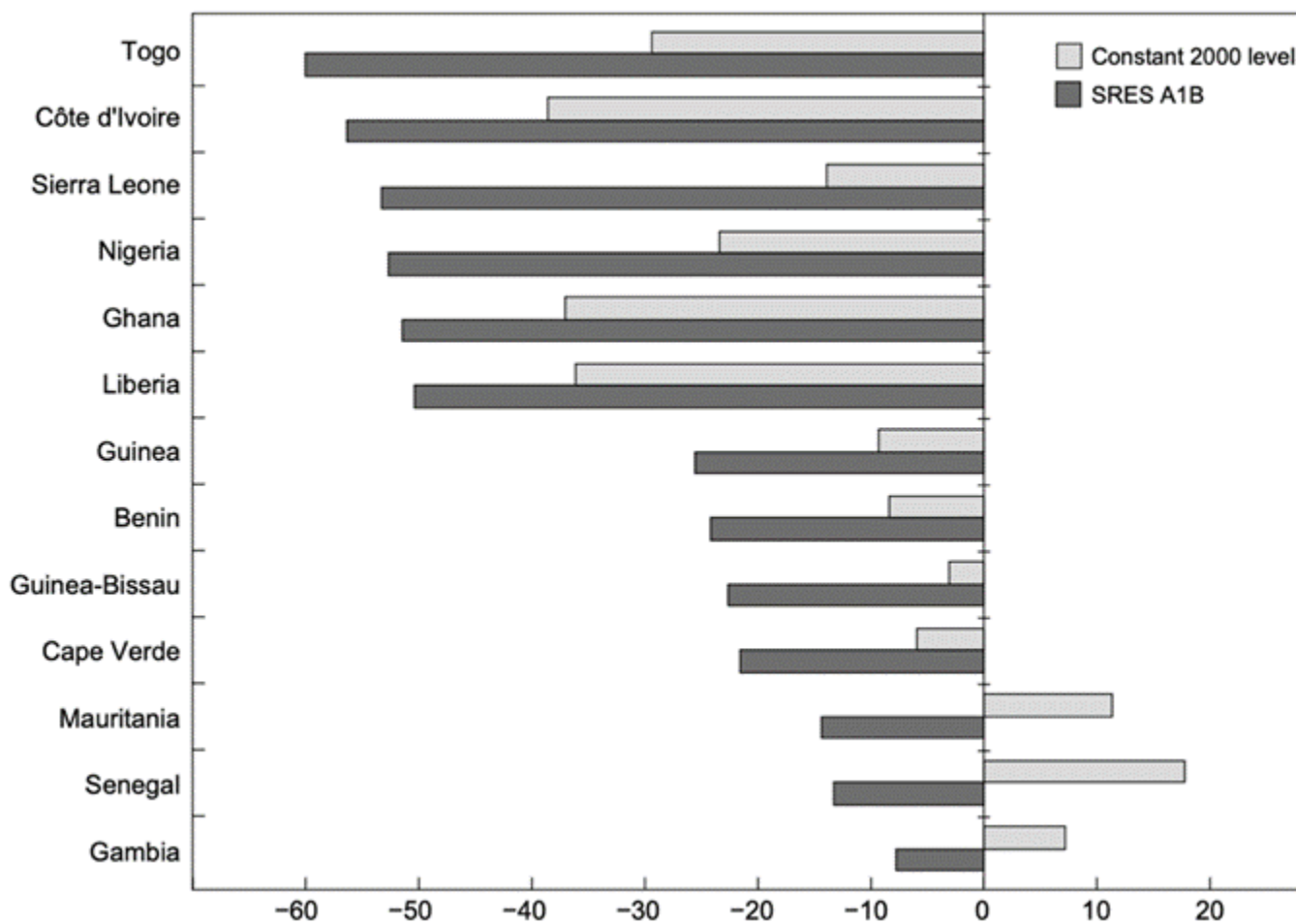


Figure 19: Projected annual average change in fisheries-related jobs (%) in the 2050s in relation to the 2000s under the low-range emissions scenario (constant 2000 level) and the high-range emission scenario (SRESA1B)[76]<sup>76</sup>

72. In addition, rising oceanic temperatures carry the risk of diverting the currents which govern planetary water and air circulation posing threats to the distribution of fish feeding and spawning grounds and to the seasonal patterns and intensity of rainfall.

73. In summary, the fact that Sierra Leone lies on the West Coast of Africa exposes it to a high level of vulnerability in terms of coastal erosion with many coastal communities including the capital city Freetown being exposed to the hazardous effects of flooding and storm surge. A large proportion of Sierra Leonean's population lives in coastal communities, and they constitute some of the poorest in the country. Table 12 summarises the potential climate stressors and risks in the food sector.

Table 12: Summary of the potential climate stressors and risks in the food sector under different RCPs scenarios for 2080-2099

Climate-related impact drivers	Vulnerability areas from the CRVA	Impact intensity under varying RCPs for 2080-2099				Climate Risks
		RCP 2.6	RCP 4.5	RCP 6.0	RCP 8.5	
Increased temperature	Western / Freetown	Light Orange	Orange	Dark Orange	Dark Orange	1) Yield changes, including potential increases, reductions; crop failure/loss 2) More pests, and crop diseases 3) Reduced aquatic biodiversity and productivity 4) Disruption of water and air circulation with impacts on fish feeding and spawning grounds 5) Increased algae bloom with impacts to the fish and human health
	Northern	Light Orange	Orange	Dark Orange	Dark Orange	
	Eastern	Light Orange	Orange	Dark Orange	Dark Orange	
	Southern	Light Orange	Orange	Dark Orange	Dark Orange	
Increased frequency of intense precipitation and floods	Western / Freetown	Dark Blue	Blue	Dark Blue	Light Blue	1) Soil nutrient leaching 2) Flood disruption in transportation systems and reduce access to market 3) Soil erosion 4) Crop damage due to flooding 5) More diseases and fungal attacks due to high air humidity 6) Flash floods may impact fish feeding and spawning grounds 7) Increase food insecurity
	Northern	Dark Blue	Light Blue	Dark Blue	Light Blue	
	Eastern	Dark Blue	Blue	Dark Blue	Light Blue	
	Southern	Dark Blue	Dark Blue	Dark Blue	Light Blue	
Decreased dry season precipitation	Western / Freetown	Light Green	Light Green	Green	Light Green	1) Increase risk of livestock mortality 2) Crop water stress in some areas due to seasonal draughts 3) Water stress on island fisheries and aquaculture production
	Northern	Light Green	Yellow	Yellow	Light Green	
	Eastern	Light Green	Light Green	Light Green	Light Green	
	Southern	Light Green	Light Green	Light Green	Light Green	

Sea Level Rise	Western / Freetown			NA		1) Coastal erosion, including damage of coastal ecosystem, 2) Contamination of freshwater aquifers / groundwater (water table) with impact on fish 3) Quantity of freshwater aquifers available for WEF sector activities
	Northern			NA		
	Eastern	-	-	NA	-	
	Southern			NA		

**Note:**

NA ? RCP6.0 scenario not provided on the CCKP for sea level rise



Mean Temperature: This index refers to the average of the maximum and minimum temperatures of a year, taking the mean average of the coldest month of the year and averaging it with the mean average of the hottest month of the year.



Mean Drought Index: This index represents changes in the mean of 12-month cumulative water balance and is a measure of the given water deficit in a specific location, accounting for contributions of temperature-dependent evapotranspiration and providing insight into increasing or decreasing pressure on water resources. Brown/Yellow areas are more likely to experience severe drought compared to the baseline period (Reference period: 1986-2005). Meanwhile, Green areas are less likely to experience severe drought.



Days with Rainfall >20 mm: Raising temperatures bring along a change in the potential carrying capacity of moisture in the air. With ~7% increase of theoretical water holding with every degree Celsius, the potential for heavy rainfall is increasing. Looking at the changes in the number of days with at least 20mm of daily rainfall helps to estimate how likely the impacts are of heavy rainfall. Water routing, and thus storage and other management options, are often very different if the input comes in form of many weak or a series of heavy rainfall events. 20mm is one of the thresholds used and represents very heavy precipitation.



Projected Sea Level rise (SLR): indicates future, model-derived relative Sea Surface Height (SSH) for three different RCPs: 2.6, 4.5, 8.5.

74. From this section 1.2 it can be concluded that under different RCP scenarios, there will be different hazards and different climate change expected effects on the WEF sectors in Sierra Leone. The severity of the climate change impacts that Sierra Leone has been facing and will face in the future may vary depending on the adaptive capacity of the country to address and cope with these impacts.

See below an analysis of the adaptive capacity and assessment of vulnerable segments of the population in Sierra Leone.

### **1.2.6 Analysis of adaptive capacity and assessment of vulnerable segments of the population:**

75. In order to determine the vulnerable regions and vulnerable groups that this project will target the country's adaptive capacity was assessed. Find below a summary of the adaptive capacity determinants [77] **economic wealth, equity, information and skills, technology, infrastructure, and institutions** - in Sierra Leone and specific information collected from the country's stakeholders.

76.

#### Economic resources, Equity, Information and Skills:

77. The level of impacts and coping strategies of populations depends heavily on their socio-economic status, socio-cultural norms, access to resources, poverty as well as gender [78]<sup>78</sup>. As mentioned, in terms of HDI, Sierra Leone ranks 182 out of 189 countries and territories around the world [79] <sup>79</sup>. Sierra Leone HDI value (0.452) is below the average of low human development group value (0.513) and the average SSA value (0.547) [80] <sup>80</sup>, which indicates a low economic development and low economic welfare.

78. Climate change affects environmental inequities as it highly influences health, economy and human rights. The IPCC Fourth National Climate Assessment Report states that low-income individuals and communities are more exposed to natural hazards and pollution and have harder time recovering from the impacts of climate change [81] <sup>81</sup>. Thus, the most vulnerable to the ill-effects of climate change are the ones that are high susceptible to its effects and for whom it is very hard to recover from climate change hazard events. This includes the poorest, especially the ones living in poverty, that have limited financial resources to cope with disasters and the smallholder farmers, herders and fisheries who depend on the climate and natural resources for food and income [82] <sup>82</sup>. This is really a big issue for Sierra Leone population as the big majority of the population lives below the poverty line and is dependent on agriculture for food and subsistence as explained.

79.

80. Due to its many economic and social challenges, Sierra Leone is placed on the bottom 25 countries of the ND-GAIN Index which summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. The high vulnerability score and low readiness score of Sierra Leone places it as the 17th most vulnerable country and the 49th least ready country [83] <sup>83</sup> meaning that the country is highly vulnerable to, yet extremely lacking

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capacity to adapt to climate change effects. Furthermore, the lack of financial instruments adapted to the needs of the vulnerable groups is one of the main barriers that have been identified during the PPG stage (75% of the consulted stakeholders indicated that insufficient availability and access to funding for the vulnerable groups was considered one of the main barriers and the provision of finance to vulnerable population was identified as a key action (second place) to develop a market for climate change adaptation).

81. Climate variability and change are likely to exacerbate existing vulnerabilities, political instability and conflict, food insecurity and the existing high poverty rates, and with 60% of the Sierra Leone population living below the poverty line: (US\$1.90/day<sup>[84]</sup><sup>[84]</sup>), and 10.8% of its population living in extreme poverty, this is something that will probably happen. As described in the Baseline Report (Annex P), the vulnerable populations will be the ones that will be most impacted by the effects of climate change, including people living in poverty (and extreme poverty), people dependent on rain-fed agriculture, pastures, forests, and coastal resources for their livelihood and especially women.

82. Food security is of primary concern as most of the country's agriculture is primarily rainfed and conducted by small-holder farmers, which are part of the vulnerable groups, and compose a big majority of the country population. Agriculture (including fisheries) is the pillar of Sierra Leone's economy, since it accounts for 55% of the GDP<sup>[85]</sup><sup>[85]</sup>, providing employment to about 75% of the country's population, with women as the predominant workforce<sup>[86]</sup><sup>[86]</sup>. Thus, impacts on agriculture and its production severely impacts both the livelihood of a big percentage of Sierra Leone's population as well as the availability of food. Increased food insecurity can result from natural disasters and changes in climate, as those lead to land degradation and soil erosion, direct crop failure due to floods and heavy rains, and possible nutrient leaching and fungal growth due to increased humidity; all of these exacerbated by the lack of capacity of the population to adapt to these effects. The Deputy Director-General at the Sierra Leone Meteorological Agency referred "In the past 10-15 years, more frequent and prolonged droughts or dry spells have severely disrupted the farming calendar. A cousin of mine, who used to make a living from backyard gardening, told me how less rain and low moisture content in the soil had caused her harvest to drop away. Plants like krain?krain (a nutritious green leaf, popular in Sierra Leonean stews), lettuce, pepper and cabbage were turning yellow and failing. She was forced to abandon her vegetable gardening business for petty trading ? buying and selling assorted items such cement, iron rods and nails. This is one example among thousands of how climate change is threatening our food security?<sup>[87]</sup><sup>[87]</sup>. This, and the increased unpredictability of the climate and rainy season, was also emphasized by many stakeholders and people leaving and working in Sierra Leone. For example, one stakeholder said: "The country is experiencing reduced annual precipitation which affects crop yields in a country that depends solely on rain-fed agriculture. I have also observed that significant part of the rural population is depending on cassava as their staple food rather rice which tell me local rice production is dwindling and its price is unaffordable for many. I have also observed that the seasons for our local fruits are becoming shorter.?"

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83. Within this group, women constitute 50% of the Sierra Leone's population[88]88, and make up a significant proportion of Sierra Leoneans farmers and so are one of the most vulnerable groups to climate change impacts. In fact, most of the farmers in Sierra Leone are women and a lot of the agriculture related MSMEs are women-led (73% of the MSMEs registered in SMEDA are women led[89]89), and they provide up to 60% of farm labour for food production[90]90. However, women farmers rarely own their lands or control land[91]91. Women play a key role in the family and the community as caregivers, have the greatest control over family nutrition and are among the poorest, and climate change disrupt their lifestyle and overload them as not only it impacts their crops' productivity, but they have to cover more distance to fetch water or wood for cooking. Furthermore, Sierra Leone was ranked 121 out of 156 countries by the World Economic Forum in the most recent Global Gender Gap Index (2021)[92]92, emphasizing the prevailing gender imbalance which marks an additional socioeconomic hurdle. Women in the Sierra Leone face challenges due to continued imbalances in social norms and power relations (see Annex I- Gender Analysis with a full analysis of this vulnerable group)

84. Furthermore, climate events will not only impact the farmer sector in rural areas but will also affect people in urban areas since they depend heavily on the production of those rural areas. Having into account that 50% of the urban households are engaged in petty trading and 35% in formal trading[93]93, these will be impacted if there are no products to be traded. .

85. Furthermore, *successful adaptation requires a recognition of the necessity to adapt, knowledge about available options, the capacity to assess them, and the ability to implement the most suitable ones*[94]94. The lack of trained and skilled personnel can limit a nation's ability to implement adaptation options. In general, countries with higher levels of stores of human knowledge are considered to have greater adaptive capacity than developing nations and those in transition. Results from the Baseline Report showed how there is a need to build capacity in Sierra Leone in the Adaptation field in general. See Table 17 in section 1.3 (Main barriers to be addressed).

86. The position of young people in Sierra Leone's labour market is extremely precarious, even though the youth represent an asset for the workforce and an enormous potential for the country's development. The National Human Development Report (NHDR) indicates that 11.2% of the youth aged 15-24 are not in employment or in education or training[95]95. Within this group, girls are more vulnerable than boys. Significant gender gaps do form after early childhood, notably in education, in health care, in labour force participation, in fewer-owned businesses, in greater control of husbands of marital property, and in lower access to bank accounts (see Annex I- Gender Analysis for further information on this gender imbalance). With limited skills and knowledge, unfriendly market structures that concentrate women in lower-paying work ? such as agriculture and fisheries ?, restricted access to

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capital and credit, traditional family structures perpetuating gender inequality through patriarchal norms of property and inheritance, discrimination in the public domain, and equal and unequal trade and economic patterns<sup>[96]</sup>, makes women capacity to adapt to climate change very limited (as they need information on how to adapt and financial resources to do that).

87. Of the young population in Sierra Leone, 70% are underemployed or unemployed and 50% illiterate and unskilled<sup>[97]</sup>. Thus, the country is badly affected by unemployment and underemployment, with more than half of the young people unable to realize their productive potential and often forced to work in the informal sector (informal employment affects nine in ten young workers in Sierra Leone), which is characterized by low or irregular incomes, poor working conditions, and lack of any social protection. This situation is the result of the low economic growth and then hence lack of jobs. Factors that have significantly reduced youth employment opportunities in Sierra Leone include the 11 years of conflict, degeneration of the formal economy, malfunctioning of the educational system that led to lack of qualified training and recognition of certified skills acquired as well as implementation of inappropriate policies that failed to give sufficient prominence to the 'employment' dimension<sup>[98]</sup>. In fact, the 'illiteracy level' in Sierra Leone as well as the 'lack of qualified professionals' to work for MSMEs has been highlighted by several of the consulted stakeholders and a key factor affecting Sierra Leone businesses. Knowledge of climate change science for developing policies, making decisions, implement projects, specially in younger generations that will be the ones projected to suffer more from climate change impacts, is key to be able to identify how they can adapt to it.

88. A survey conducted by the International Labour Office (ILO) revealed that the underutilization of the youth potential is a top concern for Sierra Leone, being worst for young women (72.8% underutilization rate in 2015) than for young men (59.9% underutilization rate in 2015) as well as that the low-quality jobs remain a strong hindrance to the countries productive sector, with a big majority of the young people working informally<sup>[99]</sup>.

89. Children in Sierra Leone (0-14 years) make up to 42% of the population, and more than half of the nation's children (66%) are considered multidimensionally poor, suffering deprivation when it comes to at least one or more of their basic rights (including nutrition, water, sanitation, health, housing, education and information)<sup>[100]</sup>. Housing is the area with the highest incidence of severe deprivation, with 50% of the children living either in a dwelling with mud or sand floors, or in a dwelling with more than five occupants<sup>[101]</sup>.

90. Sierra Leone is composed of about 16 ethnic groups, each its own language. The Temne in the North and the Mende in the South are the largest and make the most of Sierra Leone population as shown in the table below. The big majority are sedentary, farmers, hunters and traders, and are spread across the country (see Table 13). Fula, that represent 4.4% of the Sierra Leone's population are the

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nomadic, pastoralist, trading people, herding cattle, goats and sheep across the vast dry hinterlands of their domain, keeping somewhat separate from the local agricultural populations, but found all over Sierra Leone.

91. The above-mentioned capacity determinants are indeed intrinsically linked: more than half of the people living in poverty are smallholder farmers. Land degradation and soil erosion, exacerbated by recurrent flood adversely impact agricultural production, disproportionately affecting the livelihoods of the rural poor, especially the most vulnerable ones. MSMEs have the unique potential to provide vulnerable populations with economic resources, information and skills they are lacking (see listed solutions in table 14 below), and strengthen equity (e.g. by targeting women and youth). Nevertheless, to date MSMEs in Sierra Leone in the agricultural value chain are particularly susceptible to climate change events. As referred in the Baseline Report, strengthening MSMEs ? the 'backbone' of the Sierra Leone economy - addresses on one hand, a need of MSMEs, entrepreneurs and start-ups to sustain themselves, and thus the need to adapt to climate change impacts and, on the other hand, an opportunity to develop and supply innovative Technologies, Products and Services (TPS) that are targeted to the needs of actors operating in the WEF sectors in the country impacted by climate change. MSMEs, entrepreneurs and start-ups located in poor areas prone to climate change events are particularly exposed to climate risks, especially if they depend on the natural environment. This is important, as many of them operate in sectors highly exposed to climate change events (such as agriculture, fisheries, livestock and forestry) and thus will be impacted by changes in the resources/activities in the referred sectors. Furthermore, these enterprises are, not only part of the country's global supply chain, but are a crucial vehicle to deploy and disburse TPS in the country due to their reach in rural areas and their role as social hubs in some cases. They will probably require additional support to adapt and cope with the impacts of climate change on their operations (see section 1.3 Main barriers to be addressed).

92.

Table 13: ETHNIC GROUPS in Sierra Leone<sup>[102]<sup>102</sup></sup>

Ethnic Groups	% of population	Type of lifestyle	Location in Sierra Leone	Main occupation
Mende	31.2%	Sedentary	Southern and Eastern	Farmers and hunters
Temne	35.5%	Sedentary	Northern, Western and Freetown	Farmers, growing rice, cassava, millet and kola nut. Their cash crops include peanuts and tobacco. Some Temne are fisherman, artisans and traders.



Fula	4.4%	Nomadic	Found in all regions of Sierra Leone	Nomadic, pastoralist, trading people, herding cattle, goats and sheep across the vast dry hinterlands of their domain, keeping somewhat separate from the local agricultural populations.
Limba	8.4%	Sedentary	Northern	Rice farmers, traders and hunters
Mandingo	NA	Sedentary	Northern and Eastern	Traders
Kono	NA	Sedentary	Eastern	Diamond miners
Sierra Leone Creole (Krio)	1.3%	Sedentary	Freetown & Western area	NA
Aku	0.5%	Sedentary	Freetown & Western area	NA
Kuranko	NA	Sedentary	Northern	Hunters and traders as well as farmers.
Loko	NA	Sedentary	Northern	Farmers and hunters
Susu and Yalunka	NA	Sedentary	Northern	Traders located close to the border with Guinea
Kissi	2%	Sedentary	Southern	Baskets and weaving and iron making skills
Vai	NA	Sedentary	Southern	Farmers
Kru	7%	Sedentary	Eastern	Fisherman and traders
Sherbro	1.9%	Sedentary	Southern	Fisherman and farmers
Lebanese Merchants		Sedentary	Freetown, Southern	Traders

Note: NA ? Not Available



Figure 20: Location of the Sierra Leone ethnic groups<sup>[103]<sup>103</sup></sup>

Technology:

93. Adaptive capacity is likely to vary, depending on availability and access to technology at various levels (i.e., from local to national) and in all sectors. Many of the adaptive strategies identified for management of climate change directly or indirectly involve technology (e.g., warning systems, protective structures, crop breeding and irrigation, settlement and relocation or redesign, flood control measures). Hence, a community's current level of technology and its ability to develop technologies are important determinants of adaptive capacity.

94. In the case of Sierra Leone, as per the NAP 2021, strategies, plans and the consultation with stakeholders, the adoption of climate adaptation technologies is very low due to:

- ? Limited technology options,
- ? Lack of skills and knowledge on the technologies and how to operate them,
- ? Few investors to make the technologies accessible,
- ? High prices of the technologies resulting in unaffordability,
- ? Unstable business environment and lack of access to finance

95. Sierra Leone population make use of traditional methods for the deployment of their activities across the water, energy and food sectors. The lack of knowledge and information on possible technologies, associated with the poverty and illiteracy levels, make it hard for the most vulnerable to identify, use and maintain technologies. In addition to that, vulnerable groups have difficulty to afford those and there are few investors making the technologies available at affordable prices for the people that need them.

96. Sierra Leone has potential for climate change adaptation technologies in the energy, water, and agriculture sectors. Therefore, the need for investment and support in creating the appropriate enabling environment for adoption and scale-up is crucial in order to contribute to the social and economic development of the country.

#### Infrastructure:

97. Adaptive capacity is likely to vary with social infrastructure. Some researchers regard the adaptive capacity of a system as a function of availability of and access to resources by decision-makers, as well as vulnerable subsectors of a population.

98. Sierra Leone ranks poorly[104]104 in infrastructure reflected by constraints in road transport, low internet connectivity, and the access to electricity, water, and sanitation.

99. Sierra Leone uses hydroelectric power to generate around 70% of its electricity, which in turn supports local development and industry. As already referred, drought conditions might result in suspension of production by the hydroelectric plants and severely increase the economic vulnerability of the region. In fact, one of the consulted stakeholders already mentioned that the drop of the water levels is already being witnessed in all hydropower generation locations across the country. Furthermore, an increase in the frequency and intensity of heavy rains and floods is likely to also impact the already fragile hydropower facilities since more variable run-off patterns will disrupt river flows which could affect hydropower generation and also affect the economic vulnerability of the region. As both power demand and production are tied to water availability, especially in the case of hydropower systems, changes in the rainfall quantity and patterns will certainly impact electricity production. This becomes even more relevant for Sierra Leone when current access rate of the Sierra Leonean population to electricity is 26% with no equal distribution (6% in rural areas and 51% in urban areas)[105]105. See Figure 21 with the transmission and distribution grid just covering a small part of the country. Climate change events (floods and droughts) will impact these infrastructures resulting in serious problems tied to lack of electricity in the regions that the grid supplies, which will in turn aggravate the lack of electricity supply issue that already exists.

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Figure 21: Network map and major power plants in Sierra Leone[106]<sup>106</sup>

100. As already mentioned in the Water section, access to safe drinking water and sanitation remains low in Sierra Leone: water facilities prior to the onset of COVID-19 were available to 77% of the Sierra Leone's population and only 16% had access to improved sanitation[107]<sup>107</sup>. This sector is increasingly impacted by climate change events. This was stressed by several stakeholders that mentioned: "Contamination of water wells in Freetown as a result of pollutions from surface runoff due to flooding?"; and "Water pollution is another hazard that mostly affects coastal communities and their adjacent water bodies. Depletion of dissolved oxygen in water is a phenomenon that often leads to the damage of aquatic ecosystem. The introduction of organic waste or discharge of sewage loaded with organic effluents from coastal pit latrines through flooded runoff water into the aquatic environment, especially in sheltered bays such as the estuaries and depending on the duration of the pollution episode, amount of waste, size of the water body and the prevailing ambient temperature, leads to depletion of dissolved oxygen and also water born related public health illnesses.?"

101. Climate change also poses a threat at the individual and household level. This is supported by a statement issued by Makmid Kamara after the 2017 mudslide in the Regent community of Freetown: "Right now, Sierra Leone needs immediate assistance to save lives and provide for those who have lost

their homes? ? ?The thousands of men, women and children who have lost their homes urgently need temporary accommodation and access to proper sanitation and healthcare?[108]108.

102. Climate change not only poses a threat to individuals, households, and to the private sector by damaging built infrastructure, but also by disturbing production processes, and reducing productivity of their employees and indirectly by disturbing/destroying critical transport infrastructure that impacts their businesses. Lack of flexibility reduces the capacity to respond to climate change events. Farmers and entrepreneurs incur in high transportation costs due to the poor state of roads. There are 11,300 km of national roads in Sierra Leone, of which only 8% are paved[109]109. Roads, that are the primary mode of transport, have limited or non-existent rail and river systems are often impassable during the rainy season. For example, one stakeholder mentioned: ?At times raining season does change, sometimes it does not rain normally, there is flooding all rivers overflow, roads are affected and some settlements.? In addition, rising temperature also impact the potential carrying capacity of moisture with a potential increase for heavy rainfalls, which are already being registered. More investments and maintenance of water storage infrastructure and transportation networks to reduce the impacts in groundwater and surface water sources will be needed to increase adaptive capacity.

#### Institutions:

103. In general, countries with well-developed social institutions are considered to have greater adaptive capacity than those with less effective institutional arrangements?commonly, developing nations and those in transition. The role of inadequate institutional support is frequently cited in the literature as a hindrance to adaptation.

104. The country has endured political instability and cycles of conflict countrywide. Since the last election in 2018 the country has been experiencing experienced tensed political rivalry, that sometimes results in violent confrontations[110]110 The country is ranked 163 out of 190 countries by the Doing Business Report 2019[111]111 because of its failure to implement policies that strengthen governance.

105. Furthermore, as already mentioned in the Baseline Report and next in Section 1.3 (Main barriers to be addressed) the lack of financial support offered by institutions in Sierra Leone to early-stage MSMEs and farmers/communities/vulnerable population has been identified.

### **1.2.7 Conclusions of the CRVA**

106. From the vulnerability assessment it can be concluded that several climate risks will result from increased temperatures, increased intensity and variability of precipitation, sea level rise and floods and drought. Sea level rise already threatens coastal areas of Sierra Leone, particularly the vulnerable communities of Kroo Bay and Moa Warf, increasing coastal flood events (in number of occurrence and severity), reduction in freshwater quality, population displacement, loss of property and reduced

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agriculture potential in coastal areas (e.g., mangroves)[112]<sup>112</sup>. In addition, if the current tendency of increased number of heat waves and intense rains continues, Sierra Leone will experience more flooding and storm surges leading to soil erosion, less productive agricultural land, destruction of roads and other infrastructure across the country[113]<sup>113</sup>. All these impacts will have significant consequences on the environment, society health (by increasing the likelihood of articular diseases such as cholera and diarrhoeas), food security, biodiversity along the coast and the wider economy.

107. In addition, when extreme weather events occur in densely populated areas of Sierra Leone (e.g., Freetown), the impact is likely to be more severe than it would be in areas with fewer people. Freetown, the capital of Sierra Leone, has already been experiencing the devastating consequences of these events of which its severity is aggravated by deforestation, poor planning and uncontrolled construction in the city. This was the area highlighted by the stakeholders as the one where most effects of climate change have been felt. Scientific evidence as above referred shows that seasonality changes, increased temperatures and increased number of heat waves and intensity of droughts are expected to occur throughout the country and does not point out for very specific areas prone to these effects.

108. With this, more people will need emergency rations of food, water and medical care and demands on existing facilities and resources may be quickly overwhelmed, especially if climate change impacts force rural populations to migrate to urban areas. In the case of Sierra Leone, climate stressors will not be evenly distributed and thus, some locations will experience more severe climate risks than others.

109. Although each sector (WEF) will require the implementation of different strategies and technologies to cope with the impacts of climate change, the implementation of adaptation strategies and measures to adapt and mitigate the impacts of sea level rise along coastal Sierra Leone is essential for the country. Moreover, implementation of early warning systems to storm events, strengthening meteorological and hydrological institutions and adoption of suitable water routing, storage and supply systems to enhance the sustainability of water usage in the region stood out as most needed across the 3 sectors. As already seen, sea level rise, floods and droughts have implications for the WEF sectors:

*Sea level rise is accelerating and with that the country will experience more frequent coastal flooding events, that will be aggravated by an increase in average precipitation and heavy rainfall events. This will have consequences not only on the physical coastline, but also on coastal ecosystems. Saltwater intrusions can contaminate freshwater aquifers, with impacts on municipal and agricultural water supplies as well as natural ecosystems*

*Crop damage may occur due to flooding, excess of water, loss of nutrients in the soil, and diseases and fungal attacks due to high air humidity and increase food insecurity. Water shortage will also increase the demand for water pumping, particularly in regions of intense agriculture and affected by droughts.*

*Water quality and availability in urban and rural areas will be affected by floods and droughts and both urban and rural communities will need more fresh water to cope with heat waves.*

*The recharge rate of groundwater will be impacted as evaporation rates increase due to higher temperature. In addition, groundwater quality will be impacted by sea level rise.*

*Fish availability is expected to be severely impacted by the increase in sea temperature and sea level rise, as marine ecosystem is expected to change, fish are expected to migrate to colder waters reducing its availability. Since fish is one of the main foods for Sierra Leone population, and a main source of protein for undernourished population, this will not only aggravate food security but will also aggravate poverty.*

*Floods affect hydropower generating capabilities as it can damage infrastructure and it can interrupt transportation lines for fuel. Draughts also affect the hydropower generation and the cooling of power plants as water becomes scarce. Energy demand is exacerbated by heat waves and the need for cooling of the home.*

*Droughts will have an impact on agricultural productivity and will compromise the availability of freshwater for irrigation and human consumption*

110. In addition to that Sierra Leone adaptation capacity is very low, making it very vulnerable to all climate change stressors. From this assessment, it can be concluded that the four regions of Sierra Leone are prone to climate change impacts and hazards, since they do not have the adaptive capacity required to face these hazardous events and thus, are all vulnerable to the effects of climate change. Within these four regions, the most vulnerable groups are:

*MSMEs operating in sectors highly vulnerable to climate change (such as agriculture, fisheries, livestock and forestry) that are part of the country's global supply chain.*

*Sierra Leonean women farmers from the 4 provinces (see Annex I- Gender Analysis for further information on this vulnerable group).*

*Youth (ages 15- 24), especially girls*

*Any inhabitant living in poverty in these provinces (both urban and rural areas) where Climate Change events will impact their livelihood, shelter, the infrastructure services (water, sanitation and energy facilities), and transportation routes, therefore causing an overall negative effect on their lives, the related value chains, as well as their access to education and health services.*

*People living in poverty and dependent on rain-fed agriculture, pastures, forests, and coastal resources (fishermen) for their livelihood, including ethnic Groups*

111. Thus, as a result of the CRVA, this project will focus on the four regions, i.e., the entire country: Northern, Southern, Western/ Freetown, and Eastern region. See Figure 22 below with the regions that this project will target.

MSMEs are the backbone of SL economy thus strengthening MSMEs strengthens the resilience of SL economy. At the same time, MSMEs have the unique potential to provide targeted Adaptation Technologies, Products and Services (listed in table 14 below) to vulnerable populations and thereby

strengthen their adaptive capacity. The project will support and contribute to increase the resilience to climate change of the identified most vulnerable groups by selecting and supporting MSMEs with adaptation TPS that can be used by the identified vulnerable population and by making financial instruments available to support the vulnerable population to acquire those technologies. It is important to refer that although ethnic groups have been identified as one of the most vulnerable population alongside smallholder farmers and people living in poverty and dependent on rain-fed agriculture, pastures, forests, and coastal resources, they will not be specifically targeted because they are ethnic groups, but rather targeted as part of the vulnerable population dependent on the sectors targeted by the project. Nevertheless, environmental and social screening of SMEs will ensure that no ethnic groups are excluded from project benefits, as this would exacerbate existing inequalities and potentially drive conflict. In case potential negative impacts on any ethnic group are identified, a Free, Prior and Informed Consent (FPIC) process should be undertaken by the respective SME.



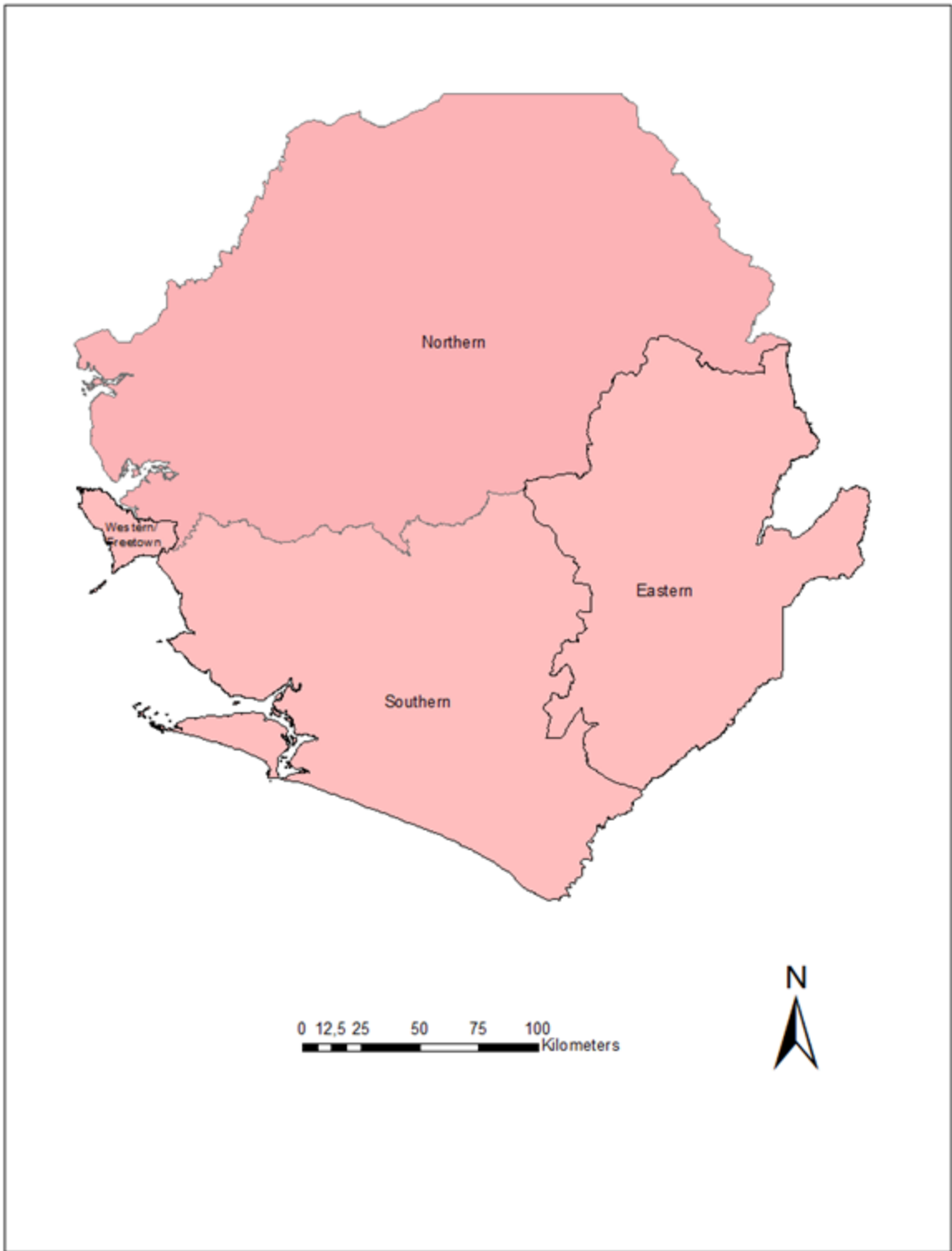










































Figure 22 regions targetted by the project

112. Based on the identified climate change hazards, adaptation needs, and existing vulnerabilities the following climate adaptation solutions listed in the following two tables (Table 14 and Table 15) have been identified to be supported by the proposed GEF/UNIDO Adaptation Project for the WEF sectors in Sierra Leone. Table 16 shows a summary of the expected short, medium and long term impacts of the different companies providing these TPS in adaptation. These tables were compiled to support the PMO, incubators/accelerators in identifying/selecting potential MSMEs to be supported through the project.

Table 14: Climate Adaptation Intelligence TPS

Warmer conditions	Climate event		Climate Adaptation Intelligence	Sectors		
	Floods and/or increased precipitation & Sea Level Rise	Droughts and seasonality variation		W	E	F
			A.1) Installations of weather station of collection of data (provision of reliable and accurate data) and adoption of forecasting models and software <sup>114</sup> , which can increase the accuracy and quality of forecasted natural disaster events (e.g., water resource mapping).	♦	♦	♦
			A.2) Testing and deployment of more drought-resistant varieties and storage infrastructure to mitigate drought years and crop-failure. Also, finding species resistant to salinity and temperature fluctuations for aquaculture and to predict where will fish population move to <sup>115</sup>			♦
			A.3) Remote sensing-based drought monitoring tools using different drought indicators (Precipitation Index, Soil moisture, Groundwater and Terrestrial Water Storage, Evapotranspiration, snow, vegetation index) for early	♦	♦	♦

			drought detection. Also, remote sensing for crop assessment, weather conditions, soil quality, monitoring and impact assessment.			
			A.4) Remote sensing data sets to develop multiple global flood models for monitoring, understanding and managing flood risks on transportation networks.	♦	♦	
			A.5) Develop and adopt appropriate modelling tools to assist strategic planning of water resources both for droughts and flood events	♦		
			A.6) Drones for crop or livestock data collection and analytics platform with mapping interface. For example: PrecisionHawk automatically processes aerial imagery into 2D maps and 3D elevation models, features a continuously expanding library of on-demand analysis tools, and makes sharing data easy. It shows growth trends, count and size plants, generate prescription maps, identify early indicators of plant stress, and measure the zonal efficiency of a farm. All through a web-based crop data management platform.			♦
			A.7) In-situ monitoring to improve soil structure and fertility, study weather conditions in the field to forecast rain, drought, or wind changes. Control of humidity and temperature levels in crops to prevent fungus and other microbial contaminants. For example: Sensors that allow monitoring of multiple environmental parameters <sup>16</sup> .			♦
			A.8) In-situ monitoring of water quality in both surface and underground water given the risks of contamination from pit latrines particularly in densely populated urban areas (E.g., Drones to collect water quality samples with Nixie or sensors)	♦		
			A.9) In-situ monitoring, control and surveillance of fishing ground and fish stocks for sustainable exploitation			♦
			A.10) Water Monitoring and modelling to avoid damages or disturbances due to droughts and floods (E.g., water resource mapping).	♦	♦	
			A.11) Livestock monitoring: to track the location, health, and well-being of cattle.			♦
			A.12) Early warning systems to provide notifications to farmers (including fisher farmers) about potentially hazardous events, such as intense precipitation, landslides and floods. Also, pest and disease early warning systems.			♦
			A.13) Conduction of comprehensive vulnerability and climate risk assessment in the WEF sectors in the country and dissemination of that information, including analysis disaggregated by gender <sup>18</sup> . Local models and climate change scenarios for operational and strategic management of the water system as well as for strategic management of the agricultural and energy sectors.	♦	♦	♦
			A.14) Flood vulnerability zoning maps, in which areas classified from higher to lower levels of vulnerability. Flood management plans to ensure limited damages to infrastructure and transportation routes during high rainfall events. Flood defence mechanisms, effective flood control measures, evacuation planning and early flood warning systems to provide notifications to people about potentially hazardous events, such as intense precipitation, landslides and floods.	♦	♦	♦
			A.15) Installation of a monitoring system on the national electricity network and generation infrastructure		♦	































			A.16) Assessment of climate service capabilities that includes all climate-sensitive institutions is needed to analyse and identify training, technical and financial support <sup>18</sup>	♦	♦	♦
			A.17) Integration of climate change into Agriculture Development Strategies <sup>18</sup>			♦
			A.18) Improve institutional and functional capacities for integrated water management <sup>18</sup> :  Improve planning and coordination of the use of the river basin, which may provide solutions for water quality and supply  Fund research into a water resource and water supply planning method under climate change  Develop and adopt appropriate modelling tools to assist strategic planning of water resources  Investigate shifting focus from groundwater to surface water storage for water supply to reduce the resilience on vulnerable coastal aquifers.	♦		











Table 15 Climate Adaptation Products and Services

Climate Event			Climate Adaptation Technologies, Products and Services	Sectors		
Warmer conditions	Floods and/or increased precipitation	Droughts and seasonality variation		W	E	F
			B.1) Switching to new alternative and more suitable crop species and varieties. For example: drought resistant crops (Adoption of new cassava varieties already outperforms yields of more popular types of this important crop <sup>117</sup> ).			♦
			B.2) Sustainable agriculture:  Use of organic matter to protect field surfaces and to preserve soil moisture (e.g., mulching and crop residue management). The use of compost and manure to enrich soil organic and mineral matter  Conservation tillage (enhance soil moisture storage and improve soil structure and organic matter contents)  Intercropping by planting trees to create windbreaks and maintain soil moisture and fertilize the earth without needing chemical fertilizers. For example, intercropping maize with fast-growing N-fixing trees, including <i>Gliricidia sepium</i> , <i>Tephrosia candida</i> or <i>Pigeon peas</i> , using trees such as <i>Sesbania sesban</i> as an improved fallow, or integrating full-canopy fertilizer trees such as <i>Faidherbia albida</i> has proven to be a particularly effective practice. <sup>118</sup>  Crop rotation practices, improves soil fertility as well as helps control weeds, pests and diseases. For example, some insect pests and disease-causing organisms are hosts' specific. Rice stem borer feeds mostly on rice. If you don't rotate rice with other crops belonging to a different family, the problem continues as food is always available to the pest. However, if you plant legume as the next crop, then corn, then beans, then bulbs, the insect pest will likely die due to absence of food <sup>119</sup> .  <del>Agro-sylvo</del> Agro-sylvopastoral system, combining both livestock as well as crop cultivation. This integrated system improves the land, makes livestock better able to handle high temperatures, and provides new sources of income.	♦		♦



























			<p>To improve yield of pastures, the zero-grazing technique could be implemented. This means that the livestock will not graze in the pasture, but the grass is cut regularly and then fed to the animals<sup>120</sup>.</p> <p>Agroforestry systems can help reduce erosion risk and nutrient leaching. E.g., Cocoa is one commodity that benefits from agroforestry. Cocoa plants can grow better and be even more resilient under the shade of other trees. Agroforestry systems, which include incorporating deep-rooted trees and shallow-rooted crops, can be used to better exploit available soil moisture, providing sufficient shade to allow high-value crops to be grown and maximizing benefits at the farm level<sup>121</sup>.</p> <p>Greenhouse farming: Is concerned with increasing the yields of vegetables, crops, fruits etc. Greenhouses control the environmental factors through manual intervention or a proportional control mechanism (sensors).</p>			
			B.3) Improve pest and weed management practices (crop rotation using also cover crops) (also practices mentioned in B.2).			♦
			<p>B.4) Nutrient management techniques such as:</p> <p>Promote biological nitrogen fixation: Planting leguminous trees and shrubs could contribute up to 60 kg N/ha/year, thereby decreasing chemical fertilizer requirements by up to 75% while substantially increasing maize yields.</p> <p>Organic fertilizers e.g., BILANGA BIO</p> <p>Split application</p> <p>Integrated soil fertility management (involves combining judicious quantities of chemical fertilizers with organic inputs)</p> <p>Fertilizer trees: mentioned in intercropping technology</p> <p>Foliar application</p> <p>Coated soluble granules to allow controlled release of nutrients in the root zone</p> <p>Urea deep placement: using super-granules of urea in rice production to improve nitrogen recovery;</p> <p>Adding inhibitors to slow the conversion of urea fertilizer to ammonia and thereby minimize potential ammonia loss</p> <p>Fertigation: adding soluble fertilizer to irrigation water to deliver nutrients to the root zone in a more precise and timely manner</p>			♦
			<p>B.5) Rainwater harvesting: provides many services (recharge groundwater through infiltration for water supply in dry seasons, reduce fast flows and reduces incidences of flooding, reduces soil erosion, increase crop productivity, food supply and income, water and fodder for livestock and poultry, wood for human use, bridge water supply in droughts and dry spells, especially in current rainfed areas and areas where scaled-up irrigation is environmentally unsustainable or economically not feasible).</p> <p>Examples of rainwater harvesting are:</p> <p>Small individual water storages in small reservoirs (ponds, and pans) and tanks</p> <p>Roof water harvesting techniques</p> <p>Underground storage. Cistern and underground ponds. This involves channelling rainfall runoff into re-charge basins of underground water systems so that installed wells can yield longer into the dry season. A good example of such storage can be found in Ethiopia where the water</p>	♦		♦















		<p>is used for domestic purposes, livestock watering and supplemental irrigation, especially of horticultural crops <sup>122</sup></p> <p>Build dams and reservoirs, both small and large to store water for later use and reduce rainwater run-off.</p> <p>Infiltration systems to recharge ground water where underlying soils have suitable infiltration properties, and to reduce run-off.</p> <p>Examples of these systems are:</p> <p>A soakaway: an underground structure, typically circular in plan, which facilitates infiltration into the ground.</p> <p>An infiltration trench: a linear excavation, usually stone-filled, achieving the same aim with a greater area of exposure to the ground.</p> <p>Filter drains: perforated or porous pipes laid in a trench containing granular fill and are typically located on the verge of a road to collect water from the road surface and carry it away<sup>123</sup>.</p> <p>In larger applications a series of infiltration basins (open depressions in the ground which collect water and allow it to be absorbed gradually) may be necessary to achieve the source control desire<sup>124</sup>.</p>			
		<p>B.6) Drainage systems to prevent water logging and increased yields.</p> <p>For example:</p> <p>Drainage ditches or subsurface drains (tile or plastic drain tubing).</p> <p>Nature-based solutions such as Ecosystem- based Adaptation (EbA): EbA involves the conservation, sustainable management and restoration of ecosystems such as natural wetlands and mangroves<sup>125</sup></p> <p>Build wetlands (man-made) that also provide resources for consumption, indirectly supporting crop and livestock production<sup>126</sup></p> <p>Urban forestry with fruit trees and organic garden in urban areas also for water retention and food security.</p>			♦
		<p>B.7) Drainage systems for urban areas to reduce incidence of flooding as flooding can destroy energy production, transmission and distribution.:</p> <p>Pipe systems</p> <p>Porous pavements for roadways.</p> <p>Nature-based solutions such as Ecosystem- based Adaptation (EbA) (see B.6)</p> <p>Green infrastructure: include green roofs as well as tree pits. Also, green wall systems for stormwater retention in urban areas, street side swales (grass-lined channels which allow the infiltration, storage and conveyance of stormwater. Small swales can run beside local roads, large swales beside major roads, and swales may also form landscaped channels for conveyance of stormwater). Filter strips are gently sloping areas of vegetated land.</p> <p>Build wetlands (both natural and man-made)</p> <p>Urban forestry and green spaces (parks, others)</p> <p>Green infrastructure and wetlands delay and reduce stormwater peaks</p>	♦	♦	

			B.8) Ecosystem-based Adaptation (EbA) (see B.6), green infrastructure (see B.7), wetlands and urban forestry to reduce urban heat islands and to enhance groundwater storage by more infiltration through the soil <sup>127</sup>	♦	♦	
			B.9) Ground water management for water shortage:  Spring and hand dug wells where aquifer conditions are favourable. To avoid contamination protect them. For example: fence the area all around it and dig a drainage ditch to carry away surface runoff and waste. This will also keep animals out. Plant native trees near the spring to protect it even more. Trees will prevent erosion.  Shallow boreholes with handpumps (better response of water level recovery than the previous two in dry seasons). To avoid contamination properly sealing the top 3–5m of the borehole and constructing a sanitary seal and safe soakaway is required to help minimize surface contamination. <sup>128</sup>	♦		♦
			B.10) Irrigation and drainage techniques to reduce dependency on rainwater and thus reduce the risk of crop failure due to lack of rains:  Drip irrigation: enables the supply of water in frequent small amounts to the exact place where crop plants can utilize it most efficiently. It can help to increase crop yields while conserving <b>agri</b> -related inputs, water resources, as well as result in labor and energy savings. Drip irrigation is the most efficient method of irrigating a crop. For instance, whereas sprinkler systems can achieve around 75-85% efficiency, drip systems typically are 90% efficient or higher if managed properly, since evaporation and runoff are minimized.  The System of Rice intensification (SRI) is an innovative technology for growing paddy rice, which uses less water but incredibly increases yields <sup>129</sup>  Planting pits that are deeper and bigger than traditional planting pits allowing them to store more water  "Binage", a new method of hoeing which maximizes the benefits of irrigation <sup>130</sup>	♦		♦
			B.11) Build irrigation infrastructures to transport water from water rich areas to water poor areas.	♦		
			B.12) Relatively simple and inexpensive mechanical tools for pumping water and /or for irrigation:  Treadle pumps. A treadle pump is a human-powered suction pump that sits on top of a well and is used for irrigation. It is designed to lift water from a depth of seven metres or less. The pumping is activated by stepping up and down on a treadle, which are levers, which drive pistons, creating cylinder suction that draws groundwater to the surface. Hip-pumps for irrigation have been developed and sold in SSA by a number of NGOs, such as KickStart international and W-3-W  Irrigation pumps: e.g., Solar irrigation pumps, windmills for groundwater, others  Hand pumps: Treadle pumps and hip-pumps for irrigation have been developed and sold in SSA by several NGOs, such as KickStart international and W-3-W  Hydraulic ram pumps (Hydraulic ram pumps use the energy of a large amount of water falling a small height to lift a small amount of that water to a much greater height. In this way, water from a spring or stream in a valley can be pumped to a village or irrigation scheme on the hillside. Inexpensive and does not require any source of energy.	♦	♦	♦

			<p>The hydraulic ram is a simple construction system, and its energy efficiency is around 70%.</p> <p>Solar pumps. For example: RPS Solar well pump</p> <p>More expensive pumps: Micro pumps (petrol, diesel) and motorized pumps.</p>			
			B.13) Dryers: e.g., Solar or wind powered improved dryers		♦	♦
			B.14) Improved crop storage technologies/material that impede insect intrusion. For example: The Purdue Improved Crop Storage (PICS) bag is a low-cost, simple, and effective technology for low-resource farmers to help them preserve their dry crops after harvest with minimal losses due to storage insects. PICS technology involves storing grain in triple layer plastic bags. These bags are a great option for farmers who see major losses in their crops each year due to insect pests. The bags eliminate insecticide use and enable farmers to store and sell their crops at peak times, instead of selling at harvest when price is at the lowest. PICS technology also ensures farmers have enough supply of clean grain for home consumption for many months after harvest. <sup>131</sup>			♦
			B.15) Cold storage and cold chain facilities powered by solar energy: Off-grid cold-store solutions can help farmers in remote areas who are not yet connected to roads and electricity to reduce waste and to sell when prices are good. E.g.: Cold rooms are well insulated to maintain the necessary temperature, often up to 8°C. The energy comes from the solar panels that are mounted on the roof-top of the cold room and is stored in high-capacity batteries that feed an inverter, which in turn feeds the refrigerating unit <sup>132</sup> . Another example, <a href="#">Aidelano Solar Solutions</a> and <a href="#">Inspirafarms</a> have deployed solar-powered cold boxes for the storage and processing of harvested food <sup>133</sup> . Another example, Solar cold chain to temperature-controlled supply chain <sup>134</sup>		♦	♦
			B.16) Solar refrigerators (E.g., <a href="https://www.kit4africa.com/kits-solaires">https://www.kit4africa.com/kits-solaires</a> )		♦	♦
			B.17) Improve energy efficiency in buildings, industries, and the residential sector in urbanized areas. For example, promote sustainable constructions (green roofs, natural light, thermal insulation materials, recycling of water, rainwater harvesting, solar and wind energy for electricity, solar energy to heat water, incorporate trees for shadow, waste recycling (compost), others) and adoption of energy efficient equipment (energy efficient, freezers, others).		♦	
			B.18) A veterinary and phytosanitary services could be launched to provide farmers with helping hands in keeping livestock healthy and minimize loss of crops due to diseases <sup>135</sup> . These services can also provide training to optimize for example livestock raising techniques			♦
			B.19) Selective breeding for increased resilience in aquaculture. For example: selection of species based on feed efficiency <sup>136</sup>			♦



			B.20) Effective aquaculture feed management systems: fishmeal and fish oil replacement; find more appropriate feeds <sup>137 138</sup>			♦
			B. 21) Aquaculture systems that are more resilient to a changing environment. For example, Integrated Multi- Trophic Aquaculture system (IMTA) where multiple aquatic species from different trophic levels are farmed together to improve efficiency <sup>139</sup> .			♦
			B.22) Barriers and flood defence mechanisms to reduce the risk of flooding and to safeguard life, protect property and sustain economic activity. For example: hard defences (e.g., sea walls) or soft defences (e.g., Nature- based solutions such as wetland rehabilitation) in areas next to rivers and coasts <sup>140</sup> . Also, man-made materials such as geosynthetic products (geotextiles, geogrids, geonets, geomembranes, geofoam, geocells, and geocomposites) to help control floods, manage erosion, and provide protection against damage from waves or currents.	♦	♦	♦
			B.23) Climate insurance products for livestock, crops and fish, especially small-scale farmers.			♦
			B.24) Expand small-scale access to flood insurance, compensation and tax relief, and finance to adaptive technologies to build resilience.	♦	♦	
			B.25) Building capacity for sustainable farming (agroforestry, <u>agrosylvopastoral</u> , zero-grazing techniques. For example, Ibi Village ( <a href="https://www.ibi-village.cd/">https://www.ibi-village.cd/</a> ) train local communities in agroforestry practices and <a href="http://kitoko-food.com/services/">http://kitoko-food.com/services/</a> help communities organize in cooperatives and help them with all the training they need. <u>Shopinic Sarl</u> , <u>LE GRENIER SARL</u> and <u>CSCO SARL</u> are other examples of agriculture training organizations. Also, build capacity for cold storage facilities. For rainwater, surface, and ground harvest. Relief and development agencies should make a bigger effort to promote this type of farming. Increased agricultural support should be provided through increased and reinforced agricultural extension programs specially for women and youth. Build capacity and raise awareness on fishing practices.	♦		♦
			B.26) Adequate training of technicians in fish culture (e.g., help to change fishers' behaviour to ensure a continued supply of fish, use effective techniques and management or resources such as: fish food, learn about climate change, others)			♦
			B.27) Build capacity for integrated water management. Substantial public education and technical assistance is required to ensure the water safety of private sources.	♦		
			B.28) Improved farmer's access to agroclimatic data through Digitally – enabled information and education tools. The decision-making includes the type of crop and the variety of seed to select, land size and the number of farmlands to cultivate, when to plough, when to sow seeds, when to transplant seedlings, when to do irrigation, when to apply fertilizer and(or) agrochemicals, and when to start harvesting, marketing, and processing. Also, access to information on weather and seasonal forecasts, pest and disease early warning, digital soil maps, and information on adaptive production practices <sup>141</sup>			♦
			B.29) Improve fish farmer's access to climate data to help fisheries optimise quotas and reduce uncertainty around species' distribution.			♦

			B.30) Improved people's access to climatic data. Digitally- enabled information and education tools.	♦	♦	
			B.31) Communication and outreach: In every country, farmers and people in general have innovated. It's important to learn from these TPS (E.g., to promote the sustainable intensification and diversification of agriculture, to promote water management techniques and to promote TPS in the energy sector)	♦	♦	♦
			B.32) Flood management plans to ensure limited damages to infrastructures, transportation routes and to agricultural systems during high rainfall events. Evacuation planning and flood awareness campaigns <sup>142</sup>	♦		
			B.33) Sustainable fishing app to connect fishers directly with end consumers, also creating a market for local fish species <sup>143</sup> .			♦
			B.34) Improved institutional capacity to support coastal resource management and analyse the best structures to adapt the Sierra Leone coast to possible sea level rise	♦		♦
			B.35) Analyse and implement mangrove protection measures in coastal areas as well as build capacity of the coastal population on the needs to maintain and restore mangroves <sup>18</sup> .	♦		♦
			B.36) Improvement of coastal and fisheries resource management <sup>18</sup> : Promotion on non-destructive fishing techniques to prevent destruction of marine environment (e.g., help to change fishers' behaviour to ensure a continued supply of fish, use effective techniques and management or resources such as: fish food, learn about climate change, others) Improve productivity and sustainable management of fisheries and marine sector Develop integrative coastal zone management plans and build awareness and capacity on those to ensure proper implementation and monitoring Build capacity and raise awareness on fishing practices and on other coastal activities Improve fish farmer's access to climate data to help fisheries optimise quotas and reduce uncertainty around species' distribution.	♦		♦
			B.37) Improve natural resource management in critical biodiversity hotspots <sup>18</sup> : Manage rangelands and pastures by managing grazing systems and grazing intensity, fire management and pasture rehabilitation Restore degraded lands with high production potential Establish new forest reserves, national parks and protected areas	♦		♦

**TABLE 16: EXPECTED IMPACTS OF OVERARCHING INNOVATIVE ADAPTATION SOLUTION IN THE SHORT, MEDIUM, AND LONG TERM**

Overarching climate change adaptation solution(s)	W	E	F	Short	Medium	Long
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Changing sustainable agricultural practices, planting multiple crops, crop diversification, focus on crop selection, new crop varieties and productivity and incorporating nutrient management systems	?		?	Improve soil structure and fertility, reduce nitrate leaching, increase soil carbon and control weeds, pests and diseases, reduce crop water stress.	Increase yields and thus, increase agricultural production  Mitigate the impacts of Climate Change	Positive effect on food security. Incorporation of sustainable food systems, diversification of agriculture production and valorisation along the agriculture chain.
Choosing selective breeding in aquaculture and effective aquaculture feed management systems			?	Improve feed efficiency in fishes	Improvement of farmers income	Enhancement of the whole country's economy.
Incorporate technologies and measures that capture and efficiently use water as well as new irrigation techniques	?	?	?	Reduce crop water stress by reducing runoff and removal of excess water; by facilitating crop production in dryland areas. <a href="#">[144]</a> <a href="#">114</a>  Recharge groundwater through infiltration for water supply in dry seasons  Reduce fast flows and reduces incidences of flooding,  Reduces soil erosion,  Increase water and fodder for livestock and poultry, wood for human use  Bridge water supply in droughts and dry spells <a href="#">[145]</a> <a href="#">115</a>	Reduction on dependency on rainwater  Improves market capacity  Reduce vulnerability of farmers to Climate Change impacts  Increase resilience	Improvement of social variables such as: poverty reduction and access to education.  Improvement of food security not only in Sierra Leone but in the whole Sub-Saharan region.

Nature- based solutions such as wetlands and Green infrastructure specially in urban areas	?	?	?	Delay and reduce stormwater peaks, trap pollutants and silts, reduce urban heat islands, reduce the level of CO <sub>2</sub> , enhance groundwater storage by more infiltration through the soil and provide resources for consumption
Diversifying income by adopting an agro-sylvopastoral system, combining both livestock as well as crop cultivation and agro-forestry. Also, Integrated Multi- Trophic Aquaculture systems.			?	Reduce vulnerability of farmers by diversifying their income
Improved food stocking techniques. Improved crop storage technologies/material		?	?	Help preserve crops dry and cold after harvest with minimal losses due to storage insects[146]116
Climate insurance products for livestock, crops and fish.			?	Reduce vulnerability of farmers to climate change impacts and build resilience
Building capacity for sustainable practices, cold storage facilities as well as for rainwater, surface, and groundwater harvest, training in fish culture.	?		?	Increase knowledge and experience, and thus productivity
Improved farmer's access to climatic data through digitally- enabled information and education tools	?	?	?	Improve productivity by learning about the likelihood of near-term drought and other climatic shocks[147]117

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Communication and outreach	?	?	?	Increase knowledge and experience and build capacity
Climate monitoring, early warning, and forecasting	?	?	?	Enhance planning adaptation of current agricultural systems, of new crop varieties, of pasture and livestock management. Enhance planning adaptation for the fisheries sector.
Flood management and flood awareness campaigns	?	?	?	Ensures disaster reduction through the prevention of flooding, mitigation of adverse impacts through appropriate adaptation strategies. [148]118

### 1.3 Main barriers to be addressed

113. The barriers that were identified, analysed and described in this section are based on desktop research, the stakeholders' inputs collected through the deployment of an online questionnaire (details are provided in Section **Error! Reference source not found.** of the Baseline report), face-to-face interviews carried out with key stakeholders, as well as on information from the original PIF document.

114. The most relevant barriers are summarised in Table 17. The barriers identified can be categorised in five main groups: (i) low level of awareness and knowledge on effects of climate change and limited access to climate information; (ii) limited regulatory and institutional framework; (iii) low level of innovation and entrepreneurial performance; (iv) weak market linkages for the provision of affordable and reliable climate change adaptation-oriented solutions; and (iv) insufficient availability and access to funding.

Table 17: Overview of the climate change adaptation market barriers

Low Priority		Moderate Priority	High Priority
Barriers	Description		Priority
Low level of awareness and knowledge on effects of	Lack of awareness within MSMEs and vulnerable groups regarding the risks and opportunities of climate change and its negative impacts		?
	Lack of awareness at the government and institutional level of the problem of climate change and its adverse impacts on the WEF sectors		?

climate change and limited access to climate information	Lack of awareness within the private sector regarding new developments and trends related to their value chain, locally or globally	?
Limited national regulatory and institutional frameworks	Weak institutional capacity to drive innovation, incubation and MSMEs promotion	?
	Insufficient or not properly implemented policy and regulatory frameworks as well as support mechanisms	?
	Lack of an effective channel to release relevant information regarding policy, regulatory and fiscal frameworks for MSMEs and entrepreneurs	?
	Weak institutional framework (e.g., bureaucracy of company's registration procedures; heavy fiscal burden on MSMEs, no fiscal incentives for start-ups, complicated process of protection of intellectual property rights)	?
	Lack of available training and business development services for entrepreneurs and MSMEs	?
Low level of innovation and entrepreneurial performance	Lack of capacity by MSMEs to develop solid and validated business plans and marketing strategies to reduce risk of failure	?
	Limited entrepreneurial and management capacities of MSMEs (administrative, legal, financial, marketing, distribution, business plan development)	?
	Lack of knowledge of the climate change adaptation market, target clients and market potential	?
	Lack of knowledge and limited experience of vulnerable groups with climate change adaptation technologies and practices	?
	Little developed professional training sector with limited capacities	?
	Lack of specialized education (technical colleges), training and research programmes (universities) in climate change adaptation and related technologies	?
	Lack of qualified and well-trained experts in the market	?
	Lack of understanding on economic benefits derived from the use of TPS	?
Weak market linkages for the provision of affordable and reliable climate change adaptation-oriented solutions	Limited value chain mainstreaming climate change adaptation in the WEF sectors	?
	Lack of coordination amongst sectoral players on market intelligence research (market opportunities and penetration strategies)	?
	Lack of access to markets/distribution channels	?
	Little developed innovation ecosystem and weak market mechanisms for innovation and entrepreneurship	?
Insufficient availability and access to funding	Limited access to finance to commercialise and grow MSMEs	?
	Lack of grants and seed-funding for early-stage MSMEs	?
	Limited affordability of climate change adaptation TPS of vulnerable groups	?

115. As it can be seen from the previous table, there is a column that prioritises the barriers in High, Moderate and Low priority. This prioritisation gives an indication of the urgency to address the barrier. The priority that was allocated to each barrier is the result of the analysis of all the background information available and the result of the stakeholders' feedback received through meetings and the

online questionnaire. Figure 23 below shows how many stakeholders think which barriers are the most pressing for businesses to grow in the climate change adaptation market in Sierra Leone. A full description and characterisation of each barrier is provided after the figure.

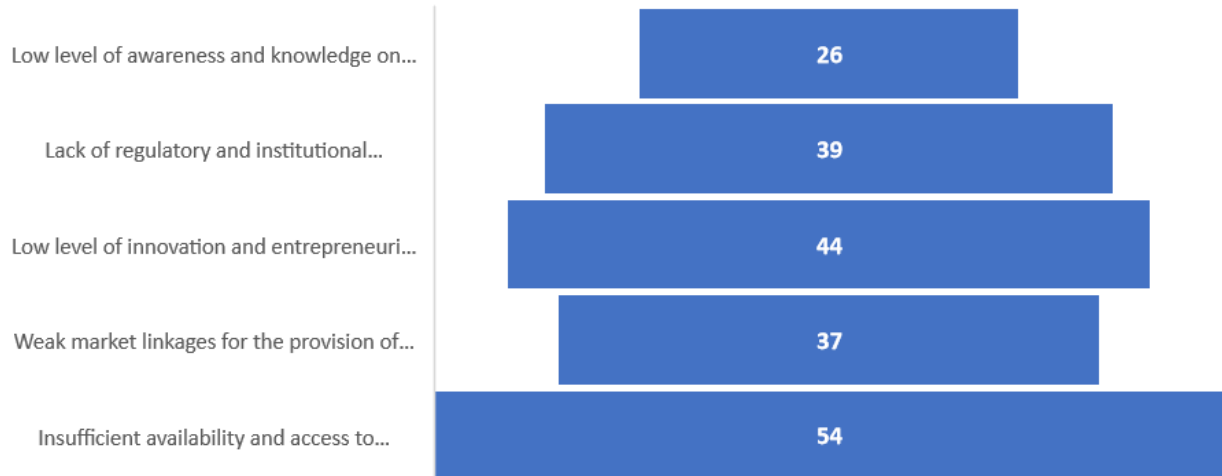


Figure 23: Opinion of consulted stakeholders regarding the main barriers that MSMEs or entrepreneurs face to grow or sustain a successful business in the climate change adaptation market in the WEF sectors (number of stakeholders that selected each barrier)

**Insufficient availability and access to funding:**

116. Insufficient availability and access to funding is indicated as the main barrier by 75% of the consulted stakeholders (54 out of 72), as shown in Figure 23. The Doing Business ranking puts Sierra Leone in position 163 out of 190, and in position 32 out of 48 in the SSA region<sup>[149]</sup><sup>119</sup>, for ease of doing business in the country. Although this ranking does not focus on a particular sector or type of business, the result goes in hand with the overall perception of the Sierra Leone stakeholders regarding the challenges faced to conduct businesses in the climate change adaptation market.

117. The lack of financial capital for MSMEs to improve their businesses is also recognised in the Directorate of Science Technology and Innovation (DSTI) Ecosystem Mapping Report<sup>[150]</sup><sup>120</sup> (draft). The report provides a review of the digital, innovation and entrepreneurship landscape in Sierra Leone, covering companies involved, stand-out cases, funding trends, regional comparisons, policy environment, current market size, and near-term growth outlook. It shows that 50% of all entrepreneurs consulted refer that access to and availability of affordable finance is the main challenge for business development. It is important to note that the DSTI study also mentions that start-up finance for 67% of the consulted MSMEs was originated from personal savings or finance and loans from family/friends. As such, financing from external investors, grants and loans from banks and microfinance institutions (MFIs) are the least common source of funding. The unmet financial needs and the lack of affordable finance, and thus the need to resort to their personal savings, friends and family hinder the ability of

starting, maintaining/adapting and growing a business, as prevents hiring the qualified personnel, upgrading equipment, renting workspace, increasing staff salaries, diversifying products and services, and expanding geographically.

118. The limited financial support offered by institutions in Sierra Leone has been also confirmed while assessing the type of support they offer and the target groups, as it can be seen in Figure 24. As it can be seen, early-stage MSMEs, early-stage entrepreneurs and farmers/communities/vulnerable population are the target groups that receive less financial support. Nevertheless, those are the ones that are more often targeted to receive capacity building and training.

119. Limited financial support for early-stage MSMEs includes limitations to access seed-funding and grants, insufficiency of available financing mechanism and inadequacy of financial services providers to provide investment in the medium and long terms. There are big gaps between what is offered by financial service providers and what is needed by entrepreneurs and MSMEs in all stages of development, as well as what farmers, communities, and vulnerable population need. Other issue raised by several of the consulted stakeholders is the fact that the financial institutions have too many applicability conditions or requirements (collaterals) that are hard for them to fulfil when requesting finance.

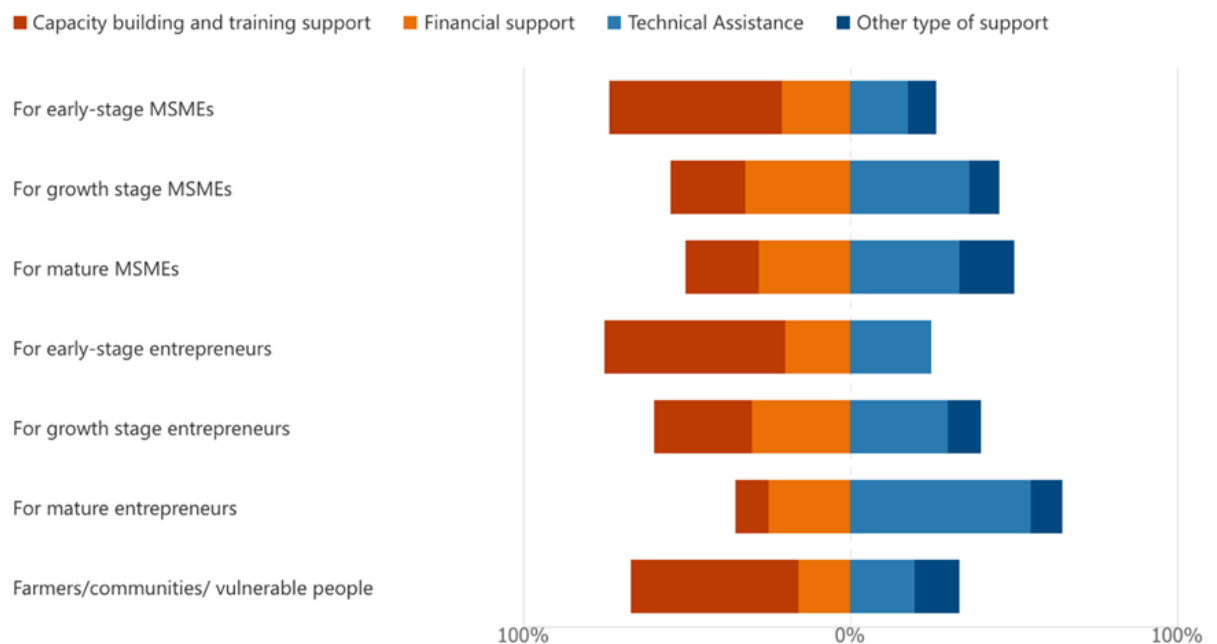


Figure 24: Assessment of type of support offered by consulted stakeholders as well as the target group

120. As a result of the interviews and information analysed at PPG stage, it can be concluded that financial service providers (FSPs) show limited awareness and appreciation of the benefits of climate change adaptation and resilience and, although addressing climate change is part of their overall strategy, it is not a main part of their portfolio. One of the key barriers to accessing finance by MSMEs, entrepreneurs and farmers communities / vulnerable population is the high cost of capital. The FSPs responded that the cost of finance is related to the central bank's policies and high lending rates, which



makes it impossible to on-lend at lower rates. Lending at lower rates is only possible when FSPs collaborate with other partners who provide cheaper sources of funds (like the MUNAFA Fund<sup>[151]<sup>121</sup>), allowing them to on-lend at lower interest rates. Nevertheless, almost all the FSPs that answered the online questionnaire show interest in providing financial products for MSMEs or entrepreneurs acting in the climate change adaptation market.</sup>

121. One key challenge of climate change adaptation is financing. In fact, lack of finance is one of the main factors behind slow economic development in developing countries and it has been highlighted as the main barrier to adaptation by the consulted stakeholders. Similarly, the consulted stakeholders also highlighted the limited access to finance by vulnerable population to purchase TPS offered by climate change adaptation MSMEs. These same observations were made in the stakeholder consultation meetings and are also corroborated by SMEDA, who referred that the MSMEs registered in their database appoint financial barriers, poor infrastructure, weak regulatory framework and governance as top barriers for their growth.

**Low level of innovation and entrepreneurial performance:**

122. Consulted stakeholders (see Figure 24) indicated that Sierra Leone’s business environment is not attractive and further indicated that the MSMEs have limited support regarding training and coaching to develop their businesses, especially those that are at an early-stage of development. This may have a negative impact on entrepreneurial activity. The current innovation ecosystem required to identify suitable innovations and transform these into marketable products is still weak in Sierra Leone. This was one of the key challenges identified in the DSTI Ecosystem Mapping report – growth entrepreneurs are in short supply in the country and thus there is a strong need to invest in developing a pool of these entrepreneurs. This is largely attributed to insufficient institutional capacities to foster knowledge, expertise and entrepreneurial culture, regulatory environment to streamline innovation, as well as lack of available business development services.

123. As it can be seen in Figure 25, measures regarding creation/strengthening of business networks and improvement of training/coaching for climate change adaptation MSMEs as well as entrepreneurs have been identified as high impact actions by the consulted stakeholders. Entrepreneurs have limited knowledge on how to develop a successful business plan, which highly impacts on their ability to apply for funding.

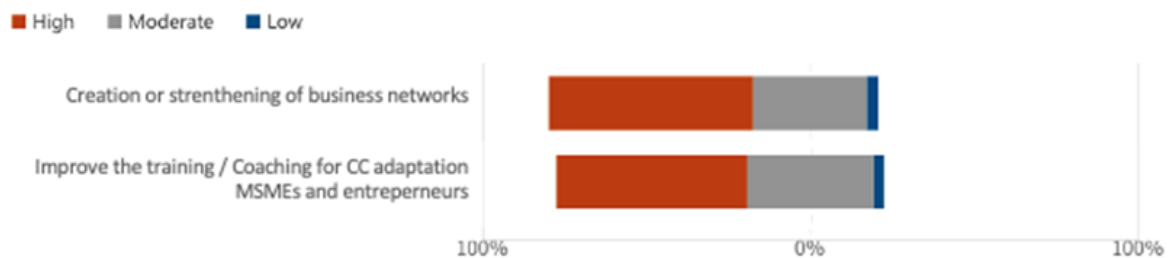


Figure 25: Stakeholder's judgement regarding the impact each action might have for climate change market growth

124. Innovative TPS are not systematically supported in Sierra Leone and even universities and research centres lack dedicated innovation support and promotion programmes, mostly the ones addressing climate change and developing climate change adaptation solutions. This is also evident in the Sierra Leone National Innovation & Digital Strategy (NIDS)2019-2029[152]<sup>122</sup> which aimed at guiding Sierra Leone's investments, policies, and governance frameworks for the country's present and future development but misses to address climate change through innovation.

125. It is also evident from the stakeholders' consultations as a lot of MSMEs considered themselves to be providing TPS in the adaptation market, but they are in fact providing TPS in the WEF sectors that need to be adapted to climate change impacts.

126. On the other hand, the lack of capacity, knowledge about innovative and efficient technologies, skilled labour and human resources also impacts on market development and productivity. An example of the low level of innovation is the fact that most farmers (68%) store food in baskets and bags and around 30% use open space for storage, which contributes to the extremely high post-harvest losses and insect infestations[153]<sup>123</sup>. The same occurs with seeds if they are improperly stored. Having access to innovative technologies such as e.g., cold storage facilities would reduce the loss and farmers would have the opportunity to manage their sales, increase income and increase productivity.

127. Another important reason for low agricultural productivity is lack of access to sufficient agricultural labourers to cultivate larger areas of land in the absence of modern agricultural technology and machinery, mainly due to lack of interest of the younger generation in farming and, particularly in 2020, due to restrictions during the COVID outbreak. Another reason is lack of money [154]<sup>124</sup> that restricts their ability to buy farming inputs (fertilizers, improved seeds) as well as modern farming tools and processes.

#### **Limited national regulatory and institutional frameworks:**

128. As it can be seen in Figure 26 from the responses to the online questionnaire, the stakeholders seem to be relatively aware of the national policies and strategies that address medium- and long-term climate change adaptation needs. Only 21% referred that they were not aware of any of the mentioned documents and the rest of the stakeholders were aware of some of the documents but not all. Also, 25% referred that they were aware of the National Adaptation Programme and 28% of the National Adaptation Plan Framework. This means that although there is knowledge about the general climate change framework, there is a need to create more awareness on the climate change adaptation topic in particular.

129. On the other hand, in terms of institutional coordination, the lack of an appropriate coordination framework or mechanism is another main barrier identified by stakeholders. The majority of them have recognised that the national policies, governmental coordination and incentive mechanisms that create a market-pull for private sector providing climate change adaptation solutions are still weak in Sierra Leone.82% have indicated that the current Sierra Leone's policy and regulatory framework is not sufficient to encourage climate change adaptation entrepreneurship in the WEF sectors to foster innovation in the climate change adaptation field. Of those stakeholders, 50% suggested that the policy

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and regulatory framework needs a more harmonized and integrated approach to tackle climate change effectively and simultaneously support innovation. In addition, they stressed the need for capacity building, for political and financial incentives and programmes; for control and enforcement of policies, and for monitoring policies? implementation. Moreover, it is the overall opinion of the stakeholders that the Government of Sierra Leone should play a leading role in creating the legal framework for climate change adaptation entrepreneurship and encouraging MSMEs across the WEF sectors to develop adaptation TPS that can be commercialized across the country.



**Figure 26 : Stakeholders awareness on national policies and strategies that address climate change adaptation**

130. Of the consulted stakeholders, 34% mentioned they were involved in the development or implementation of national policies/strategic plans that address climate change adaptation needs. From those, most are involved in project and programme execution/implementation.

131. The main policy for MSMEs in Sierra Leone is the SMEDA Act. In addition, there are other development policies that include entrepreneurship as a vehicle for the delivery of its mandate ? such as the Medium-term National Development Plan (MTNDP) and the NIDS 2019 ? 2029. In the MTNDP, entrepreneurship is seen as the vehicle to ensuring private sector growth, which is believed to be the most stable engine of economic growth. However, it is not clear how the plan targets are set to address the different challenges that hinder entrepreneurship growth (such as limited capital provision and labour market, limited data and information on private investment opportunities which are intrinsically associated with information asymmetry, regulatory constraints including inconsistent tax regimes, etc). Furthermore, the NIDS 2019 ? 2029 includes provisions for interactions between entrepreneurship and technology, but does not provide speci?c, tangible priorities and activities for that. There is a need to establish new policies and/or regulations that support innovation and entrepreneurship as well as to

include climate change adaptation considerations into sectoral ones. In addition, it is necessary to develop policies and incentives to bring MSMEs from the informal sector to the formal sector, as well as make sure that gender issues are mainstreamed into those.

132. In terms of business-related laws, consulted stakeholders have pointed out a heavy fiscal burden, namely the Tax Laws, on MSMEs in Sierra Leone and the lack of incentive mechanisms to encourage investments in the country. Moreover, the bureaucratic process involving the establishment of a formal enterprise has been also indicated by the consulted stakeholders as a window for improvement of the institutional framework in Sierra Leone.

133. In conclusion, the overall perception is that policy, regulatory and institutional coordination frameworks for addressing climate change and fostering MSMEs development should be reviewed and strengthened.

**Weak market linkages for the provision of affordable and reliable Climate Change adaptation-oriented solutions:**

134. MSMEs play a key role in technological innovation, often leading to the introduction of paradigm-shifting TPS and behavioural changes. However, they face many challenges in maturing to a point where they grow and have positive social, environmental and economic impacts. They often have weak entrepreneurial support systems, fragmented linkages to climate technology markets, in addition to limited access to finance for business growth. These challenges are exacerbated in developing countries, such as Sierra Leone.

135. Structural deficiencies and lack of a conducive business environment with targeted incentive and promotion mechanisms hamper the development of a sound, prosperous market delivering suitable climate change adaptation TPS. As seen in Figure 25, 62% of the consulted stakeholders have identified that the creation or strengthening of business networks to connect climate change adaptation MSMEs and entrepreneurs with potential investors would have a high impact to foster the growth of the climate change adaptation market in Sierra Leone or even to transform innovative climate change adaptation solutions into viable commercial enterprises. Also, the limited access to information and available market platforms, as well as the existence of large informal sector hinders the productivity and competitiveness of a local market.

136. This issue is even worse when assessing the barriers women face to establish or grow their businesses. Despite the fact that women constitute 50% of Sierra Leone's population<sup>[155]<sup>125</sup></sup>, make up a significant proportion of Sierra Leoneans farmers and they provide up to 60% of farm labour for food production<sup>[156]<sup>126</sup></sup>, they rarely own or administer land<sup>[157]<sup>127</sup></sup>. Some consulted stakeholders indicated that on top of the 'normal ecosystem' barriers, women face more intensely barriers regarding access to information and finance. A National Study on Women Access to Financing<sup>[158]<sup>128</sup></sup> showed there are immediate causes and root causes that limit women entrepreneurs to access finance. Immediate causes include mainly: (i) limited access to finance due to the stringent conditions imposed by the financial institution; and (ii) limiting human capital, as most women and girls in Sierra Leone

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experience high levels of illiteracy. Root causes include: (i) cultural inherent gender bias, as Sierra Leone is a high patriarchal society with institutionalized gender biases and inequalities (e.g., discriminatory customary on female entitlement and property rights) impeding the ability of women to develop appropriate skills required to access finance. Thus, many women entrepreneurs feel that the broader community and society are not supportive of MSMEs, especially micro-enterprises, which are the most commonly owned by women; and (ii) inadequate government policies for the support of female entrepreneurs.

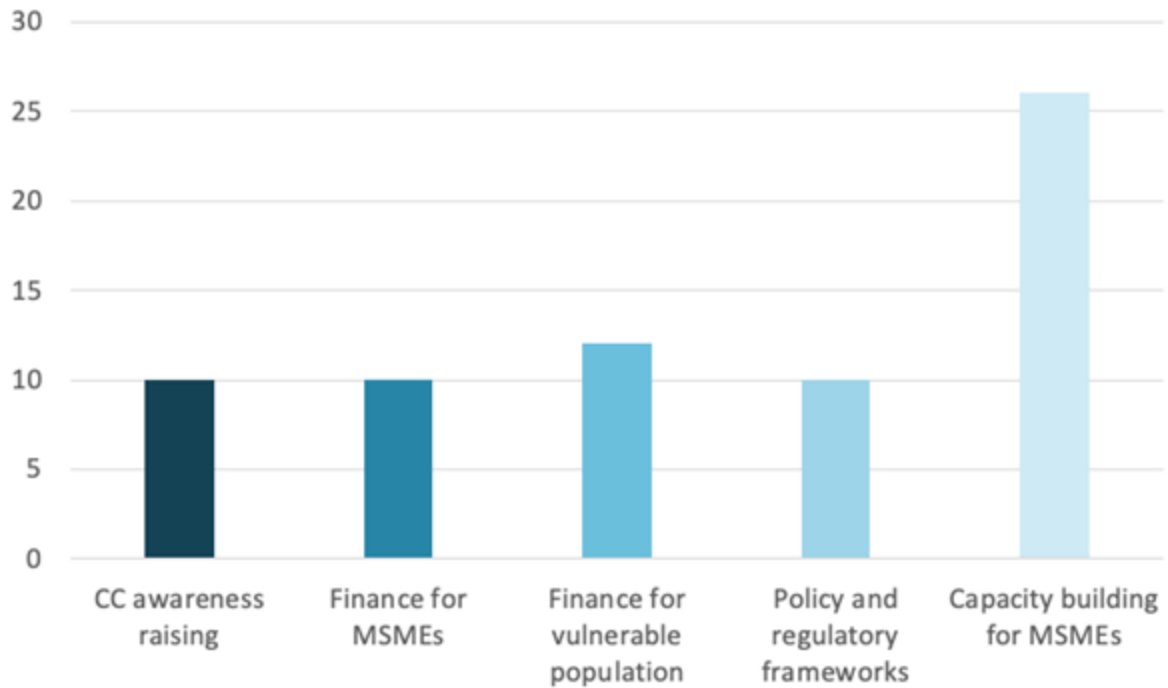
137. Although most of the referred barriers prevail, it is important to refer that, since it was established in 2016, SMEDA has been providing services and supporting women-led businesses. Nowadays, approximately 73% of the MSMEs registered in the SMEDA database are led by women<sup>[159]<sup>129</sup></sup>, and these have the same access to SMEDA services as men led MSMEs, including access to the MUNAFA fund.

**Low level of awareness and knowledge about climate change effects and limited access to climate information:**

138. The awareness about climate change and its adverse impacts on the environment remain low within Sierra Leone's population as well as within the governmental / financial institutions and private sector including MSMEs, start-ups and entrepreneurs. The knowledge and expertise on climate change impacts and adequate solutions providing climate change adaptation benefits is still very low. This is due to a lack of specialised training programmes and curricula on climate change and climate change adaptation as well as its threats and opportunities, as this training and information is not offered at technical colleges and universities. Both urban and rural communities generally report limited awareness of the benefits of climate change adaptation and resilience-oriented TPS. As depicted in Figure 23, 26 out of 72 consulted stakeholders indicated this issue as one of the main barriers. There is a general lack of information about what climate change adaptation is and about what can be done, e.g., by MSMEs, to support adaptation to climate change. This is based on the perception of the consulted MSMEs, who think that the adaptation market potential for TPS is medium or small size. In addition to this, there is no common understanding about what an 'adaptation MSME' is, and what TPS can be considered adaptation TPS and their applicability. This is evident from the online questionnaire results, since many of the stakeholders that responded claim to be providing climate change TPS, but in fact only few qualify as adaptation TPS, and thus only a couple of the MSMEs can be considered adaptation MSMEs<sup>[160]<sup>130</sup></sup>. Consequently, it can be concluded that there is a strong need and a common interest to build an adaptation market, but there is little knowledge and information about it and its potential.

139. As overall conclusion, it can be seen in Figure 27 that the main areas of action identified by the consulted stakeholders to develop the climate change adaptation market in Sierra Leone are, firstly, the capacity building for MSMEs and, secondly, the enhancement of financing options, both for MSMEs and the vulnerable population. In addition, awareness raising regarding climate change and strengthening of policy and regulatory frameworks are also identified as important areas of action.

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*Figure 27: Opinion of consulted stakeholders regarding the main areas of action to develop the climate change adaptation market in Sierra Leone*

## 2) THE BASELINE SCENARIO AND ANY ASSOCIATED BASELINE PROJECTS;

### 2.1 Baseline Scenario

140. Sierra Leone is one of the poorest countries of the continent (60% of the population living below the international poverty line) with a very fragile economy that relies on natural resources, such as those from agricultural activities that have historically represented a large part of the GDP (55% in 2019, see Figure 28) and are, unfortunately, subject to climate change impacts and variability. Biomass resources represent the main source of energy used (accounts for around 80%<sup>[161]</sup><sup>131</sup> of the energy used), mainly by households in the form of fuelwood for cooking purposes.

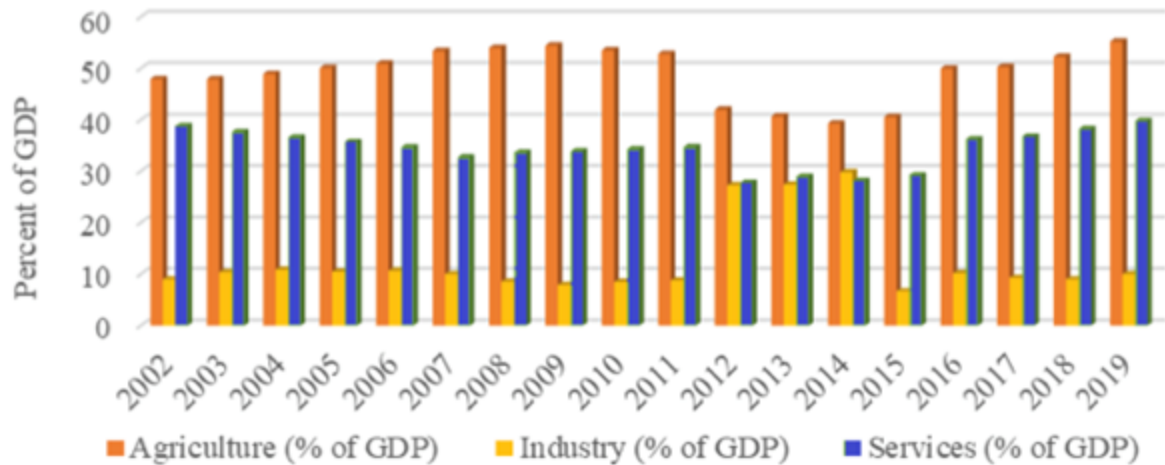


Figure 28: Sierra Leone Economic Structure Evolution in terms of sector share in GDP between 2002 - 2019[162][132]

141. Sierra Leone faces constraints associated to the negative impacts of conflict that left infrastructural and institutional deficiencies. Sierra Leone has a very low electricity access rate (26% of the people have access to electricity -one of the lowest electricity access rates in the world- which is further reduced in rural areas to 6%[163][133]); the electricity grid covers a small part of the country and the renewable energy resources, though abundant, have not been yet explored to their full potential.

142. Over half the country's population is food insecure (mostly in rural areas). According to USDA (U.S. department of Agriculture), food insecurity is a household- level economic and social condition of limited or uncertain access to adequate food[164]<sup>134</sup>which eventually leads to malnutrition and related health problems. Factors that contribute to food insecurity in Sierra Leone are old agricultural methods, poor yield due to insufficient and expensive agricultural inputs, unacceptably high harvest and post-harvest losses, uneconomical access to market and high food prices. Another factor contributing to malnutrition is lack of knowledge of how to provide rich-nutrient food to their children so in 2019, Partners in Health (PIH) established the moderate acute malnutrition program (MAM) providing support to hundreds of families in Kono each year and ensuring that children have access to the care they need to restore their health and how to access ingredients without going to the market, such as through gardening and fishing [165]<sup>135</sup>. Furthermore, while Sierra Leone has recorded comparatively low rates of COVID-19 infections and deaths, the virus' ripple effects have, unsurprisingly, proven serious and long-lasting in the country's context of extreme poverty, few formal safety nets, and already rising food prices. According to one study, 67% of Sierra Leonean households have seen their incomes decrease from last year, as three-day lockdowns enacted throughout the pandemic caused catastrophic losses for families surviving on daily wages. Relatedly, between June and August of this year, nearly 2 million people—a quarter of the population—fell into the category

of severely food insecure[166]<sup>136</sup>. Agriculture is the primary food source of Sierra Leone and the main economic driver of the country. 80% of rural households in Sierra Leone depend on production and sale of food crops while the major sources of income in urban areas are petty trading and formal trading, which are activities carried out by 50% and 35% of the urban households, respectively[167]<sup>137</sup>. In terms of agriculture subsectors contribution to the GDP, crops represent 70% of the agricultural output while fisheries contribute 14%, forestry 11% and livestock only 4%[168]<sup>138</sup>. In terms of the crops produced, rice is the major food crop, followed by cassava and potato. Other crops produced include maize, groundnuts, sorghum, palm oil and millet[169]<sup>139</sup>.

143. In terms of water and wastewater infrastructure, there is a large percentage of the population that lack access to clean water and sanitation facilities and the existent infrastructure is sensitive to storm surge, sea level rise and flooding[170]<sup>140</sup> which compromise both its quality (open sewage and rubbish can contaminate water sources and increment sedimentation) and thus availability. As already mentioned, Sierra Leone is exposed to various diseases influenced by climatic and environmental factors that may be enhanced by climate change (such as, the cholera outbreaks associated with heavy rainfall)[171]<sup>141</sup>.

144. Agriculture (including fisheries) is the primary food source and the pillar for Sierra Leone's economy, providing employment to about 75% of the country's population, with women as the predominant workforce[172]<sup>142</sup> (as example, note that 73% of the MSMEs registered in SMEDA are women led[173]<sup>143</sup>). Most of the agricultural activities are rainfed, thus making MSMEs in the agricultural value chain particularly susceptible to variability in precipitation patterns. Poverty, climate change and resilient agriculture are indeed intrinsically linked: more than half of the people living in poverty are smallholder farmers. Land degradation and soil erosion, exacerbated by recurrent floods, adversely impact agricultural production, disproportionately affecting the livelihoods of the rural poor, especially the most vulnerable ones (e.g., rural women and children).

145. The private sector, and particularly MSMEs, play a key role in the economy and should be actively involved in the development of the climate change adaptation market in Sierra Leone, but they still face several barriers (as captured previously in Table 17) that prevent them from maturing to a point where they grow and have positive social, environmental and economic impacts. They are particularly important for driving technological innovation, which often lead to the introduction of paradigm-shifting TPS and behavioural changes.

146. In order to adopt and deploy the necessary climate change adaptation TPS in the WEF sectors, it is crucial to tackle those barriers and support MSMEs so that they can become the vehicle to disburse climate change adaptation TPS throughout the country. In the baseline scenario, the above-mentioned barriers will not be adequately addressed which will hamper the identification of appropriate climate change adaptation TPS and deployment in the priority sectors. Consequently, there are missed

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opportunities for unlocking local innovation potential for addressing required climate adaptation and resilience needs and priorities. Further, the creation of effective market linkages between private sector and vulnerable populations will remain underdeveloped. Hence, access to climate change adaptation TPS for vulnerable population remains limited, and their adaptive capacities stay low.

147. The respondents to the online questionnaire released during PPG stage have classified a set of possible options (based on their own judgement) to evaluate each actions? positive impact potential from "very high" to "low". The result is shown in Figure 29. The three options that are considered to have the highest impact potential are related to creating linkages with potential investors and business networks, training and coaching for MSMEs, and strengthening / improving the policy and regulatory frameworks.

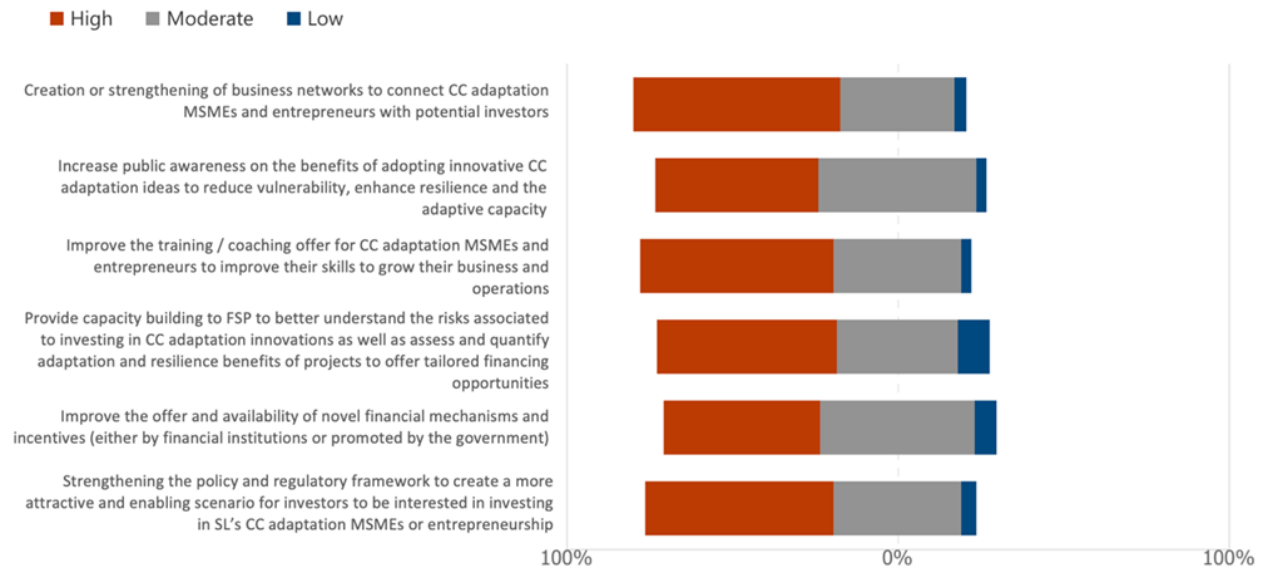


Figure 29: Classification of potential actions with regards to their positive impact from 'very high' to 'low' to foster the development of the Climate Change adaptation in the WEF sectors in Sierra Leone

148. During the PPG stage, a list of anticipated incubators/ accelerators was compiled. These incubators/ accelerators provide different services across the incubation / acceleration spectrum, which are summarised in Table 18 and have co-working / meeting rooms available in different locations of the country. Although this table provides information on the existence of 7 different accelerators, it is important to note that, from the investigation carried out during the PPG stage, the identified incubators/accelerators do not have a focus on the adaptation ecosystem. They do not have the knowledge and/or information on overall climate change adaptation and/or climate change adaptation TPS. They provide general acceleration services that are not palatable to the specific need of adaptation MSMEs. Furthermore, as seen in the table only a few provide seed funding or investment facilitation support to enterprises and some of them are in an early-stage of development.

149. The Sierra Leone Adaptation Incubator/ Accelerator Programme created within the project will be key since it will be the first programme focalized in enhancing the adaptation ecosystem through building the capacity of existing accelerators and incubators in the whole country. Without this project, existing accelerators / incubators and testing labs would continue operations without prioritizing

innovation in adaptation and would continue to lack the capacities to transform adaptation TPS into marketable products. It is therefore very important that accelerators and incubators in the country are trained on how to accelerate adaptation MSMEs. Furthermore, without an understanding on how to quantify adaptation and resilience benefits of projects, FSPs would not have the capacities to tailor financing (seed and business growth capital) to support adaptation MSMEs to grow nationally and regionally.

150. The Sierra Leone Adaptation Incubator/Accelerator Programme will also be the first to train a high number of MSMEs, entrepreneurs and start-ups (at least 336 throughout the whole period of implementation (seven (7) years in total: the first year the necessary materials for the Sierra Leone Programme will be prepared such as the adaptation innovation website and incubators/accelerators will be trained and thus, competitions will start from the second year onwards). Not only capacity will be built but seed funding and investment facilitation support will be provided to enterprises to overcome the financial barriers already mentioned above through the Climate Adaptation Venture Fund (described below in more detail under section 3). By means of building capacity of existing accelerators and incubators this project will help develop the adaptation ecosystem needed to support MSMEs and other vulnerable groups, for example, MSMEs operating in sectors highly vulnerable to climate change in Sierra Leone (such as agriculture, fisheries, livestock and forestry) that are part of the country's global supply chain. Enterprises will be trained in climate adaptation, adaptation technologies, business growth support and investment facilitation support needed to increase their likelihood of transforming adaptation innovations into technically and commercially viable products, thus helping develop a pool of adaptation technologies to help face the climate risks and hazards and build vulnerable groups' resilience to climate change impacts.

**Table 18: Assessment of the services provided by existing accelerators and incubators identified in the PPG phase**

Incubator / Accelerator	Provide training / education		Incubation Services / Acceleration	Advanced Acceleration (Business growth / seed funding)	Post-Acceleration (Investment Facilitation)	Co-working spaces / Meeting rooms	Events / Networking	Internet / WIFI	Specific programmes for vulnerable groups	Supported start-ups / MSMEs	Location
	Climate change	Other									
Innovation Sierra Leone (Innosl)[174] <sup>144</sup>		?	?	?		?	?	Likely	?	25+	Freetown
Seedstars[175] <sup>145</sup>			?	?	?						Freetown
Climate-KIC[176] <sup>146</sup>	?		?	?				Likely			Across Africa
Freetown Media Centre [177] <sup>147</sup>		?				?					Freetown
Faster Capital [178] <sup>148</sup>		?		?	?		?	Yes			Sierra Leone (online)
Innovations Axis[179] <sup>149</sup>		?	?	?	?	?	?	Likely			Kingdom (Freetown area)

?Freetown Pitch Nights ? (run by Innosl)										160+	Freetown
Sensi Tech Hub[180] <sup>150</sup>	?	?	?			?	?	Likely		32+	Aberdeen (Freetown), Makeni and Pujehun
The Aurora Foundation[181] <sup>151</sup>		?	?				?		?	4+	Sierra Leone / Iceland
AFFORD Sierra Leone[182] <sup>152</sup>		?	?								Freetown
UNDP Accelerator Lab[183] <sup>153</sup>	? (related to SDGs)	?	?				?		? (from targeting the SDGs)	130+ (submitted, under review)	Freetown
World Bank Accelerator[184] <sup>154</sup>	? (related to SDGs)	?	?				?		? (from targeting the SDGs)		

*\*Note: The cells with no information are because the above referred services were not found on publicly available information provided by the incubators*

151. On the local level, vulnerable groups will also be trained in the Adaptation ecosystem through workshops so that they are aware of hazards and can identify the adaptation technologies needed to face those risks. They will also have access to financial support through the Climate Adaptation Venture Fund described below in detail under section 3. Without the Sierra Leone Accelerator Programme, there would be limited awareness and capacities to acquire adaptation technologies by

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rural population. Vulnerable communities including women and youth who are most impacted by climate change impacts would not have access to safety nets and diversified livelihoods (such as MFI products) to withstand climate change impacts. They would not be able to voice their needs on what kind of adaptation measures can improve their productivity in a sustainable way, such as women who manually cultivate in the agriculture sector.

152. The Sierra Leone Adaptation Incubator/Accelerator Programme will also support the development of the Adaptation Innovation Platform. This platform will build capacity of national and local institutions as well as other relevant stakeholders of the adaptation ecosystem (see Section 3 below). Without this support, there would be limited coordination mechanisms and institutions will likely lack the capacity to appropriately support adaptation technologies MSMEs, entrepreneurs and start-ups. Furthermore, this project will help develop and improve policies to engage MSMEs and mainstream climate resilience in their operations.

153. Overall, it will be more difficult for the country to take advantage of the opportunity to engage the private sector, especially adaptation MSMEs, in leading the transformative change towards an adaptation development trajectory. The Sierra Leone Adaptation Incubator/Accelerator Programme will help enterprises to develop and scale-up and will increase market adoption of adaptation technology innovations, thus leading to a reduction of the climate change impacts in the whole country. Furthermore, it will facilitate increased investment, job creation and market development among others. Please see Section 3 and Section 6 (Global Environmental benefits and/or adaptation benefits) of this document to learn more about the benefits of building the Sierra Leone Adaptation Incubator/Accelerator Programme.

### **Policy Baseline**

154. Sierra Leone's vision to climate change<sup>[185]<sup>155</sup></sup> supports proposals in the National Climate Change Policy (NCCP) revised in early 2021 and is aligned with the Medium-Term National Development Plan (MTNDP) 2019-2023, the African Union Vision and the SDGs. The vision is divided into mitigation and adaptation:

? For mitigation, the vision is to earn forest carbon credits through the implementation of Reducing Emissions from Deforestation and Forest Degradation (REDD+) programmes.

? For adaptation, the vision is to reduce vulnerability by half by 2030 through increased risk awareness, improvements in rule compliance, increased institutional capacity and an integrated approach to adaptation in development policy and programmes across sectors and scales.

155. Sierra Leone's vision towards addressing climate change and its impacts has been further elaborated in the updated Nationally Determined Contribution (updated NDC), issued in July 2021, expanding on the foreseen goals of the National Adaptation Plan (NAP), which includes:

Increasing resilience capacity at all scales;

Supporting an integrative approach to climate change programming and policymaking;

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Allocating 10% of annual national budgets to climate change adaptation across sectors;

Harmonizing climate-relevant policies and regulations to improve coordination and cross-sector linkages;

Mainstreaming adaptation into local development plans by 2025;

Institutionalize NAP implementation through laws, policies, and regulation;

Establishing a National Trust Fund for channelling adaptation support across sectors; and

Securing 40% of international development funding to support adaptation priorities across different sectors.

156. These goals contribute to the achievement of the overall adaptation goal through the integration of respective considerations into all relevant plans, policies and strategies and by prioritizing and planning for adaptation. They also ensure that the NDC adaptation component becomes a strategic vehicle for capturing, reporting and updating commitment and progress at the same time as it ensures alignment with long-term national development priorities and with the Sustainable Development Goals (SDG). In addition, the above referred goals also contribute to improving the delivery of the climate services described in the National Framework for Climate Services (NFCS), benefiting a wide range of sectors and climate intervention areas, such as biodiversity, health, energy, agriculture, human settlements, water. The GoSL is also signatory to the UNFCCC and has committed itself, through the work of the Environment Protection Agency (EPA), to respond to the challenges of climate change by developing adaptation policies.

157. The country has been undertaking a wide range of studies and is actively developing plans and strategies to fight against and adapt to climate change. These and other relevant documents addressing adaptation as well as the WEF sectors, MSMEs and the financial sector are briefly listed here and further described in the Baseline Report (Annex P):

*Sierra Leone's updated Nationally Determined Contribution (NDC) (2021)*

*Sierra Leone's initial National Adaptation Plan (NAP) (2021)*

*Sierra Leone National Adaptation Plan to achieve resilience across all sectors (2020)*

*The Sierra Leone Climate Change Adaptation Plan (SLCCAP) (2020)*

*Sierra Leone National Adaptation Plan to achieve resilience across all sectors (2020)*

*Sierra Leone's Climate Change Communication Strategy under the National Adaptation Plan (NAP) (2020)*

*Climate Change Adaptation Plan for the Sierra Leone Coastal Landscape Complex (2019)*

*Third National Communication (TCN) of Sierra Leone to the UNFCCC (2018)*

*Sierra Leone National Adaptation Programme of Action (NAPA) (2007)*

*Sierra Leone National Adaptation Plan to achieve resilience across all sectors (2007)*

*Ratification of UN Convention on Climate Change (2016)*

*Climate Risk Profile-Sierra Leone (2006)*

158. In addition to climate-related policies and legislation, it is of relevance for this Adaptation project objective and approach to take into account WEF-related policies and MSMEs related policies as part of the baseline scenario. These are all described in detail in the Baseline Report (Annex P), and listed here:

Overarching development strategies (including the ones for the WEF sectors):

The National Disaster Management Agency Act, 2020

Medium term National Development Plan (MTNDP) 2019-2023

Establishment of the Ministry of Environment

Sierra Leone Meteorological Agency (SLMA)

Inclusive and Comprehensive Agriculture Development Programme (ICADeP)

The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security

The Environmental Protection Agency Act (2008)

National Drought Management Plan (DMP)

National Environmental Policy (NEP)

National Environmental Action Plan (NEAP)

Water Energy and Food Sector Documents:

Sierra Leone's WASH policy

MSMEs, Financial Sector and Innovation Promotion Documents:

National Innovation and Digital Strategy (NIDS) 2019-2029

The Small and Medium Enterprises Development Agency (SMEDA) Policy (National SME Policy 2019)

National Promotion Act (2004) and the Sierra Leone Investment and Export Promotion Agency (SLIEPA)

National Strategy for Financial Inclusion 2017 - 2020

The Companies Act

The Registration of Business Act (ROBA)

Intellectual Property Laws: Trademark Act (2014); Copyright Act (2011) and Patent and Industrial Design Act (PAID) (2012)

Telecommunication Act

## **2.2 Baseline Projects**

159. Sierra Leone has developed many adaptation projects to address the adverse effects of climate change based on existing coping mechanisms and practices, such as, development and enactment of appropriate policies and regulations relevant to the development of coastal communities, urban growth planning, and critical coastal ecosystems preservation and the establishment of a National Sea-Level Observing System for Sierra Leone<sup>[186]</sup><sup>156</sup>.

160. The proposed GEF/UNIDO Adaptation Project will be complementary and leverage the results achieved from the set of past climate change adaptation projects and will try to create synergies with ongoing projects focusing on climate change adaptation or targeting the development of WEF sectors in the country. An in-depth review of on-going and planned programmes and projects in relation to climate change and adaptation technology in Sierra Leone shows that there are a number of on-going projects being undertaken by numerous national and international agencies, with current implementation life spans of between three and twelve years. The length of the implementation life span for some of these programmes/projects highlights the challenges of creating a comprehensive framework that should strengthen policy, institutional frameworks and coordination mechanisms to support and engage MSMEs in mainstreaming climate resilience and adaptation. Table 19 lists the most relevant projects that should be considered under the baseline scenario.

### **TABLE 19: PROJECTS RELATED TO CLIMATE CHANGE ADAPTATION OR TARGETING WEF SECTORS IN SIERRA LEONE**

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Name of the Programme/ Project	Duration Period /Budget	Short Description of the Programme / Project	Contribution (lessons learnt) / synergies with the proposed GEF/UNIDO Adaptation Project
GEF Small Grant Program	1st July 2020 - 30th June 2021	<p>Implementing Agency: UNDP            Executing Agency: United Nations Office for Project Services (UNOPS)            Main Objective/Activities  <b>The GEF Small Grants Programme</b> provides community-based organizations, NGOs and research institutions in Sierra Leone with funds to tackle global environmental challenges in the country: Biodiversity conservation, climate change, Land degradation, Sustainable Forest Management, International Waters and Chemicals; while addressing local sustainable development needs. SGP Sierra Leone is currently in the First Year of GEF 7<sup>th</sup> Operational Phase (1<sup>st</sup> July 2020 - 30<sup>th</sup> June 2021). Main activities include community-based conservation of threatened ecosystems and species; Sustainable agriculture; Fisheries, and food security; Low-carbon energy access co-benefits: Local to global coalitions for chemicals and waste management and Capacity Building.            Information source:  <a href="https://sgp.undp.org/component/countrypages/?view=countrypage&amp;country=142&amp;Itemid=">https://sgp.undp.org/component/countrypages/?view=countrypage&amp;country=142&amp;Itemid=</a></p>	<p>This project is well aligned with the proposed Adaptation project, and it is in the first year of operation therefore synergies are expected to be made especially with regards to community engagement, information dissemination and capacity building activities, which address climate change adaptation topics and WEF sectors.</p>
Building and Strengthening Sierra Leone's National Capacity to Implement the Transparency Elements of the Paris Agreement	<p>Project launched in March 2020</p> <p>GEF Grant Amount: \$1,344,495            Total Cost: \$1,594,495.00</p>	<p>Implementing Agency: EPA            Executing Agency: United Nations Environment Programme (UNEP)            Main Objective/Activities            Sierra Leone adopts upgraded institutional arrangements and tools to track NDC implementation in accordance with the UNFCCC modalities, procedures and guidelines.            Information source:  <a href="https://www.thegef.org/project/building-and-strengthening-sierra-leones-national-capacity-implement-transparency-elements">https://www.thegef.org/project/building-and-strengthening-sierra-leones-national-capacity-implement-transparency-elements</a></p>	<p>This project's main aim of strengthening institutions abilities and tools to better track NDC results would be of relevance for the proposed Adaptation Project since it has linkages to NDC's adaptation goals. On the other hand, the proposed Adaptation project has to implement its own M&amp;E plan and monitor results therefore synergies could be explored.</p>

Name of the Programme/ Project	Duration Period /Budget	Short Description of the Programme / Project	Contribution (lessons learnt) / synergies with the proposed GEF/UNIDO Adaptation Project
<p>Promoting Climate Resilience in the Cocoa and Rice Sectors as an Adaptation Strategy in Sierra Leone</p>	<p>Project Approved for Implementation on 7 Aug 2019</p> <p>Duration period: 6 years Adaptation Fund Grant Amount: \$9,916,925</p>	<p>Implementing Agency: International Fund Agricultural Dev Executing Agency: Ministry of Agriculture and Forestry (MAF) Main Objective/Activities The overall objective of this additional climate finance for adaptation is to reduce vulnerability and increase adaptive capacity to respond to the impacts of climate change, including variability at local and national levels as well as on natural resources critical for sustaining agricultural production and increasing food security and nutrition of vulnerable poor communities. The project will deliver the stated objective through three components:</p> <ul style="list-style-type: none"> <li>●Climate-proofed agricultural production and post-harvest combined with livelihood diversification</li> <li>●Climate-resilient rural transportation and water infrastructure</li> <li>●Institutional capacity building and policy</li> </ul> <p>Information source: engagement Information source: <a href="https://www.adaptation-fund.org/project/promoting-climate-resilience-coco-rice-sector-sierra-leone/">https://www.adaptation-fund.org/project/promoting-climate-resilience-coco-rice-sector-sierra-leone/</a></p>	<p>This project is focused on the agriculture sector. A sector very susceptible to climate change risks and impacts. The information that this project may generate can be really useful to understand in a deeper way the risks Sierra Leone people face and therefore help identify potential Adaptation TPS that may be supported by the proposed GEF/UNIDO Adaptation project. In addition, the described project will increase adaptive capacity for vulnerable populations. Outcomes of these trainings can be useful to help enterprises acting in the agriculture sector register in the proposed Adaptation Incubator/ Accelerator Project.</p>

Name of the Programme/ Project	Duration Period /Budget	Short Description of the Programme / Project	Contribution (lessons learnt) / synergies with the proposed GEF/UNIDO Adaptation Project
<p>Adapting to Climate Change Induced Coastal Risks Management in Sierra Leone</p>	<p>Project Approved for Implementation on 31 Oct 2017</p> <p>GEF Grant: \$9,975,000 Co-Financing Total: \$31,800,000 Total Cost: \$41,975,000</p>	<p>Implementing Agency: EPA Executing Agency: UNDP Main Objective/Activities</p> <p>Strengthen the ability of coastal communities to systematically manage climate change risks and impacts on physical infrastructure and economic livelihood; enhance the availability of high quality climate risk information that is critical for development decision-making in the coastal zone through (i) the installation of Climate and oceanographic monitoring equipment?s and related data processing systems, (ii) the probabilistic modelling and assessment of natural hazard risk and vulnerability; (iii) the economic impact modelling on the projected costs of climate change impacts and net benefits of adaptation options; and (iv) the design and implementation of a National Coastal Risk Information and Planning Platform that will facilitate decision-making on coastal development; Develop appropriate protection measures (e.g. Engineering Designs for Coastal Stabilization structures), policy, budgeting / legal tools (Integrated Coastal Management Plans, guidelines to revise EIA, infrastructures &amp; properties norms, participatory budgeting) and integrated coordination mechanisms to improve/support policy design and implementation in dealing with current and long-term coastal challenges.</p> <p>Information source: <a href="https://www.thegef.org/project/adapting-climate-change-induced-coastal-risks-management-sierra-leone">https://www.thegef.org/project/adapting-climate-change-induced-coastal-risks-management-sierra-leone</a></p>	<p>This project is focused on coastal areas, which are susceptible to climate change risks. The information that this project may generate can be really useful to understand in a deeper way the risks these areas face and therefore help identify potential Adaptation TPS that may be supported by the proposal Adaptation project. In addition, the described project envisages the implementation of pilot adaptation investments in high risks areas. Outcomes of these pilot investments can be useful learnings about what technologies or adaptation solutions work better for coastal areas.</p>

Name of the Programme/ Project	Duration Period /Budget	Short Description of the Programme / Project	Contribution (lessons learnt) / synergies with the proposed GEF/UNIDO Adaptation Project
<p>Building Resilience to Climate Change in the Water and Sanitation Sector</p>	<p>Project Approved for Implementation on 19 Oct 2016            GEF Grant: \$4,000,000            Co-Financing Total: \$28,735,000            Total Cost: \$32,935,000</p>	<p>Implementing Agency: Ministry of Finance and Economic Planning, and Ministry of Energy and Water Resources            Executing Agency: UNDP            Main Objective/Activities            Reduced vulnerability to climate change in the water and sanitation sector; Increased knowledge and understanding of climate variability and change-induced threats at country level and in targeted vulnerable areas; Strengthened adaptive capacity to reduce risks to climate-induced economic losses; successful demonstration and deployment of relevant adaptation technology in targeted areas; enhanced enabling environment to support adaptation-related technology transfer.            Information source:  <a href="https://www.thegef.org/project/building-resilience-climate-change-water-and-sanitation-sector-0">https://www.thegef.org/project/building-resilience-climate-change-water-and-sanitation-sector-0</a></p>	<p>The water sector is one key sector under the scope of the proposed Adaptation Project and also under the described project. It has started implementation in 2016 thus any learnings from this project can be useful in addition to understand the results that were obtained and explore if more can be done on top of those results.</p>

Name of the Programme/ Project	Duration Period /Budget	Short Description of the Programme / Project	Contribution (lessons learnt) / synergies with the proposed GEF/UNIDO Adaptation Project
Guma Valley Reservoir and Freetown Water Supply Climate Change Resilience and Emergency Plan	2015	<p>Implementing Agency: UNDP            Executing Agency: Guma Valley Water Company (GVWC)            Main Objective/Activities            Main objective in 2016, Freetown experiencing a severe water shortage which made international headlines and Guma Valley Water Company (GVWC) introduced emergency measures. These involved tankering water to the most affected communities, tapping additional minor sources and mending leaking pipes. The preparation of this Emergency Plan is intended to formalise and give added weight to the efforts that are already in progress and to ensure that measures are taken to reduce the risk of any future crisis in water supply. Main activities are the Development of an Emergency Contingency Plan for the GVWC and training of Guma Staff and Technicians including tanker drivers, engineers etc. Financed by the GEF under a programme on climate change in Sierra Leone managed by UNDP.</p>	<p>It would be useful to learn the results and sustainability of the technological solutions adopted through the Emergency Plan as well as explore what measures were taken to reduce risks of future water crisis. It could be of use for the proposed Adaptation project to understand if these measures were effective to reduce the risks in the water sector (especially in a populated area like Freetown), particularly in connection to the energy and the food sectors, which are also targeted by the proposed Adaptation project.</p>

Name of the Programme/ Project	Duration Period /Budget	Short Description of the Programme / Project	Contribution (lessons learnt) / synergies with the proposed GEF/UNIDO Adaptation Project
<p>Building Adaptive Capacity to Catalyse Active Public and Private Sector Participation to Manage the Exposure and Sensitivity of Water Supply Services to Climate Change in Sierra Leone</p>	<p>Project Approved for Implementation on 16 Apr 2014            GEF Grant Amount: \$2,940,000            Co-Financing Total: \$10,150,000            Total: \$13,160,000</p>	<p>Implementing Agency: EPA, Ministry of Water Resources            Executing Agency: UNDP; Global Environment Facility (GEF)            Main Objective/Activities:            The project aims to enhance adaptive capacity of decision-makers in the public and private sector involved in water provision to plan for and respond to climate change risks on water resources. The project seeks to complement a number of water-related projects established by the UNDP and other funders in Sierra Leone. Within water resources management, the project focuses on addressing the skills deficit of water managers and the insufficient policy framework to secure the vital economic and the functionality of water management systems in a changing climate.            Information source:  <a href="https://www.thegef.org/projects-operations/projects/4599">https://www.thegef.org/projects-operations/projects/4599</a></p>	<p>The project aimed at addressing deficits in terms of skills and policy framework in the water sector. It has been approved in 2014 and it would therefore be useful to understand what the results have been so far to be able to identify any remaining gaps that this proposed Adaptation project may be able to tackle.</p>

Name of the Programme/ Project	Duration Period /Budget	Short Description of the Programme / Project	Contribution (lessons learnt) / synergies with the proposed GEF/UNIDO Adaptation Project
<p>Strengthening Climate Information and Early Warning Systems in Sierra Leone for Climate Resilient Development and Adaptation to Climate Change</p>	<p>Project Approved for Implementation on 25 Sep 2013            GEF Grant Amount: \$4,000,000            Co-Financing Total: \$20,347,310            Total: \$24,347,310.00</p>	<p>Implementing Agency: EPA, Climate Change Secretariat, Meteorological Department, ONS            Executing Agency: UNDP            Main Objective/Activities:            To strengthen the weather, climate and hydrological monitoring capabilities, early warning systems and available information for responding to extreme weather and planning adaptation to climate change in Sierra Leone. Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas; strengthened adaptive capacity to reduce risks to climate-induced economic losses; enhanced capacity of the Sierra Leone Meteorological Department of (SLMD) and Directorate for Water Resource (DWR) to monitor extreme weather events.            Information source:  <a href="https://www.thegef.org/project/strengthening-climate-information-and-early-warning-systems-africa-climate-resilient-0">https://www.thegef.org/project/strengthening-climate-information-and-early-warning-systems-africa-climate-resilient-0</a></p>	<p>The aim of the described project was mainly on improving the available tools to record and monitor weather, climate and hydrological information. Information availability and accessibility to technology developers, investors, agricultural producers, farmers, and the overall population allows them to make better choices. It would be useful to understand any potential learnings from this experience and confirm if this type of information is available to potential Adaptation TPS developers that may be supported by the current Adaptation project.</p>
<p>Resilient Urban Sierra Leone Project</p>	<p>Duration: 60 Months            Project Approved for Implementation on 7 Jan 2021            GEF Grant Amount: \$ 6,727,262            Co-Financing Total: \$50,000,000            Total: \$ 56,727,262</p>	<p>Implementing Agency: World Bank            Executing Agencies: Freetown City Council, Fiscal Decentralization Division in Ministry of Finance, National Disaster Management Agency, Western Area Rural District Council, Bo City Council            Main Objective/Activities:            To improve integrated urban management, service delivery, and disaster emergency management in Freetown and select cities of Sierra Leone            Information source:  <a href="https://www.thegef.org/projects-operations/projects/10768">https://www.thegef.org/projects-operations/projects/10768</a></p>	<p>The information that this project may generate can be really useful to identify nature-based solutions, water/energy efficient irrigation systems and waste management solutions that may be supported by the proposal Adaptation project.</p>

### 3) THE PROPOSED ALTERNATIVE SCENARIO WITH A BRIEF DESCRIPTION OF EXPECTED OUTCOMES AND COMPONENTS OF THE PROJECT;

161. The proposed alternative scenario is to implement a series of project components and activities that will deliver innovation, knowledge transfer and large-scale deployment of climate change adaptation-oriented TPS in the WEF sectors by the private sector (MSMEs and financial institutions) as well as boost job creation in order to reduce vulnerability, enhance resilience and the adaptive capacity of the vulnerable segments of the population including women, youth, smallholder farmers/fishers, small entrepreneurs and MSMEs, in rural and urban areas of Sierra Leone.

162. Under the baseline scenario, the root causes and barriers would not be adequately addressed hampering the identification of appropriate climate change TPS and its deployment in the priority sectors (WEF) as identified in the Sierra Leone NAPA and NAP, thus providing a rationale for GEF involvement. The GEF financing will provide the necessary catalytic support to form a localized market providing affordable and reliable climate change adaptation TPS to vulnerable populations and support the vulnerable population to build their adaptive capacity through a threefold approach: (1) contributing to the creation of an integrated, coordinated and harmonised legal and regulatory environment that motivates and stimulates the private sector to support the public sector delivering its adaptation and resilience mandates; (2) support transformation and growth of innovative climate change adaptation TPS and business models through private sector (MSMEs) engagement; (3) raising awareness and providing information to the vulnerable population on climate change, climate change adaptation and adaptation TPS, as well as by supporting the development of innovative financing mechanisms for large-scale deployment and buy-out of climate change adaptation-oriented TPS for both MSMEs and the vulnerable population, contributing in this way to build resilience of these vulnerable groups (both supply side and demand side). All of these supported by activities including capacity building, awareness raising and information dissemination, to ensure that stakeholders in the climate change adaptation field as well as the vulnerable groups can make and take informed decisions and start adapting to climate change.

163. The proposed project is aligned with the updated GEF-LDCF programming strategy (2018-2022) which highlights the importance of i) private sector engagement for climate adaptation action and ii) supporting LDCs with deployment of adaptation technologies. The proposed project aims to address the barriers previously described by engaging the private sector and tapping into the innovation potential by supporting the development of entrepreneurs, start-ups and MSMEs and facilitate the transformation of innovative and entrepreneurial ideas into market ready products for large-scale deployment of climate change adaptation-oriented technologies and solutions in line with the priority areas identified in the Sierra Leone's NAPA and NAP:

164. In order to reach the project's objective, five project components (PC) are proposed:

**Project Component 1 (PC1):** Strengthening institutional and policy frameworks and Coordination mechanisms supporting ?adaptation MSMEs? to develop and deploy their technologies, products and services into the water, agriculture and energy sectors

**Project Component 2 (PC2):** Growth and scale-up support for adaptation MSMEs in water, agriculture and energy sectors



**Project Component 3 (PC3):** Innovative financing for deployment of climate adaptation-oriented technologies and solution to build the resilience of vulnerable groups

**Project Component 4 (PC4):** Monitoring and learning

**Project Component 5 (PC5):** Project Evaluation

165. Figure 30 shows the Theory of Change underlying the proposed GEF/UNIDO Adaptation Project. It shows the climate change risks which are exacerbated by socioeconomic factors and the existing barriers to climate change adaptation, innovation and entrepreneurship in Sierra Leone that the project aims to mitigate. The expected outcomes and impacts aim to contribute to build inclusive and resilient WEF sectors. The Theory of Change is based on the assumption that supporting the national ecosystem for Adaptation MSMEs not only strengthens the resilience of MSMEs, forming an important part of the Sierra Leone economy, but at the same time strengthens the adaptive capacity of vulnerable populations by improving their access to with targeted adaptation Technologies, Products and Services (listed in table 14 above).

166. The project focus on building a stronger legal and regulatory framework to support adaptation and provide the tools for the government's institutions to identify and analyse climate change impacts and effects across the countries and in the most essential sectors of the economy - WEF. Furthermore, the project aims to build the capacity of the MSMEs in the country to provide adequate and prioritised adaptation TPS to the most vulnerable on the sectors, by providing information and building the capacity of MSMEs on climate change, adaptation and entrepreneurship etc as a way to stimulate innovation and creation of new business and employment as well as supporting them to test ideas and concepts applicable to SL WEF sectors. Finally, project further envisages to target the demand for the adaptation services, by provision of information and awareness on climate change, climate change adaptation and climate change adaptation TPS, as well as through developing and providing financial products and services that can support the most vulnerable in the acquisition of these technologies. To summarize, the project builds institutional framework, supports the development of supply of adaptation TPS, raises awareness and information on technological options for the most vulnerable and provided financing to both the MSMEs and the most vulnerable, closing the loop.

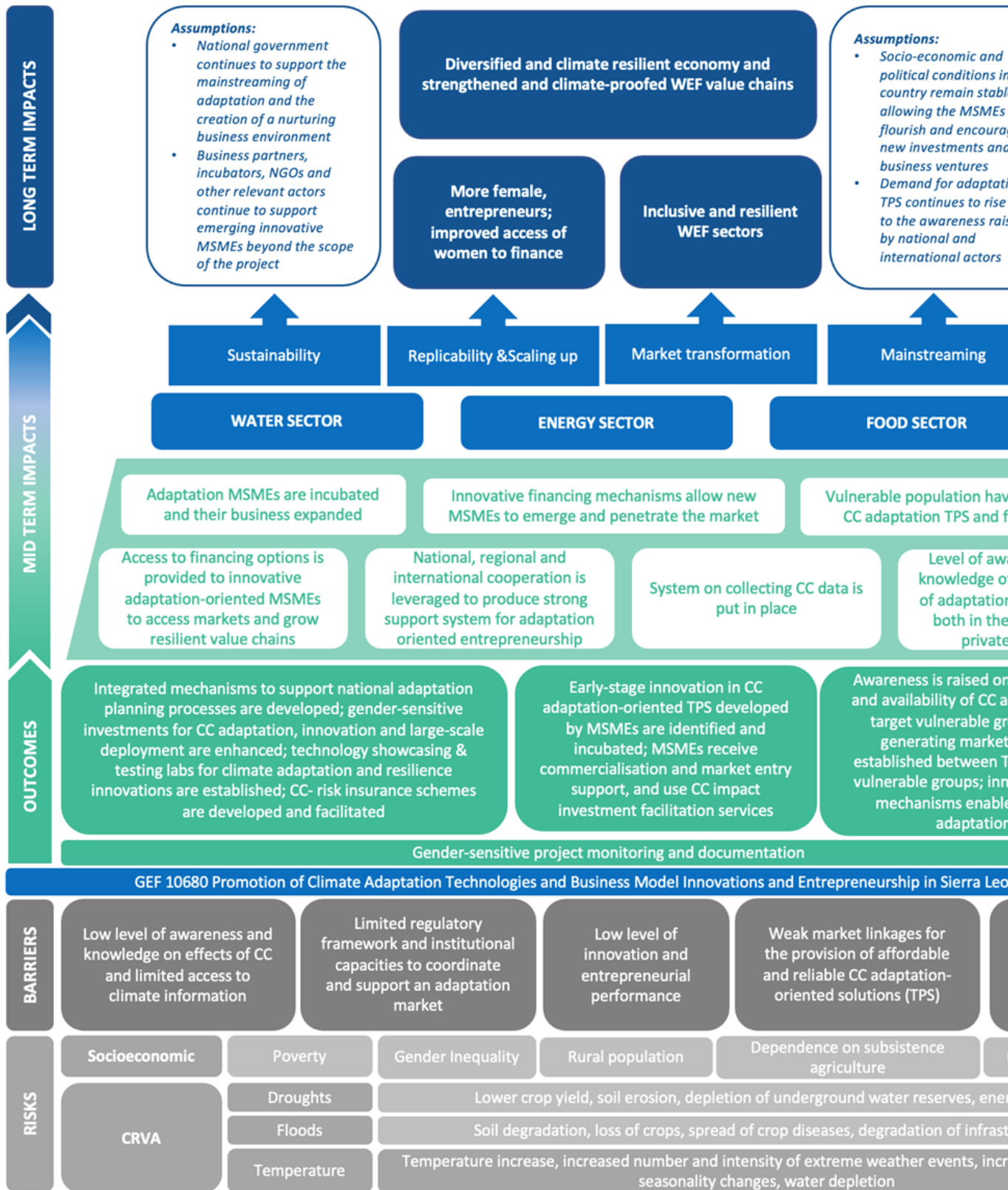


Figure 30 theory of change (TOC)

***PC1: Strengthening institutional and policy frameworks and Coordination mechanisms supporting ?adaptation MSMEs? to develop and deploy their technologies, products and services into the water, agriculture and energy sectors***

167. The lack of (i) a national coordinated and conducive legal and regulatory environment and (ii) the low level of awareness and knowledge on the effects of climate change and the potential role of adaptation TPS are barriers that hinder the development and sustenance of any market. Along with lack of access to finance, the lack of business environment and qualified resources were key barriers highlighted by the MSMEs and other stakeholders consulted.

168. As referred in the Baseline Report, climate change adaptation requires increased flows of private capital and more effective leverage of public capital, especially to and within developing countries such as Sierra Leone. In fact, Sierra Leone NDC refers that the achievement of the country's adaptation commitments relies, amongst other things, on the availability of finance. While project transactions and climate aid (areas on which policymakers and financial institutions have largely been focused) have been and are valuable, they lack a systematic approach necessary to generate finance at the scale required to build a project pipeline and ensure corollary benefits of enhancing economic and social development in a sustainable way<sup>[187]</sup><sup>157</sup>. In addition, national frameworks should integrate laws and regulations (including incentives and guarantees) which are 'fit for purpose' to de-risk, unlock, mobilise, leverage and mainstream in-country public and private climate finance.

169. 'Legal readiness' is required in Sierra Leone (as in other developing countries) to attract both public and international funds, including private sector finance. That includes<sup>[188]</sup><sup>158</sup>:

- Laws and regulations that have been carefully considered and enacted based on comprehensive assessment, analysis and consultations, [that] can enable access to climate finance and investments and realise NDC targets.
- Building legal and institutional capacity through knowledge and technical expertise.

170. This will not only increase climate finance flows but also provide transparency, clarity and accountability for multi-stakeholders by providing the framework for regulating behaviours and activities, and thus, a solid basis in which a given market can be established and developed such as the adaptation one. The development of green growth and sustainable development strategies have emerged as a tool that enables countries to effectively integrate low-emission and climate-resilience policies into their national economic and social objectives (including the achievement of critical national development goals and the SDGs). Green growth and climate resilience considerations have already been included in several strategies in Sierra Leone (such as the NAPA and the NDC), however, those are only effective when accompanied by well design, clear, coherent, flexible and enforced legislation.

171. PC1 aims to contribute towards the development of 'legal readiness' focusing on financing mechanisms to promote adaptation solutions for Sierra Leone. This will be done, by setting up a mechanism that will: contribute to the development of legislation and regulations necessary for the

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market (especially ones that foster innovation and the creation of a business environment where entrepreneurs and MSMEs can thrive); provide a platform for collaborations across a wide range of stakeholders (as adaptation is a cross-sectorial issues) in both the public and private sectors; build capacity (including training) and provide information on climate change and 'adaptation?; and catalyse innovation. This, and the collaborative platform 'Innovation Adaptation Platform ', will guarantee that the proposed interventions are closely linked to: (a) National Adaptation Planning Processes and (b) help to fill gaps and make use of synergies with other on-going initiatives in the country. As the result, the project will establish integrated and sustainable mechanisms to support MSMEs by entrepreneurial activities and establish financial instruments to support the development and acquisition of climate change adaptation TPS, ultimately contributing to the national development. PC1 aims at improving the institutional and regulatory framework and the business environment for innovations in climate adaptation-oriented technologies by entrepreneurs, start-ups and MSMEs in Sierra Leone, with a view to develop a thriving and conducive innovation ecosystem for climate-resilient TPS as well as ensure the mainstreaming of these adaptation solutions across the WEF priority sectors. In addition, the project will help to build a market for adaptation TPS, which is very important as referred by the stakeholders. There are projects targeting MSMEs in Sierra Leone, but none, or just a few, target adaptation MSMEs, and the enabling environment in which they need to be created, nurtured, and developed.

**Outcome 1.1: An integrated mechanism with strong linkages to national adaptation planning processes is developed to support and engage adaptation MSMEs in delivering their mandates with gender mainstreaming**

**Output 1.1.1: The Directorate of Climate Change, SMEDA and support institutions in water, agriculture and energy sectors capacitated through improved tools, planning instruments (technology roadmaps and climate smart investment plans) and trained to support and engage adaptation MSMEs in their operations, through three (3) specialised education and training courses on climate change and climate change adaptation TPS for 60 stakeholders**

**Activity 1.1.1.1: Identify and develop tools to assess climate vulnerability and support the identification of appropriate adaptation solutions (TPS) for the WEF sectors**

172. There are several tools on the market that allow for CRVA assessments, identification of climate change vulnerabilities, and information on adaptation solutions that can be adopted. However, only a few provide multi-sector risk assessment results. Examples of models that allow for multi-risk assessment across sectors are the Global Hotspot Explorer<sup>[189]</sup><sup>159</sup> and LEAP-WEAP<sup>[190]</sup><sup>160</sup>. Then there are off-the-shelf models that can be used to assess climate change impacts and identify climate change vulnerabilities separately and not in an integrated manner, such as the WB CCKP and ThinkHazard<sup>[191]</sup><sup>161</sup>. Also, institutions working in the adaptation field, such as Climate-KIC are developing its own tool for that.

173. This activity aims to develop a tool that allows assessment of climate change sectors risks and vulnerabilities. The tool should:

Allow spatial analysis and identification of climate change risks and vulnerabilities across the country under different scenarios and climate change pathways.

Analyse the expected impact of the incorporation of infrastructure and investment projects in the climate change, and thus assess the impact of project and policy and strategy options

To provide a catalogue of possible adaptation TPS that could be adopted to adapt to different climate change risks and events.

Map MSMEs, start-ups, incubators/accelerators, financial institutions that will be supported through the GEF/UNIDO Adaptation Project.

174. This tool can be used for multiple purposes:

To analyse policy and strategy options and their impacts on the role to adapt to climate change by government institutions.

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To guide the identification/selection process by the PMU on *what?* entrepreneurs, start-ups and MSMEs, incubators/accelerators are going to be supported (by identifying climate change risks and vulnerabilities hotspots, the tool will provide an indication of the priority adaptation TPS for a certain area).

The tool can be used by the Sierra Leone government institutions (EPA, Ministry of Environment, MTI, MLHCP, and other institution in the Scientific and Technical Advisory Committee of the NAP process etc), including research institutions and universities, and other stakeholders identified by the Adaptation Innovation Platform to build capacity on climate change vulnerability and risk analysis tools.

Systematically identify, flag and address risks of maladaptation and other environmental and social risks.

175. In addition to the previous, the development of this tool should be complemented with the work of a social scientist that can analyse and take into consideration the local dynamics derived from different levels of wealth, gender, politics, identity, location, etc. A complementary anthropological analysis of this sort will be useful to understand local experiences and how people in different places who carry out different activities cope with climate change risks. This can then lead to the identification of more sustainable adaptation solutions for each area and try to avoid maladaptation as much as possible[192]162. As necessary, further auxiliary materials should be developed to improve the tool and its uses, included as a supplement for training purposes. The tool will be used to build capacity of government stakeholders and other institutions in the country, identified by the Adaptation Innovation Platform (see Output 1.1.2).

176. Climate-KIC will be engaged for the development and testing of the tool. The tool will be developed with guidance and support from EPA and the Climate Change Secretariat (CCS) with guidance and inputs from the PMU and a group of selected stakeholders. It is envisaged that the group of appointed stakeholders will include Government institutions across the WEF sectors as well as other agencies? representatives involved in adaptation planning (e.g., the institutions within the NAP Scientific and Technical Advisory Committee) to contribute to these activities by providing national data and information to build the tool. This activity will be implemented during the first year of the project, to be used, tested and improved during the project implementation. The tool will be developed through a participatory process which will encompass carrying out 3-4 meetings with the PMU and the group of stakeholders appointed for the development of the tool.

177. The PMU will use the developed modelling tool to identify vulnerability in the WEF sectors and to support decision making during the project implementation. The model will also be available to other Sierra Leone stakeholders that are interested in using it. At the end of the project, the modelling tool will be passed to EPA, the CCS, Ministry of Environment, SMEDA and other interested in continuing to using use it after the end of the project.

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### **Activity 1.1.1.2: Guide on the use of the developed tool**

178. A guide that identifies the climate change risks and vulnerabilities of Sierra Leone and the potential adaptation TPS will be developed, illustrating the use of the modelling tool. The tool will be useful for assessing climate risk and vulnerability and identifying potential adaptation TPSs for other sectors of activity as well (since water and energy are cross-cutting to other sectors). Thus, it could be useful for other government agencies and development organizations to use in the future. This activity will be carried out by Climate-KIC with guidance from EPA and the CCS.

### **Activity 1.1.1.3: Build capacity on the use of the developed tools & provide support on its use throughout the project**

179. Climate-KIC, with support from EPA and the CCS, will organise two workshops to build the capacity of the PMU and the group of appointed stakeholders that supported the development of the modelling tool.

180. In addition, the Climate-KIC will remain available for providing support on the use of the model throughout the project. It is expected that this support will not be more than one week every quarter from the second year onwards, and it will be provided as per request on an ad-hoc basis.

### **Activity 1.1.1.4: Needs assessment to identify the needs in terms of training on climate change and climate change adaptation TPS**

181. During the PPG phase, consultation with stakeholders highlighted lack of information and capacity as one of the key barriers to the identification of climate change risks and vulnerabilities as well as for the development and provision of TPS in Sierra Leone. Stakeholders referred that:

There is a need to assess Universities and Training Institution capabilities and training courses offered so that those can be complemented and expanded to include information on innovation, climate change, climate change adaptation, climate change adaptation technologies and entrepreneurship and business development, among others

Capacity building of the different institutions and stakeholders is vital for successfully identifying climate risks/vulnerabilities and deploying suitable adaptation solutions. It is essential that the institutions dealing with climate risks, natural resources degradation, loss of biodiversity and providers of climate change adaptation TPS (including entrepreneurs, MSMEs, financial institutions) have knowledge and information about these issues. The demand side of the market is equally important to know about suitable adaptation TPS that can help them adapt their business / activities. Thus, there is a need to provide this information to create successful market for adaptation TPS to be nurtured, developed and sustainable in the long run.

It is essential to engage a critical mass of people that can identify innovative climate adaptation TPS, test them, take them to market, and maintain them with adequate technical knowledge so that the provided TPS for climate change adaptation are sustainable in the long run. In addition, these adaptation TPS are supported with maintenance and management services addressing the key concern of stakeholders that some projects/technologies and products often fail/ or become inefficient due to poor design, implementation, management, and maintenance service provision. This project ensures

and the added value for developed adaptation TPS should include management/maintenance assistance and should be included in the curricula/training

Ensuring maintenance assistance and expert services will contribute to the development of a service market that is required in the country, which will consequently be beneficial for the creation of jobs. Furthermore, this could also be a catalyst for exporting services to other neighbouring countries.

It should target, amongst other:

Public sector institutions that promote/regulate WEF sectors, innovation, businesses and MSMEs as well as climate change adaptation issues: institutions such as the EPA, NWRMA, EWRC, Sierra Leone Meteorological Agency, MTI, DSTI, SMEDA, SLIEPA, MLHCP, MAF, MWR, Ministry of Fisheries, MoE, Ministry of Local Government and Rural Development, between others, should have knowledge and information on the climate change, climate change vulnerabilities, risks and opportunities adaptation needs in the sectors that they are acting on and other transversal sectors, and on the role of adaptation TPS in delivering their mandates.

Entrepreneurs, start-ups and MSMEs that act on the climate change adaptation space: as they will need information/training on climate change, identification of climate change risks and opportunities for their TPS as well as their business; identification of what might be adaptation TPS; training on entrepreneurship and business development services (for example, development of solid business plans and marketing strategies to reduce risk of failure); information on available financial / insurance services, as well as different business models that they can adopt to take their TPS to market.

Financial service providers (FSP), including insurance providers: need information on climate change, identification of climate change risks and opportunities in their businesses well as for understanding the benefits for the provision of finance for entrepreneurs/start-ups/MSMEs and/or for the recipients/ buyers of the adaptation TPS.

Farmers, vulnerable population: on the climate change risks and vulnerabilities that their sector of activities is projected to face, what and how they can adapt to it and what would be the benefits of that; financial and insurance services available that they can get to support them to buy the necessary TPS etc.

Education and training institutes: The education and training institutes should be able to know and understand climate impacts and project risks in order to educate and train to identify and integrate climate change adaptation issues.

182. Although several capacity building needs have been identified and listed during the PPG stage (listed in the Barriers section of this document), it is important that existing curricula and university/ training centres capacities/needs in terms of identification of climate change issues and their impacts, climate change adaptation solutions, innovation and business creation are identified. These are aligned with the capacity building and technical/business needs of the different players and enablers in the climate change market space. For that, a thorough needs assessment will be carried out to identify the curriculum, training needs that need to be put in place to create this critical mass of people that will



then have the information and knowledge to create and contribute to a sustainable adaptation market. The results of this needs assessment will inform the development of Activity 1.1.4.2.

183. The PMU will subcontract an international/national expert team to carry out the needs assessment. The subcontractor will conduct this assessment with guidance from EPA and the CCS and will build it on the findings of the stakeholders needs assessment developed under this PPG and under the CBIT project implemented by EAP and the CCS. The assessment involves consultation with the member of the NAP Scientific Advisory Taskforce (Universities, SLARI, SLMet, NNWRMA, EPA, NAEP, SLIE, SSL, SLIG), and Training Institutions in the country as well as with the potential beneficiaries of these training courses. This activity will be carried out at the beginning of the project implementation.

#### **Activity 1.1.1.5: Development of the curricula for the several target groups**

184. Once the target beneficiaries (government institutions, universities/training institutions and incubators/accelerators) and their training needs are identified, curricula for capacity building/ training programmes as well as modules to include in existing Universities and Training Institutions curricula will be developed, including the necessary materials for the trainings. As within the NAP process the curricula of Universities and Training institutions are expected to be revised, the PMU will make sure by articulating with EPA that this activity takes into account those revisions.

185. A train-the-trainers programme will be developed to capacitate (i) Universities and training institutions and (ii) the incubators/accelerators in delivering training on climate change adaptation and entrepreneurship and business development. In addition, a specific training programme for government institutions will also be set up. These training courses will be then delivered in Activity 1.1.1.6.

186. It is envisaged that amongst other subjects, the training modules/addition to the curricula will include information and materials on how to use the software model developed in Output 1.1.1 as well as on other subjects related to adaptation and business identification and development support described in PC2.

187. This task will be guided by EPA and the PMU that will subcontract a team of consultants to develop the curricula and supporting training materials. EPA will ensure that the subcontractor will create synergies with a similar initiative that EPA is working on with the Lancaster University.

#### **Activity 1.1.1.6: Delivery of three (3) capacity building/training courses to 60 different stakeholders (with 35% women participation target)**

188. The training courses/modules proposed will be delivered and tested during the implementation of the proposed GEF/UNIDO Adaptation Project. It is proposed that three different training sessions targeted to different type of stakeholders will be organised: (i) government institutions; (ii) universities/training institution; and (iii) incubators / accelerators. These training sessions are envisioned to train at least 20 stakeholders at a time (total 60 stakeholders during the project).

189. The training and capacity building sessions will be organised by the subcontractor with support from the PMU. The subcontractor will be available to provide support on the use of the model throughout the duration for the three targeted stakeholder groups. For the incubators/accelerators and universities and training institutions, the idea is that capacity is built through a train-the-trainers programme. For the government institutions, a specific programme will be provided.

190. A team of trainers and qualified professionals will be contracted to deliver the three training courses. The primary purpose of the training program is to create qualified people/trainers to be able to train others.

**Output 1.1.2: Inter-ministerial coordination mechanism established to promote the integration of adaptation and resilience through engaging adaptation MSMEs in the water, agriculture and energy sectors alongside the establishment of an Adaptation Innovation Platform to implement national strategies and involving relevant stakeholders**

**Activity 1.1.2.1: Mapping of the national adaptation planning process and relevant stakeholders as well as the programmes/projects/ activities targeting directly or indirectly innovation, entrepreneurs and MSMEs across the WEF sectors**

191. Since 2007, there has been an ongoing national adaptation planning process put in place to provide the legal and regulatory basis for adaptation through which several policies, plans and projects have been implemented /developed. Sierra Leone's vision towards addressing climate change and its impacts have been further elaborated in the updated NDC, issued in July 2021, expanding on the foreseen goals of the National Adaptation Plan (NAP) submitted in May 2021, such as<sup>[193]</sup><sup>163</sup>: (i) increasing resilience capacity at all scales; (ii) supporting an integrative approach to climate change programming and policymaking; (iii) allocating 10% of annual national budgets to climate change adaptation across sectors; (iv) harmonizing climate-relevant policies and regulations to improve coordination and cross-sector linkages; (v) mainstreaming adaptation into local development plans by 2025; (vi) institutionalize NAP implementation through laws, policies, and regulation; (vii) establishing a National Trust Fund for channelling adaptation support across sectors; and (viii) securing 40% of international development funding to support adaptation priorities across different sectors. As part of the actions, the NDC envisages the creation of the Sierra Leone Climate Finance Fund (SLCFF) to mobilize and track the flow of finances towards the implementation of both climate change adaptation and mitigation activities to be chaired and operated by EPA<sup>[194]</sup><sup>164</sup>. For the implementation of the NAP an institutional framework coordination mechanism was established (Figure 31) composed of<sup>[195]</sup><sup>165</sup>:

Parliamentary Committee, chaired by the head of the Environment Committee in the House of Parliament, providing legislative support and oversight, monitoring and evaluation, policy advocacy and public outreach.

Inter-Ministerial Committee, chaired by the Ministry of Environment and Finance, providing policy oversight, coordination and resource mobilization for the implementation of the NAP;

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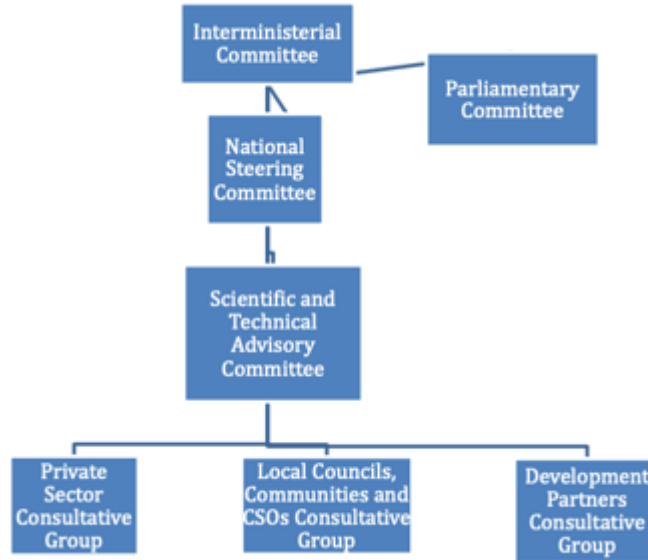


Figure 31: Sierra Leone NAP institutional framework coordination mechanism

National Steering Committee, chaired by the EPA, providing coordination of the NAP implementation, definition of policies and strategies, resource mobilization, ensuring policy coherence, leading adaptation planning across sectors and levels and driving the ownership of the NAP process. The Parliamentary Committee and the Inter-Ministerial Committee oversee the National Steering Committee. The PSC include the following institutions: EPA, National Protected Area Authority, Sierra Leone Agricultural Research Institute (SLARI), National Water Resources Management Agency (NWRMA), Electricity and Water Regulatory Commission (EWRC), National Tourist Board (NTB), Ministry of Planning and Economic Development, Sierra Leone Maritime Administration (SLMA), Sierra Leone Meteorological Agency (SLMet), Sierra Leone Roads Authority (SLRA), Sierra Leone Housing Corporation (SALHOC), Forestry Division, Office of National Security (ONS) and National Fire Force (NFF).

Scientific Advisory Taskforce, providing technical support and advisory services to the National Steering Committee and consultative committees (including data gathering and analysis, advising the National Steering Committee and consultative committees on data gathering and dissemination best practices, defining, identifying and conducting research to support adaptation actions for vulnerable groups including women, people with disabilities, children and the elderly, developing processes for information sharing and collection of lessons learned, coordinating bilateral and multilateral assistance and link with municipalities and support actions on sectoral priorities. This taskforce includes Universities, SLARI, SLMet, NNWRMA, EPA, National Association of Environmental Professionals (NAEP), Sierra Leone Institution of Engineers (SLIE), Statistics Sierra Leone (SSL), Sierra Leone Institution of Geoscientists (SLIG).

Three consultative committees: (1) the private sector consultative group, (2) local councils, communities and civil society consultative group and (3) development partner consultative group. The

three committees provide policy and implementation advice to the National Steering Committee on relevant issues and build support for NAP implementation through activities such as research, capacity building and awareness raising.

192. In addition, Sierra Leone has developed many adaptation projects to address the adverse effects of climate change based on existing coping mechanisms and practices, such as, development and enactment of appropriate policies and regulations relevant to the development of coastal communities, urban growth planning, and critical coastal ecosystems preservation and the establishment of a National Sea-Level Observing System for Sierra Leone[196]166.

193. There are a series of on-going activities targeting entrepreneurs, MSMEs, farmers and vulnerable groups acting in the WEF sectors. However, they are implemented in silos with little coordination amongst the different actors and activities, and few of them target adaptation technology and finance innovation in the WEF sectors. SMEDA is working in the coordination of the programme/initiatives targeting MSMEs, to ensure that the companies in Sierra Leone are being supported and the country is making the best use of the funds that they have for the sector (such as the MUNAFA fund). For that SMEDA has established a transversal Working Group ? ?National Stakeholders Dialogue Forum on Effective Coordination of SME Development in Sierra Leone?, comprised of the representatives from the public sector, private sector, including their associations as well as the international donors. The first forum took place in August 2021 and, depending on the availability of funding is planned to be replicated in the regional levels and take place at least once every year at the national level.

194. Also, as in other LDCs, once a programme/project comes to an end (financing ceases), the activities implemented also cease and are not maintained after programme/project ends. Adaptation is cross-sectoral, and something that needs to be sustained into the future because economies and their underlying sectors will indeed need to adapt to climate change extreme events that are expected to happen more frequently and with higher intensity in the future. Thus, it is necessary to have a clear understanding of the different players and their activities, in order to make sure that integrated approaches on climate change adaptation technology and finance innovation in the WEF sectors are adopted and implemented. Knowledge and information on ?who is who?, ?who is doing what?, ?how that is contributing to adaptation and improving the livelihoods of the Sierra Leoneans? and ?what results are expected and when? is key to the design and implementation of cross-sectoral projects and its actions, especially in the case of one, such as the proposed GEF/UNIDO Adaptation Project, that aims to tackle such a transversal market.

195. It is important to identify what the on-going processes are, as well as projects that are being put in place in the adaptation field. Thus, at the start of the proposed GEF/UNIDO Adaptation Project a mapping exercise of the national adaptation planning process, as well as policies, strategies, plans, programmes and projects that target innovation, entrepreneurs and MSMEs, incubators/accelerators and innovative finance, will be carried out, with clear identification of the carried out and planned actions, delivery ?vehicles? as well as the partners responsible for their execution. This will be important so that the project can create synergies with these actions, in order to cooperate with on-going activities, confirm/identify the gaps that need to be addressed and add added-value to those. In addition, the

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capacities of the different institutions to implement the necessary policies and regulations will be assessed in order to identify capacity building needs to be addressed.

196. In terms of the incubators/accelerators providing training on climate change there are the Sensi Tech Hub, the UNDP Accelerator Lab<sup>[197]<sup>167</sup></sup> and the World Bank Accelerator<sup>[198]<sup>168</sup></sup>, both of them supplying incubation services and networking and with specific programmes for vulnerable groups. Synergies are expected to be created with these initiatives in this activity as well as in other activities of the project that are targeting and/or engaging with incubators/accelerators.

197. This mapping exercise will allow the Project Management Unit (PMU) to confirm and adapt its activities at the start of the project as well as to confirm the different partners to be engaged in the project activities. The mapping exercise should be updated regularly (annually) throughout the project, as it will be a useful tool to track what is being done in the adaptation field, what results are being generated and existent gaps as well as a tool to inform and guide the PSC decisions.

198. The PMU will work with EPA and SLMet be responsible for compiling and updating the mapping information annually.

#### **Activity 1.1.2.2. Establish an Adaptation Innovation Platform and the Adaptation Innovation Website**

199. As there are specific projects targeting the inclusion of climate change adaptation in the different sectorial policies/regulation within priority sectors that include the WEF sectors, the proposed GEF/UNIDO Adaptation Project, will be focused on:

Maintaining the link with the NAP adaptation planning process; providing inputs to the policies and projects supported as needed as well as making sure that the proposed GEF/UNIDO Adaptation Project is aligned with those. This is ensured by having EPA, the Chair of the NAP National Steering Committee, chairing the Adaptation Innovation Platform, as well as other ministries and stakeholders that are involved in the NAP institutional framework coordination mechanism participating in the Platform. As the proposed GEF/UNIDO Adaptation Project aims to engage with entrepreneurs, start-ups and MSMEs, and financial institutions that will be delivering on the policy/strategy implementation and with the farmers and vulnerable population in the WEF sectors. The GEF/UNIDO Adaptation Project will provide valuable contributions to the adaptation policy development process in Sierra Leone, as it will understand the needs/barriers that both demand and supply side of the adaptation market face. The platform will promote integration of adaptation and resilience through engaging adaptation MSMEs in the specific sectors and in the NAP process in itself.

Contributing to support the development of regulations, incentives, and information to create the necessary ecosystem to engage the private sector (MSMEs, entrepreneurs, finance sector etc) in the creation and delivery of the climate adaptation TPS to farmers and vulnerable groups in Sierra Leone, and thus, supporting the delivery of the overarching policies/strategies in the adaptation field.

Promoting intersectoral dialogue and participation between public and private sector stakeholders.

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200. The proposed GEF/UNIDO Adaptation Project, will establish an Adaptation Innovation Platform that will meet on a regular basis, hosted and chaired by the EPA with support from the PMU. This platform will bring together (i) national public sector institutions (Ministry of Environment, EPA, NWRMA, EWRC, Sierra Leone Meteorological Agency, Ministry of Trade and Industry (MTI), Directorate of Science, Technology and Innovation (DSTI), SMEDA, SLIEPA, Ministry of Lands Housing and Country Planning (MLHCP), MAF, MWR, Ministry of Fisheries, Ministry of Energy (MoE), Ministry of Local Government and Rural Development, MHS, Ministry of Gender and Children's Affairs, Ministry of Finance), national private sector (NGOs, CSOs representing the private sector, entrepreneurs, MSMEs and financial institutions), international organizations (CTCN, PFAN, AECF, ASAP, AfDB, IFAD, FAO, AfDB, WB, GIZ), and vulnerable groups (adaptation TPS consumers, such as farmers and vulnerable population associations and representatives). As this involves a very large number of possible stakeholders, initially and following the results of the stakeholders mapping exercise, fixed members for the Adaptation Innovation Platform will be identified and those are expected to attend to all the meetings. Depending on the issues to be discussed and analysed, other stakeholders will be invited to attend to meetings or discussion fora. SMEDA is working in the coordination of the programme/initiatives targeting MSMEs, so to make sure that the companies in Sierra Leone are being supported. The country is making the best use of the funds that they have for the sector (such as the MUNAFA fund), for which it has a Working Group (National Stakeholders Dialogue Forum on Effective Coordination Of SME Development In Sierra Leone) that involves most of the stakeholders identified as member of the Adaptation Innovation Platform. This platform will establish links with SMEDA working group that promotes discussion and sharing of lessons learned between the different players working with the MSMEs in Sierra Leone and with the Sierra Leone NAP institutional framework coordination platform.

201. Each of the institutions appointed as fix members of the Adaptation Innovation Platform will be asked to appoint at least two people to be part of the platform and one or two replacements. This will be done in order to make sure that there is continuity of the people assigned to the platform throughout the project duration and to avoid losing knowledge, information and context due to changes of people within the organizations.

202. The Adaptation Innovation Platform will coordinate and support the following activities:

Conduct on-going detailed mapping exercise and analysis on the gaps and synergies between the different initiatives within the adaptation field/ entrepreneurs, start-ups and MSMEs / incubators & accelerators/ financial institutions and international institutions that contribute to adopt adaptation TPS in the WEF sectors in order to provide recommendations on how to promote better coordination and a joint approach to adaptation across WEF sector on an integrated manner (Activity 1.1.1.1 and Output 1.1.2).

Advise and direct on the implementation of the project activities, acting as the Project Steering Committee (PSC) for the GEF/UNIDO Adaptation Project.

Agree on the proposed integrated mechanism to promote adaptation innovation and entrepreneurship subjacent to the project as proposed in Output 1.1.2.

Discuss and contribute towards the identification of possible adaptation start-ups, MSMEs and FSP as well towards the definition of a financial mechanisms to be developed under PC2 and PC3.

Encourage the adoption of gender and youth dimension into adaptation in all the activities carried out under the project.

203. A strong coordination effort will be needed in order to organise and guide the Adaptation Innovation Platform work towards the contribution to the creation of the necessary legal readiness that is necessary for the proposed GEF/UNIDO Adaptation Project to deliver on its objective. With this in mind, establishing and improving mechanisms for synergy building, information sharing, shared awareness and advocacy is advisable. The mechanism may comprise:

Conducting scheduled meetings/fora among Adaptation Innovation Platform members (fixed and invited), having in mind the following suggestions:

Each participating institution/entity should select two representative persons to attend the Adaptation Innovation Platform meetings as well as one or two replacements if the person cannot attend.

The Adaptation Innovation Platform host (EPA) supported by the PMU should be responsible for scheduling meetings and informing members about upcoming dates.

The Adaptation Innovation Platform work should be coordinated by EPA with support from the PMU. During the meetings, activities and tasks to be conducted should be identified and assigned to the corresponding members (entities), indicating objectives, critical path activities, milestones and deadlines to be fulfilled. The results should be discussed in the following meeting to identify any possible delays, hurdles, or changes.

Meeting minutes / forum proceeding should be created each time the Adaptation Innovation Platform meets where the discussions held, the people present, and next actions are identified. This is useful to avoid future misunderstandings on allocated responsibilities. They should be distributed to all the attendees (even to those not present).

Creating a computer-based information sharing and storage tool within the Project's Website/Webpage to which members can have access to (with a specific login/administrative function). If members are allowed to upload/modify information they should inform the Adaptation Innovation Platform Coordinator & PMU.

Creating a communication protocol to be followed by Adaptation Innovation Platform members.

Sharing the outcomes/actions of the Adaptation Innovation Platform with the public through the project Website/Webpage and through fora.

Apply best practices in Good Governance to ensure intended outcomes are achieved. The function of good governance in the public sector is to ensure that entities act in the public interest at all times. This requires:

Strong commitment and integrity, ethical values, and the rule of law; and

Openness and comprehensive stakeholder engagement.

Defining outcomes in terms of sustainable economic, social and environmental benefits;

Determining the interventions necessary to optimize the achievement of intended outcomes;

Developing the capacity of the entity, including the capability of its leadership and the individuals within it;

Managing risks and performance through robust internal control and strong public financial management; and

Implementing good practices in transparency and reporting to deliver effective accountability.

204. Women of the respective institutions and entities participating in the Adaptation Innovation Platform will be encouraged to participate in it, in order to promote equal gender opportunities. Also, the Ministry of Gender and Children's Affairs as part of the Adaptation Innovation Platform should provide recommendations at any time on how to better integrate gender equity and youth into the project activities and respective deliverables

205. It is envisaged that through the joint participation and discussions carried out under this activity that sustainable linkages with national planning processes for improved climate change resilience (focused on technology and finance innovation in the WEF sectors) are created and maintained. The platform will bring together the public sector (government institutions acting on the targeted sectors and in adaptation and DFIs) involved in the national adaptation planning process within the GCF project, the private sectors (entrepreneurs, MSMEs, financial institutions) and vulnerable groups (already described in section 1.2.6 of this document) With EPA chairing the Adaptation Innovation Platform and stakeholders involved in the NAP development process in Sierra Leone also participating in the Platform, sharing of experience and information from both the GEF/UNIDO Adaptation Project and the NAP process is ensured.

206. As the development of policies and regulations aimed to improve the legal and regulatory framework to foster adaptation technology and innovative financing in the WEF sectors will be developed throughout the project duration, this activity will be carried out throughout the project. The Adaptation Innovation Platform will meet 2 times a year during the proposed GEF/UNIDO Adaptation Project to oversee, guide and coordinate the implementation of the project. These meetings will be half-day working meetings where the National and International Consultants and the PMU will be invited to present results of the Activities PC1, PC2, PC3 and PC4. The Adaptation Innovation Platform will also discuss needs for improvement of the legal and regulatory framework in place, as well as experience of implementing the developed policies and regulations. This will allow the project to adapt the developed and improved policies to the changing environment.

207. As part of this activity the Adaptation Innovation Website will be established. The website will serve the following functions:



Raise awareness of the general public on climate change adaptation in the WEF sectors and the roles of entrepreneurs and MSMEs and how:

Climate change risks and vulnerabilities in Sierra Leone, climate change expected impacts in the WEF sectors of Sierra Leone, multi-sector risk assessment results (results of the CRVA developed in the PPG)

Adaptation TPS that could be adopted in response to climate change risks and impacts

Innovative adaptation approach that can be adopted and is being promoted by the proposed GEF/UNIDO Adaptation Project

Advantages of adaptation to climate change risks and vulnerabilities.

Serve as a cooperation and aggregation platform of information of programmes/projects and partners acting on adaptation innovative TPS and financing instruments, by providing information to the public on:

The GEF/UNIDO Adaptation Project implementation status, on-going/planned activities, activities result (deliverables, materials for consultation etc), and lessons learnt from project implementation.

Other on-going and synergetic country initiatives (including projects promoted by other DFIs, incubators/accelerators that exist in the country and their activities etc) ? sharing the main outcomes of Activity 1.1.2.1. Thus, this should provide information on *?who is who??*, *?who is doing what??* and how are those activities *?how is that contributing to adaptation and improving the livelihoods of the Sierra Leoneans?.*

Serve as a communication tool for entrepreneurs and MSMEs to submit their project ideas/concepts and request technical assistance and/or financial assistance for the development and implementation/provision of their innovative adaptation TPS for the WEF sectors.

Advertise available financial options for: (i) entrepreneurs and MSMEs and (ii) farmers and vulnerable population.

Advertise discussion fora, workshops and other events being put in place by the proposed GEF/UNIDO Adaptation Project.

Advertise competitions run by the GEF/UNIDO Adaptation Project within the Sierra Leone Adaptation Incubator/Accelerator as well as the results of such competitions.

Showcase and provide contacts of entrepreneurs, start-ups and MSMEs and financial institutions that provide adaptation TPS for the WEF sectors ? so that it is a platform where supply can meet demand.

Advertise demonstration and information events, exhibitions and roadshows organized to foster the link between technology suppliers and vulnerable groups.

To communicate and share knowledge and information materials on best-practices and lessons learnt for integration of suitable technologies into priority sectors to capacitate national stakeholders.

208. The Adaptation Innovation Website will be developed and hosted by the PMU and will be linked to other ministries? existing platforms, including linked to other platforms identified in the Communication Strategy developed under PC4. Special efforts will be made to have this website translated in some of the local languages spoken in the Sierra Leone so that outreach and communication activities are successful in reaching the target audience. The design of the Website will be done by a National IT Consultant and the maintenance, and the updating of the platform content/information will be carried out during the project as a joint task of the PMU (that will include amongst its team a Public Relations/Marketing person that will oversee the online content that will be made available) and with time-to-time support from a National IT Consultant. The National IT Consultant will be hired to provide one or two days of support each month to the online platform. It is envisaged that the Website will be hosted by the PMU during the first five (5) years of project implementation and then transferred to an institution chosen by the Adaptation Innovation Platform / PSC in the last year of project implementation so that the platform is then maintained by both that institution once the project comes to an end, and thus ensuring its sustainability. For this, the PMU will build the capacity of selected people within SMEDA and EPA in the administration of the website.

#### **Activity 1.1.2.3. Establishment and testing and continuous improvement of the proposed integrated mechanism**

209. Effective national adaptation relies on a broad range of actors playing different but complementary roles in adapting to climate change. To adapt to new realities brought by climate change, there is a need for change: change the way businesses are done, develop and promote TPS that are low-carbon and climate-resilient and change the mindset of both supply and demand side. Innovation and entrepreneurship play a key role in identifying what the ?change? should/might be and can be the catalysts of that ?change?. However, for that, several factors need to align, such as regional and market conditions, external resources, information etc.

210. To drive innovation and entrepreneurship in adaptation to climate change in the WEF sectors of Sierra Leone, there is a need to define and establish an integrated mechanism. The mechanism, that is the basis for the proposed GEF/UNIDO Adaptation Project aims to drive innovation and entrepreneurship include mapping stakeholders & convening networks of expertise, developing people and capacity, leveraging financing and catalysing innovation. The mechanism also considers providing guidance for the improvement of the business environment. Figure 32 shows the proposed integrated mechanism to be adopted to promote adaptation, innovation, and entrepreneurship.

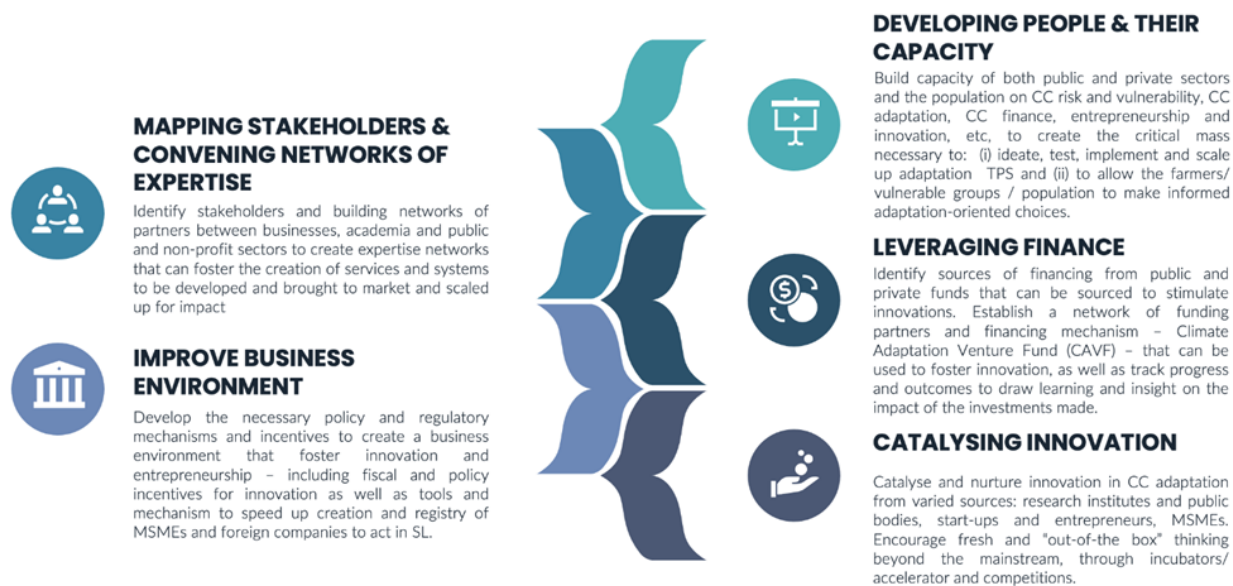


Figure 32: Integrated Mechanism to promote adaptation innovation and entrepreneurship

211. The proposed GEF/UNIDO Adaptation Project, through the implementation of its activities, aims to test the implementation of the proposed integrated mechanism. Table 20 shows how the GEF/UNIDO Adaptation Project’s outputs are expected to contribute towards the implementation of the proposed mechanism.

Table 20: Contribution of the GEF/UNIDO Adaptation Project Outputs for the implementation of the proposed integrated mechanism

Contribution of the GEF/UNIDO Adaptation Project outputs for the implementation of the integrated mechanism	
Mapping stakeholders & convening networks of expertise	Output 1.1.1, Output 1.1.2, Output 1.3.1, Output 1.3.1, Output 2.1.1, Output 2.1.2, Output 2.2.1, Output 2.2.2, Output 3.1.1, Output 3.1.2, Output 3.2.1, Output 4.1.2
Improve business environment	Output 1.1.1, Output 1.1.2, Output 1.1.3, Output 1.1.5, Output 1.2.1, Output 1.2.2, Output 1.2.3, Output 1.2.4, Output 2.1.1, Output 3.2.1, Output 3.3.2, Output 4.1.2
Developing people & their capacity	Output 1.1.1, Output 1.1.2, Output 1.1.3, Output 1.1.4, Output 1.1.5, Output 1.2.2, Output 1.2.3, Output 1.2.4, Output 2.1.1, Output 2.1.2, Output 2.1.3, Output 2.2.1, Output 2.2.2, Output 3.1.1, Output 3.1.2, Output 3.2.1, Output 3.3.2, Output 4.1.2
Leveraging financing	Output 1.1.1, Output 1.1.2, Output 1.2.1, Output 1.2.2, Output 2.1.1, Output 1.2.4, Output 2.1.3, Output 2.2.1, Output 2.2.2, Output 2.2.3, Output 3.2.1, Output 3.3.1, Output 3.3.2, Output 4.1.2
Catalysing innovation	Output 1.1.1, Output 1.1.2, Output 1.1.3, Output 1.2.1, Output 1.2.2, Output 1.2.4, Output 2.1.3, Output 2.2.1, Output 3.2.1, Output 3.3.1, Output 3.3.2, Output 4.1.2

212. At the start of the project and the first meeting of the Adaptation Innovation Platform, the proposed mechanism will be discussed and agreed on, as it is the basis for implementing the entire project. If necessary, changes to the mechanism will be incorporated by the PMU guided by the Adaptation Innovation Platform members. The PMU should present how the different outputs are contributing to the implementation of the integrated mechanism at the Adaptation Innovation Platform meetings. The PMU should share any issues and challenges to the meetings to explore viable solutions ensuring adaptation of the mechanism to the local conditions. In addition, PMU will also share how the proposed mechanism is including and impacting women and youth.

213. It is expected that at the end of the project, the mechanism has matured and has been embedded into the different stakeholder's procedures/actions/capacity so that it continues to be implemented organically in the Sierra Leone market.

#### **Activity 1.1.2.4. Development of a Manual on the implementation and operationalization of the integrated mechanism to promote adaptation, innovation and entrepreneurship**

214. To capture the 'dos' and 'don'ts' of such an approach and share them with other organizations working on climate change adaptation, the PMU will develop a Manual with support from a consultant on the steps taken on the development, implementation/testing of such mechanism, as well as on its impact. This will be an important document as it may inform and guide the design and implementation of similar projects. This paper should be made available to the public through the created Website/Webpage.

#### **Output 1.1.3: Climate data collection to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance**

##### **Activity 1.1.3.1: Develop a climate data collection platform to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance**

215. A centralised platform for climate data collection will be established at the Meteorological Division at the SLMet. This data will be collected by SLMet and made available through the Innovation Adaptation Website to support and validate adaptation innovations and services and to support the development of future insurance schemes for the most vulnerable<sup>[199]</sup><sup>169</sup>.

216. This centralized platform will be developed by a subcontractor, with guidance from the SLMet, EPA and the PMU. The establishment of this platform will contribute to aggregate the information from the existent weather station in Sierra Leone and to make this information available, enabling the implementation of several adaptation TPS in the country (see the tables of adaptation TPS for Sierra Leone in Output 2.1.2). Links will be created with this platform and business proposals developed and supported under PC2.

217. The subcontractor will also build the capacity of the SLMet on how to use and maintain the platform.

218. Awareness will be raised among insurance companies on what information is collected by the platform and why it is useful for the development of insure schemes. This awareness will be raised as part of the activities under Output 3.2.1 and/or 3.2.2.

### **Outcome 1.2: Business environment for climate adaptation innovation is improved**

#### **Output 1.2.1: At least four (4) policy and regulatory recommendations to improve the climate adaptation business environment developed with a gender perspective**

##### **Activity 1.2.1.1: Needs for policy instruments to incentivize investment in innovation and deployment of climate change TPS assessed**

219. The private sector operational legal and regulatory framework established to promote innovation in Sierra Leone will be revised in order to identify the gaps and/or existing barriers and challenges that should be addressed. This assessment will result in the development of a list of recommendations on the necessary policies, regulations, incentives and tools that should be taken into consideration by policy - makers to address the identified barriers/challenges.

220. The needs assessment report will also identify needs to foster women and youth participation in the climate change adaptation market and also what their specific needs are to innovate and carry out entrepreneurial activities.in Sierra Leone.

221. The needs assessment analysis will build on the Baseline Report. It will be carried out at the start of the assignment to allow the project to identify and develop some of the recommendations early in the process. It will be conducted by a team of International and National Consultants. The results will be presented and discussed at one of the Adaptation Innovation Platform meetings. The analysis will be developed through a consultative process where the government key stakeholders (EPA, NWRMA, EWRC, Sierra Leone Meteorological Agency, MTI, DSTI, SMEDA, SLIEPA, MLHCP, MAF, MWR, Ministry of Fisheries, MoE, Ministry of Local Government and Rural Development, Ministry of Gender and Children's Affairs) as well as agencies and associations that can contribute information and knowledge will be involved.

222. The results of this activity will inform the development of Activity 1.2.1.2.

##### **Activity 1.2.1.2: Develop four (4) policy recommendations for improvement of the business environment in Sierra Leone considering a gender perspective approach**

223. Based on the list of analysed policies, regulations, and tools currently in force, and following the advice of the Adaptation Innovation Platform, at least four (4) policy recommendations will be developed.

224. The policy recommendations will be developed by a team of International and/or National Experts with guidance from MEDD through a consultative process (national workshops, see Activity 1.2.1.3). The project will hence supply relevant inputs (e.g., guidelines and policy recommendations) to the government (regulators of the country) to draft evidence-based policy and/or formulate future projects. This project does not involve policy drafting. The key stakeholders from the government (EPA, MTI, SMEDA, DSTI, SMEDA, SLIEPA and others identified) will be involved as well as agencies and

associations that can provide information and expertise. The set of recommendations for the proposed instruments will be compiled and submitted to local authorities for consideration.

**Activity 1.2.1.3: Conduct one (1) national workshop to collect feedback on the proposed policy instruments**

225. During the development process of the recommendations on the necessary policy instruments to improve the climate change adaptation framework, one (1) national workshops will be organised to collect feedback from key stakeholders. The event will be conducted to validate the identified gaps in the framework with the stakeholders and to discuss the proposed instruments to fill in those gaps. Following the detailed review and mainstreaming of all the feedback collected from the event, the Subcontractor will develop the set of recommendations working closely with key governments institutions, the Adaptation Innovation Platform, and under the guidance of the PMU.

**Output 1.2.2: Two (2) national fora held for 70 national and subnational policymakers to raise awareness on climate adaptation innovation TPS, entrepreneurship, and sustainable and innovative financial mechanisms**

**Activity 1.2.2.1: Organize two (2) national fora for national and subnational policymakers to raise awareness on climate adaptation innovation TPS, entrepreneurship, and sustainable and innovative financial mechanisms**

226. Besides the training that will be provided for government institutions, this activity provides information and raise awareness on entrepreneurship, innovation and sustainable financial mechanism related to climate change adaptation. For that, two (2) national level fora will be carried out throughout the project duration (once every three years approximately).

227. These fora will provide information on:

Climate change, climate change adaptation and the role of entrepreneurship and innovation (MSMEs) in adaptation to climate change and in supporting the delivery of climate change adaptation mandates

Tool developed and available to identify climate change risks and vulnerabilities (developed in Output 1.1.3)

Climate finance, adaptation finance and the role of the private sector

The activities of the GEF/UNIDO Adaptation Project, its state of implementation and how stakeholders can be involved

The tools / existent mechanism that the project has put in place to support entrepreneurship, innovation and the development of financial instruments for both the supply and demand side of adaptation TPS

Importance of gender and youth mainstreaming

228. These fora will have a double folded objective:

Provide information and raise awareness on climate change adaptation and the role that entrepreneurs and MSMEs can and will be playing through the implementation of the GEF/UNIDO Adaptation Project, and

Collect feedback from the policymakers on how they are addressing adaptation in their sectors and how they see the contribution of the project to their sectors, allowing the project to identify areas that should strengthen / opportunities for improvement, making sure that it remains aligned with the country development vision.

229. These fora will be a mixture of virtual/physical fora, allowing for the participation of national and subnational policymakers across the Sierra Leone. As internet connection might be an issue, and to ensure that national policymakers outside Freetown can connect to the fora, existing incubators facilities/ associations will be used as connection points across the country.

230. This activity will be led and implemented by the Climate Change Secretariat CCS with support from the PMU, national/international consultants, the trainers trained in Output 1.1.1, existent incubators/ accelerators (both national and international) and associations. These events are supposed to take place in second and fourth years of the project implementation and are supposed to cater to at least 35 government policymakers per event.

#### **Activity 1.2.2.2: Fora proceedings and newflash of the fora are developed and uploaded on the Website/Webpage**

231. For each forum, forum proceedings and newflashes will be developed by the Climate Change Secretariat (CCS) with support from the PMU and uploaded on the Adaptation Innovation Website.

#### **Output 1.2.3: Technology show-casing laboratory at EPA office in Bo strengthened for climate adaptation and resilience technology innovations**

##### **Activity 1.2.3.1: Strengthening technology laboratory at EPA office in Bo to showcase innovative adaptation technologies**

232. To ensure sustained buy-in especially by the vulnerable populations, a technology laboratory at EPA office in Bo will be strengthened to showcase innovative adaptation TPS and create continued market demand. This would aid MSMEs in their 'route to market' to prove that their TPS can be commercialised and scaled-up. The eligibility criteria or requirements for TPS to be analysed and showcased through this lab should be defined at project start (first year) among the EPA, the PMU, and the Incubators/Accelerators that will be working on the acceleration programme criteria development. These technologies will be showcased by EPA in organised demonstration and information dissemination events during the project (Output 3.2.1) and they will be the property of EPA once they are supplied to the laboratory

233. There are many well-formed tertiary educational facilities in Sierra Leone including: the University of Sierra Leone and the University of Njala, located in Freetown; the University of Sierra Leone's Fourah Bay College (it is the country's main tertiary education facility for Engineering); the Njala University (it has three research and teaching laboratories with well-trained staff and sophisticated equipment, which can be used to interpret, and analyse various ecological samples); and

the Ernest Bai Koroma University of Science and Technology, which hosts the Faculty of Agriculture and Natural Resource Management. EPA can explore collaboration opportunities with the listed institutions for the identification and analysis of technologies, and to support monitoring and evaluation of adaptation innovations.

#### **Activity 1.2.3.2: Information brochures on the adaptation technologies being showcased at the EPA lab**

234. At least 2 brochures will be developed as information dissemination materials on the innovative adaptation technologies being shown at the established testing lab at the EPA office in Bo. This paper should highlight the technologies, its applicability to Sierra Leone and the main climate change adaptation benefits for the sectors they can be applied to. The brochures will be made available on the Adaptation Innovation Platform Website and disseminated through other means as necessary.

### **Output 1.2.4: Four (4) adaptation clusters are created and nurtured in Sierra Leone**

#### **Activity 1.2.4.1: Four (4) adaptation clusters are created and nurtured in Sierra Leone**

235. Awareness raising and information dissemination is essential for building an ecosystem that promotes adaptation innovation in Sierra Leone. Thus, it is important to raise awareness and share information about climate change, climate change adaptation, climate change adaptation TPS with a wide range of stakeholders from both the demand and the supply side so that the ecosystem can be created.

236. This activity will identify and form, for each of the four Sierra Leone's regions a 'cluster' composed of the different stakeholders that are expected to be engaged in adaptation. The idea is that these clusters will support step changes in resilience to current and future climate change impacts while securing co-benefits around employment, skills and well-being.

237. This activity will be implemented by Climate-KIC. Climate-KIC is the EU's largest public private partnership addressing climate change through innovation to build a zero-carbon economy. Climate-KIC addresses climate change across four priority themes: urban areas, land use, production systems, climate metrics and finance. Education is at the heart of these themes to inspire and empower the next generation of climate leaders. Stitching Climate-KIC International Foundation into the component has a formal objective to contribute to environmental conservation, including enhancing sustainability, by way of catalysing systemic change for climate action through innovation. The Climate-KIC Foundation is at the forefront of engaging in activities that benefit the climate mission, and most importantly, the public and communities across the globe. Their approach starts with improving the way people live in cities. Their focus on industry creates the products required for a better living environment, and they look to modelling land use to produce the food people need. Climate-KIC is supported by the European Institute of Innovation and Technology (EIT), a body of the European Union. Thanks to GIZ's funding support, a new phase and scale starts for the Foundation's diverse portfolio of entrepreneurship offerings in Africa and beyond. This partnership adds to GIZ's portfolio of initiatives on the continent to offer a new response to climate change challenges. The Foundation's entrepreneurship portfolio covers the development pipeline that starts at the activation and ideation stages and offers innovators the opportunity to incubate solutions into successful climate-



positive start-ups. The initiative will expand the entrepreneurial ecosystem in countries where climate start-ups are often overlooked and underfunded[200]<sup>170</sup>.

238. Climate-KIC which has a four (4) step approach (see box below) to helping climate innovation clusters develop through helping regions to identify their comparative advantage in the adaptation economy and support the development of an ecosystem of organisations, policies and partnerships that will enable them to thrive in the global marketplace.

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Step 1: Identification of the cluster, engagement, and evaluation: having the CRVA and stakeholders mapping developed during the PPG stage (presented in the Baseline Report) as a basis, for each of the four (4) regions of Sierra Leone, their adaptation priorities and individual competitive advantages will be identified for the cluster development, along with the stakeholders to be engaged (local government, private sector, university stakeholder, associations). As this will be done in parallel to Activity 1.1.1.1 and Activity 1.1.2.1, strong communication will be kept between these two activities. For the group of stakeholders identified, a set of programmes will be identified and developed, aiming to raise their awareness on climate change adaptation technologies as well as on what their role and participation on it might be.

Step 2: Ecosystem building: the set of programmes identified and developed in Step 1 will be implemented, drawing together the local stakeholders across public, private and knowledge sectors within the cluster focus area. The idea is that the implemented programmes will enable the identified stakeholders to share knowledge and engage in open innovation, such as research challenges, incubation/accelerator platforms and dedicated capacity development/knowledge sharing programmes that are key activities that enable partners within an ecosystem to work together and for individuals to experience other parts of the cluster. Within this, at least two (2) 1-day meetings per cluster and one (1) general meeting with all the clusters together will be held every year (before the Pre-acceleration Programme Activities). From these meetings and the analysis carried out in Step 1, a list of gaps and needs from the different stakeholders within each cluster will emerge that will then be addressed by skills and competence programmes as well as other activities implemented through the GEF/UNIDO Adaptation Project.

Step 3: Skills and competences building, development of the innovation pipeline and scaling: the identified capacity gaps and needs of the different stakeholders within the cluster (that should have been inventoried in Output 1.1.4 and confirmed/complemented in the clusters meetings in Step 2) will then be addressed through the implementation of a series of awareness raising activities, capacity building/training programmes and provision of funding. This will be done by engaging the different stakeholders in each cluster in activities of PC1, PC2 and PC3 of the proposed project:

The Sierra Leone Adaptation Incubator/Accelerator, as the clusters will be engaged in the Pre-Acceleration Programme to gain knowledge and awareness on climate change, climate change adaptation, adaptation TPS to be provided for the WEF sectors, and sequentially in other Incubation/Acceleration programmes depending on their interest and needs;

In activities of PC3, regarding the FSP financial products for MSMEs and vulnerable population to get engaged in the market (both for supply and demand side of the market), as well as in other activities of PC3

In the training and testing labs activities of PC1 depending on their needs and interest.

Step 4: Sustainability: through this and by engaging the different stakeholders in clusters in the four (4) Sierra Leone regions and by engaging them in the different activities of the GEF/UNIDO Adaptation Project, a market for adaptation will start to be created and start to get embedded in the Sierra Leone economy through the stakeholders engaged in the different clusters. The stakeholders engaged in the four (4) clusters will have an opportunity to share experiences in the annual workshops / events promoted by the GEF/UNIDO Adaptation Project.

239. It is expected that during the implementation of the GEF/UNIDO Adaptation Project the four (4) clusters are expected to be/become:

Group with high level political commitment that considers that strengthening climate resilience is also an economic development strategy that can create jobs and improved well-being, as well as helping to enhance adaptive capacity.

Vibrant group of local organisations active on climate resilience, including sub-regional ones ? like universities, community groups, NGOs, business associations ? that are already connecting to find solutions to adaptation challenges.

Increase Sierra Leone scores on the global innovation index[201]<sup>171</sup> relative to neighbour countries, indicating a conducive environment for innovation to emerge (including access to market, investment, transparency, positive tax regimes and so on).

A supply of talented people through strong education institutions, including producing passionate, skills entrepreneurs and policy leaders.

Network of accessible investors

Presence of committed and trusted intermediaries/catalysts to help advance the agenda.

Network of existing business support mechanisms, including incubators, accelerators, and investors.

240. Climate-KIC will work in cooperation with EPA, SLMet the PMU of the project, in order to promote the creation of the four (4) clusters every-year, before running the Sierra Leone Adaptation Innovator/Accelerator. In addition, as Climate-KIC is implementing similar activities in other Africa countries virtual meetings will be organised to share experience and discuss adaptation challenges.

Table 21 Summary of the outcomes, outputs and activities of PC1.

***PC1: Strengthening institutional and policy frameworks and Coordination mechanisms supporting ?adaptation MSMEs? to develop and deploy their technologies, products and services into the water, agriculture and energy sectors***

PC1 is directed at contributing to the creation of the legal and regulatory ecosystem necessary to foster the development of the adaptation market in the Sierra Leone through:

putting forward and testing the integrated mechanism to promote adaptation, innovation and entrepreneurship;

creating a platform for (i) coordination and discussion of issues related with climate change adaptation in the WEF (ii) bringing together the government, MSMEs, vulnerable groups and financial institutions; and (iii) guiding project implementation;

contributing to the development of tools and capacity for assessing and identifying climate change risks and vulnerabilities as well as adaptation TPS to address the identified climate change risks and vulnerabilities;

identifying and developing some of the necessary policy incentives for green investment for innovation and deployment of climate change TPS; and

creating clusters and raising awareness on entrepreneurship, innovation and sustainable finance mechanisms that will be developed in this project.

**Outcome 1.1: An integrated mechanism with strong linkages to national adaptation planning processes is developed to support and engage adaptation MSMEs in delivering their mandates with gender mainstreaming**

***Output 1.1.1: The Directorate of Climate Change, SMEDA and support institutions in water, agriculture and energy sectors capacitated through improved tools, planning instruments (technology roadmaps and climate smart investment plans) and trained to support and engage adaptation MSMEs in their operations, through three (3) specialised education and training courses on climate change and climate change adaptation TPS for 60 stakeholders***

<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 1.1.1.1: Identify and develop tools to assess climate vulnerability and support the identification of appropriate adaptation solutions (TPS) for the WEF sectors	Climate-KIC with guidance and support from PMU and a group of appointed national stakeholders, including social scientist or anthropologist
Activity 1.1.1.2: Guide on the use of the developed tool	Climate-KIC
Activity 1.1.1.3: Build capacity on the use of the developed tools & provide support on its use throughout the project	Climate-KIC
Activity 1.1.1.4: Needs assessment to identify the needs in terms of training on climate change and climate change adaptation TPS	Subcontracted by the PMU
Activity 1.1.1.5: Development of the different curricula for the different target groups	Subcontracted by the PMU
Activity 1.1.1.6: Delivery of three (3) capacity building/training courses to 60 different stakeholders (with 35% women participation target)	Subcontractor & other subcontracted partners

***Output 1.1.2: Inter-ministerial coordination mechanism established to promote the integration of adaptation and resilience through engaging adaptation MSMEs in the water, agriculture and energy sectors alongside the establishment of an Adaptation Innovation Platform to implement national strategies and involving relevant stakeholders***

<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 1.1.2.1: Mapping of the national adaptation planning process and relevant stakeholders as well as the programmes/projects/ activities targeting directly or indirectly innovation, entrepreneurs and MSMEs across the WEF sectors	PMU

Activity 1.1.2.2: Establish an Adaptation Innovation Platform and the Adaptation Innovation Website	Environmental Protection Agency (Chair of the Adaptation Innovation Platform) supported by the PMU  PMU, Public and Private sector organizations, incubators/accelerators, MSMEs FSPs etc
Activity 1.1.2.3: Establishment and testing and continuous improvement of the proposed integrated mechanism	PMU
Activity 1.1.2.4: Development of a Manual on the implementation and operationalization of the integrated mechanism to promote adaptation, innovation and entrepreneurship	PMU / Subcontractor
<b><i>Output 1.1.3: Climate data collection to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 1.1.3.1: Develop a climate data collection platform to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance	Subcontractor with guidance from the SLMet
<b><u>Outcome 1.2: Business environment for climate adaptation innovation is improved</u></b>	
<b><i>Output 1.2.1: At least four (4) policy and regulatory recommendations to improve the climate adaptation business environment developed with a gender perspective</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 1.2.1.1: Needs for policy instruments to incentivize investment in innovation and deployment of climate change TPS assessed	Subcontract
Activity 1.2.1.2: Develop four (4) policy recommendations for improvement of the business environment in Sierra Leone considering a gender perspective approach	PMU and Subcontracts
Activity 1.2.1.3: Conduct one (1) national workshops to collect feedback on the proposed policy instruments	PMU and Subcontracts
<b><i>Output 1.2.2: Two (2) national fora held for 70 national and subnational policymakers to raise awareness on climate adaptation innovation TPS, entrepreneurship, and sustainable and innovative financial mechanisms</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>

Activity 1.2.2.1: Organize two (2) national fora for policymakers on entrepreneurship, innovation and finance mechanism	Climate Change Secretariat with support from the PMU
Activity 1.2.2.2: Fora proceedings and newsflash of the fora are developed and uploaded on the Website/Webpage	Climate Change Secretariat with support from the PMU
<b><i>Output 1.2.3: Technology show-casing laboratory at EPA office in BO strengthened for climate adaptation and resilience technology innovations</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 1.2.3.1: Strengthening technology laboratory at EPA office in Bo to showcase innovative adaptation technologies	EPA, Universities, PMU
Activity 1.2.3.2: Information brochures on the adaptation technologies being showcased at the EPA lab	EPA
<b><i>Output 1.2.4: Four (4) adaptation clusters are created and nurtured in Sierra Leone</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 1.2.4.1: Four (4) adaptation clusters are created and nurtured in Sierra Leone	Climate-KIC, with support from the PMU

### ***PC2: Growth and scale-up support for adaptation MSMEs in water, agriculture and energy sectors***

241. Under this component, adaptation MSMEs will receive specialized training and technical assistance to help them understand and access financial services such as microfinance products for improving their innovations. Successful adaptation MSMEs will receive specialized business growth support and seed funding to grow their businesses. Through these interventions, adaptation MSMEs can improve their businesses and secure funding to scale-up the delivery of TPS in the water, agriculture and energy sectors. More specifically, Outcome 2.1 focuses on MSMEs, entrepreneurs and start-ups identification, training and business incubation/acceleration support while Outcome 2.2 on investment facilitation services for MSMEs, entrepreneurs and start-ups at growth stage that demonstrate market traction and sales evidence and can benefit from specialised support and access to funding for delivery of climate adaptation-oriented solutions at scale. To enable this, the PMU, in coordination with existing accelerators and incubators, will establish and run a dedicated Adaptation Accelerator with the following sequencing:

#### **Pre-Accelerator:**

i) will build the capacity of existing incubators/accelerators to mainstream Climate Change Adaptation into their programmes. Dedicated trainings will be provided to enable these incubators/accelerators to focus on integrating climate risk and vulnerability assessments and how innovative adaptation

technologies and services can help to address the risks, learn about ASAP taxonomy<sup>[202]<sup>172</sup></sup>, Adaptation Technologies and products and maladaptation and identify business opportunities of innovative technologies for Climate Change adaptation, among others, and

ii) will raise awareness of 150 MSMEs, entrepreneurs and start-ups to assess climate risks and vulnerabilities, learn about Climate Change and ASAP taxonomy, Adaptation Technologies and products and maladaptation and identify business opportunities of innovative technologies for Climate Change adaptation, among others (see Output 2.1.1).

**Incubator/accelerator** ? will contemplate an Incubation/Acceleration, Advance Acceleration and Post Acceleration programme from which MSMEs, entrepreneurs and start-ups could benefit. The Programme will last seven years (in the first year the necessary materials for the Sierra Leone Programme will be prepared such as the Adaptation Innovation website and incubators/accelerators will be trained and thus, competitions will start from the second year onwards). These enterprises might come from the existing incubators/accelerators or might be enterprises interested in participating but not being part of any existing incubator/accelerator. The Sierra Leone Adaptation Incubator/Accelerator has in total three (3) different types of annual competitions: i) Incubator/Accelerator (Output 2.1.3), ii) Advanced-Accelerator (Output 2.2.1) and iii) Post-Accelerator (Output 2.2.2). In the Sierra Leone Adaptation Incubator/Accelerator Programme, a total of 64 Adaptation MSMEs, entrepreneurs and start-ups will be first chosen to receive training in entrepreneurship to transform and improve their businesses. In the Advanced-Accelerator Programme, a cohort of 150 MSMEs, entrepreneurs, and start-ups will be chosen for the next phase of business growth from the Sierra Leone Adaptation Incubator/Accelerator Programme. These may be companies that come from the Acceleration Programme or that have applied directly and did not participate in the previous stage of the Sierra Leone Adaptation Incubator/Accelerator. However, these companies should have gone through the Pre-Acceleration Programme, so that they have acquired the climate change adaptation knowledge necessary to report on the performance of their business ideas or, if they did not participate in the Pre-accelerator, they will need to demonstrate their knowledge based on some indicators for business performance and Climate Change Adaptation benefits (MSMEs will fill out the application form and the questions will be designed in a way that it becomes evident whether the MSMEs are mature enough to classify for the Advanced Accelerator). The Advanced Accelerator stage will support 50 MSMEs, entrepreneurs or start-ups. Finally, at least 6 alumni enterprises, that participated in the Advanced Accelerator Programme or that want to apply directly to this last stage of the Sierra Leone Acceleration/incubation Programme, will be chosen to benefit from tipping-point investment facilitation support services. In any of the three stages of the Acceleration Programme enterprises will have the possibility to apply for different types of financing depending on what stage the MSME, entrepreneurs and start-up are on their innovation value chain. Two distinct financial barriers impede MSME, entrepreneurs and start-up progress in the innovation technology field. These obstacles are known as the early-stage ?Technological Valley of Death? and the later-stage ?Commercialization and scaling-up Valley of Death?<sup>[203]<sup>173</sup></sup>. The Technological Valley of Death sits between the first and second stages of technological development, as laboratory research seeks further capital to develop a commercial product and prove its basic market viability. The Commercialization

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and scaling-up Valley of Death occurs later in a technology's development, as entrepreneurs seek capital to fund demonstration or first-of-a-kind commercial-scale projects or manufacturing facilities. Thus, to help enterprises overcome these barriers financing support will come from the Climate Adaptation Venture Fund (CAVF). This CAVF will provide patient and affordable capital to adaptation ventures so that they have the time to grow and scale their businesses and be connected to follow-on investor to ensure an overall effect of driving adaptation innovations towards formalisation and scaling up (See Output 2.2.3 for further information of the CAVF). Accordingly, as part of SMEDA's co-financing contribution in Component 2 will also focus on formalizing the Adaptation MSMEs to help them grow and expand their services so that they can access SMEDA services such as the SMEDA MSME fund. SMEDA's mandate will be to guide them to secure registration that is recognized by SMEDA and other FSPs. Once they are officially registered, the MSMEs can have access to SMEDA and MSME financing provided by other FSPs. In particular, the accelerations will inherently steer them towards finding adaptation solutions that can be integrated into their operations and services. In this way, the MSMEs will be able to access financing facilities as recognized enterprises, in particular the SMEDA MSMEs low interest financing product currently under development.

242. The MSMEs, entrepreneurs and start-ups incubation/acceleration process will follow a stepwise approach that will consist of the steps summarized in Figure 33. In conclusion a total of 150 MSMEs will be supported through the Incubation/Acceleration , Advanced Acceleration and Post-Acceleration stages.



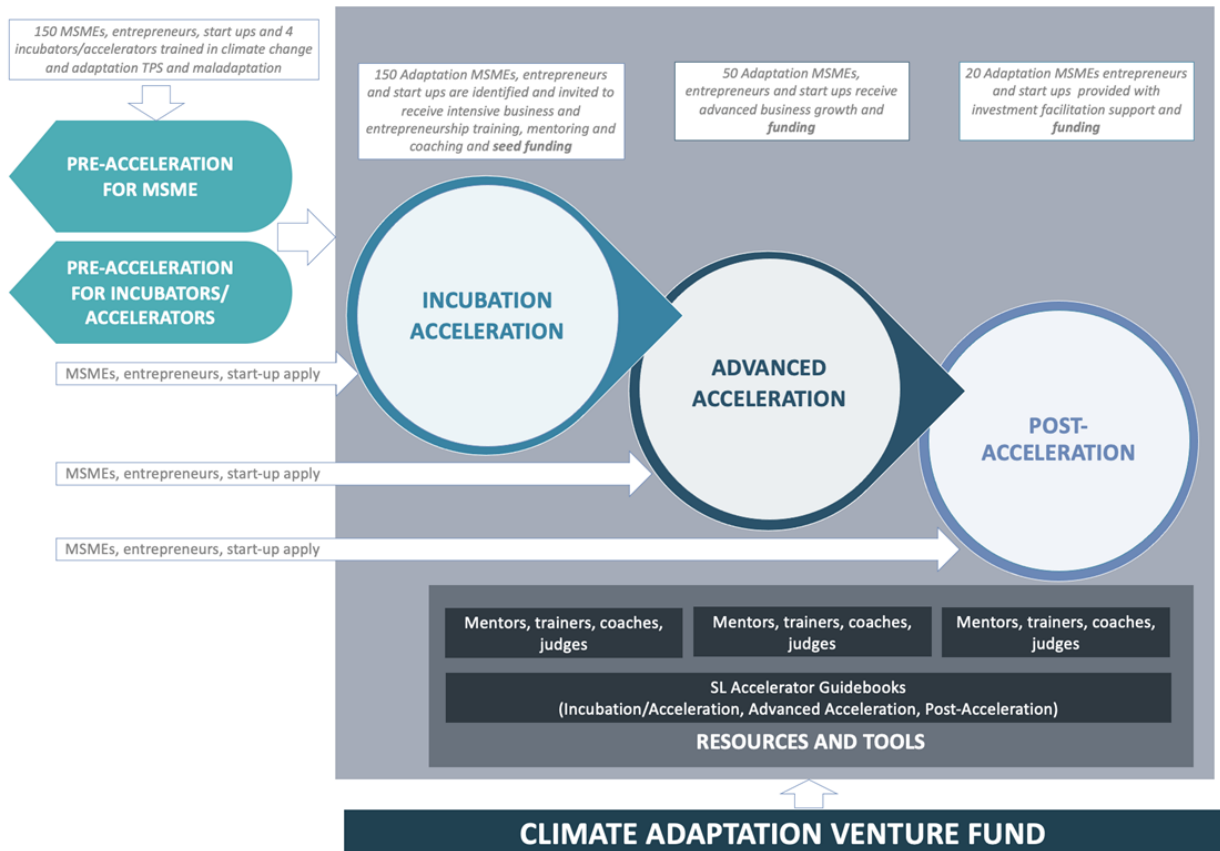


Figure 33: overview of msmes, entrepreneurs and start-ups acceleration/incubation support

*Note: The programmes of ?Incubation/Acceleration? and ?Advanced Acceleration? within the Sierra Leone Adaptation Incubator/Accelerator aim to address the ?Technological Valley of Death? and the ?Post-Acceleration? programme the ?Commercialization and scaling-up Valley of Death?*

243. For the design of the training modules/ mentoring and provision of seed funding for MSMEs and start-ups, the proposed GEF/UNIDO Adaptation Project will partner with:

*The Africa Enterprise Challenge Fund (AECF) is the most active fund for SSA based green investments. They invest in many firms but a small amount of capital per each firm (often in the form of grants). AECF has a record in operating and supporting MSMEs in Sierra Leone with a focus on agribusiness development and seek to expand their portfolio for adaptation MSMEs. UNIDO and AECF have since established an MoU to collaborate on developing climate technology industries across SSA.*

*The Private Financing Advisory Network (PFAN), hosted jointly by UNIDO and the Renewable Energy and Energy Efficiency Partnership (REEEP) is a global network of climate and clean energy financing experts that offer business coaching and investment facilitation to entrepreneurs developing climate projects in emerging markets. The experts in the PFAN-REEEP network offer personalized one-on-one coaching and targeted introductions to investors, providing a fast track to commercial investment.*

UNIDO and UNEP are leading the transfer of climate technologies, especially adaptation technologies through hosting the Climate Technologies Centre Network (CTCN). The CTCN programme recently added a new financing opportunity for the most climate-vulnerable communities under the Adaptation Fund's overall Innovation Facility, which includes a recently launched separate innovation grant funding window that is available to accredited national implementing entities (NIEs). The Adaptation Fund also recently launched new grant funding windows to accelerate project scale-ups and disseminate knowledge of effective adaptation actions.

Adaptation SME Accelerator Project (ASAP)<sup>[205]<sup>174</sup></sup>. The project will have strong coordination mechanisms with the ASAP, as during consultations between UNIDO and the Lightsmith Group, it was agreed to link ASAP's activities related to methodologies and adaptation framework for MSMEs to accelerator programmes and adapt those to have an adaptation focus. Successful MSMEs which are identified at these adaptation-focused accelerators will participate at regional convenings under ASAP Project. ASAP is an ecosystem-system building exercise that seeks to identify and support SMEs that offer TPS, which can enhance the resilience and adaptation of their users and customers in response to a changing climate across Africa, Asia, and Latin America and the Caribbean. ASAP targets key barriers to the supply and uptake of climate adaptation solutions which are 1) knowledge & technical capacity barriers, 2) market failures & financial barriers and 3) technology barriers and challenges and thus, making ASAP a great partner for this project (see Figure 34).

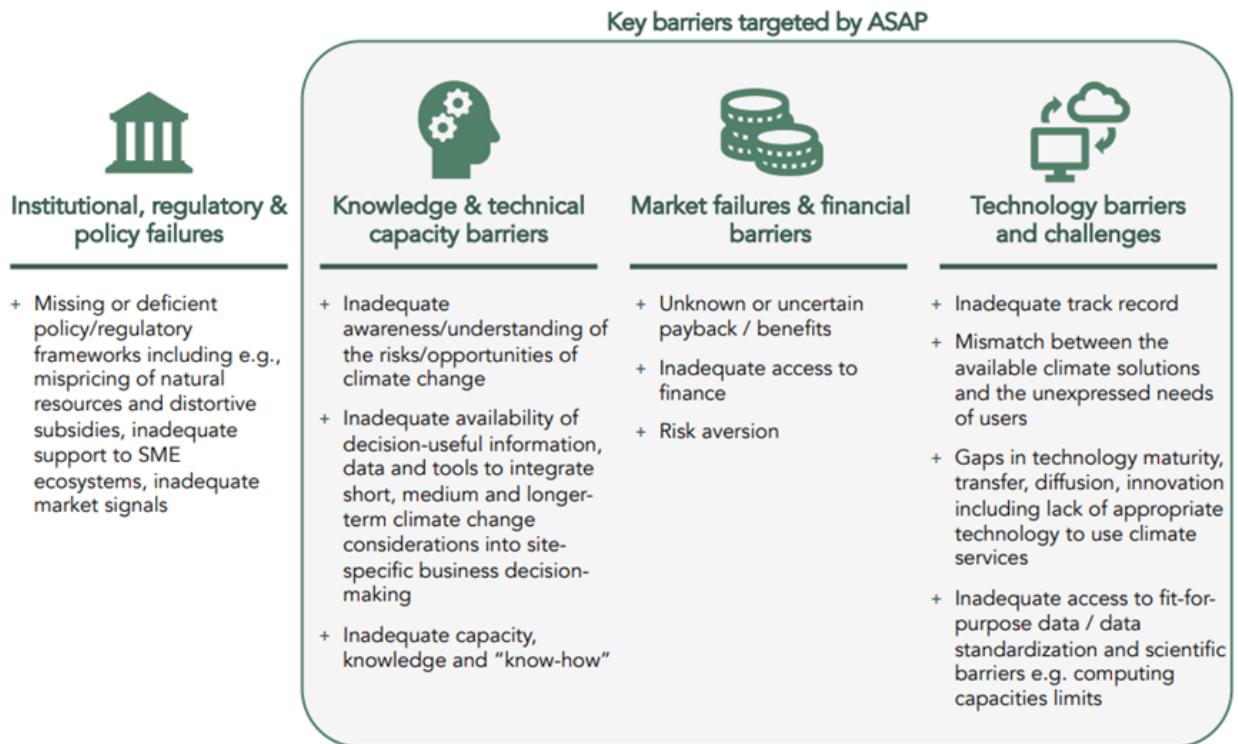


Figure 34: Barriers targeted by ASAP

*Economic Community of West Africa States (ECOWAS). As Sierra Leone is part of the ECOWAS region there are very few climate-focused accelerators, namely the Ghana Climate Innovation Centre (GCIC) and Nigeria Climate Innovation Centre, with which the Sierra Leone Adaptation Incubator/Accelerator can establish links with.*

*Climate-KIC will share innovation ideas and could potentially collaborate with exchange programmes, and in the provision of materials to integrate in the Sierra Leone Adaptation Incubator/Accelerator.*

## **Outcome 2.1 Adaptation MSMEs grow their businesses and operations**

### **Output 2.1.1: 150 MSMEs, entrepreneurs, start-ups are trained on climate adaptation topics to increase their capacities to understand climate risks and vulnerabilities and to identify business opportunities for climate change adaptation during the Pre-Accelerator Programme (aiming at 35% women participation)**

244. This output will have two main aims:

245. i) Train selected incubators and accelerators: This training will specifically focus on supporting adaptation MSMEs, entrepreneurs and start-ups. Capacity of accelerators/incubators will be built to assist MSMEs, etc. to assess the business exposure to climate risks and vulnerabilities as well as the identification of business opportunities for climate change adaptation. See Activity 2.1.1.1, and Activity 2.1.1.2.

246. Incubators/accelerators will be selected by the PMU during project implementation. See Table 18 with a list of incubators/ accelerators identify during the PPG stage. It is expected that Activity 1.1.2.1 under PC1 will support the further identification of number of incubators/ accelerators that exist in the Sierra Leone, the type of services they provide and to what type of start-ups / businesses, which will help to complement this list and provide further detail on each of them. Four (4) different accelerators will be chosen to ensure that there is a diversity in the Sierra Leone Adaptation Incubator/ Accelerator Programmes offered. This will minimize delivery risk.

247. The criteria used for the selection of these incubators/accelerators will be established by the PMU and discussed and agreed with the Adaptation Innovation Platform at the start of the project. These selection criteria should include, but are not limited to:

? Expertise to train adaptation MSMEs, entrepreneurs and start-ups in the different programmes (Incubator/Accelerator, Advanced-Accelerator and Post- Accelerator) (see the different curriculum/ programmes indicated in Activity 2.1.2.2).

? Geographical scope of intervention: incubators/accelerators located in the four regions should be selected to run the annual Adaptation Incubator/Accelerator competitions. Still, some incubators/accelerators that may not be located in the seven target provinces but are interest in establishing business in the provinces could be selected based on their expertise.

? Requirement that they have gone through the train the trainers' programme (see Activity 2.1.1.2).

? How they will tailor/adapt their existing incubator/accelerator programmes to contemplate specific calls for adaptation MSMEs, entrepreneurs and start-ups.

- ? How they will conduct outreach campaigns and communication to reach out to as many beneficiaries as they can.
- ? How many beneficiaries are they expecting to reach within the WEF sectors
- ? Experience working with adaptation start-ups and/or MSMEs.
- ? Knowledge on national regulation requirements to support MSMEs/entrepreneurs/ start-ups in quality/safety standards and in the environmental and social risks on their technologies. Stringent monitoring of innovations will be carried out post-Sierra Leone Adaptation Project support and thus, it is important that the enterprises are guided in this quality/safety standards and on mitigation of E&S risks. (See Annex J: ESMP)
- ? How they will foster women (and youth) empowerment and entrepreneurship in a transformative manner. This will also be a key consideration in the selection process to run the Adaptation Incubator/Accelerator. Throughout all Sierra Leone Adaptation Incubator/Accelerator cycles, special attention will be paid to gender mainstreaming activities, as outlined in the Gender Mainstreaming Action Plan (Annex I). These include: (i) recruitment of women trainers, mentors, judges; (ii) efforts to ensure that women and men are given equal opportunity to lead, access, participate in and benefit from the project; and (iii) awareness raising on the relevance of ensuring gender equality. This Programme should target at least >35% of women-led enterprises.

248. For each criterion, scoring will be given to make the assessment and selection process as clear as possible. The selection criteria will be made available to all incubators/accelerators invited to present proposals which will be defined by the PMU and the Adaptation Innovation Platform.

249. The selection process will be carried out by the PMU, which will prepare a report evaluating all the received proposals and selecting the incubators/accelerators that are envisaged to carry out the competition's cycles.

250. Raise awareness of at least 150 Adaptation MSMEs, entrepreneurs and start-ups to build their capacities to assess climate risks and vulnerabilities and to identify business opportunities for innovative TPS for climate change adaptation. This will be done through workshops and any MSMEs will be able to participate. There will **not be selection criteria to participate on these workshops since the idea is to raise awareness of MSMEs that are unknowingly providing adaptation solutions and a few MSMEs that are actually (recently) focusing on adaptation solutions and/or might be MSMEs operating in the WEF sectors and are interested in learning and venturing into adaptation TPS**. This phase is very important since it will help existing accelerators and incubators to advertise and source enterprises and develop a pool of potential applications prior to the launch of the actual Sierra Leone Adaptation Incubator/Accelerator Programme. Ultimately, MSMEs with promising high-impact innovative climate adaptation-oriented TPS will be sourced from these incubators/accelerators through a competitive process to participate in the dedicated Adaptation Incubator/Accelerator. Importantly, this Programme should target at least >35% of women-led enterprises. See Activity 2.1.1.6.

#### **Activity 2.1.1.1: Design the Pre-Acceleration Programme**

251. Two programmes will be designed:

- Train-the-trainers programme for the incubators/accelerators? to build the capacity of the accelerators/incubators to support the delivery of the Pre-Acceleration Programme throughout the GEF/UNIDO Adaptation Project implementation period
- General programme for the MSMEs, entrepreneurs and start-ups

252. The training will include the programs developed under Output 1.1.4 from PC1. Among other modules, the training sessions will also include:

A training module to raise awareness and knowledge of MSMEs about climate change, climate impacts, climate risks and vulnerabilities in the different sectors (WEF) and in the four regions (Northern, Western, Eastern and Southern) of Sierra Leone that are most prone to climate risks.

A training module in the Adaptation Taxonomy so that incubators/ accelerators know what adaptation technologies are so that they can identify MSMEs, entrepreneurs and start-ups to participate in the Accelerator programme. The Adaptation Taxonomy<sup>[206]<sup>175</sup></sup> developed by ASAP, that as explained above is an initiative led by the Lightsmith Group to identify and engage corresponding MSMEs providing climate adaptation solutions in developing countries. The Adaptation Taxonomy is used as a tool to define whether an SME qualifies as 'Adaptation SME' based on the type(s) of technologies, products and services offered ('Climate Adaptation Intelligence' (for examples, climate monitoring and forecasting, early warning systems, and remote sensing based tools for physical climate risk exposure assessment) and Climate Adaptation Products and Services (for examples, drought tolerance crops, water-efficient irrigation systems, water storage and harvesting, mini-grid based on renewable energy sources). This tool can be used for the identification of possible adaptation TPS in the WEF sector for the Sierra Leone (please refer to Table 14 and Table 15 with a list of Climate Adaptation intelligence and climate Adaptation TPS already identified . This table also provides information on the sectors (WEF) and on the climate event that these technologies can be applied to in the four regions).

A training module to raise awareness of MSMEs on suitable and available technologies and practices that reduce climate risk and vulnerability in the different sectors (WEF) in the four regions. The training module allows them to learn about specific adaptation solutions and potential business opportunities in WEF sectors of Sierra Leone. For example, they will be trained to improve soil and water management and to use climate-appropriate crops. Building on the existing rural MSME support provided by the WB Agro progressing Competitiveness Project<sup>[207]<sup>176</sup></sup>, training will also be provided on value chain business opportunities such as eco- processing and sustainable packaging and conservation.

Training on the modelling tool developed by the Subcontractor under activity 1.1.3.3 (under PC1).

Specific training module as part of the acceleration curriculum to address gender related climate change challenges and barriers (see Annex I)

**Training module on Maladaptation:** it is important to make sure that the MSMEs supported to be promoting a technology that leads to adaptation, does not lead to maladaptation. Maladaptive actions (maladaptation) are *[a]ctions that may lead to increased risk of adverse climate-related outcomes,*

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*increased vulnerability to climate change, or diminished welfare, now or in the future [208]'*?. Maladaptation arises in many forms, but several broad causes can be identified. Actions that may benefit a particular group, or sector, at a particular time may prove to be maladaptive to those same groups or sectors in future climates or to other groups or sectors in existing climates. For example, adaptation efforts aimed at armouring the coastline may result in coastal erosion elsewhere while building levees along a flood-prone area provides protection to coastal population and infrastructure but might encourage unwanted development within that area, often accentuated by an exaggerated sense of safety and the levees may increase damage when they fail. Under the Pre- Accelerator MSMEs will learn about different Maladaptation Assessment Frameworks so that they can learn to identify maladaptive actions. The project will also incorporate lessons learned from IFAD such as avoiding the use of NERICA rice that faced difficulties to adapt to Sierra Leone's long wet season. See Annex J for the different Assessment that can be used.

A training module on quality/safety standards used on national regulation requirements and on the identification and mitigation of Environmental and Social risks related to their technology. An Environmental and Social expert will be contracted to teach this module (See Annex J: ESMP)

253. The CRVA in the Baseline Report can be a resource to design the first two modules. The report provides information and includes a full range of best-practice examples and best available adaptation technologies for the WEF sectors of Sierra Leone that could be used in these training sessions.

254. The training programmes will be designed to be taught both virtually and physically, allowing the programmes to reach wider audiences within the Sierra Leone. The design of the programmes will be carried out by Climate-KIC.

**Activity 2.1.1.2: Select the incubators/accelerators and carry out at least two (2) rounds of train the trainers? programme for incubators/accelerators**

255. A call will be released to select the four (4) incubators/accelerators to undergo training.

256. It is important to note that, from the investigation carried out during the PPG stage, the existent incubators/accelerators in Sierra Leone do not have the knowledge and/or information on climate change adaptation and/or climate change adaptation TPS. They provide general acceleration services that are not palatable to the specific need of adaptation MSMEs. See Table 18. Thus, under activity 2.1.1.2 a train-the-trainers programme for incubators/accelerators will be carried out by Climate-KIC to prepare them to build the capacity of entrepreneurs, start-ups and MSMEs under Activity 2.1.1.5.

**Activity 2.1.1.3: Prepare the platform to launch the Pre-Accelerator Workshop for MSMEs, entrepreneurs and start-ups**

257. Selected incubators/accelerators previously trained in Activity 2.1.1.2. with the help of the PMU, will prepare the launch of the Pre-Accelerator Workshop in the Adaptation Innovation Website (Activity 1 1.1.2 from PC1). The Adaptation Innovation Website will host the registration for the Pre-Accelerator Workshop.

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258. Incubators/accelerators will receive adequate training on how to access the Adaptation Innovation Website (by an IT subcontractor as the part of the package for the design of the Adaptation Innovation Website) and advertise for the opening/closure/results of the registration. The PMU will be responsible for overseeing the launch of the Pre-Accelerator calls and guaranteeing that the Adaptation Innovation Website page is operational to advertise the calls and receive the applications.

#### **Activity 2.1.1.4: Outreach and communication**

259. The outreach and communication activities related to the launch of the program and calls for applications for the annual Sierra Leone Pre-Accelerator cycles will be led by the PMU and the selected incubators/ accelerators with the involvement of local business associations (especially those dedicated to encouraging women-led businesses and entrepreneurship to achieve fair share of female-led and/or gender balanced MSMEs) and universities that would like to get involved, to enlarge and improve the potential project pipeline. Different means of communication will be used, such as: text messages on cellular phones, WhatsApp messages, local radio stations, television, social media influencers on platforms such as Facebook and Instagram, as well as on the institutional website developed in PC1 (as already mentioned, special efforts will be made to have this website translated in some of the local languages spoken in the four regions to increase the success of outreach and communication).

260. It is foreseen that Ministry of Environment, EPA, MTI, DSTI, SMEDA, SLIEPA, MLHCP, MAF, MWR, Ministry of Fisheries, Ministry of Energy (MoE), Ministry of Local Government and Rural Development, Ministry of Gender and Children's Affairs, also be engaged in advertising and communication activities.

#### **Activity 2.1.1.5: 150 MSMEs, entrepreneurs and start-ups register in the Pre-Accelerator Workshop**

261. Interested MSMEs, entrepreneurs and start-ups will be able to register through the Adaptation Innovation Website. At least 10-11 MSMEs will register each year to participate in these workshops (150 in total during the six years of the Project implementation since the first year will be for preparing all the materials and training existing selected incubators/ accelerators). It is important to note that deadlines might be extended if the number of MSMEs target per workshop is not fulfilled.

262. Every year the incubators/accelerators engaged in the Pre-Accelerator Workshops will have to report the PMU on the number of entrepreneurs, start-ups and MSMEs benefiting from the programme, as well as their sectoral focus and their interest in getting engaged in other phases of the Incubator/Accelerator.

#### **Activity 2.1.1.6: The Pre-Accelerator Workshop is launched**

263. The Pre-Accelerator Workshop will be held every year doing one event before the Sierra Leone Adaptation Incubator/Accelerator application deadline. A total of 6 Pre-Accelerator Workshops will be conducted over the six (6) years of the project (seven years in total but one year of set-up so the pre-acceleration will run from the second year onwards). Each Pre-Accelerator Workshop will train the 10-11 entrepreneurs/start-ups/MSMEs that register for the programme. Thus, it is estimated that during the entire project, it will train the targeted 150 start-ups/entrepreneurs/MSMEs. The training can be

organised virtually to reach out to entrepreneurs, start-ups and MSMEs, and also to comply with e.g., COVID-19 restrictions if requires. Climate-KIC will provide support to the PMU and the selected incubators/accelerators in delivering this programme.

**Output 2.1.2: Four (4) existing business development accelerators are trained to run the annual cycles of climate change adaptation-oriented technology innovation and entrepreneurship competition-based accelerators**

264. Under this output, capacity will be built of the chosen four (4) incubators/accelerators to run the annual climate change adaptation TPS Accelerator programmes. Capacity will also be built on the selection criteria described below. By building the capacity of identified incubators/accelerators in climate change risks and vulnerability assessments, adaptation TPS (Output 2.1.1), on the Accelerator Programmes as well as on how to run the Sierra Leone Adaptation Incubator/Accelerator, the project aims to integrate adaptation-focused skills into existing incubators/accelerators and replicate identified international best-practices and successful technology in Sierra Leone.

265. During the PPG stage, the selection criteria to choose MSMEs, entrepreneurs and start-ups in each of the different programmes were drafted. Based on outlined climate change impacts and vulnerabilities in the NAPA, INDC and 3NC for the water, agriculture and energy sectors, the project will identify best-practice examples and best available technologies, which can create clear climate adaptation benefits and have high replication potential. In coordination with the GEF-World Bank Sustainable Cities Impact Program (SCIP) Nature Based Infrastructure (NBI) such as innovative water harvesting schemes and water/energy efficient irrigation systems will be stressed as critical adaptation solutions that adaptation MSMEs can develop further and adapt to their operations (as per the table below).

266. Selection criteria to choose the 150 adaptation innovation entrepreneurs, start-ups and MSMEs to go through the Sierra Leone Adaptation Incubator/Accelerator Programme include:

- Any MSMEs, entrepreneurs and start-ups offering innovative climate adaptation technologies with strong adaptation solutions to address climate change hazards and risks in the most vulnerable regions of Sierra Leone. **They should provide adaptation technologies that are affordable and accessible solutions to be implemented in any of the WEF sectors for the identified vulnerable groups (MSMEs of the agro-value chain, women farmers, ethnic groups and any poor inhabitant living in Sierra Leone (both urban and rural areas))** where climate change events impact their houses, the infrastructure services (water, sanitation and energy facilities), and transportation routes having an overall effect on their lives, the market as well as their education and health) of the four regions targeted by this Project (Northern, Southern, Western and Eastern). Section 1.2 (Climate risk and vulnerability assessment and validation of the findings) has a full description of these vulnerable groups as well as of the climate hazards and risks that they will be exposed to. It is very important to note that there are many MSMEs that are unknowingly providing adaptation solutions and a few MSMEs that are actually (recently) focusing on adaptation solutions. The project will be aware of these facts while selecting MSMEs so that these enterprises that have innovative technologies that can be connected with climate change adaptation can also be selected to participate in this programme. A comprehensive list of innovative adaptation solutions was compiled during the PPG stage and can be found in Table 14 and Table 15 above.



- Priority will be given to innovative climate adaptation solutions that address cross-sectoral impacts since they provide multiple adaptation benefits across the WEF sectors (see Table 16 above). For example, **Nature-based Infrastructure solutions** due to their integrated approaches and cross-sectoral benefits.

Furthermore, MSMEs, entrepreneurs and start-ups will be selected if they provide adaptation technologies that qualifies under the Adaptation Taxonomy framework<sup>[209]</sup><sup>178</sup> developed by Adaptation SME Accelerator Program (ASAP), an initiative led by the Lightsmith Group. If the applications of adaptation start-ups/MSMEs present their clear understanding of adaptation taxonomy, linking to Climate Change risks and vulnerability of the Sierra Leone but are not included in Table 14 and Table 15, they should still be considered to be included in the Sierra Leone Adaptation Incubator/Accelerator programme.

Box 1: Definition of Adaptation MSME

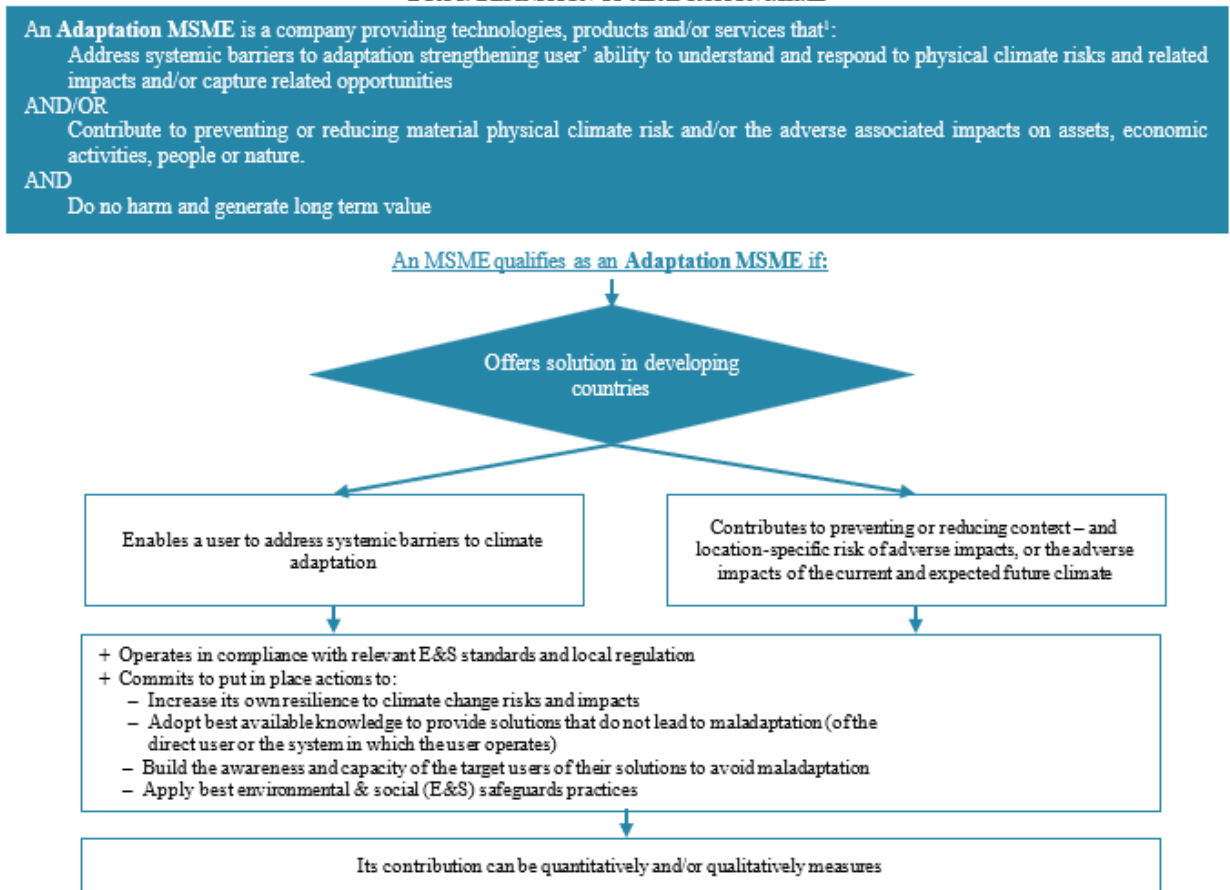


Figure 35: Screening criteria for identifying adaptation MSMEs<sup>[210]</sup><sup>179</sup>.

267. Addressing the risk of maladaptation: it is important to make sure that the MSMEs supported to be promoting a technology that leads to adaptation, does not lead to maladaptation. Maladaptive actions (maladaptation) are actions that may lead to increased risk of adverse climate-related outcomes, increased vulnerability to climate change, or diminished welfare, now or in the future. Maladaptation arises in many forms, but several broad causes can be identified. Actions that may benefit a particular group, or sector, at a particular time may prove to be maladaptive to those same groups or sectors in future climates or to other groups or sectors in existing climates. For example, Adaptation efforts aimed at armouring the coastline may result in coastal erosion elsewhere while building levees along a flood-prone area provides protection to coastal population and infrastructure but might encourage unwanted development within that area, often accentuated by an exaggerated sense of safety and the levees may increase damage when they fail[211]180. Assessment Frameworks can be used to identify maladaptive action. Find three different Assessment Framework described in the ESMP (see Annex J) to help select MSMEs, entrepreneurs and start-ups that promote adaptation and do not lead to maladaptation.

268. In addition to the selection criteria described above to choose 150 enterprises for the first stage of the Sierra Leone Incubator/ Accelerator programme, enterprises willing to go through the Advanced Accelerator Support Programme (50 enterprises); and the Post-Accelerator support Programme (6 enterprises) will have to meet the following criteria:

*MSMEs, entrepreneurs and start-ups that have innovative climate adaptation solutions with strong catalytic and multiplier effects; business models with potential for replication and scaling-up and hence maximizing impact for resilience building within the country and increasing the cost-effectiveness of innovation support will be prioritized for the Advanced and Post Accelerator programme.*

*Contribution to the empowerment of women and youth: priority will be given to MSMEs, entrepreneurs, and start-ups that (i) promote women and youth innovators, entrepreneurs, start-ups; and (ii) that have a significant impact on gender-responsive employment creation.*

*Cause no significant environmental or social risks to local people and the environment. Additionally, priority will be given to the potential for generating additional co-benefits including job creation, social and economic development in general and community empowerment which, in turn, will also strengthen the resilience of the population*

*Potential number of clients for the TPS or market and demand driven TPS will also be considered to select enterprises.*

269. Finally, priority will also be given to those enterprises that can provide benefits in the short, medium and long term according to Table 16 above.

270. Each MSME, entrepreneur and start-up that applies to the programme will have to register an account on the Adaptation Innovation Website and provide its basic information and optional information such as website address, co-founder picture, social media link, and an introduction video. Most importantly, start-ups will be required to answer a list of online questions about their team, product, operations, markets, competitors, and future plans. Please see Table 2 of Jianxi Luo's paper

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(*How Do Accelerators Select Startups? Shifting Decision Criteria Across Stages*)[212]181 with a list of questions that could be used for this project.

271. Once these MSMEs, entrepreneurs and start-ups have registered and completed the form, the selection process will consist of two stages:

*First stage: Screen and shortlist the applications: an evaluation committee gathered for each call (this evaluation committee will be defined by the PMU with the help of the Adaptation Innovation Platform and the selected accelerators/incubators, and its terms of reference developed at the start of the project) will screen and shortlist the best applications to go to the second stage based on the questions answered on the registration form and based on selection criteria described above.*

*Second stage: In person or online interview will be developed to shortlist the best applications to select the enterprises that will participate in the different Accelerator programmes based on the selection criteria described above. Additional information might be requested in order to make this final selection.*

272. The selection criteria and evaluation methodology, will be used to select:

150 adaptation innovation entrepreneurs, start-ups and MSMEs to go through the Incubator/Accelerator Programme;

50 adaptation innovations entrepreneurs, start-ups and MSMEs to go through the Advanced-Accelerator Support Programme; and

20 adaptation innovation entrepreneurs, start-ups and MSMEs to be supported through the Post-Accelerator Programme.

#### **Activity 2.1.2.1: Develop Sierra Leone Adaptation Incubator/Accelerator Programmes**

273. Once the adaptation innovation ecosystem needs are identified, curricula for capacity building/training programmes as well as modules to include in existing Universities and Training Institutions curricula will be developed, including the necessary materials to provide the training.

274. The rules and procedures that will be used in the competitions as well as the curricula/programmatic content will be designed for each programme (Incubator/Accelerator, Advanced Accelerator and Post-Accelerator Programmes) so that each programme will last on average between one (1) of two (2) weeks. The contents should include the needs identified in Activities 2.1.1.2 as well as the content described in Activity 2.1.3.2 (Output 2.1.3), Activity 2.2.1.2 and Activity 2.2.1.3 (Output 2.2.1) and Activity 2.2.2.2 (Output 2.2.2). The partnership with Climate-KIC to exploit common trainings, facilitate corporate relationships and investor introductions will be key to ensure that the programmes/curricula are of regional and international standards.

275. During the design of the different curricula/programmes, the programmes and curricula already offered by the selected incubators/accelerators will be referred to make use of their materials.

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Additional subjects and materials will then be prepared to complement and/or update existing materials as necessary.

276. The project will ensure that the MSME operations / infrastructure are resilient: business plans will be mandated to reflect the realities that climate shocks can and will disrupt adaptation technology proliferation. Training to be supported to MSMEs will ensure that their business practices can be adaptive to adjust to the climate risks at hand. For instance, if a water conservation technology is employed but flooding becomes more problematic, the MSME will be guided to reflect these risks in their plans and to have mitigation measures such as robust technologies that can withstand flood events. By providing the tools for MSMEs to identify risks and mitigation measures, it will be more likely that their ideas are used in the long-run throughout Sierra Leone.

277. The proposed project interventions will build the capacities of existing accelerators and will integrate an adaptation-focused curriculum and have an open-innovation format to catalyse more adaptation MSMEs to transform and scale-up their innovations and operations. Furthermore, local adaptation MSMEs will be trained to adapt technologies and services developed in other countries and replicate them in line with local markets and adaptation needs. The formulation of business partnerships with international and regional MSMEs will be explored. Business growth and investment facilitation services will ensure that identified MSMEs will be nurtured to develop into commercial businesses with scalable solutions for large-scale deployment of adaptation solutions.

278. As already mentioned, the methodology for accelerating adaptation MSMEs will be adopted from the regional GEF project: Adaptation SME Accelerator Project (ASAP) executed by the Lightsmith group. UNIDO and Lightsmith group have agreed to incorporate the developed methodology by Lightsmith group under the ASAP programme by the national accelerator programme to ensure alignment and consistency. ASAP aims to enhance the availability and uptake of climate adaptation solutions by identifying, engaging and empowering SMEs providing such solutions in developing countries. ASAP's three- pronged intervention strategy entails[213]182:

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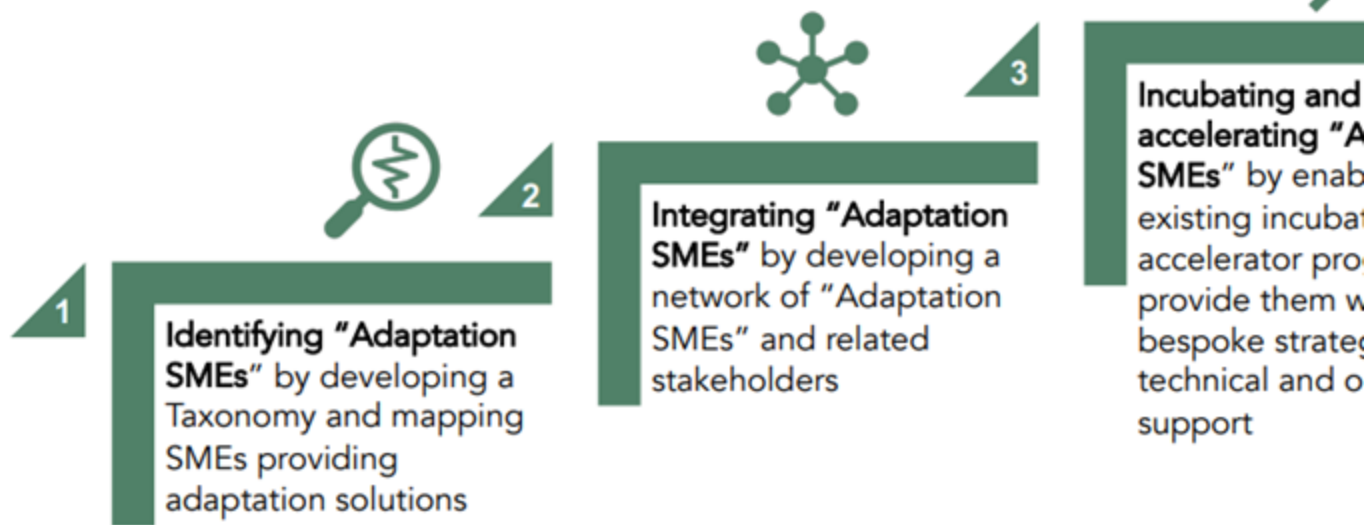


Figure 36 ASAP-s three-pronged intervention strategy

279. The project will also highlight and reward the best Nature-based Infrastructure innovations (such as restoring soil quality with crop rotation schemes and combining agriculture and aquaculture where appropriate).

280. Furthermore, the project will also collaborate with The Climate Technology Centre and Network (CTCN). The CTCN as the operational arm of UNFCCC and hosted under UNEP and UNIDO supports developing countries through technical assistance for the development of climate technology sectors. As such CTCN has developed guidelines providing identification and evaluation assistance when looking for adaptation solutions. CTCN offers support through an Incubator Programme as well as through financing opportunities under the Adaptation Fund. Building the programme linked to international and regional accelerators allows learning and adopting their successes to enrich the training programs and facilitate corporate relationships including regional/international investments. This will also ensure the programmes/curricula are of regional and international standards.

281. The design of the curricula /programmes and the underlying materials will be carried out by Climate-KIC with the supervision and input from the PMU, relevant institutions (such as EPA, SLMet, MEDD) and the chosen incubators/accelerators and relevant stakeholders (Climate-KIC, ASAP, CTCN, etc). Climate-KIC will also develop all the rules and procedures to be applied in the different competition cycles, including the evaluation criteria and methodology that will be used to assess the different applications.

**Activity 2.1.2.2: Train incubators/ accelerators run the annual competitions of the different programmes under the Sierra Leone Adaptation Incubator/Accelerator**

282. Climate-KIC will be subcontracted to train the incubators/accelerators in delivering the established programmes as well as to provide a yearly refresher. For that, Climate-KIC will identify the

capacity building needs of the selected incubators/accelerators and strengthen their capacity for them to host and run the annual competition-based programmes through a regional approach, including capacity on the use of the selection criteria and the evaluation methodology for entrepreneurs, start-ups and MSMEs. Capacity will be built on:

The process that should be followed to open Adaptation Innovation Calls: By establishing Adaptation Innovation Calls (Adaptation Innovation Calls will include publicity campaigns to attract adaptation MSMEs to submit their ideas and to be accepted as a cohort of companies in the Adaptation Accelerator programmes) technology innovations with high-impact potential in the area of climate change adaptation will be admitted into competition-based accelerator programmes at existing accelerators.

The process that needs to be implemented for the selection of the adaptation entrepreneurs, start-ups and MSMEs applicants to participate into the different programme cycles within the Sierra Leone Adaptation Incubator/Accelerator;

Developing different curricula and materials for each programme

The evaluation report that should be provided to the PMU on the selected candidates as well as on the performance of the different candidate on the Sierra Leone Adaptation Incubator/Accelerator

283. The capacity building will be done in an intense 1-week training session for the selected incubators/accelerators running the competitions cycles by Climate-KIC. Yearly refreshers will also be provided during the course of the project by Climate-KIC.

284. The Sierra Leone Adaptation Incubator/Accelerator has in total three (3) different type of annual competitions: Incubator/Accelerator, Advanced-Accelerator and Post-Accelerator. In the Incubator/Accelerator Programme a total of 32 Adaptation MSMEs, entrepreneurs and start-ups will be first chosen to receive training in entrepreneurship to transform and improve their businesses. In the Advanced-Accelerator Programme, a cohort of approximately 50 MSMEs, entrepreneurs and start-ups from the Incubator/Accelerator Programme will be chosen for progressing into the next phase of business growth and in overcoming product related market barriers. These enterprises will also receive seed funding in order to have an overall effect of driving adaptation innovations towards formalisation and scaling up. Finally, at least 6 alumni enterprises, that participate in the Advanced Accelerator Programme will be chosen to benefit from tipping-point investment facilitation support services.

285. The competition will cover the 4 regions (North, South, West and East of Sierra Leone) and before the Programme starts there will be one year of set-up and capacity-building / marketing for the accelerators. From the second year onwards, the three annual competitions will be run, adding up in total throughout the project period: six (6) cycles of the Incubator/Accelerator Programme, six (6) cycles for the Advanced-Accelerator Programme and six (6) cycles for the Post-Accelerator Programme.

**Output 2.1.3: 150 MSMEs, entrepreneurs and start-ups with high-impact innovative climate adaptation-oriented TPS are trained and coached through the Incubator/ Accelerator Programme to overcome the Technological valley of Death (aiming at 35% women participation)**

286. Through the Sierra Leone Adaptation Incubator/Accelerator and by establishing Adaptation Innovation calls, a cohort of more than 150 MSMEs, entrepreneurs and start-ups with high-impact innovative climate adaptation-oriented technologies and solutions will be identified and invited to receive intensive business and entrepreneurship mentoring and coaching to accelerate their business growth. As already described in the Barrier section, there are a number of barriers impeding MSMEs, entrepreneurs and start-ups engagement in innovative climate adaptation TPS and thus, these trainings will build capacity to reduce these barriers, and enable them to:

Preparing quality business plans that are consistent with existing financing mechanisms

Preparing solid marketing strategies for their TPS

Entrepreneurship and business management

Administrative, legal, financial, marketing (including sharing and outreach of information on internet-based platforms and social media) and distribution capabilities for TPS (route to market)

Preparing quality business plans that are consistent with existing financing mechanisms

Mainstreaming gender and youth into the provision of adaptation TPS

287. This output will identify high-impact potential MSMEs, entrepreneurs and start-ups involved in climate resilience and adaptation activities as well as will identify enterprises that are contributing to climate adaptation and are not aware of it. This activity will provide them with rigorous and competitive curriculum training, mentors as well as connect entrepreneurs to key strategic partners. All the activities developed in this Output will be executed by the selected incubators/ accelerators using the curricula and materials made available to them.

288. Furthermore, as mentioned previously one of the obstacles that MSMEs, entrepreneurs and start-ups face at the early-stage is the Technological Valley of Death. The first valley of death occurs early in the development of a technology, as breakthrough research and technological concepts aim to achieve commercial proof-of-concept. At this stage, innovators and entrepreneurs conducting basic and applied research need further capital to undergo a process of developing, testing, and refining their technologies in order to prove to private funders that these technologies will be viable in markets beyond initial success in the laboratory. However, investors are typically reluctant to fund such early-stage research and product development, largely due to the high technical, market, and management execution related risks and long development horizons associated with as-yet-unproven technological concepts. As a result, many entrepreneurial start-up firms and research laboratories fail to accumulate the necessary capital to see their innovative research concepts translated into commercial products and ventures<sup>[214]</sup><sup>183</sup>. Thus, under this output financial support will be provided to enterprises to overcome these obstacles.

289. All entrepreneurs, start-ups and MSMEs that apply to this programme should have gone through the Pre-Acceleration workshop, so that they acquire the climate change adaptation basic skills and knowledge necessary to report on the performance of their business ideas. If they did not participate in

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the Pre-accelerator, they will need to demonstrate their knowledge based on some indicators for business performance and climate change adaptation benefits (MSMEs will fill out the application form and the questions will be designed in a way that it becomes evident whether the MSMEs are mature enough to classify for the Advanced-Accelerator). This application form will be designed by the incubators/accelerators selected to run these programmes.

**Activity 2.1.3.1: Launch an Open Innovation Adaptation call for the Incubator/Accelerator Programme and select target entrepreneurs, start-ups and MSMEs (aiming at 35% women participation)**

290. Using the procedures and application materials in prepared in Activity 2.1.2.3 and Activity 2.1.2.4, the following stepwise process will be adopted to launch the competition of the Incubator/Accelerator Programme:

Sub- Activity 2.1.3.1.1 Launch the call for applications and the registration form: official launch of the competition should be carried out through the Adaptation Innovation Website.

Sub- Activity 2.1.3.1.2 Outreach and communication activities related to the launch of and calls for applications.

The outreach and communication activities related to the launch of and calls for applications for the annual Sierra Leone Adaptation Incubator/Accelerator cycles will be led by the selected incubators/accelerators with support from the PMU and local business associations (especially those dedicated to encouraging women-led businesses and entrepreneurship to achieve fair share of female-led and/or gender balanced MSMEs) and universities that would like to get involved, to enlarge and improve the potential project pipeline. Different means of communication will be used, such as text messages on cellular phones, WhatsApp messages, local radio stations, television, social media influencers on platforms such as Facebook and Instagram as well as on the institutional website developed in PC1 (as already mentioned, special efforts will be made to have this website translated in some of the local languages spoken in the four regions to increase the success of outreach and communication).

Sub- Activity 2.1.3.1.3 Screen and shortlist the applications using the selection criteria described under Output 2.1.2 for the Incubator/Accelerator Programme

Sub- Activity 2.1.3.1.4 Organise physical or online interviews.

291. The outcome of the process will be posted on the Adaptation Innovation Website and shared through other outreach and communication channels. Efforts will be made to encourage women-led applications and target 35% women-led applications.

292. The selected cohort group will undergo the programme activities (Activity 2.1.3.2 and Activity 2.1.3.3). This process will be implemented by the selected incubators/accelerators that will deliver the Incubator/Accelerator Programme. The PMU will oversee the process and should be kept informed about it. After the selection process, the incubator/accelerator responsible should prepare and share the report with the PMU.



### **Activity 2.1.3.2: Conduct one cycle per year of the Incubator/Accelerator Programme targeting the four regions**

293. One annual cycle of the Incubator/Accelerator stage will be conducted. Depending on the number and regional origin of the applicants, the PMU, assisted by the incubators/accelerators companies may choose to run the cycle in each of the 4 regions independently or in groups. The Sierra Leone Adaptation Incubator/Accelerator is expected to support approximately 25 MSMEs, entrepreneurs or start-ups per year, for a total of 150 over the 6 years. In the first year, the necessary materials for the Sierra Leone Adaptation Incubator/Accelerator will be prepared such as the website, the programmes, others. Thus, it is not expected that competitions will be carried out during that first year of the 7 years of the project implementation period.

294. The goal of Sierra Leone Adaptation Incubator/Accelerator will be to enhance the talent in the country (particularly among young and women), and to formalize the MSMEs, entrepreneurs and start-ups. To ensure that successfully accelerated MSMEs, entrepreneurs and start-ups will be nurtured to grow into commercial businesses, the project seeks to provide technical assistance and business development support training, mentoring, and coaching based on identified international best-practices and successful technology applications for Sierra Leone. Specific guidance will help the enterprises maximize their potential climate benefits and to minimize negative environmental or social impacts identified, particularly relating to local climate risks and to maladaptation.

295. This process will create a pipeline of MSMEs, entrepreneurs and start-ups in Sierra Leone that will provide suitable and localized adaptation-oriented TPS to farmers and vulnerable population. Chosen technologies and innovative ideas will demonstrate that they can improve productivity and boost employment opportunities in the key sectors. These top innovators will be showcased at national and regional fora and participate at roadshow demonstration to communities across Sierra Leone in PC3. Woman and youth led and focused MSMEs will be highlighted in annual competitions for adaptation innovation. Awards such as "Best Woman Entrepreneur in Adaptation" will be distributed and part of the EPA's Environment Care Awards[215]184. Furthermore, collaboration with ASAP Project will provide an opportunity for successful MSMEs, entrepreneurs and start-ups identified at these adaptation-focused accelerators, to participate in regional and global events and plug into a regional and global network of businesses.

296. In general terms, in the Sierra Leone Adaptation Incubator/Accelerator, priority will be given to MSMEs, entrepreneurs and start-ups with adaptation innovations that fall under the selection criteria approved in Activity 2.1.2.3. In the first year of the Sierra Leone Adaptation Incubator/Accelerator, rewards might be considered to those showing overall sustainability, cross-sectoral interventions with multiple adaptation benefits and considering gender mainstreaming in a transformative manner. The Sierra Leone Adaptation Incubator/Accelerator will have a curriculum designed specifically to support MSMEs, entrepreneurs and start-ups with high-impact innovative climate adaptation-oriented technologies and solutions to develop viable business models and grow into solid Adaptation MSMEs/entrepreneurs/start-ups.

297. The training sessions within the Incubator/Accelerator programme will include:

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The generation of viable business ideas and formulation of business plans to launch adaptation TPS. At start-up, there are commonalities among all entrepreneurship process even though the TPS might differ. The training will include the first three stages of the entrepreneurial process (the Four stage is part of the Advanced- programme). A good guidebook to follow the four stages described in Chapter 3 of the entrepreneurship process [216]<sup>185</sup> depicted in Figure 37.



Figure 37: The Entrepreneurship Process [217]<sup>186</sup>

In addition, Communication skills will be also provided to gain visibility in Sierra Leone and internationally (this will include skills in social media and learning the benefits and usefulness of having a business website). In fact, this was one of the points that was highlighted as quite relevant for the business in Sierra Leone and that is currently lacking.

Furthermore, a specialized training and technical assistance workshop will be held to help them understand and access financial services such as microfinance products for improving their innovations. In particular the SMEDA MSMEs low interest financing product currently under development.

The project will also seek to ensure women empowerment through (i) specific training and mentoring to promote women innovators, entrepreneurs, start-ups; and (ii) design of specific prizes and follow-up

support programmes for innovative start-ups that have a significant impact on women's entrepreneurial development and gender responsive employment creation.

Specific training modules about gender mainstreaming (see Annex I Gender Analysis)

Specific information on relevant new business opportunities as well as policy/regulations so that the entrepreneurs are fully informed of the market and policy trends post-COVID-19.

298. At the end of the programme the start-ups and MSMEs will undergo a test to verify that they have acquired the capacities. The test will also collect feedback from the participants on the programme, so that the feedback can be used to revise and improve the programme as necessary.

299. The training will be delivered by the incubator/accelerator running the programme. The incubator/accelerator should report to the PMU on the implementation of the programme, including information on the achieved skills by the cohort group as well as the different TPS that the cohort group is looking to provide in Sierra Leone.

#### **Activity 2.1.3.3: Invite international and regional incubators/accelerators to share experiences and lessons learnt**

300. This activity seeks to demonstrate good business models and assist entrepreneurs, start-ups and MSMEs, entrepreneurs and start-ups in having commercially successful business models. For that, lessons from Climate-KIC and Climate Innovation Centres (CIC) in Nigeria<sup>[218]</sup><sup>187</sup> and Ghana will be instrumental in how to successfully support adaptation MSMEs. Through partnerships, the project will invite some adaptation-focused MSMEs from Climate-KIC and CICs to demonstrate good business models and assist entrepreneurs and MSMEs in having commercially successful business models. Also, to share their experience and lessons learnt to support the entrepreneurs, start-ups and MSMEs in their early stages of development. The project will work with these regional accelerators to exploit common trainings, facilitate corporate relationships and investor introductions.

301. The PMU will engage with these international and regional incubators/accelerators and assess how this experience sharing can be organized. Due to the number of programmes within the Sierra Leone Adaptation Incubator/Accelerator that will be carried out during the project, it is envisaged that these organizations will be asked to prepare videos on their experiences and lessons learned for dissemination purpose. The PMU will contract a team to produce the video materials to work with the international and regional incubators/accelerators.

#### **Activity 2.1.3.4 Provide early-stage funding to companies to overcome the Technological Valley of Death**

302. As mentioned previously one of the obstacles that MSMEs, entrepreneurs and start-ups face at the early-stage is the Technological Valley of Death. Thus, to help enterprises overcome these barriers financing support will come from the Climate Adaptation Venture Fund (CAVF). This CAVF will provide patient and affordable capital to adaptation ventures in this early-stage so that they have the

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time to grow and scale their businesses and be connected to follow-on investors (See Output 2.2.3 for further information on the CAVF).

**Output 2.1.4: Business replication, expansion and partnership services provided to help regional and global adaptation MSMEs establish climate resilient business operations in Sierra Leone**

303. Through the integration of an adaptation-focus into existing accelerators, the project seeks to replicate identified international best-practices and successful technology applications for Sierra Leone. This approach of replication will deliver a pipeline of innovative technologies and services which will generate the expected climate adaptation results. It will also help regional and global adaptation MSMEs establish climate resilient business operations in Sierra Leone.

**Activity 2.1.4.1: Pairing established regional/ international enterprises with local entrepreneurs**

304. This activity seeks to pair regional/international established enterprises with local entrepreneurs in Sierra Leone to develop localized business models ensuring high replicability and scaled deployment.

305. The project will engage with Climate-KIC and Climate Innovation Centres (CIC) in Nigeria[219]<sup>188</sup>, Ghana and the CTCN. This project will also work with ASAP project and this will provide an opportunity for successful MSMEs, entrepreneurs and start-ups identified at these adaptation-focused accelerators, to plug into a regional and global network of businesses. Lessons from successfully adaptation MSMEs from these incubators in other countries of the region will be instrumental in how to successfully support adaptation MSMEs in Sierra Leone.

306. At PPG stage three companies ? two (2) regional adaptation companies with interest to enter the Sierra Leone market and one already operating in the country that wanted to expand its business ? were pre-selected to be supported by the GEF/UNIDO Adaptation Project, as pilot adaptation technologies. Identifying and supporting the development and deployment of successful regional/international adaptation enterprises will help to overcome the institutional, technological, market, information barriers which currently limit adaptation investment in Sierra Leone. It will also help to replicate best practices of climate adaptation TPS and bring green jobs to Sierra Leone. At the project start this list will be revised and approved by the Adaptation Innovation Platform, before this business opportunities are implemented. A summary of each pre-selected adaptation business proposal is provided in the following table and in the bullet points that follow. Details and the corresponding co-finance letters can be found in Annex N.

Table 22: Adaptation MSMEs/Technologies to be supported

MSME	Technology	Number of Units	Location within Sierra Leone	Number of Beneficiaries
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ColdHubs[220] <sup>189</sup>	Cold storage facilities for farmers markets	3 storage units of 3tons each	Freetown, Kabala and Kenema	1,800
ESOKO	Automated solutions to disseminate critical climate change information to farmers in Sierra Leone	44,000 units	All country	44,000
EasySolar	Solar freezers and solar water pumps	60 Koolboks solar freezers (210L and 540L) for women/youth own MSMEs 40 water pumps	Kenema, Kambia, Pujehun, Kailahun and Bonthe	600

? ColdHubs proposes to deploy, operate, and maintain three (3) units of the ColdHubs, each holding and cooling down three (3) tons of fresh fruits and vegetables per day, in three (3) high potential fresh fruits and vegetables consumption clusters of Sierra Leone: (1) Congo Produce Market, Freetown; (2) Central Market, Kabala, Koinadugu District and (3) Central Market in Kenema. The 3 sites are daily outdoor wholesale and retail, food markets dominated, by more than 5,000 smallholder farmers, wholesalers and retailers of fresh fruits and vegetables. ColdHubs will manage and maintain the cold rooms, offering users a simple pay-as-you- store payment model. Smallholder farmers, retailers and wholesalers will pay the equivalent of US\$0.50 to store and preserve one 20kg plastic crate of fresh produce inside the cold room per day. Through the deployment of the three (3) ColdHubs, ColdHubs will: (i) Serve an estimated 300 smallholder farmers, retailers and wholesalers of fresh fruit and vegetables; (ii) increase the outcome of the household of the 300 smallholder farmers, retailers, and wholesalers by 50%, impacting the live of 1,800 people; (iii) save around three (3) tons of food per day/hub (total of nine (9) tons of food per day in the 3 ColdHubs) that can be made available to the Sierra Leone population and (iv) created six (6) new jobs for women as Hub Operators.

? ESOKO is ready to roll out its reseller model for the Sierra Leone, through Jamor Support Consulting, a local technology firm based in Sierra Leone, that will act as a representative of ESOKO in that market. ESOKO believes that the reseller model is the most cost-effective way of expanding its services to other markets. In fact, ESOKO has been approached in 2019 by Jamor Support Consulting, a local technology firm based in Sierra Leone to act as a representative of ESOKO in that market. However due to lack of funding, this company was unable to undergo ESOKO reseller licensing procedures. The financing provided by the GEF/UNIDO project will off-set the reseller licensing costs enabling the reseller to implement ESOKO model in the country. ESOKO automated solutions will be used to profile and disseminate critical climate adaptation information to an initial 20,000 farmers in Sierra Leone, with the potential for this number to increase 20% in subsequential years ? totalising

44,000 through the GEF/UNIDO Adaptation Project duration. The Digital Information services will cover: rainfall forecasts; the onset and end of the rainy season; climate smart agronomic tips; market price alerts in the 16 districts of Sierra Leone as well as agro-advisories intended to enable the farmers to understand and apply received information in the best possible way as well as health and nutritional tips. In addition, the proposed business will also generate 25 direct jobs plus additional 60 short-term employment. ESOKO will establish a close link with the SLMet platform created under this project for the provision of the climate information on its platform.

? Easy Solar ?The company proposes to expand and accelerate the distribution of two adaptation technologies ? solar freezers and solar water pumps ?, focusing primarily on women-owned MSMEs and farming communities in the districts of Kenema, Kambia, Pujehun, Kailahun and Bonthe. For that EasySolar will: (i) make these adaptation technologies accessible to MSMEs located in remote areas utilising its large distribution network; (ii) ensure affordable payment plans using pay-as-you-go models technology to facilitate credit lines; and (iii) increased awareness and demand for these products through a strong value proposition centred on a warranty, responsible after-sales support and technical specs and through investing in community engagement and educational campaigns. This business proposal will benefit directly 100 vulnerable people and indirectly 600 vulnerable people in Sierra Leone by improving their living conditions as a result of access to productive use appliances on financing (more available income than upfront cash investment) and increased MSMEs income; as well as through the modification of behaviour through capacity building and increased on the use of productive use appliances that can increase the economic activities outputs.

307. The implementation of these business proposals, its direct and indirect impacts and lessons learned will be closely followed by the PMU and shared with the public through the Adaptation Innovation Website. ESOKO, ColdHubs and Easy Solar will be asked to share this information with the PMU as well as to prepare videos on their experiences and lessons learned for dissemination purposes.

308. In case at the start of the project the Adaptation Innovation Platform decides to support other technologies/companies, new pilot projects will be selected through a tendering process.

## **Outcome 2.2 Adaptation MSMEs secure funding to grow and scale-up their operations and projects**

309. Building on activities conducted under Output 2.1, additional support will be provided to selected enterprises under the Outcome 2.2. As highlighted in the baseline scenario, MSMEs lack access to finance. Hence this outcome will focus on creating the conditions to help overcome these barriers.

### **Output 2.2.1: 50 successful MSMEs, entrepreneurs and start-ups are trained and coached through the Advanced Acceleration Programme to receive early-growth financing and overcome the Commercialization Valley of Death (aiming at 35% women participation)**

310. An Advanced Accelerator Program will be provided to 50 MSMEs, entrepreneurs and start-ups for progressing into the next phase of business growth and in overcoming product-related market barriers. These enterprises will be chosen to receive training to help them grow to develop localized business models ensuring high replicability and scaled deployment with adaptation benefits. Selected enterprises will also receive early-growth financing support in order to have an overall effect of driving adaptation

innovations towards formalisation and scaling up. The Advanced Acceleration will help enterprises overcome the Commercialization and scaling-up Valley of Death. This means that they will be able to develop a commercial production system which integrates product technologies, manufacturing technologies, the establishment of the market network, and the restructuring of the organisation in order to establish a production system. This Commercialization and scaling-up Valley of Death plagues technologies that have already demonstrated proof of concept but still require large capital infusions to demonstrate that their design and manufacturing processes can be brought to full commercial scale (e.g., a manufacturing facility). To move a technology from the pilot/demonstration stage to the commercialization stage, the central challenge is accumulating enough capital for the commercialization, production, and manufacturing processes associated with demonstration and market launch[221]190. This programme will help them overcome these barriers by training MSMEs, entrepreneurs and start-ups in the last stage of the Entrepreneurial process (see Figure 37) and by providing financial support through the Climate Adaptation Venture Fund.

311. The Advanced Accelerator programme offered to selected entrepreneurs participating in the Sierra Leone Adaptation Incubator/Accelerator will be focused on providing tailored and needs-based individual support, including some group training, mentoring and coaching.

**Activity 2.2.1.1: Launch an Open Innovation Adaptation call for the Advance Accelerator Programme and select target entrepreneurs, start-ups and MSMEs for the Advanced Accelerator Programme**

312. Following the same procedure to the Incubator/Accelerator Programme (Activity 2.1.3.1), the open call for proposals for the Advanced Accelerator Programme, will be launched and posted on the Adaptation Innovation Website and shared through other outreach and communication channels. Efforts will be made to encourage women participation aiming at targeting 35% women-led applications.

313. The selected cohort group will undergo the programme activities (Activity 2.2.1.2 and 2.2.1.3). This process will be implemented by the selected incubators/accelerators that will deliver the Advanced Accelerator Programme. The PMU will oversee the process and should be kept informed about it. Once a selection process is carried out, the incubator/accelerator responsible should generate a report to the PMU.

**Activity 2.2.1.2: Conduct one cycle per year of the Advanced Accelerator Programme**

314. Approximately two (2) start-ups/MSMEs will be selected to receive support through this programme per year, for a total of 50 throughout the project period. In the first year, the necessary materials for the Sierra Leone Adaptation Incubator/Accelerator will be prepared such as the website, the programmes, others. Thus, it is not expected that competitions will be carried out during that first year of the 7 years of the project implementation.

315. The Advanced-Accelerator Programme support will consist of training in advanced business growth and commercialization support, investment readiness, market readiness, and technology

readiness. The training sessions within the Advanced Accelerator programme will include the last stage in the entrepreneurial process<sup>[222]</sup><sup>191</sup> depicted in Figure 37.

316. The last stage in the entrepreneurial process relates to that which facilitates the continued survival of the firm, which may lead to its expansion to some optimum size determined by the market demand. Growth is critical to entrepreneurial success and distinguishes the entrepreneurial venture from the small business. There are five indicators for growth: financial, strategic, structural, organizational and image indicators as briefly described below:

Financial growth relating to increases in turnover, costs and investment needed to achieve the turnover, profits, business assets and all related value added.

Strategic growth relating to changes taking place through mergers and acquisitions, exploiting of new markets, new products and new opportunities.

Structural growth relating to the changes taking place in the way the business organizes its internal systems with regard to managerial roles, increasing employees and their responsibilities, reporting relationships, communication links and increased use of internal systems to control resources.

Organizational growth relating to changes taking place in terms of processes used, the organization's culture, management attitudes towards staff, as well as changes regarding the entrepreneur's role as the business moves from small to large.

Image growth which relates to the changes taking place in the small business such as becoming more formal (e.g., having formal business premises), moving to newly built premises, redecorating the premises and moving to a new environment.

317. At the end of the programme, the start-ups and MSMEs will undergo a test to verify that they have acquired the capacities. The test will also collect feedback from the participants on the programme, so that the feedback can be used to revise and improve the programme as necessary.

318. The training will be delivered by the incubator/accelerator running the programme. The incubator/accelerator should report to the PMU on the implementation of the programme, including information on the achieved skills by the cohort group as well as the different TPS that the cohort group is looking to provide in the Sierra Leone.

#### **Activity 2.2.1.3: Provide funding to companies to overcome the Commercialization and scaling-up Valley of Death**

319. As mentioned previously, to help MSMEs, entrepreneurs and start-ups overcome the later-stage of the Commercialization and scaling-up Valley of Death<sup>203</sup>, financing support will come from the Climate Adaptation Venture Fund (CAVF). This CAVF will provide patient and affordable capital to adaptation ventures in this stage so that they have the time to grow and scale their businesses and be connected to follow-on investor have in order to have an overall effect of driving adaptation innovations towards formalisation and scaling up and overcoming the Commercialization and scaling-up Valley of Death (See Output 2.2.3 for further information of the CAVF).

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320. Output 2.2.3 will define the Climate Adaptation Venture Fund available through the projects to the MSMEs/entrepreneurs/start-ups, as well as the criteria/conditions to access and the process that will be used for its attribution. All these mechanisms and procedures will be presented and approved by the Adaptation Innovation Platform before they become available to the MSMEs, entrepreneurs and start-ups.

321. The provision of funding (early-growth) will be decided by the PMU and incubator/accelerator, based on the procedures, guidelines that will also be developed in Output 2.2.3. As per the other activities within the programmes of the Sierra Leone Adaptation Incubator/Accelerator, the incubators/accelerators will have to report to the PMU on the attributed funding during the Advanced-Accelerator Programme.

**Output 2.2.2: 20 MSMEs, entrepreneurs and start-ups receive investment facilitation support in the Post-Acceleration Programme for projects that deliver climate adaptation technologies and solutions at scale (aiming at 35% women participation)**

322. In many instances, high-impact and high-market potential adaptation technologies fail due to lack of access to financial resources. Recognizing this need, support will be provided to 6 early-stage enterprises in addressing the financing gap. Therefore, alumni enterprises that participate in the Advanced Accelerator, as well as others that do not participate but have high replication and scaling up potential, will benefit from tipping-point investment facilitation support services. Support will be provided to improve their business skills and investor pitch and connecting them to potential business partners, financiers or investors.

323. Within the Post-Accelerator Programme MSMEs/start-ups will be able to receive:

Post-Acceleration capacity building and training (Activity 2.2.2.2).

Connect with investors and financiers through Investor Connect (Activity 2.2.2.3).

Receive investor facilitation services from PFAN (Activity 2.2.2.5).

**Activity 2.2.2.1: Launch an Open Innovation Adaptation call for the Post-Acceleration Programme and select target entrepreneurs, start-ups and MSMEs (aiming at 35% women participation) to go through the Post-Acceleration phase**

324. Using the procedures and application materials prepared in Activity 2.1.2.3 and similarly to that activity, the open call for proposals for the Post-Accelerator Programme will be launched, posted on the Adaptation Innovation Website and shared through other outreach and communication channels.

325. The selected cohort group will undergo the programme activities (Activity 2.2.2.2 and 2.2.2.4). This process will be implemented by the selected incubators/accelerators that will deliver the Post-Accelerator Programme. The PMU will oversee the process and should be kept informed about it. Once a selection process is carried out, the incubator/accelerator responsible should generate a report to the PMU.

**Activity 2.2.2.2: Conduct one cycle of the Post-Acceleration Programme per year**

326. Through the Post-Accelerator Programme, the intention is to assist a total of 6 Adaptation MSMEs, entrepreneurs and start-ups to be able to raise funding, find markets, and build partnerships. One annual cycle of the climate change adaptation-oriented technology innovation and

entrepreneurship Post-Accelerator Programme will be conducted in Sierra Leone. As the GEF/UNIDO Adaptation Project will run every year from the second year onwards, it is estimated that it will support **between 6-7 MSMEs per year, totalising 20** over the 6 years. In the first year, the necessary materials for the Sierra Leone Adaptation Incubator/Accelerator will be prepared such as the website, the programmes, others. Thus, it is not expected that competitions will be carried out during that first year of the 7 years of the project implementation.

327. Support will be provided to improve their business skills and investor pitch and connecting them to potential business partners, financiers or investors. For example, guidance will be provided to help them grow and expand their services so that they can access SMEDA services such as the SMEDA MSME fund. SMEDA's mandate will be to guide them to secure registration that is recognized by SMEDA and other Financial Service Providers (FSPs). Once they are officially registered, the MSMEs can have access to SMEDA and MSME financing provided by other FSPs. In particular, the accelerations will inherently steer them towards finding adaptation solutions that can be integrated into their operations and services. In this way, the MSMEs will be able to access financing facilities as recognized enterprises, in particular the SMEDA MSMEs low interest financing product currently under development

328. The formulation of business partnerships with international and regional MSMEs will be explored. Business growth and investment facilitation services will ensure that identified MSMEs will be nurtured to develop into commercial businesses with scalable solutions for large-scale deployment of adaptation solutions

329. The acceleration of these technology innovations, business growth and investment facilitation services will ensure development of economic sound businesses as well as creation of effective market linkages for deployment of adaptation technologies, products and services. The project will leverage UNIDO's strong connection of adaptation MSMEs and their projects to Private Financing Advisory Network (PFAN) (REEEP) who will offer one-on-one mentoring and targeted introductions to climate-focused investors at national, regional and global levels. The project will also link enterprises with Climate-KIC, the CTCN and the African Enterprise Challenge Fund (AECF) to provide experts to support business plan development, post-acceleration technical trainings and seed funding. The project will blend the CTCN and AECF financing with that of commercial lenders so that adaptation MSMEs can receive prioritized financing for scaling up.

330. The training will be delivered by the incubator/accelerator running the programme. The incubator/accelerator should report to the PMU on the implementation of the programme, including information on the achieved skills by the cohort group as well as the different TPS that the cohort group is looking to provide in the Sierra Leone and to what beneficiaries.

331. Business facilitation and partnership establishment will be provided through the implementation of Activities 2.2.2.3, 2.2.2.4, 2.2.2.5 and 2.2.2.6 described below.

**Activity 2.2.2.3: Connect 20 MSMEs, entrepreneurs and start-ups with potential investors through national investment facilitation events (Investor Connect) for Accelerator alumni**

332. Taking advantage of various investment and promotion opportunities in Sierra Leone, direct support for **20** Adaptation MSMEs, entrepreneurs and start-ups will allow them to connect with potential investors, financiers, and tech scouts of large corporations. **These 20 MSMEs are the ones that**

are part of the Post-Acceleration Programme. To this end, half-day Investor Connect events will be co-organized regularly with partners including corporations and government agencies to highlight opportunities for investment, loans, grants, technology adoption and partnerships. Investor Connect aims to bridge the gap between the MSMEs/start-ups providing adaptation innovation TPS and investors that can support market-based dissemination and scale-up of the TPS. Through this networking opportunity, Accelerator Programme Alumni from any of the three stages of the Sierra Leone Adaptation Incubator/Accelerator (Incubator/Accelerator, Advanced-Accelerator and Post-Accelerator) will introduce their innovations to the investment community, and investors gain exclusive access to credible adaptation technology solutions with high-impact potential.

333. In total, it is foreseen that one Investor Connect event will be conducted every 2 years, starting the 2<sup>nd</sup> year of the Sierra Leone Adaptation Project, thus adding up three (3) events. These events will be organized by the incubator/accelerator running the programme. In total, the events aim at connecting 20 MSMEs, entrepreneurs and start-ups with potential investors (i.e., 7 MSMEs per event in average).

334. Newsflashes will be produced from these Investor Connect events and included on the Adaptation Innovation Website. The incubator/accelerator will be responsible for this task and updating the PMU on these events.

#### **Activity 2.2.2.4 Provide funding to successful companies to scale up deployment of their technologies**

335. As mentioned previously, to help MSMEs, entrepreneurs and start-ups overcome the later-stage of the Commercialization and scaling-up Valley of Death<sup>[223]</sup><sup>192</sup>, financing support will come from the Climate Adaptation Venture Fund (CAVF). This CAVF will provide patient and affordable capital to adaptation ventures in this stage so that they have the time to grow and scale their businesses and be connected to follow-on investor have in order to have an overall effect of driving adaptation innovations towards formalisation and scaling up and overcoming the Commercialization and scaling-up Valley of Death (See Output 2.2.3 for further information of the CAVF).

#### **Activity 2.2.2.5 Engage Private Financing Advisory Network (PFAN) to connect with MSMEs/start-ups engaged in the Post-Acceleration Programme**

336. To ensure the full growth of these enterprises into commercial businesses with mature products, ready for large-scale deployment of adaptation-oriented TPS and ability to access and absorb commercial finance, it is envisaged to further link enterprises successfully transitioned through the development and business growth phase to the Private Financing Advisory Network (PFAN).

337. The PFAN is a global network of climate and clean energy financing experts, which offers free business coaching and investment facilitation to entrepreneurs developing climate and clean energy projects in emerging markets. To date PFAN has supported 176 projects and leveraged around US\$2 billion in total investment.

338. PFAN goals are to build clean energy markets one business at a time, mitigate Climate Change and mobilise private investment in support of the Paris Agreement on Climate Change and the Sustainable Development Goals. Initiated by the UNFCCC and the Climate Technology Initiative in

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2006, PFAN is hosted jointly by the UNIDO and the Renewable Energy and Energy Efficiency Partnership.

339. Clear synergies and links will be established with PFAN in the proposed GEF/UNIDO Adaptation project. At the PPG stage, PFAN demonstrated interest in supporting adaptation MSMEs/start-ups through the provision of its services. For that, the PMU and PFAN will launch open calls for the adaptation MSMEs, entrepreneurs and start-ups alumni within the Post-Acceleration Programme.

**Activity 2.2.2.6 Engage CTCN and AECF to connect with MSMEs/start-ups engaged in the Post-Acceleration Programme**

340. It is envisaged to further link enterprises successfully transitioned through the development and business growth phase of the Global Lab Instrument CRAFT developed by Lightsmith Group. CRAFT is a growth equity fund (that has received funds from the Global Environment Facility (GEF) and from Nordic Development Fund (NDF)) that, together with an accompanying Technical Assistance Facility, help companies ? like weather analytics, catastrophe risk modelling services, and drought resilient seed companies, among others ? expand into new sectors and geographic markets. CRAFT target companies in countries already experiencing substantial economic losses from climate change.

341. The project will link enterprises with the CTCN and the African Enterprise Challenge Fund (AECF) to provide experts to support business plan development, post-acceleration technical trainings and seed funding.

342. The project will explore the possibility of inviting and establish cooperation mechanisms with Climate-KIC, Climate Innovation Centres (CIC) and the CTCN for cross-referencing MSMEs as well as to share lessons from successful adaptation MSMEs they have supported in the Sierra Leone [224]193. The project will also work with the ASAP project. Collaboration with ASAP Project will provide an opportunity for successful MSMEs, entrepreneurs and start-ups identified at these adaptation-focused accelerators, to plug into a regional and global network of businesses.

343. Clear synergies and links will be established by the PMU with the above-mentioned projects and organizations to help adaptation MSMEs, entrepreneurs and start-ups alumni access their services. Also, the PMU will engage with the international and regional incubators/accelerators and assess how this experience sharing can be organized. Due to the number of programmes within the Sierra Leone Adaptation Incubator/Accelerator that will be carried out during the project, it is envisaged that these organizations will be asked to prepare videos on their experiences and lessons learnt for dissemination purposes. The PMU will subcontract a team to produce the videos and materials to work with the international and regional incubators/accelerators.

344. The PMU will keep track of the Sierra Leone Adaptation Incubator/Accelerator alumni that successfully access the services or informs that a collaboration opportunity has been formalized with any of those projects and/or organisations.

**Activity 2.2.2.7: Develop exit strategy from the SL Adaptation Incubator/ Accelerator**

345. In the last phase of the project implementation, an exit strategy will be developed, based on the lessons learned and gained experience. This exit strategy will define the details of transfer and further

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continuation of the DRC Incubator/Accelerator Programme and will ensure the sustainability of the project. The PMU will be responsible for the exit strategy and will present the final strategy to the PSC for their approval.

**Output 2.2.3: The Climate Adaptation Venture Fund is established and operationalized to financially support at least 20 climate change adaptation enterprises and to de-risk and leverage public/ private investment**

346. This output aims to address the critical funding gaps that early-stage adaptation MSMEs/start-ups face. For that, a sustainable financial mechanism will be designed and provided to prioritize climate adaptation and resilience actions, including financing support for the MSMEs/start-ups that have entered the Sierra Leone Adaptation Incubator/Accelerator programmes. In addition, the CAVF will also provide financial support for other companies identified under Output 2.1.4 to establish businesses in Sierra Leone. Also, the strategy for the establishment, resource mobilization and operational mechanism, including procedures for disbursements will be developed.

347. The CAVF fund will be designed and managed by the PMU with supervision from EPA. AECF will guide the design of the fund.

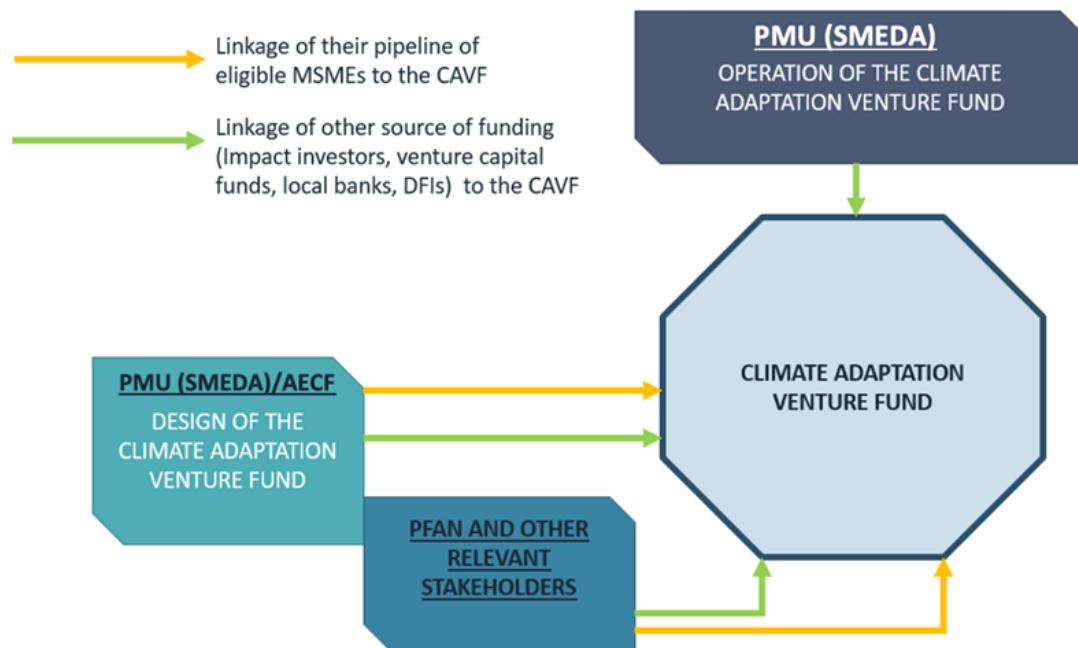


Figure 38: CAVF Ownership structure

**Activity 2.2.3.1: Design the Climate Adaptation Venture Fund to enable de-risking and leverage public and private investment towards these adaptation technologies**

348. A Climate Adaptation Venture Fund (CAVF) that would enable de-risking and leverage of public and private investment with the aim of supporting (by e.g., seed funding or dispersing grants) the accelerated adaptation MSMEs, entrepreneurs and start-ups whose solutions help improve Climate Change adaptation (and depending on the adopted TPS potential for reducing GHG emissions) of the country at the same as improving food, energy and water access, promoting cleaner generation means, reducing energy and water consumption, among others will be designed or adapted to an existing mechanism that responds to the project needs. Special focus will be given to these issues. The project will work with interested financial institutions in Sierra Leone to adapt existing financing tools to support climate adaptation and resilience operations. As mentioned previously, two distinct financial barriers impede MSME, entrepreneurs and start-up progress in the innovation technology field. These obstacles are known as the early-stage 'Technological Valley of Death' and the later-stage 'Commercialization and scaling-up Valley of Death'[225]194. See Figure 39 below.

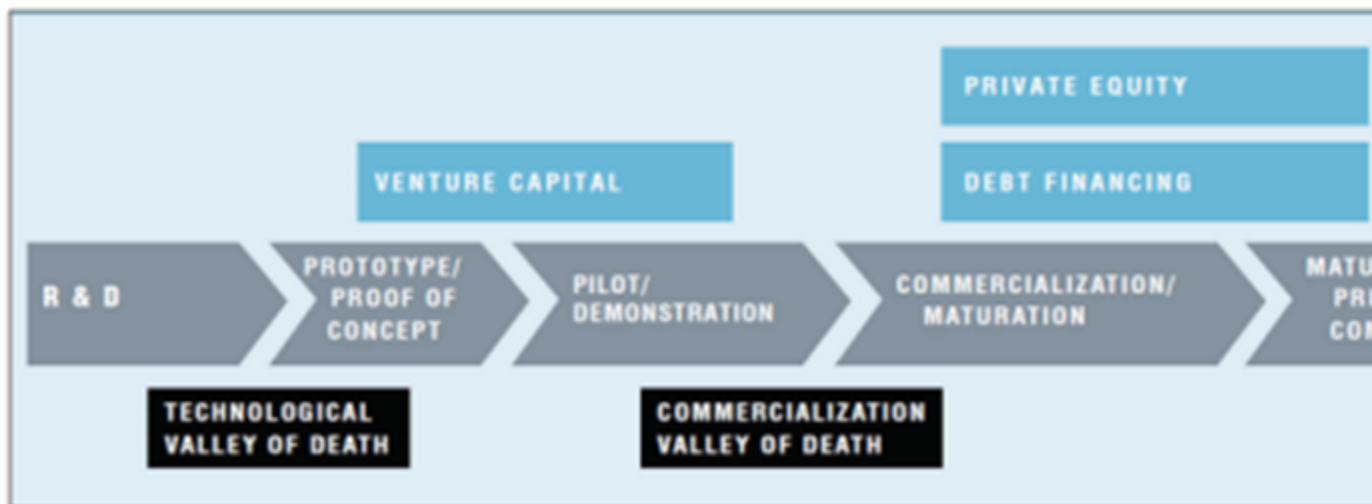


Figure 39 valley of death

349. The fundamental difference between both valleys is their activities. Where, in the technological Valley of Death, it is about the research, development, and innovation of the product, the commercialisation Valley of Death is about the development of a commercial production system. This includes testing and validation of the manufacturing, as well as demonstrating manufacturing to customers. This second valley integrates product technologies, manufacturing technologies, the establishment of the market network, and the restructuring of the organization in order to establish a production system. The conclusion is that support to cross the Valley of Death is not only about

technology (product/manufacturing), but it should also address organizational and market issues[226]195.

350. Thus, the aim of the CAVF is to provide seed-funding as well as long-term financing for high-potential adaptation and resilience-related start-up/MSMEs for business expansion and scaling up through de-risk investment from other financial sources through grants, refundable grants, equity and guarantees depending on the needs of the enterprises.

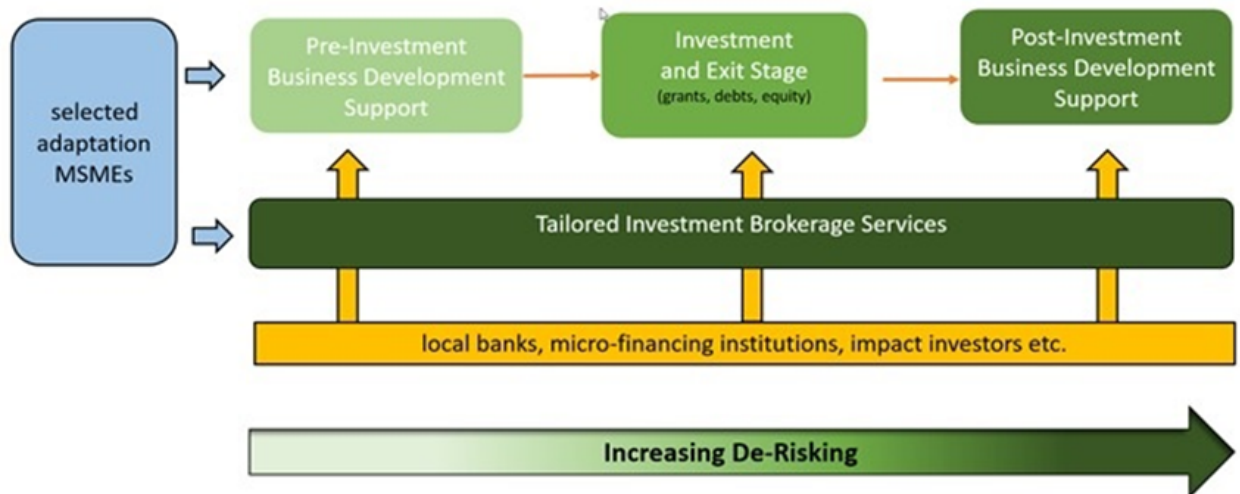
351. The project will support SMEDA's new microfinance product in addition to any existing MF products to ensure the successful graduation of MSMEs into commercial businesses. A strategic alliance with SMEDA in this project will facilitate tailored technical and financial services to MSMEs. The project will work with other innovation and adaptation innovation programmes such as ASAP for financing the scaling up and deployment of MSME ideas.

352. Innovation support will be provided via blended finance by linking SMEDA with regional ASAP, AECF and PFAN (REEEP) programs. Blending will be achieved by providing seed capital and loans alongside development finance and commercial capital. The blended finance will reduce the implementation risk of adaptation-oriented technologies and is expected to create a conducive investment climate to attract large-scale investments and galvanize funding for large-scale deployment and replication. An evaluation committee will be identified to take decisions on the blended finance to be used. The Terms of Reference for this evaluation committee will be drafted by the PMU once the CAVF is defined and will further ensure the committee's alignment with UNIDO's standards on grant management through the provision of Grant Manuals.

353. The PMU will define the CAVF with support from the EPA and PFAN and guidance from AECF. The PMU will then manage the CAVF with oversight from EPA and the evaluation committee. At the end of the project the CAVF will either continue to be managed by SMEDA (where the PMU will be established) or passed to EPA, according to the decision taken by the Adaptation Innovation Platform, ensuring continuity of the management of the fund when this project comes to an end.

354. Furthermore, this Climate Adaptation Venture Fund will provide support investments brokerage services by reaching out to financiers in the ecosystem. Two financial experts subcontracted by the CAVF will be working with MSMEs coming from the Sierra Leone Accelerator programme and link them to various investors and support facilities and help them with the commercialization and scaling-up valley of death. As an example, if a company that comes out of the incubator is looking for 50,000US\$ debt and reaches out to a bank that agrees to finance, 35,000US\$ at 7% interest, the CAVF can then provide the remaining 15,000US\$ at 0.5% interest to make the debt manageable. See also Figure 40 below as an example:

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**FIGURE 40: INVESTMENT BROKERAGE SERVICES**

355. The design of the Adaptation Innovation Venture Fund foresees the active involvement and participation of domestic financial institutions as well as possible interaction with multilateral/regional development banks who can provide seed funding, credit and/or guarantees schemes to support adaptation-focused entrepreneurs, start-ups and MSMEs. The project will work with existing Financial Service Providers (FSPs) including commercial banks, MFIs and funds who can provide seed funding, credit and/or guarantees schemes to select adaptation-focused entrepreneurs and that demonstrate interest to participate in the project.

356. A preliminary stocktaking of existing finance institutions shows that there is an infrastructure and willingness of the latter to engage in financing innovative business solutions:

- a. Apex bank[227]<sup>196</sup> is a commercial bank headquartered in Sierra Leone with several regional branches that has a focus on rural finance. They have agribusiness products and an expansive reach throughout Sierra Leone.
- b. Eco Micro bank currently helps over 2 million low-income individuals through support to other Microfinance Institutions with one of the bank's core sectors being loans to agriculture, forestry and fishery sectors.
- c. Village Capital supports agriculture entrepreneurs and innovators to have the potential to raise productivity for small farmers and food security, improve and secure the value chain, and strengthen links to markets, all while generating job growth and local economic development. Village Capital also initiated an innovative programme, ViCap Communities Africa, that aims at accelerating the flow of capital to early-stage companies in sub-Saharan Africa including Sierra Leone.
- d. BRAC has already benefitted thousands of women and entrepreneurs with micro-loans for groups and small enterprise loans for individuals.



e. Union Trust Bank (UTB) is the only indigenous private bank in Sierra Leone which targets local MSMEs, and women owned businesses in agriculture and energy.

f. In addition to the institutions listed, we also received responses from United Nations, IFAD, European Union (EU), AfDB. They do not provide financial products but are implementing projects, some of them addressing climate change related areas and supporting MSMEs. They expressed their interest in providing finance for climate change adaptation MSMEs or entrepreneurs in Sierra Leone. Of the 11 financial institutions that responded to the online questionnaire, four (4) claimed to have experience working in the climate change adaptation market and seven (7) claimed to have no previous experience in the climate change adaptation market. Furthermore, a number of multilateral funds, bilateral innovation fund initiatives (such as the MUNAFA, AECF), government institutions, cooperatives and MFIs were also identified as part of the mapping exercise as a possible source of funding for the MSMEs/start-ups and thus, identified as potential good partners to be included in the financial mechanism to be set up by the project.

357. Also, the project will blend the CTCN and AECF financing with that of commercial lenders so that adaptation MSMEs can receive prioritized financing for scaling up.

358. Due to numerous years of experience and work with rural clients, these FSPs as well as others that will be targeted will have sufficient core capacity for training on adaptation, management of new credit lines (brought by the revolving fund) and provision of services targeted to rural-focused MSMEs and cooperatives. They will also be trained to have adaptive financing products for adaptation MSMEs considering climate risks (see Output 3.1.2 and Output 3.3.1).

359. During the PPG, a detailed mapping of existing local financial service providers (FSPs) ? both private and public - and their products and services was conducted (see Annex P).

360. These entities will be involved in the design of the venture fund to include on the ground knowledge and networks. Innovative financing mechanisms, including credit guarantees, lending products and suitable line(s) of credit that help MSMEs to leverage financing to de-risk and scale-up operations, will be explored. Table 23 shows the most common direct and indirect financial instruments that could be used in the design of the financial mechanisms to finance adaptation TPS that can be provided to MSMEs. Special attention will be put on women-led enterprises, and the mechanism will be designed in a way that ensures that women can equally access financial support. In the first year of project implementation, the details of the financial mechanism will be designed.

**TABLE 23: MOST COMMON DIRECT AND INDIRECT FINANCIAL INSTRUMENTS**

Type	Instrument	Definition	Examples
<b>DIRECT</b>	Grants	A transfer made in cash, goods or services for which no repayment is required.[228]197 it constitutes a direct subsidy to private companies.	Technical assistance Grants/subsidies Grant elements in loans
	Debt	Transfers for which repayment is required[229]198	Loans Credit lines (loan to an intermediary for on-lending) Syndicated loans

	Equity	Investments that involve the ownership of shares in a company. It can be made either directly or through an investment fund.	Public equity Private equity
	Quasi-equity	Instruments with equity or debt features that have a lower repayment priority in case of liquidation than debt, but higher than equity.	Debt-based: Subordinated or junior loans; mezzanine loans Equity-based: Preferred stocks; Convertible bonds
	De-risking	Instruments intended to reduce the risk profile of the private sector investment with the idea of facilitating finance.	Loan guarantees Investment guarantees (political and macroeconomic insurance)
INDIRECT	Market mechanisms	Key feature of market mechanisms (or market-based instruments) is that a price signal is used to promote the production of a certain service or good, or to reduce it (in this case promote adaptation measures). They also can also be used to raise money for adaptation.	Adaptation credit mechanism Carbon market (mitigation)
	Bonds	Fixed income financial instruments used to raise money, in this case, for adaptation.	Catastrophe bonds (e.g., Mexico) World Bank green Bonds
	Internalizing adaptation costs	private investment on adaptation can be increased by encouraging business likely to be affected by climate change to adopt measures to reduce their vulnerability.	Awareness-raising Advice and information Accurate climate modelling legislation
	Technology development and transfer	Supporting research and pilot projects can help to lower the risk and deployment costs of adaptation techniques. Also includes dissemination of the technology.	Research Pilot projects

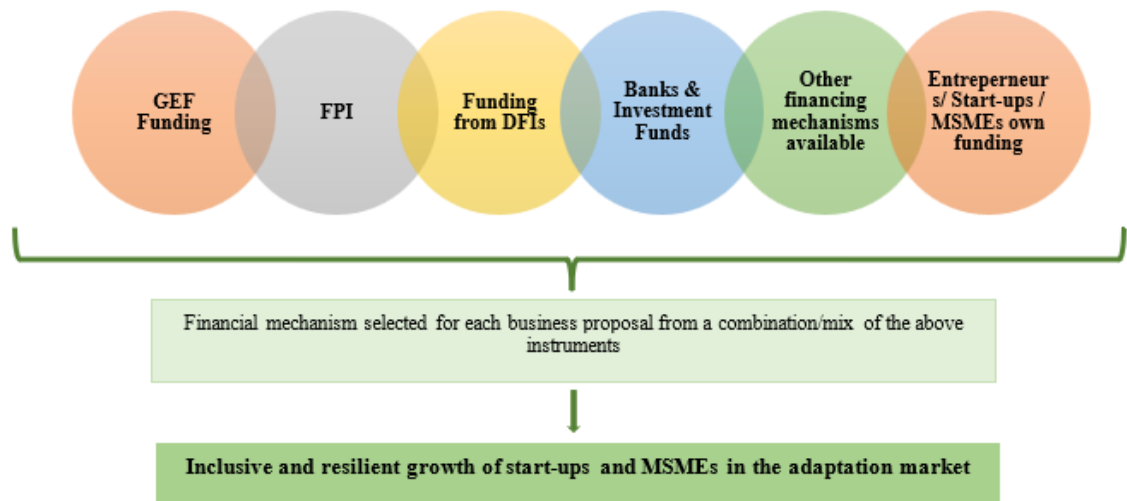
*Note: This table is also presented in the Baseline Report (Annex P)*

361. The idea is that the financial mechanism will be designed to make use of: (i) the GEF grant that will be available for leveraging financing from national, regional and international platforms; (ii) other instruments already available in the country with whom the project can create synergies; and (iii) the entrepreneur/start-up/ MSME own funding.

362.

363. Figure 41 shows the relations between the different co-finance sources that can be used in the design of the proposed financial mechanism.

### **Inclusive and resilient growth of start-ups and MSMEs in the adaptation market**



**FIGURE 41: RELATIONSHIP OF THE DIFFERENT SOURCE OF FUNDING TO BE CONSIDERED IN THE DEVELOPMENT OF THE FINANCIAL MECHANISMS**

364. When designing the financial mechanism, the criteria and the different caps that should be considered in the definition of the financial mechanism will be defined and agreed. It is envisaged that a different mix of financial products may be available for the different types of start-ups and MSMEs (early stage, growth stage and mature stage) and available for the different sectors of activity in which they will be operating (WEF). Then depending on the business proposal needs, the financial mechanism/mix of financial products will be adjusted.

365. In general, it is expected that under the CAVF:

The MSMEs and star-ups requesting for finance under the Sierra Leone Adaptation Incubator/Accelerator, under the Advance Acceleration and Post Acceleration programme will contribute with at least 10% the total investment of their business proposal (sourced by his/her own funds or through a loan from a bank). For MSMEs and start-ups requesting finance under the Incubator/Accelerator programme, they need to contribute with at least 2% of the total investment.

GEF grant: can contribute up to 30% of the total investment, varying from business proposal to business proposal, and its contribution can be in the form of a grant or technical assistance services to support the development/establishment of the project.

Grants and loans provided by other institutions (such as banks and Investment funds, such as FPI, AECF etc): They will provide grants and loans according to a specific set of criteria to be defined at the start of the project. For the provided loans, lower interest rates than the ones available on the market will be provided.

366. Once designed, the financial mechanism will be presented to the Adaptation Innovation Platform for validation before it starts to be operationalised within the proposed project. The setting up of the financial mechanism will be subcontracted by the PMU and should involve intense stakeholder consultation with the entities above referred.

#### **Activity 2.2.3.2: The Climate Adaptation Venture Fund becomes available**

367. Once designed, the financial mechanism supporting local adaptation MSMEs, entrepreneurs and start-ups will be ideally operationalized annually from the second year onwards. The Fund's main purpose is help increase access to finance for adaptation MSMEs.

368. The provision of financing products will be requested by the incubator/accelerator delivering the Sierra Leone Adaptation Incubator/Accelerator programme to the PMU before the start of each competition. The PMU through the evaluation committee and with oversight from EPA will analyse the request and connect the incubator/accelerator with the Fund Manager to analyse the request and provide the available finance according to the guidelines for implementing the financial mechanism.

#### **Activity 2.2.3.3: Develop exit strategy for the Climate Adaptation Venture Fund**

369. In the last phase of the project implementation, an exit strategy will be developed, based on the lessons learned and gained experience. This exit strategy will define the details final ownership and opportunities of scale up of the fund through multilateral funding windows, such as the Green Climate Fund. The PMU will be responsible for the exit strategy and will present the final strategy to the PSC for their approval.

Table 24: table that summarises the outputs and activities of PC2

#### ***PC2: Growth and scale-up support for adaptation MSMEs in water, agriculture and energy sectors***

Under PC2, adaptation MSMEs will receive specialized training and technical assistance to help them understand and access financial services such as microfinance products for improving their innovations. Successful adaptation MSMEs will receive specialized business growth support and result based seed funding to grow their businesses. Through these interventions, adaptation MSMEs will improve their businesses and secure funding to scale-up the delivery of technologies, products and services in the water, agriculture and energy sectors.

#### ***Outcome 2.1: Adaptation MSMEs grow their businesses and operations***

***Output 2.1.1: 150 MSMEs, entrepreneurs, start-ups are trained on climate adaptation topics to increase their capacities to understand climate risks and vulnerabilities and to identify business opportunities for climate change adaptation during the Pre-Accelerator Programme (aiming at 35% women participation)***

<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 2.1.1.1 Design the Pre-Acceleration Programme	Climate-KIC
Activity 2.1.1.2 Carry out at least two (2) rounds of train the trainers? programme for incubators/accelerators	Climate-KIC
Activity 2.1.1.3 Prepare the platform to launch the Pre-Accelerator Workshop for MSMEs, entrepreneurs and start-ups	PMU, IT Subcontractor, and selected incubators/accelerators
Activity 2.1.1.4 Outreach and communication	PMU and selected accelerators, with support from other stakeholders
Activity 2.1.1.5 150 MSMEs, entrepreneurs and start-ups register in the Pre- Accelerator Workshop	Selected incubators/accelerators and the PMU
Activity 2.1.1.6 The Pre-Accelerator Workshop is launched	PMU and selected accelerators with support from Climate-KIC

***Output 2.1.2: Four (4) existing business development accelerators are trained to run the annual cycles of climate change adaptation-oriented technology innovation and entrepreneurship competition-based accelerators***

<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 2.1.2.1 Develop Sierra Leone Adaptation Incubator/Accelerator Programmes	Climate-KIC
Activity 2.1.2.2 Train incubators/ accelerators run the annual competitions of the different programmes under the Sierra Leone Adaptation Incubator/Accelerator	Climate-KIC

***Output 2.1.3: 150 high-impact adaptation MSMEs are trained and coached through the Incubator/Accelerator Programme to overcome the Technological valley of Death (aiming at 35% women participation)***

<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 2.1.3.1 Launch an Open Innovation Adaptation call for the Incubator/Accelerator Programme and select target entrepreneurs, start-ups and MSMEs	Selected incubators/accelerators

Activity 2.1.3.2 Conduct one cycle per year of the Incubator/Accelerator Programme targeting the four regions	Selected incubators/accelerators
Activity 2.1.3.3 Invite international and regional incubators/accelerators to share experiences and lessons learnt	PMU, Subcontractor and identified regional and international incubators/accelerators
Activity 2.1.3.4 Provide early-stage funding to companies to overcome the Technological Valley of Death	PMU and incubator/accelerator
<b><i>Output 2.1.4: Business replication, expansion and partnership services provided to help regional and global adaptation MSMEs establish climate resilient business operations in Sierra Leone</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 2.1.4.1 Pairing established enterprises with local entrepreneurs	PMU with ESOKO, ColdHubs and Easy Solar
<b><i>Outcome 2.2: Adaptation MSMEs secure funding to grow and scale-up their operations and projects</i></b>	
<b><i>Output 2.2.1: 50 successful MSMEs, entrepreneurs and start-ups are trained and coached through the Advanced Acceleration Programme to receive early-growth financing and overcome the Commercialization Valley of Death (aiming at 35% women participation)</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 2.2.1.1 Launch an Open Innovation Adaptation call for the Advanced Acceleration Programme and select target entrepreneurs, start-ups and MSMEs for the Advanced Accelerator Programme	Selected incubators/accelerators.
Activity 2.2.1.2 Conduct one cycle per year of the Advanced Accelerator Programme	Selected incubators/accelerators.
Activity 2.2.1.3 Provide funding to companies to overcome the Commercialization and scaling-up Valley of Death	PMU and incubator/accelerator
<b><i>Output 2.2.2: 20 MSMEs entrepreneurs and start-ups receive investment facilitation support in the Post-Acceleration Programme for projects that deliver climate adaptation technologies and solutions at scale (aiming at 35% women participation)</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 2.2.2.1 Launch an Open Innovation Adaptation call for the Post Acceleration Programme and select target entrepreneurs, start-ups and MSMEs to go through the post-Acceleration phase	Selected incubators/accelerators.
Activity 2.2.2.2 Conduct one cycle of the Post-Acceleration Programme per year	Selected incubators/accelerators.

Activity 2.2.2.3 Connect 30 MSMEs, entrepreneurs and start-ups with potential investors through national investment facilitation events (Investor Connect) for Accelerator alumni	Selected incubators/accelerators.
Activity 2.2.2.4 Provide funding provided to successful companies to scale deployment of their technologies	PMU and selected incubators/accelerators
Activity 2.2.2.5 Engage Private Financing Advisory Network (PFAN) to connect with MSMEs/start-ups engaged in the Post-Acceleration Programme	PMU, selected incubators/accelerators and PFAN; AECF, FPI
Activity 2.2.2.6 Engage CTCN and AECF to connect with MSMEs/start-ups engaged in the Post-Acceleration Programme	PMU with CTCN and AECF
Activity 2.2.2.7. Develop exit strategy for the Sierra Leone Adaptation Incubator/Accelerator	PMU
<b><i>Output 2.2.3: The Climate Adaptation Venture Fund is established and operationalized to financially support at least 20 climate change adaptation enterprises and to de-risk and leverage public/ private investment</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 2.2.3.1 Design the Climate Adaptation Venture Fund to enable de-risking and leverage public and private investment towards these adaptation technologies	The PMU will design the fund with supervision from EPA and guidance from AECF.
Activity 2.2.3.2 The Climate Adaptation Venture Fund becomes available	PMU with oversight from EPA and the evaluation committee
Activity 2.2.3.3: Develop exit strategy for the Climate Adaptation Venture Fund	PMU

***PC3: Vulnerable groups access financing to acquire climate resilience and adaptation technologies, products and services in the water, agriculture and energy sectors***

370. PC3 focuses on the demand side of the project and seeks to improve and facilitate accessibility for vulnerable groups to the identified and nurtured TPS through the development of innovative financing products and services for climate change adaptation TPS to help build the resilience of these target groups.

371. Under this PC, the project seeks to build resilient livelihoods to the most vulnerable groups to climate risk, and in doing so contributing to increase financial inclusion in the Sierra Leone as it addresses some of the market barriers related to both FSP and consumers already described in the barrier section. The proposed GEF/UNIDO Adaptation Project will do that by: (i) raising awareness and capacity-building of both the FSP and the vulnerable population; (ii) working with FSP in

improving and adapting the delivery of financial products and services to offer to the most vulnerable; (iii) supporting the FSP through a financial mechanism to make those products and services available; (iv) supporting the development of risk mitigation instruments and climate-smart investment planning tools to FSP; (v) linking the vulnerable population with Adaptation TPS providers and FSPs allowing the most vulnerable to be able to buy innovative Adaptation TPS from MSMEs in order to build resilience and adapt to climate change impacts.

### **Outcome 3.1 Demand and accessibility to financing for adaptation services increased amongst vulnerable groups**

#### **Output 3.1.1: At least 50 roadshows are carried out to connect adaptation MSMEs to aggregator platforms and cooperatives to raise awareness of the resilience and adaptation benefits of their technologies, products and services amongst vulnerable groups and communities in rural areas**

372. Among other barriers identified during the PPG stage, the weak market linkages for the provision of affordable and reliable climate change adaptation-oriented TPS stood as important. Thus, the main objective of this output is to address this gap by organizing joint activities linking adaptation TPS suppliers and the vulnerable population since, for any market to exist, it is important to create connections between the supply and the demand, and of these with financial service providers that can support both sides.

373. The Adaptation Innovation Website created under PC1 (special efforts will be made to have this website translated in some of the local languages spoken in the four regions to increase the success of outreach and communication) will serve as a platform that can be used:

- o by the Adaptation MSMEs, start-ups, entrepreneurs to advertise their TPS;
- o by the vulnerable population to identify adaptation TPS providers that they can contact to acquire their needed goods
- o by both, Adaptation MSMEs, start-ups and entrepreneurs and the vulnerable population to identify FSP that can address their financial needs in this particular market.

374. Besides the online platform, awareness-raising events (see activity 3.1.1.1) and exhibitions and roadshow demonstrations (see activity 3.1.1.2) will be organized.

375. Through awareness-raising and information sharing events, the vulnerable target groups will be informed about suitable adaptation technologies, tools and services appropriate to the WEF sectors and this will spur greater understanding and interest in using and disseminating these appropriate technologies and services in these priority sectors.

376. Through exhibitions and roadshows, enterprises will be able to feature adaptation TPS and their potential use in supporting activities in the WEF sector to the vulnerable groups to adapt to climate change impacts. FSPs and MFIs will also be able to present their products for both the demand and supply side. If needed, some leaflets will be also developed in local languages to help them better understand the role and function of these adaptation TPS. See activity 3.1.1.2 below. The greater understanding of the benefits of the technologies and the availability of revolving funds from FSPs and MFIs will create a willingness to pay for adaptation technologies, products and services.

377. The PMU will be in charge of the implementation of this output.



### **Activity 3.1.1.1 Organise awareness-raising events**

378. The following sub-activities will be implemented:

#### **3.1.1.1.1 Design the programme to the target groups**

This activity is very important since it will enable the target groups living in the Sierra Leone to have increased capacity to assess climate risks and vulnerabilities and identify innovative TPS that can be adopted for climate change adaptation. In principle, the content of the programme will be the same developed under output 2.1.1 (Activity 2.1.1.1). Although printing material is not recommended because it is not environmentally friendly, a brochure should be developed since some target groups might need it to remember concepts and technologies (these brochures should be in their local languages). Furthermore, the programme should encompass information about the innovative financial products and services available to the vulnerable groups designed in Output 3.3.1 below. In addition, this activity will also include the selection of the location where these awareness-raising events will take place.

During these events the same content delivered in the Pre-Accelerator Programme will be shared. These events will be carried out by CSOs, NGOs and associations representing specific groups identified in Output 1.2.4. and will be supported by the selected incubators/accelerators in PC2 for the delivery of content.

#### **3.1.1.1.2 Organise outreach and communication activities to build awareness**

The outreach and communication activities related to the awareness-raising events will be led jointly by the PMU, the selected incubators/ accelerators with the involvement of national, regional, and local CSOs, NGOs and associations in the four regions (farmers associations, businesses associations acting in the WEF sectors and especially those dedicated to empowering women and youth) and universities that would like to get involved, to enlarge and improve the outreach of these events to vulnerable groups already described in section 1 (see Annex K of Stakeholder Engagement Plan with these organizations). Different means of communication will be used, such as: text messages, WhatsApp messages, local radio stations, television, social media influencers on platforms such as Facebook and Instagram, and on the institutional website developed in PC1. Special efforts will be made to have this website translated in some of the local languages spoken in the four regions. Furthermore, local radio stations will be very important since it will help reach out to communities that are not reachable through internet. Also, leaflets in their local languages will be developed and hand out at the local associations

PMU with support from the activities implemented in PC1 will build on its database throughout the project. This database (one per region) will help plan for reaching out to the target areas during the project.

#### **3.1.1.1.3 Conduct awareness-raising events**

The frequency of the events will depend on the number of target audiences identified and their location. A social scientist/anthropologist will be consulted to define the nature of the events, based on the community members and vulnerable groups that are to be addressed. Taking into account the target of

reaching 250,000 beneficiaries and considering that the Sierra Leone Integrated Household Survey (SLIHS) Report 2018<sup>[230]</sup><sup>199</sup> (released in 2019), indicates an average household size of 6.0 people per household at national level, then this means that through the events and across 6 years of project it is necessary to reach at least 41,666 people across the country. Some assumptions were made in order to estimate the approximate number of events that need to be conducted to reach this number of people. It was assumed that each event can host 500 people and that some (50%) of the household representatives will create a multiplier effect by disseminating information to other people or neighbours, which would reduce the number of events that are needed. An estimate of the number of events that need to be conducted in each of the regions is in the table below:

Table 25: Estimate of events to reach 250,000 Beneficiaries

*Assumptions for these estimates: Average household size: 6 / Project years: 6 / Number of people per event: 500 / Multiplier effect: 1.5*

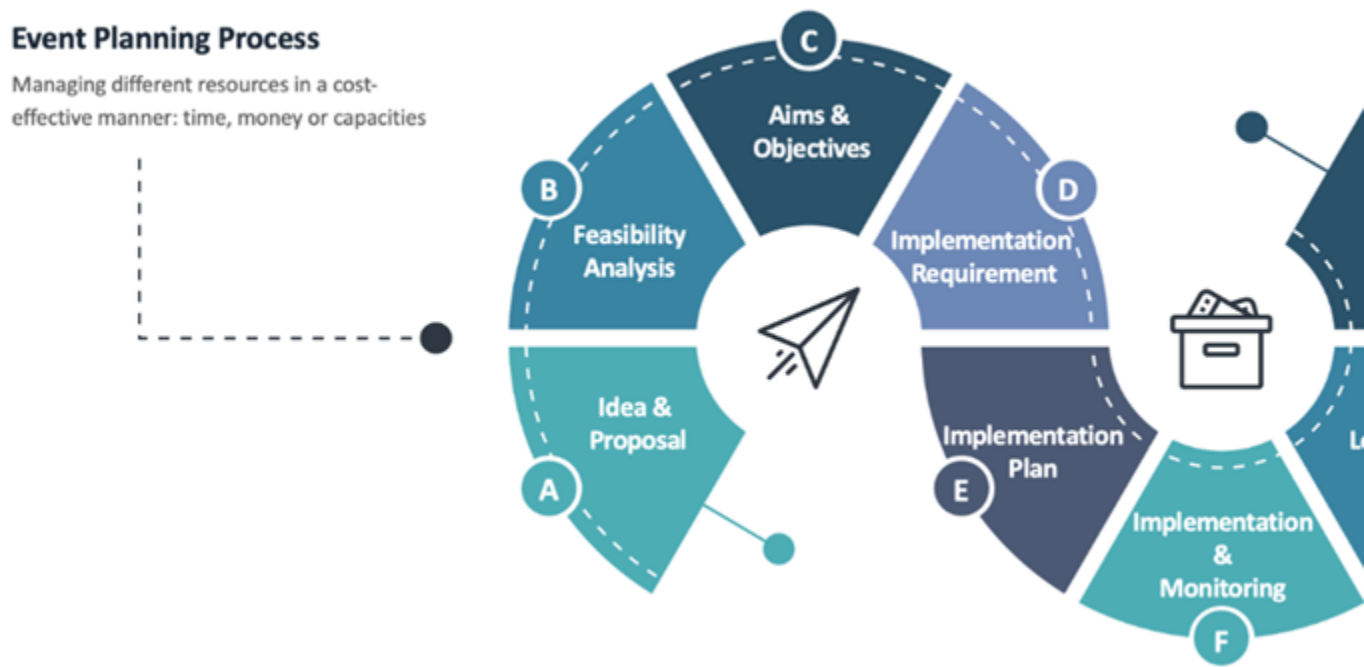
Distribution of population per region		No. household representatives to be reached per region	Household representatives to be reached/year	Events per year and region	Total number of events throughout the project period (6 years)
East	21.4%	8,896	988	2.0	11.86
North	22.3%	9,271	1,030	2.1	12.36
Northwest	17.6%	7,313	813	1.6	9.75
South	20.7%	8,604	956	1.9	11.47
West	18.2%	7,583	843	1.7	10.11
<b>Total</b>	<b>100.0%</b>	<b>41,666.67</b>	<b>4,630</b>	<b>9</b>	<b>56</b>

### Activity 3.1.1.2 Organise exhibitions and roadshow demonstrations featuring benefits and case studies

379. In this activity, exhibitions and roadshow demonstrations that foster partnerships between MSMEs/start-ups and regional distribution networks and aggregator platforms will be organised in order to stimulate the distribution of climate adaptation TPS to the target groups/vulnerable population in the WEF sectors. For example, the Sierra Leone Adaptation project could explore getting in touch with the Global Entrepreneurship Network (GEN), which is active in 200 countries including in Sierra Leone. GEN connects entrepreneurs, investors, researchers, policymakers and other actors to foster project development and scaling up. They run different programmes, competitions, initiatives and support entrepreneurs at all stages of development. In Freetown, *Freetown Pitch Nights* are organized to provide entrepreneurs in Sierra Leone with the opportunity to pitch their ideas in front of potential investors. This initiative is co-organized by GEN-Sierra Leone and the Sierra Leone Brewery that is part of Heineken.

380. As a first step, the companies who had excelled in the Adaptation Accelerators will be able to market their technologies in the field. These events are important for companies to present their products and innovations in their local languages and to get in touch with their potential customers and business partners. To the vulnerable groups, these exhibitions are a good way to find out more about the benefits of incorporating climate adaptation TPS and learn about businesses, particularly if some of these target groups are engaged in a business that might be directly impacted by climate change. Furthermore, during these events, the most vulnerable groups will be informed about the innovative financial products and services available for them by FSPs (these developed in Output 3.3.1). It is imagined that some demonstrations will take place in Freetown when the innovations are city-pertinent.

381. Organizing events is a complex process containing the management of different resources like time, money or capacities. As time, money and capacities are limited resources; planning plays a key role in event management. **Error! Reference source not found.** defines eight steps to follow to plan and implement an event properly.



**FIGURE 42: PLANNING PROCESS ADAPTED FROM WATT, DAVID[231]200**

382. The first step (stage A) is considering the reason for the planned event, forming a clear and well established and detailed idea and proposal. To plan these events, a feasibility study (stage B) will be conducted to examine the organisation's capacity in term of marketing, budget, resources, availability. Based on the outcomes of the feasibility, formulation of aims and objectives of the event (Stage C) will be carried out. Stage D and E ? implementation requirements & implementation plan ? identify the requirements and develops the logistical distribution, including the identification of partners and their involvement in the event. The implementation plan identifies the key stakeholders of the event and how

and at what level should these stakeholders be involved in the event, as well as identifies actions and measures to be implemented to address possible challenges that may impact the event itself.

383. For example, this plan needs proper coordination and preparation among the FSP, adaptation TPS providers (MSMEs and start-ups) and the targeted vulnerable groups. The FSP should be able to market their financial packages to MSMEs and start-ups as well as to the vulnerable groups. Similarly, MSMEs and start-ups should be able to outreach their adaptation TPS to the FSP and the vulnerable populations (this requires a thorough planning, especially showing adaptation products and services is not an easy task). Implementation & Monitoring (stage F) actually implements and manages the event considering and addressing existing constraints and barriers to achieve the event's key aims and objectives. Stage G summarizes experiences of event planning and implementation to inform the development of future events. The frequency will depend on the number of target audiences identified. These events will gather a large number of visitors, currently estimated at 500 per event, in order to be able to reach the total target.

384. The PMU will contract specialised event planners to support both the CSOs, NGOs and associations in the organization of these events.

385. To support the organization of these events, the following sub-activities will be implemented:

#### 3.1.1.2.1 Carry out a technological and geographical mapping of technology providers

PMU with selected accelerators/incubators to carry out a technological and geographical mapping of the start-ups/MSMEs identified under activities developed in PC2 as well as in Activity 1.1.2.1 of PC1 where a mapping exercise of stakeholders will also be developed. This comprehensive list will help improve the PC1 mapping exercise and allow for the identification of the start-ups and MSMEs to invite to the demonstration and awareness raising events (see also Annex K with a list of MSMEs already identified in the PPG stage). In addition, this mapping of technologies and technology providers will be incorporated in the participatory tool developed in activity 1.1.3.1 (PC1) and used to identify best case studies in each region and in each WEF sector, to showcase in both the event and in the Adaptation Innovation Website.

#### 3.1.1.2.2 Identify target population to participate in these events

The database developed in Activity 3.1.1.2 will be used to target these groups of people. This database will be updated every year and used to complement the information on the Adaptation Innovation Website.

#### 3.1.1.2.3 Outreach and communication activities related to these events

The outreach and communication activities related to the awareness-raising events will be led jointly by the PMU, the selected incubators/ accelerators and national, regional, and local NGOs, CSOs and associations in the four regions (farmers associations, community centres, businesses associations acting in the WEF sectors and especially those dedicated to empowering women and youth. Women and youth will be encouraged to participate in these events through focused outreach and ensuring that topics of interest to women farmers, in general, are covered) and universities that would like to get involved, to enlarge and improve the outreach of these events to vulnerable groups already described in

section 1 (see Annex K of Stakeholder Engagement Plan with these organizations). In particular, the project will support Farmer Extension Services delivery system to integrate the engagement of communities in adaptation planning to generate the demand for the adaptation technologies, services and products (see Annex K with a list of these associations).

Different means of communication will be used, such as: text messages, WhatsApp messages, local radio stations, television, social media influencers on platforms such as Facebook and Instagram, and on the institutional website developed in PC1 as well as platforms that traditionally provide information to farmers. Special efforts will be made to have this website translated in some of the local languages spoken in the four regions. Local radio stations and TV emissions will be very important since it will help reach out to communities that do not understand French. Also, leaflets in their local languages will be also developed and hand out at this local associations.

#### 3.1.1.2.4 Event planning, implementation, and monitoring

The contracted specialised event planner will provide support to the CSOs, NGOs and the PMU in the planning and implementing the events. Feedback will be collected from the participants from these events to inform the definition and implementation of future events.

The monitoring of the implementation of the events and the collection and analysis of the feedback should then be carried out by the CSO, NGO and association selected to support the event implementation. These should be summarised on a short report to be submitted to the PMU. These reports should also collect information about businesses that the events have established among the different groups of stakeholders (e.g., number of MSMEs, start-up and vulnerable people going for different types of financial schemes provided by the FSPs and SMEDA, investment promised by the FSPs for the adaptation TPS) along with pictures and other evidence of the event.

### **Output 3.1.2: Methodologies and guidebooks for assessing and quantifying adaptation and resilience benefits of projects developed and widely disseminated**

#### **Activity 3.1.2.1: Development of methodologies and guidebooks for the assessment and quantification of adaptation and resilience benefits**

386. Based on success stories, literature and the lessons learnt from the implementation of this project, methodologies and guidebooks (or any other format as deemed relevant) will be developed by a consultant in close coordination with EPA and the PMU. The aim of those materials is to describe the methods that the MSMEs can apply in order to estimate or quantify as much as possible the potential benefits that their TPS can bring in terms of adaptation improvement and increased resilience to climate change impacts. Having a set of guidelines can also be helpful to monitor and evaluate the aggregated benefit of all the MSMEs supported by the project. These methodologies and guidelines should take into account the findings of the work undertaken for the development of the tools under Activity 1.1.1.1, with special emphasis on those derived from the work of the social scientist/anthropologist. It envisioned that at the end of the project these methodologies and guidebooks will continue to be used by EPA.

#### **Activity 3.1.2.2: Dissemination of the developed methodologies and guidebooks**

387. Knowledge creation, exchange and dissemination are especially important in strengthening the market ecosystems of developing countries. Materials based on the developed methodologies and guidebooks, and the methodologies and guidebooks themselves, will be disseminated to the stakeholders to share valuable information about how to analyse and assess potential benefits derived from the projects and TPS. The dissemination of these materials will be done in conjunction with Output 4.1.2 under PC4, with support from EPA.

**Output 3.1.3: Four (4) training sessions highlighting the actual and potentially additional positive financial, economic and social impacts of climate adaptation TPS to SMEDA and FSPs will be held**

388. To ensure increased access to finance, as well as market creation for adaptation goods and services, the project will conduct training for SMEDA and for financial service providers (FSP) and their staff ideally through ?train-the-trainer? approach? and other events.

389. Thus, under this output, further capacity building will be provided to FSP to address these gaps.

**Activity 3.1.3.1 Engage PFAN, to provide four (4) workshops to train local FSP**

390. A one-day workshop structured training covers a project development process, including key aspects such as viability, financial impact, adoption of available climate adaptation solutions to specific climate hazards, gender lens investment principles, and successful examples of enterprises that were supported by acceleration programmes similar to this. An entity, such as PFAN, would be approached to explore the possibility of conducting this training. The goal of this activity is also to facilitate cross-fertilization between local FSP experts and PFAN. As part of PFAN activities, local FSP experts, may be invited to join PFAN as new advisors, after provided with project sourcing and investment facilitation skills and tools. Furthermore, current PFAN advisors might support the training of experts (trainers, judges, and mentors).

391. The PMU and incubators/accelerators will support PFAN in delivering such trainings.

**Activity 3.1.3.2 Train FSPs and MFIs to assess and capture resilience and adaptation benefits of projects in their portfolios and pipelines**

392. The selected incubators/accelerators previously capacitated under Activity 2.1.1.2 will be in charge of delivering the pre- acceleration programme to FSP within Sierra Leone. In this way, the FSP will strengthen their capacity and be able to better understand all the concepts related with climate change, climate change impacts, climate change risks and vulnerability, Adaptation TPS, maladaptation thus mitigating some of the barriers inventoried at the PPG stage. This will also allow the FSP to adapt their financial products and services to both the (i) Adaptation MSMEs, entrepreneurs, start-ups, and (ii) vulnerable groups.

**Activity 3.1.3.3 Establish a robust network with 10-15 national financial institutions and funds**

393. Specific activities to engage the investment community (e.g., venture capital funds, angel investor networks, impact investors, etc.) will also be conducted. A robust network will be established with national financial institutions and funds to raise the awareness of financiers representing them, as well as train them and sensitize on the opportunities and risks associated with adaptation TPS and market

trends. For example, communication efforts tailored for investors will be made to promote the profitability and impact potential of the Adaptation MSMEs/start-ups and entrepreneur businesses, thereby influencing the investment landscape for the priority sectors. The intention is to broaden the engagement of impact investors in the country, both in terms of a number of investors, as well as the scope of their interest. Therefore, awareness-raising events and training will be provided to the local investor community by specialist financiers with in-depth experience in the adaptation sector.

394. An event will be carried out after each competition cycle of the Sierra Leone Adaptation Incubator/Accelerator.

395. It is foreseen that the created network of financial institutions will be invited to be present at networking events for both MSME/start-ups carried out as part of the Sierra Leone Adaptation Incubator/Accelerator and some events targeted at the demand side, more specifically vulnerable groups. Also, on the events carried out, women and youth will be incentivised to participate. At least 35% of the participants in these events will be women.

### **Outcome 3.2: FSPs provide lending to vulnerable groups to acquire adaptation technologies, products and services**

#### **Output 3.2.1: FSPs and MFIs supported to develop and improve de-risking and climate-adaptive guarantee instruments for lending to vulnerable groups**

396. This output intends to broaden the engagement of the investor community by providing them with robust risk mitigation instruments and climate-smart investment planning tools to influence the investment landscape for the Adaptation sector and foster lending to the vulnerable populations.

##### **Activity 3.2.1.1 Appropriate risk mitigation instruments and climate smart investment planning tools will be jointly developed for FSPs**

397. Risk mitigation instruments and climate-smart investment tools will be developed with FSP to support them in assessing the increasing climate induced risks to business environment so that they can provide finance to MSMEs (to grow MSMEs business of adaptation TPS) and the vulnerable populations (to get hold of these TPS to mitigate climate risks). They will be able to assess business-as-usual (such as development with fossil fuels and opportunistic land use patterns), versus appropriate business adaptation efforts and efficient green, low carbon solutions, with designs that are robust in the face of emerging climate hazards. This will enable FSPs in the investment decision-making process to improve planning and identification of business opportunities in order to prioritize possible measures to improve resilience along their supply chains and distribution networks.

398. The PMU will subcontract a team of consultants to work with a selected group of FSP to identify the most useful tools to be developed. These tools should include a tool that will enable the FSP to adapt their business to Climate Change risks and impacts, as well as a information for them to be able to adapt their products and develop specific services and products for the most vulnerable (Output 3.2.2), contributing in this way to strengthen their business.

399. Tools that can support the FSP to adapt their business to Climate Change that should be considered to develop, include (i) tools to assess Adaptation TPS against their lending to ensure risks are mitigated (ii) tools to collect and gather data on their customer base, including gender disaggregated

data; (iii) climate-related risks and opportunity assessment and reporting tools aligned with Climate Change disclosure frameworks such as the Task Force on Climate-Related Financial Disclosure (TCFD); (iv) financial planning and analysis software solutions, between others identified by the subcontracted consultancy team and the group of the FSP.

400. Climate Change presents a financial risk to the global economy, and there is a need for a clearer understanding of the climate-related risks and opportunities to the financial organisations. The TCFD provides a framework that financial organisations can follow to enable consistent reporting and disclosure on climate change. It provides a mechanism, which organisations can use to evaluate their climate-related risks and exposures to their business, suppliers and competitors and develop strategies both in the short, medium and long term. This framework also enables investors to make more informed decisions about when and where to allocate capital, thus helping them to manage their exposure to climate risk.

401. To support the FSP, a financial mechanism that will make use of part of the GEF grant will be established to support the FSP to roll-out the developed financial products and services to be provided to the most vulnerable in Output 3.2.1. For example, to be used as a guarantee for the FSP and/or a collateral, as an underlying financial mechanism that will be available by the project for FSPs. This mechanism will be assessed and defined in this activity by a Subcontracted team in consultation with the selected group of FSP, including the procedures and guidelines for its implementation.

#### **Activity 3.2.1.2 FSP are trained on the developed tools**

402. The consultants will be responsible for building capacity on the developed financial tools and instruments, first to the selected group of FSP and then to other FSP that will show their interest in adopting them. By getting the tools to enable them to understand adaptation projects and to enable them to climate proof their investment pipeline, it is foreseen that more FSP in the market start to be keen to adopt these tools and make available products and services for the most vulnerable to acquire adaptation TPS (Output 3.2.2), and that slowly those start to be incorporated in their product and service offerings.

403. It is foreseen that in the first year, one capacity building event will be carried out for the selected FSP. From the third (3) year of the project onwards, the Consultant will be invited to showcase the tools developed in at least 1 focus group meeting carried out per region, totalising 5 (five) meetings during the project implementation (assuming there are five regions in Sierra Leone). These meetings should be organised with the information and dissemination events planned in Activity 3.2.1.1 where FSP are also expected to be present. The PMU will be responsible for organizing these meetings.

#### **Activity 3.2.1.3 The developed risk mitigation instruments and climate-smart investment planning tools become available to the FSPs**

404. Once designed, the instruments and tools will be made available to the FSPs, including the financial mechanism established to support the FSP in providing the specific financial products and services to the most vulnerable (to be developed under Output 3.2.2) All these will be put in place, tested and improved throughout the project.

405. Along with the reporting on the supply of the developed financial products and services to the most vulnerable, the FSP should also report on the use and usefulness of the instruments and tools



provided to them by the project, including the financial mechanism to the PMU. This will allow the PMU to assess the relevance and impact of these instruments on the FSP, and how those led to the development of the financial products and adjust and fine tune these throughout the project. Reporting on these, especially on the use of the financial mechanism, will be key for disbursement. The PMU will be responsible for controlling the disbursement of the GEF funding part of the financial mechanism for the FSP.

**Output 3.2.2 Innovative financial products and services adapted to the needs of the most vulnerable populations are made available through partner financial services providers, selected on a competitive basis**

406. This output seeks to support the development and strengthening of funding schemes made available by FSP to improve access to funding for vulnerable groups to obtain appropriate adaptation-oriented TPS in Sierra Leone.

**Activity 3.2.2.1 Design innovative financial products and services adapted to the needs of the most vulnerable populations.**

407. The PMU will organise this activity with the FSPs already identified under Activity 2.2.3.1 and 3.3.1.1. Under this activity, support for the development and strengthening of microfinance schemes to improve access to funding for vulnerable groups in order to ensure access to appropriate adaptation-oriented technologies and services and to ensure sustainability beyond project intervention will be provided. The project will support FSPs in general, such as Apex (a commercial lending institute) and BRAC International (a world-leading MFI) to improve and adapt their existing financial products so that they become viable, affordable and adequate to the most vulnerable. The existing institutions have various products and services including for rural populations. Apex bank has agri-business products and several branches so that they have an expansive reach throughout Sierra Leone. Training for the FSPs will include providing financing products that are climate-sensitive and which will reflect the reality that production along the value chains can be impacted by climate shocks.

408. According to IFAD, lack of upfront capital can be a major drawback for farmers to adopt climate-resilient practices[232]201. This project will support MFIs in improving existent (or even designing new) revolving funds to provide credit lines to cooperatives / associations that require financial support in acquiring adaptation technologies, products and services and or, for example, ensuring that the existing financial mechanism include spreading / redistribution of risk (flexible grace periods, individual-liability contracts, etc).

409. The PMU will subcontract specialised services to work with a selected group of FSP as well as with donors supporting the implementation of the Financial Inclusion Roadmap for the development of the financial products and services to be offered to the vulnerable groups acquiring climate adaptation TPS. FSPs and MFIs will be selected on a competitive basis to establish and manage revolving funds. Loans will be provided on the condition that the technologies acquired are deemed supportive of adaptation and resilience building.

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410. Special attention will be given to farmers, women and youth. Similarly, the designed financial products and services will ensure that farmers, women and youth can equally access the financial support. In fact, specialised financial services will be provided to cater to them.

411. This activity will be implemented during the first year of the GEF/UNIDO Adaptation Project so that the financial products and services and the Venture fund underlying those can be tested and improved from the second year of the project onwards. Developing these products and services together with the FSP and supporting them to make those products and services available for the population will ensure the uptake of these services by these institutions, their ownership, guaranteeing their sustainability after the project finishes.

#### **Activity 3.2.2.2 Outreach and communication on the available financial products and services**

412. This activity will inform the available financial mechanisms to the most vulnerable groups. They will learn about the financial products and services during Activity 3.1.1.3.3 as well as through different means of communication such as text messages on cellular phones, WhatsApp messages, local radio stations, television, social media platforms such as Facebook and Instagram as well as on the institutional website/webpage developed in PC1 and local associations (community centres, farmer associations, especially those dedicated to empowering women and youth) (see Annex K of Stakeholder Engagement Plan with these organizations).

413. Furthermore, this activity will also address the 'last mile' i.e., where demand side changes or behaviour changes are a critical assumption and are likely to affect project impact. According to the GCF behavioural study<sup>[233]</sup><sup>202</sup>, nudges can be an effective way to steer decision-making, particularly when the motivation of individuals is unclear. In the context of this project, MFI lenders will send out text messages to remind borrowers to repay the loans and the lenders themselves can receive electronic suggestions on how to improve financial management skills. Similarly, the project will exercise 'boosts' that empower individuals to foster competencies. Specifically, 'personal initiative' trainings will be used to strengthen investments and responsibilities to repay.

414. Specialised communication activities on these available materials in local languages will be developed and made available to the community-based organizations and associations of the most vulnerable located in the targeted regions. Furthermore, assistance will be available to explain the financial mechanism to the vulnerable groups.

#### **Activity 3.2.2.3 Operationalization of the financial products and services and the Climate Adaptation Venture Fund**

415. The designed financial products and services will be made available to the most vulnerable by the FSPs.

416. The FSP will be responsible for supplying the developed products and services, monitoring its use and reporting on it to the PMU (including providing feedback from their customers on those products). Some of the tools developed in Output 3.3.1 will be used for that. This is also the activity that will allow improving the services and products offered based on additional needs and feedback collected from the targeted consumers.

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417. This activity is expected to start from the second year of the project. These financial products and services are envisaged to enable around 250,000 people to benefit from the adoption of adaptation TPS during the project implementation.

**Activity 3.2.2.4 Conduct awareness-raising activities on the development and provision of adaptation-related financial services and products to other FSP across the Sierra Leone**

418. The group of FSP with whom the project will be working in designing and setting up the financial products and services, and their adoption and operationalisation of these products, will be used as champions to promote the designed services and products to other FSP in the targeted regions.

419. For that, focus group meetings with FSP in the targeted regions will be carried out. The focus groups meeting should bring together small groups of 5-10 FSP by whom the financial products and services developed in Activity 3.3.1.1 and the tools and instruments developed in Output 3.3.2 will be presented and explained. It is envisaged that these meetings will be only carried out from the third year of the project onwards so that the FSP champions will have already experience to show in offering of the products and services (Activity 3.3.1.3) and on the adoption of the instruments and tools established to support them in adapting to climate change (Output 3.3.2).

420. It is envisaged that at least 1 focus group meeting will be carried out per region from the 3<sup>rd</sup> year onwards, totalising 4 meetings during the project implementation. These meetings could be organised with the information and dissemination events planned in Activity 3.2.1.1 where FSP is also expected to be present. The PMU will be responsible for the organisation of these meetings.

421. Table 26 summarises the outputs and activities of PC3.

Table 26 table that summarises the outputs and activities of pc3

<b><i>PC3: Vulnerable groups access financing to acquire climate resilience and adaptation technologies, products and services in the water, agriculture and energy sectors</i></b>	
PC3 focuses on the demand side of the project and seeks to improve and facilitate accessibility for vulnerable groups to the identified and nurtured TPS through the development of innovative financing products and services for climate change adaptation TPS to help build the resilience of these target groups.	
<b><i>Outcome 3.1: Demand and accessibility to financing for adaptation services increased amongst vulnerable groups</i></b>	
<b><i>Output 3.1.1: Adaptation MSMEs participate in annual roadshows and are connected to aggregator platforms and cooperatives to raise awareness of the resilience and adaptation benefits of their technologies, products and services amongst vulnerable groups and communities in rural areas</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 3.1.1.1 Organise awareness-raising events	CSO, NGOs, association representing specific groups and selected accelerators/incubators with support from the PMU

Activity 3.1.1.2 Organise exhibitions and roadshow demonstrations featuring benefits and case studies	CSO, NGOs, association representing specific groups and selected accelerators/incubators with the help of a professional event organizer
<b><i>Output 3.1.2: Methodologies and guidebooks for assessing and quantifying adaptation and resilience benefits of projects developed and widely disseminated</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 3.1.2.1: Development of methodologies and guidebooks for the assessment and quantification of adaptation and resilience benefits	PMU with support from a Subcontractor
Activity 3.1.2.2: Dissemination of the developed methodologies and guidebooks	PMU with support from a Subcontractor
<b><i>Output 3.1.3: Four (4) training sessions highlighting the actual and potentially additional positive financial, economic and social impacts of climate adaptation TPS to SMEDA and FSPs will be held</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 3.1.3.1 Engage PFAN, to provide four (4) workshops to train local FSP	The PMU and accelerators and PFAN
Activity 3.1.3.2 Train FSPs and MFIs to assess and capture resilience and adaptation benefits of projects in their portfolios and pipelines	The PMU and venture capital funds, angel investor networks, impact investors, PFAN
Activity 3.1.3.3 Establish a robust network with 10-15 national financial institutions and funds	The PMU and the local investor community (financial institutions)
<b><i>Outcome 3.2 FSPs provide lending to vulnerable groups to acquire adaptation technologies, products and services</i></b>	
<b><i>Output 3.2.1 FSPs and MFIs supported to develop and improve de-risking and climate-adaptive guarantee instruments for lending to vulnerable groups</i></b>	
Activity 3.2.1.1 Appropriate risk mitigation instruments and climate smart investment planning tools will be jointly developed for FSPs	PMU with FSPs and the Adaptation Innovation Platform
Activity 3.2.1.2 FSP are trained on the developed tools	Team of consultants and PMU
Activity 3.2.1.3 The developed risk mitigation instruments and climate-smart investment planning tools become available to the FSPs	PMU
<b><i>Output 3.2.2 Innovative financial products and services adapted to the needs of the most vulnerable populations are made available through partner financial services providers, selected on a competitive basis</i></b>	

Activity 3.2.2.1 Design innovative financial products and services adapted to the needs of the most vulnerable populations	PMU with FSP
Activity 3.2.2.2 Outreach and communication on the available financial products and services	PMU with FSPs
Activity 3.2.2.3 Operationalization of the financial products and services and the climate adaptation venture fund	FSP with support from the PMU
Activity 3.2.2.4 Conduct awareness-raising activities on the development and provision of adaptation-related financial services and products to other FSP across Sierra Leone	PMU with FSP

#### ***PC4: Project Implementation, Monitoring and Learning***

422. PC4 focuses on Project Monitoring and Learning. The monitoring and learning system will allow monitoring and impact tracking to ensure quality outputs and achieve expected project outcomes.

423. This project is envisaged to go through two different phases of implementation:

Preliminary phase / Inception phase, first six months after the first GEF disbursement of the project, where the Baseline Information and structures necessary to implement the project will be confirmed and the activities necessary to prepare for the actual start of the project are implemented (revision of the project work plan, setting up of the monitoring system, confirmation of the different counterpart involvement, etc.)

The actual implementation will start with the first meeting of the Adaptation Innovation Platform and that will run for 7 years. The different activities proposed in this document will be implemented.

#### **Outcome 4.1. Regular project monitoring and documentation for learning and knowledge sharing**

##### **Output 4.1.1: Regular project monitoring and data collection to track project progress**

424. The proposed project will follow UNIDO standards for monitoring and reporting processes and procedures consistent with the GEF Monitoring Policy.

425. A Monitoring process refers to the continuous process of collecting data on the agreed indicators to provide information on the extent of progress and achievements made, including project impact. It involves the systemic collection of information and data as well as calculating specific indicators to evaluate the effectiveness of the activities implemented. The monitoring should be conducted following specific procedures to collect and manage information, data (such as gender-disaggregated data), and variables. Procedures that are already in place in the country to track variables should be taken into consideration, as well as synergies with other ongoing initiatives should be taken into consideration

when defining the monitoring process to be used during the GEF/UNIDO Adaptation Project implementation.

426. A Reporting process refers to the systematic and timely provision of essential and useful information showing how the GEF/UNDO Sierra Leone Adaptation Project is progressing toward the achievement of the project's goals/impacts. It should take place at periodic intervals and should result in the publication of a simple report indicating for the corresponding monitoring period which were the expected objectives and what was achieved, as well as any issues faced during monitoring in order to take the necessary corrective actions.

**Activity 4.1.1.1 The PMU is trained on the UNIDO standards for monitoring and reporting of processes and procedures and inconsistency with the GEF Monitoring Policy.**

427. At the project outset, the PMU will receive an online training provided by UNIDO on the UNIDO standards for monitoring and reporting as well as on the GEF Monitoring Policy, so that the PMU, and especially the Project manager and the Monitoring Expert within the PMU, get acquainted with those in order to be able to develop a detailed Monitoring and Evaluation (M&E) Framework including a work plan for the execution of the project as well as for monitoring its implementation (inputs and outputs).

428. UNIDO will implement this activity.

**Activity 4.1.1.2 Design of the M&E Framework**

429. Under this activity, the M&E Framework to be used for monitoring, evaluation and reporting of the implemented activities/outputs and outcomes should be revised and consolidated, including the work plan for the implementation of the project. The Monitoring and Evaluation Framework should make use of the Project Results Framework and the project work to be able to identify what, when, how the monitoring activities should be performed and who should be carrying those out and or participating in that (e.g., submitting information). Thus, it should include all the necessary items to be applied during project execution (schedule, roles and responsibilities, milestones, materials to be checked etc.) and should be designed following GEF and UNIDO procedures (on which the PMU was trained in Activity 4.1.1.1).

430. The Logical Framework (Project Results Framework provided in Annex A) specifies indicators per outcome and/or output that should be used to track the progress based on outcomes/outputs and impacts. Environmental, social, and gender-disaggregated indicators and decision metrics are identified and should be confirmed when developing/finalizing the Monitoring and Evaluation (M&E) Framework. Process indicators will be used to identify if project interventions are effective in achieving progress towards impact. The project tracking will have a vital focus on gender and youth, in particular on the empowerment of women.

431. An indicator is a quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of an activity. A "starting point" (e.g., value) for each indicator should be selected in order to allow for later comparison against achievements during evaluation stages.

432. A proper M&E framework should consist of the following:

? Monitoring process refers to the continuous process of collecting data on the agreed indicators to provide information on the extent of progress and achievements made. It involves the systemic collection of information and data as well as calculating specific indicators to evaluate the effectiveness of the activities implemented. The monitoring should be conducted following specific procedures to collect and manage information, data, and variables. Procedures that are already in place in the country to track variables should be considered and synergies with other ongoing initiatives should be considered.

? Evaluation process refers to assessing the achievements in comparison to the original baseline scenario (at any given moment during implementation) and to the expected targets. This will help the evaluator to understand if the objectives set for each indicator were met or not. This comparison enables the country to identify delays or deviations and to take corrective actions accordingly (e.g., modify targets or implementation strategies). Proper monitoring is vital for conducting a successful evaluation, which will aid to keep the initiative on track. A proper evaluation frequency should be selected in accordance with the type of activity under execution and the targets. Typical evaluation frequency is once a year.

? Reporting process refers to the systematic and timely provision of essential and useful information showing how the GEF/UNIDO Adaptation Project is progressing toward the achievement of the project's goals. It should take place at periodic intervals and should result in the publication of a simple report indicating for the corresponding monitoring period which were the expected objectives and what was achieved, as well as any problems faced during monitoring in order to take the necessary corrective actions.

433. The project is quite complex and involves a long list of stakeholders delivering on the project activities. When designing the M&E framework, it is important to clearly stated the responsibilities of each party in terms of reporting on the activities they are implementing. The template should be used to present information as part of the monitoring procedures. This helps the PMU to confirm the data to be collected comes in the format and with the needed level of detail for the PMU to carry out its monitoring activities.

434. The M&E framework should also specific the reporting periods. The project should report on its progress formally every year and informally at the Adaptation Innovation Platform meetings (every 6 months). Formal progress reports should be compiled by the PMU annually and submitted to UNIDO.

435. The PMU will be responsible for the design of the M&E Framework.

#### **Activity 4.1.1.3 Online and in-person training session**

436. The PMU will train (online or in person) all the selected accelerators/incubators, FSPs as well as any other relevant stakeholders participating in the implementation of project activities with a particular focus on the specific activities of each stakeholder and the procedures, timing and templates that the stakeholder should use. This will be important for the PMU and the stakeholders to be able to monitor and control the progress of the project implementation.

437. In the first year, and before the actual implementation of the activity, the online training sessions occur and then every year after that, a refresh session on the M&E Framework and its implementation

will be carried out. Around five (5) sessions of 1 day will be carried out every year on average, totalising around 25 sessions during the project implementation.

438. This PMU will be responsible for the delivery of the M&E Framework sessions.

#### **Activity 4.1.1.4 M&E Framework implementation**

439. The M&E framework will be applied as described in its design. This will be the main tool used for tracking the project implementation and should be used continuously throughout the project. Reporting on the project progress should then be carried out formally (through a detailed report, whose format should be agreed with UNIDO, assessing the progress achieved, including reporting on project impacts/outcomes and outputs) annually to UNIDO and informally (through a PPT or Excel Spreadsheet). The M&E plan will be reviewed and updated periodically based on the results that are being achieved throughout the project implementation. The PMU will be responsible for the day-to-day management, monitoring and evaluation of project activities as in the agreed M&E plan. The PMU will coordinate all project activities being carried out by the project by other stakeholders.

### **Output 4.1.2: Knowledge materials and documentation on best- practices developed and disseminated widely**

#### **Activity 4.1.2.1 Develop the Sierra Leone Adaptation Project communication strategy to increase the visibility of the project's success stories lessons learnt, adaptation TPS of the project**

440. At the start of the project, the PMU will subcontract a team of consultants to support the PR& Marketing. The consultants will design the Sierra Leone Adaptation Communication strategy and the brand that the project should adopt in all its communication. The Subcontractor will have to, amongst other things, assess communications platforms and other means of communication to recommend the most effective outreach and communication action plans in its strategy. This will also include the design, branding and content planning for the of the Adaptation Innovation Website.

441. The developed strategy should also include clear guidelines and procedures for the communication and dissemination action plans, products and news from the project, the platforms to sharing and exchange of knowledge and connect with people. The communication strategy should have a clear guideline on procedures for revision, approval and dissemination of materials. All communication and information dissemination activities carried out by the project will have to follow the project communication strategy and guidelines.

442. The communication strategy will be reviewed and approved by the PMU and UNIDO. The PR & Marketing Expert in the PMU will be the main person responsible for the implementation of this strategy. The PMU will inform all the stakeholders and provide access to upload information on the Adaptation Innovation Website following the guidelines.

#### **Activity 4.1.2.2 Develop supporting documents and knowledge materials to capacitate national stakeholders**

443. Communication materials (videos, tutorials, manuals, newsflash, reports including lessons learnt, best practices and success stories on innovative adaptation TPS will be documented.



444. The knowledge products focus on capacitating national stakeholders to provide business acceleration and incubation services, investment assessment tools for FSPs, financial services and products for the vulnerable population as well as policies/incentives and tools supporting decision making in the field of adaptation. This will further strengthen the enabling environment to address medium- and long-term adaptation needs by providing options for a wide range of adaptation modalities, measures and tools.

445. Although the revision of the materials will be assigned to different experts within the PMU, the responsibility for dissemination of the materials will be the PR & Marketing Expert.

#### **Activity 4.1.2.3 Develop and upload knowledge materials on the Adaptation Innovation website to communicate lessons learnt and best practices**

446. A dedicated project website ? Adaptation Innovation Website ? will be established to communicate and share knowledge and information products with a wide range of stakeholders. This website will be developed under PC1, and will contain knowledge information including lessons learnt, success stories and all the supporting documents develop under Activity 4.1.2.3. This platform will follow, as already referred, the communication strategy and guidelines defined in Activity 4.1.2.1. The PR & Marketing Expert within the PMU will be responsible for coordinating and uploading the information on the website.

#### **Output 4.1.3. Capacity enhancements of the Project Executing Entity (?PEE?; equivalent to ?Implementing Partner? in UNIDO?s terminology) to ensure long-term sustainability, retention of institutional knowledge and ability to engage funding partners in a more harmonized and consistent manner**

##### **Activity 4.1.3.1 Conduct a needs assessment study to identify potential improvements areas**

447. In order to ensure the knowledge transferred through the project is retained at a national level and therefore long-term sustainability ensured, there needs to be a capacity building aspect to complement the project activities. Accordingly, under this component, the project will identify enhancement areas where the PEE can benefit from and receive support to increase their institutional capacities. A needs enhancement assessment study will be conducted in year one and monitored during the duration of the project. This will help identify the improvement needs in the PEE processes and regulations relevant for project execution (e.g., financial accounting, procurement, reporting tools, M&E systems).

##### **Activity 4.1.3.2 Perform up to 3 capacity building trainings on the areas needing improvements identified in the needs assessment study**

448. The results of the assessment will be utilized to design and perform up to 3 capacity building training sessions on the areas needing improvements as identified in the study. This will serve as a basis for this project as well as the execution of future projects, including those funded by other sources. Thereby the activity will help build local capacity and ownership, by enabling harmonization of the reporting across different projects (in aspects such as technical reports, financial reports, auditing, etc.).

Table 27: TABLE THAT SUMMARISES THE OUTPUTS AND ACTIVITIES OF PC4

<b><i>PC4: Project Monitoring and Learning</i></b>	
PC4 focuses on Project Monitoring and Learning. The monitoring and learning will allow monitoring of all the project activities and progress tracking to ensure quality outputs and expected project outcomes.	
<b><u>Outcome 4.1. Regular project monitoring and documentation for learning and knowledge sharing</u></b>	
<b><i>Output 4.1.1: Regular project monitoring and data collection to track project progress</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 4.1.1.1 The PMU will receive online training on the UNIDO standards for monitoring and reporting of processes and procedures and in consistency with the GEF Monitoring Policy.	UNIDO
Activity 4.1.1.2 Design M&E Framework	PMU
Activity 4.1.1.3 Online and in-person training session for those involved in the implementation of the project and the M&E	PMU
Activity 4.1.1.4 M&E Framework implementation	PMU
<b><i>Output 4.1.2: Knowledge materials and documentation on best-practices developed and disseminated widely</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 4.1.2.1 Develop the Sierra Leone Adaptation Project communication strategy to increase the visibility of the project's success stories lessons learnt, adaptation TPS of the project	PMU and Subcontractor
Activity 4.1.2.2 Develop supporting documents and knowledge materials to capacitate national stakeholders	PMU and Subcontractor
Activity 4.1.2.3 Develop and upload knowledge materials on the Adaptation Innovation website to communicate lessons learnt and best practices	PMU, incubators/accelerators, MSMEs FSMs etc (Same people from activity 1.1.1.2)
<b><i>Output 4.1.3 Capacity enhancements of the Project Executing Entity to ensure long-term sustainability, retention of institutional knowledge and ability to engage funding partners in a more harmonized and consistent manner</i></b>	
Activity 4.1.3.1 Conduct a needs assessment study to identify potential improvements areas	PMU and Subcontractor

Activity 4.1.3.2 Perform up to 3 capacity building trainings on the areas needing improvements identified in the needs assessment study	PMU and Subcontractor
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### ***PC5: Project Evaluation***

449. Apart from the internal project monitoring and evaluation carried out by the PMU on a regular basis described in PC4, a mid-term and a terminal evaluation of the project will be carried out by independent evaluators. The Mid-term Evaluation aims to assess the continued relevance of the activities and the progress made towards achieving the project objectives. It will be used to assess project progress and propose necessary revisions of project activities in the project framework if required to ensure the progress are made as planned ensuring achievements of these objectives within the lifetime of the project. The Final Evaluation will be used to assess the overall implementation of the project to facilitate a process to document project outputs and impact and extract recommendations and lessons learnt to inform future project development and implementation.

### **Outcome 5.1. Project Evaluation**

#### **Output 5.1.1: Mid-term Evaluation**

##### **Activity 5.1.1.1: Project Mid-term Evaluation**

450. The Mid-term Evaluation purpose is to provide the PMU with feedback on the ongoing project's performance. and to identify early risks to programme/project sustainability, coherence, effectiveness, efficiency and progress towards results, including gender mainstreaming and mainstreaming environmental and social safeguards. Normally, the Mid-term Review has two main objectives: 1) to enhance transparency and dialogue between project stakeholders to promote learning for the further development of the project, as well as for its replicability and scaling-up of results; and (2) to gain insights on the functioning of the project structures and processes; to check what extent project milestones are being achieved, and if targets are likely to be met and results achieved as planned. This evaluation also assesses the design of the M&E framework being used by the project to ensure efficient monitoring during project implementation and evaluability.

451. For the Mid-term Evaluation, the PMU will prepare the Terms of Reference (TORs) to recruit an Independent Evaluator to perform the mid-term evaluation of the project according to UNIDO and GEF guidance. The PM at the UNIDO Headquarters will then use these TORs to subcontract the Independent Evaluator. The MTE is an opportunity to make modifications to the project's design and implementation to ensure project's objectives are achieved within the lifetime of the project. Project's achievements made up to this stage should be identified and compared against baseline and targets, impacts and sustainability of results and possible risks until the finalisation of the project. The Mid-term Evaluation Report will include an action plan that should inform the activities of the project going forward. The coordination and oversight of the MTE will be carried out by the UNIDO Headquarters.

452. The PMU will support to the Independent Evaluator during the Mid-term Evaluation by providing the necessary information and clarifications during the process.

## Output 5.2: Terminal Evaluation

### Activity 5.1.1: Project Terminal Evaluation

453. The Terminal Evaluation purpose is to assess whether the project has achieved or is likely to achieve its main objective, and to what extent the project has also considered sustainability and scaling-up factors for increasing contribution to sustainable results and further impact. Terminal Evaluations (i) assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress in achieving project objectives and its impact; (ii) identify key learnings to feed into the design and implementation of forthcoming projects; and (iii) develop a series of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing projects by UNIDO.

454. The PMU will prepare the TORs for the recruitment of an Independent Evaluator that will perform the Terminal Evaluation of the project. The PM at the UNIDO Headquarters will then use these ToRs to subcontract the Independent Evaluator. The TE will assess achievements made and compare them against baseline and targets, impacts and sustainability of results presenting the overall project performance. This evaluation should be carried out three months prior to the end of the project. The coordination and oversight of the TE will be carried out by the UNIDO Headquarters.

455. The PMU should support the Independent Evaluator through the Terminal Evaluation by providing the necessary information and clarifications during the process.

Table 28 summarises the outputs and activities of PC5.

<b><i>PC4: Project Evaluation</i></b>	
Project evaluation.	
<b><u>Outcome 5.1: Project Evaluation</u></b>	
<b><i>Output 5.1.1: Mid-term Evaluation</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 5.1.1.1 Mid-term Evaluation	Independent Evaluators (Project Manager at UNIDO HQ will subcontract the evaluators)
<b><i>Output 5.1.2: Terminal Evaluation</i></b>	
<b><i>Planned and Envisioned Activities</i></b>	<b><i>Responsibility</i></b>
Activity 5.1.2.1 Terminal Evaluation	Independent Evaluators (Project Manager at UNIDO HQ will subcontract the evaluators)

#### 4) ALIGNMENT WITH GEF FOCAL AREA AND/OR IMPACT PROGRAM STRATEGIES;

456. The project is designed in compliance with the objective of the GEF LDCF programmatic direction, GEF/LDCF Climate Change Adaptation Focal Area 1: Reduce vulnerability and increase

resilience through innovation and technology transfer for climate change adaptation. The project interventions are tailored to enable private sector (especially adaptation MSMEs and financial sectors) engagement for climate adaptation action and provision of localized and suitable solutions for vulnerable segments of the population with increased exposure to the consequences of climate change in the country.

457. The project will focus on fostering innovation and investments for scaled dissemination of adaptation-oriented technologies and services related technologies with significant adaptation benefits ultimately contributing to reducing the vulnerability and increasing climate resilience in the priority keys areas as identified in the NAPA for Sierra Leone: i) improved access to climate data for monitoring and planning; ii) development of an Integrated Natural Resources and Environmental Management Programme; iii) development of irrigation and drainage systems for agricultural production. It responds to the NAPA of Sierra Leone with the deployment of critical measures and technologies to address pressing adaptation needs in the key priority sectors including mainly agriculture/food security, water, and energy and v) improvement of energy efficiency and conservation of energy resources.

458. Through promotion of innovation and entrepreneurship and targeted private sectors engagement, the project seeks to engage youth through green jobs creation and alternate income generation activities among various stakeholders, further contributing to resilience building in vulnerable communities. Through the initial GEF funding, the project seeks to establish the required mechanism in Sierra Leone to catalyse large-scale deployment of climate adaptation-oriented technologies and reduce systemic risk across the adaptation finance landscape. The proposed set of interventions under the project, are fully aligned with the GEF's comparative advantage and updated LDCF Programming Strategy (2018-2022).

## **5) INCREMENTAL/ADDITIONAL COST REASONING AND EXPECTED CONTRIBUTIONS FROM THE BASELINE, THE GEFTF, LDCF, SCCF, AND CO-FINANCING;**

Total GEF contributions to the project amount to USD 8,932,420 and will be used to finance catalytic activities and provide strategic inputs to achieve adaptation benefits and increase resilience in Sierra Leone. The additional cost of this project will be to address climate change adaptation through transfer and large-scale deployment of adaptation-oriented technologies, products and services at the local level cutting across the economic and climate vulnerable sectors of water, agriculture and energy.

459. While adopting an integrated multiple-sectoral approach supporting the delivery of climate adaptation TPS that can create multiple adaptation benefits across sectors, the Project will also deliver clear cost benefits as the following:

*Enabling a global shift in investment and operational decision-making across sectors, contributing to the adoption of a cross-sectorial coordinated approach to address climate change adaptation in WEF sectors. Contributing to the development of targeted policies, regulations and incentives to foster the private sector investment for adaptation TPS to mitigate risks and vulnerabilities;*

*Transition to smart-water use and monitoring and re-allocation of water across sectors (from irrigation to urban areas) can largely offset trade-offs between water efficiency and decarbonization;*

*Investing adaptation TPS in the WEF sector with the focus on contribution to SDGs in an integrated manner ensures project's cost-effectiveness in the long term. In addition, sharing the project's knowledge on products and services and lessons through the outreach and communication activities is likely to promote the market for adaptation TPS in Sierra Leone and possibly open up regional and international interests;*

*By understanding and supporting climate change adaptation in the WEF sector in an integrated manner, the project aims to make use of the synergies that exist across the WEF sectors (that are paramount) by supporting the deployment of TPS that address climate change adaptation needs in an intersectoral manner, minimizing the project costs.*

*Addressing climate risks and vulnerabilities in the WEF sector of Sierra Leone by providing proven adaptation TPS through this project would mean reducing the climate risks, strengthening the coping mechanism of the most vulnerable communities and building resilient in the WEF sector from the future climate risks and ultimately minimizing the cost in the future. A US\$1 investment in climate-resilient infrastructure (such as warning systems, climate-resilient infrastructure, improved dryland agriculture crop production, global mangrove protection, and projects to make water resources more resilient) now would benefit US\$4 by avoiding potential damages faced by lack of climate change adaptation<sup>[234]<sup>203</sup></sup>. This is also supported by the Global Commission on Adaptation (GCA). According to the GCA early action to address climate risks would bring a 'triple dividend' of avoided losses, economic benefits, and social and environmental benefits<sup>[235]<sup>204</sup></sup>*

460. The Sierra Leone project is requesting technical and financial assistance from GEF through the Least Developed Countries Fund (LDCF) to build national institutional capacities and a supportive ecosystem to accelerate and grow promising adaptation MSMEs to deliver climate adaptation solutions.

461. Through the Climate Adaptation Venture Fund developed under Output 2.2.3, the LDCF funding will be utilized to provide the necessary early-stage innovation and entrepreneurship and business growth support matched with initial grant support to transform proof of concept climate change adaptation innovations into marketable products for large-scale deployment. The project will expand the catalytic grant investments through the LDCF to establish an enabling environment and reduce systemic risk across the adaptation finance landscape in order to enable the private sector to act as an agent for market transformation as well as leveraging other partner contributions (e.g., AECF, PFAN (REEEP), ASAP, FSPs, MFIs) to deliver greater impact and scaled-up finance.

462. The proposed GEF/UNIDO project has been designed with a view to maximize the positive impact on the most vulnerable population groups, i.e., to substantially reduce vulnerability and strengthen resilience and adapt to climate change. The project seeks to achieve maximum impact by adopting a strong private sector driven market approach and by addressing both the supply side of climate adaptation-oriented technologies and service (through innovating MSMEs) under component 2 as well as the demand side (access to financial products and services for vulnerable people to acquire adaptation innovations) under component 3. Access to finance is one of the key obstacles to private sector innovation activity as well as business expansion and growth. Lack of access to financial

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products and services adapted to the needs of vulnerable populations impedes them from adopting climate adaptation technologies, products and services. The proposed interventions focus on developing a conducive market for climate adaptation-oriented solutions in Sierra Leone by providing support to the suppliers and customers of climate adaptation-oriented TPS and improving the policy and regulatory framework and the capacity of government and other public institutions.

463. Supporting private-sector adaptation MSMEs with their climate adaptation innovations has strong catalytic and multiplier effects: assisting MSMEs with transforming their early-stage ideas into viable businesses and subsequently supporting commercialization and large-scale deployment of their climate adaptation solutions for the most vulnerable. Furthermore, successful market-driven business models have potential for replication and further increase the initial interventions' cost-effectiveness. In addition to the expected improvement to climate change adaptation, supporting the development of the MSME sector in Sierra Leone will also contribute to green jobs creation, empowerment of women and the youth, and social and economic development in general, which, in turn, will also strengthen the resilience of the population.

464. The proposed project will also have a strong focus on catalysing additional public and private financing for the development and distribution of climate adaptation-oriented TPS, both by crowding in (long-term) private sector finance for innovative MSMEs/start-ups for business expansion and growth as well as by supporting the FSP in the country in developing and deploying adequate financial products and services for both the MSMEs and the targeted populations. It will:

*develop products and services that will be adopted by the FSP in the country, enabling them to offer new targeted products and services that can be acquired by the targeted population, getting new revenue streams, and thus fostering their expansion and growth;*

*contribute to the creation of a market for adaptation where the offer (MSMEs/start-ups) can be created, nurtured and grown, and it can be acquired by the demand (vulnerable population in need of the adaptation TPS).*

465. Without the LDCF funding, the deployment of technologies and innovative solutions for reducing climate-related risks to improve adaptation to climate change will be largely limited in the country. This is due to the main barriers noted earlier in the proposal, such as the limited knowledge, technical know-how and managerial skills among MSMEs and entrepreneurs, where current opportunities remain untapped as well as the low access to commercial funding needed to scale up and support climate adaptation TPS. Through a systematic approach, the project will address the main barriers for achieving adaptation targets and simultaneously support green jobs creation, income generation and contributing to multiple sectoral objectives to ensure food, water and energy security.

466. To ensure accessibility and affordability of the adaptation solutions to the most vulnerable populations, the project will raise awareness about climate risks, vulnerability and how to address using suitable adaptation solutions, and improve available funding mechanisms to get suitable and localized climate adaptation technologies for the vulnerable communities, smallholders, rural and peri-urban poor households. Through the provision of multidisciplinary services, technical training in applying appropriate technologies including the demonstration of equipment and services, the project will create the required market linkages between vulnerable populations and the private sector.

467. During the PPG phase, a detailed mapping of the existing local financial service providers (FSPs) – both private and public – and their products and services will be conducted. This will include microfinance institutions, commercial banks, incubators, VC/equity funds, national and international / bilateral and multilateral finance institutions and programmes, etc. The objective was to identify potential partners that will provide additional early-stage capital as well as long-term financing for high-potential adaptation MSMEs for business expansion and scaling up; as well as adapted financial products and services for the target customers of climate adaptation products and services.

468. With a view to catalyse additional financing and maximize additional private sector capital, the proposed interventions will include:

*Targeted training and capacity building of FSPs, especially related to technologies and services that address the effects of climate change and offer solutions for climate adaptation; assessment of the climate adaptation potential of different technologies and solutions, including, for instance, (digitally-enabled) climate information tools; evaluation of MSMEs with climate adaptation innovations and new business models; risks assessment of innovative technologies and business models; adequate financial instruments, etc. The training programmes will target management as well as loan officers and credit officers at HQ as well as the regional level;*

*The development of appropriate risk mitigation instruments to mobilize increased private sector financing, such as guarantee instruments and new revolving funds for select MFIs to provide adaptation-specific credit lines for vulnerable groups.*

469. The LDCF project will mobilize additional co-financing from national stakeholders that include the lime ministries and other institutions. It will furthermore leverage co-financing from national, regional and continental stakeholders including the Environmental Protection Agency, Small and Medium Enterprise Development Agency (SMEDA), Africa Enterprise Challenge Fund, Private Finance Advisory Network.

470. AECF will co-finance in cash/loans this project for an estimated amount of USD 6,000,000 that will be raised through their donor contributions. They will also provide an additional USD 500,000 in-kind contribution. This in-kind contribution includes human resources, training materials, events and workshops, communication channels and campaigns to assist with the achievement of the proposed project outcomes. The grant will be focused on providing growth stage support to adaptation MSMEs.

471. SMEDA will co-finance the project for an estimated amount of USD 3,000,000. This will mainly be in the form of USD 2 Million cash that SMEDA will provide as microfinance to MSMEs and adaptation projects. The rest will be in kind, mainly their tools, methodologies, market infrastructure, time for staff etc.

472. The EPA will provide in-kind co-financing up to USD 1 Million in terms of staff time, facilities to host the project and other services to support project execution.

473. FSPs and MFIs will provide USD 8.85 Million as both in-kind and cash co-financing. The project will engage FSP and MFIs in developing and expanding revolving funds that will help the vulnerable groups borrow and acquire adaptation technologies, products and services. The in-kind co-financing will come from the networks, time and other resources that the FSPs and MFIs bring to establish and run the revolving funds.



474. PFAN (REEEP) will provide up to USD 5 Million co-financing in form of the access that it will provide the adaptation MSMEs to investors once they receive the investment facilitation services.

475. MSMEs selected as pilot projects will be providing almost USD 1 million as co-finance for the implementation of its business proposals.

476. Other MSMEs that will be supported through the Incubator/Accelerator Programmes are expected to provide co-financing up to USD 3 Million during the execution of the project.

#### **6) GLOBAL ENVIRONMENTAL BENEFITS (GEFTF) AND/OR ADAPTATION BENEFITS (LDCF/SCCF); AND**

477. The project will support the development of clean and climate-smart technologies in the following areas:

*Rural and urban energy supply (Use of solar pumping and solar powered irrigation enabling more water and energy security for farmers during flood and drought periods);*

*Integrated Water Resources Management reducing flood damage and promoting infiltration to ensure more sustainable water resources for irrigation*

*Nature-based solutions*

*Agricultural value chains*

*Climate data*

*Sustainable soil and land management*

478. This will be achieved by empowering MSMEs, entrepreneurs and start-ups and expanding markets for climate adaptation products and services, generating jobs and supporting overall economic growth and building and increasing the resilience vulnerable communities. The project's objective is to support the growth of Adaptation MSMEs, entrepreneurs and start-ups by addressing a number of market barriers already described. The project will address these issues by:

*strengthening the legal and regulatory environment to support innovation and adaptation in Sierra Leone as well as to strengthen cooperation and coordination of activities in the adaptation space;*

*providing combined interventions to support the growth of high potential Adaptation MSMEs, entrepreneurs and start-ups and constitute a pipeline of a new generation of these adaptation enterprises through the establishment and operationalisation of Sierra Leone Adaptation Incubator/Accelerator;*

*improving and facilitating accessibility for vulnerable groups to the identified and nurtured TPS through the provision of information as well as by designing together with FSP financial services and products to support them acquiring adaptation TPS,*

*developing innovative financing mechanisms of climate change adaptation TPS for both MSMEs, start-ups and entrepreneurs, as well as for supporting FSP in the development and roll-out of the developed financial products and services*

479. The innovative financial mechanism and investments models will be enabled to enhance climate resilience. Also, by contributing to address some of the gaps and or existing barriers and challenges in the operational, legal and regulatory framework of Sierra Leone, the project will help promote innovation in Sierra Leone as well as development and financial inclusion strategies of the country. The needs assessment analysis will build on and expand the analysis already carried out in the Baseline Report. Different laws and proposals will result from this assessment that will help MSMEs, FSP develop adaptation TPS.

480. As per the CRVA, the whole Sierra Leone country was selected for the project intervention. The incubators/accelerators existent in Sierra Leone as well as other national/regional institutions will be supported to strengthen their capacity to run the annual competitions within the established Sierra Leone Adaptation Incubator/Accelerator. The Sierra Leone Adaptation Incubator/Accelerator will run a total of three (3) different type of annual competitions: Incubator/Accelerator, Advanced-Accelerator and Post-Accelerator. In total, the Incubator/Accelerator Programme will choose 150 Adaptation MSMEs, entrepreneurs and start-ups to receive training in entrepreneurship to transform and improve their businesses. In the Advanced-Accelerator Programme, a cohort of approximately 50 MSMEs, entrepreneurs and start-ups from the Incubator/Accelerator Programme will be chosen for progressing into the next phase of business growth and in overcoming product related market barriers. These enterprises will also receive seed funding in order to have an overall effect of driving adaptation innovations towards formalisation and scaling up. Finally, at least 6 alumni enterprises, that participate in the Advanced Accelerator Programme will be chosen to benefit from tipping-point investment facilitation support services.

481. The large-scale deployment of these technologies is expected to reach at least 41,667 households of targeted vulnerable populations. According to UN statistics on Household Size and Composition around the World in 2017, the average household in Sierra Leone consists of 6 people. This translated to at least 250,000 direct beneficiaries. Further, 70 people receive training on adaptation innovation with at least 35% women representation, 10 from each agency: Agriculture, Water, Energy, SMEDA, EPA, and 20 across the private sector plus the train-the-trainer programmes for accelerators and incubators and to staff of FSPs.

482. Through the operation of Sierra Leone Adaptation Incubator/Accelerator providing adaptation solutions in the WEF sectors at multiple scales, the project will provide best adaptation technologies and the promotion of improved climate-smart practices in the short, medium and long term, particularly for vulnerable populations and for the whole country (see Table 16 for a summary of the benefits that each specific technology will bring in each sector as well as in the whole country in the short, medium and long term). Given the nature of the project, the innovation adaptation TPS developed and commercialized will contribute to the global environmental benefits beyond the project life and scope.

483. The project supports the creation of climate-resilient food systems that generate climate adaptation, sustainable land management and biodiversity benefits while addressing the root causes of degradation and vulnerability. The project is expected to generate benefits for at least 25,000

vulnerable families, with 80% of the rural householders (20,000) engaged in production and sale of food stock and 31% (7,750) involved in the production and sale of cash crops. Of the total land area (72,000 km<sup>2</sup>) in Sierra Leone, 54,000 km<sup>2</sup> is estimated to be suitable for cultivation, including 43,000 km<sup>2</sup> in upland areas and about 1 million hectares in lowland areas. However, currently only 25% of potentially arable upland and 15% of lowland area is cultivated. In Sierra Leone there are approximately 18 arable-land hectares per 100 people[236]205. If 20,000 are engaged in agriculture and there is approximately 6230 people per family, this translates into 21,600 ha of land that is directly impacted through sustainable and resilient land management. Furthermore, promoting scaled adoption of climate adaptation-oriented technologies for the priority energy sector targeting to rural and urban households contributing to a significant reduction in the use of fuelwood by households and reduced pressure on forest ecosystem. The project is expected to contribute to the sustainable land management of an additional 4,400 ha. In total 26,000 ha of land restored and protected through sustainable and resilient land management. In addition, the project is expected to empower 500 farmer associations / cooperatives with MF credit lines supported by the project's revolving funds.

484. Along the agricultural value chains, the project will provide climate smart technologies, which will reduce post-harvest losses and improve processing and storage techniques to maintain crops dry and cold and reduce minimal losses, helping to improve food security. Furthermore, climate monitoring and early warning systems can provide earlier notifications to farmers about potentially hazardous events, such as intense precipitation, landslides and floods, helping them to apply preventive measures, for example, new crop varieties tolerant to drought and heat, earlier or late planting based on seasonal weather forecasts, application of drip-irrigation and other smart-agricultural technologies based on the weather and climate risks to adapt and build resilient agriculture and fisheries sectors to increase food security.

485. Additionally, through the promotion of water management technologies and irrigation techniques, the project will enhance agricultural productivity and reduce food insecurity as well as increase the improvements of farmer's income, improve market capacity and increase resilience to climate change. For example, rainwater harvesting systems provide many services: recharge groundwater through infiltration for water supply in dry seasons, reduce fast flows and reduces incidences of flooding, reduces soil erosion, increase crop productivity, food supply and income as well as enhance the provision of water and fodder for livestock and poultry, wood for human use, and bridge water supply in droughts and dry spells.

486. The proposed GEF/UNIDO Adaptation Project will also deliver on a set of cross-cutting issues, including nutrition, general education, climate change and environmental awareness, inclusion and gender. By promoting inclusionary entrepreneurship, especially for youth and women in vulnerable communities, the project will also help to diversify income sources and off-farm employment opportunities among rural communities. Climate-adaptation oriented TPS in the three sectors will help diversify the income and thus, increase vulnerable populations resilience to climate change. The adoption of Climate-Smart practices such agroforestry systems, which include deep-rooted trees and shallow-rooted crops that will help diversify income and increase food security as well as bring benefits at the farm level since they can be used to better exploit available soil moisture and provide

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sufficient shade to allow high-value crops to be grown, at the same time they secure the soil from being washed out during extreme rain events.

## **7) INNOVATIVENESS, SUSTAINABILITY AND POTENTIAL FOR SCALING UP.**

### Innovativeness:

487. The proposed project offers an innovative approach to unlock private sector investments to tackle the growing climate risks and provision of adaptation solutions applicable to local needs and priorities. Through the establishment of a national platform and competition based incubator/accelerator ? the Sierra Leone Adaptation Incubator/Accelerator, the project supports the creation of an conducive environment to identify MSMEs, entrepreneurs and start-up?s with innovative adaptation TPS, including business models for generating climate adaptation benefits, and nurture these start-ups into viable business delivering large-scale deployment across the priority WEF sectors, and simultaneously ensuring availability and affordability of these adaptation solutions by the vulnerable populations.

488. The proposed GEF/UNIDO Adaptation Project has adopted an innovative approach during the PPG in its design and aims to adopt an innovative approach in its implementation.

489. At the design stage, the project adopted an innovative approach by preparing the project Baseline Report and the CRVA. These reports help to identify the priority regions in Sierra Leone to design bankable project interventions. The Baseline Report was conducted using a strong participatory process and intense stakeholders? involvement to assess the challenges and barriers and identify appropriate measures to address them. The approach to conduct the CRVA and the Baseline Report used existing scientifically approved methodologies and models and crosschecked with data, new information, and local knowledge and experience from the ground, incorporating in the analysis a deeper level of local stakeholders? opinions, beliefs and perceptions. The triangulation of all this information and the multi-sector risk modelling tool developed in the GEF/UNIDO Integrated Solutions for Energy Water and Land (ISWEL) project allowed the proposed project to identify the vulnerable regions which in Sierra Leone resulted in the whole country being targeted.

490. The design of start-to-end stepwise process allow cross innovation between the three types of incubator and accelerator programs, mainstreaming women and engaging youth in a transformative manner. The stepwise process helps to select, develop and promote MSMEs/start-up, and their consistent growth in the development, deployment and scale-up of adaptation TPS. Along with ASAP, the project will support large scale deployment of adaptation-oriented technology and business model innovations jointly through categories instead of supporting single track technology deployment. For example, in coordination with the World Bank?s SCIP program and IISD, Nature-Based Infrastructure practices providing sustainable solutions to address changes in rainfall patterns and resulting seasonal variations in water scarcity such as revegetation with drought-resilient plants will be identified. MSME?s will receive targeted technical support on how to best address the specific climate adaptation needs as well as respond to market specific requirements and consumer demands. It is expected that this approach will provide cost-effective and tailored innovations according to the specific market and climate needs (e.g., storage and conservation). Such innovations will be highlighted by the ASAP project and IISD.

491. The project links MSMEs/start-up with the FSP to build coherence understanding between potential adaptation TPS and financing offered by the FSP. The project is also innovative to train FSP, not only train them in adaptation, climate risks and vulnerability but also build their understanding about potential business avenues for adaptation TPS and receive training on adaptation innovation successes and lessons learned. The project goes extra miles not only to help develop financing mechanisms to access finance by MSMEs/start-ups, also affordable financial packages for the vulnerable populations to buy needed adaptation TPS.

492. The strategy that the project aims to adopt in its implementation is also quite innovative. From the assessment of the current policy framework, the identification of innovative technologies, the development of the Climate Adaptation Venture Fund to leverage financing to de-risk and leverage of public and private investments to support the accelerated Adaptation MSMEs, entrepreneurs and start-ups as well as support to vulnerable groups to acquire climate adaptation TPS, their capacity building in climate change risks, vulnerabilities, Adaptation TPS as well as in entrepreneurship and the execution of activities to link the demand side with the TPS providers. This project supports MSMEs across the whole innovation value chain to develop demand-driven and investment-ready adaptation solutions to adapt and build resilience to climate risks. Furthermore, MSMEs will be partnered with local entrepreneurs as well as regional and international businesses to have effective business models that facilitate replication and large-scale deployment. Thus, the MSMEs, with their innovation will become the motor of mainstreaming climate adaptation solutions to build resilience of the priority sectors. The project does not only focus on enterprises but also on strengthening the entire adaptation innovation and entrepreneurship ecosystems (a gap that was identified during the baseline assessment at the PPG stage), by building capacity of national institutions, trainers and judges and by raising awareness of vulnerable groups and adaptation TPS. By contributing to the development of financial products and services for FSP and linking the supply and demand of the adaptation TPS, the project also aims to contribute to close the adaptation gap existent in Sierra Leone. Furthermore, by engaging youth in entrepreneurial activities, the project seeks to unlock the innovation potential of local talents. Importantly, the project provides an effective and innovative tool to address youth unemployment and poverty eradication. This 'value chain' approach brings adaptation innovation to Sierra Leone and mainstreaming of adaptation into the National MSMEs Development Strategy.

Sustainability:

493. The proposed project will empower MSMEs and expand markets for climate adaptation products and services, generating diversified productive livelihoods and supporting overall resilience building for the most vulnerable Stakeholders implicated in the agriculture, water and energy value chains. In Component 1, the project will support the existing Directorate of Climate Change to support mainstreaming of adaptation in MSME-focused strategies / policies and to coordinate access to adaptation-focused innovation and financing. The DoCC will link international and national partners, financing bodies and training and research institutes (testing labs) from various sectors with MSMEs. It will streamline cross-sectoral support and build national institutional capacities on adaptation innovation to ensure that innovations will continue to receive support financially across sectors.

494. The tools, materials, the EPA Lab and guidebooks developed under Component 1 will be done through strong involvement of EPA, CCS and SLMet, that will adopt these and continue to use and build on them after the project comes to an end.

495. Component 2 will ensure project sustainability by building on the existing rural MSME support provided by the WB Agro progressing Competitiveness Project and Sierra Leone Economic Diversification Project. The project will support SMEDA's efforts to provide a low-interest rate MF product. Project funds will be used to tailor a product version focused on adaptation. SMEDA is a dedicated institution and a hub for the support and coordination of all MSME development activities in Sierra Leone. SMEDA is established and operating under the SMEDA Act and has a permanent mandate related to MSMEs. Hence, the long-term results of the project and accumulated know-how will continue to be part of the MSME support ecosystem under SMEDA activities. The design of the project interventions will ensure continuity of activities and introduced services post project completion as the project will focus on capacitating the Adaptation Accelerator programmes to identify early investors and to support with filling large seed funding gaps that are required for Sierra Leone MSMEs and scaled deployment of adaptation solutions according to SMEDA.

496. The project will cooperate with existing institutions including incubator centres, professional training organizations, aggregator platforms, associations and private sector entities to ensure project activities are implemented with a view to achieve maximum outreach and sustainability beyond project duration. With a view to ensure the sustainability of operations, the project will enhance private sector engagement such as with VC firms, major corporations/industries, network operators etc. Furthermore, linkages with international accelerator and financing platforms such as ASAP and AECF will provide business growth services to MSMEs to ensure sustaining established services beyond project duration.

497. The project will attract and nurture top talent to find solutions for the most vulnerable to adapt to climate change. Youth and women will be encouraged to submit adaptation ideas. In such a manner, the government who has highlighted tackling youth unemployment rates and women poverty rates, will have the capacity and understanding on how to improve the access of women and youth to MSME funding and training needs.

498. Simultaneously, the project will use UNIDO's unique advantage in the innovation space to pool technical support and financial support from regional organizations such as AECF and international network such as PFAN (REEEP), FSP such as the Union Trust Bank among others. The new Adaptation Accelerator will promote interest and innovation in the adaptation space and has been devised to crowd in other funding to ensure continuity. A systematic pipeline of enterprises will graduate from the Adaptation Accelerator into AECF and subsequently into PFAN (REEEP). This will ensure the continuous business support and finance facilitation needed for MSMEs to grow into commercially viable business ventures. This strategic alignment will provide a continuous support for MSME's, throughout the various business development stages.

499. Component 3 will build on value chain support provided by the baseline initiatives (e.g., World Bank and GEF projects). Highlighting opportunities along the value chain such as by supporting Nature-Based Infrastructure will ensure that the rural populations can exploit diversified, productive livelihoods. The project will work with community organizations to obtain their feedback on how adaptation innovations can make the greatest positive impact with providing jobs and diversifying livelihoods. Additionally, the project will work from the ground up to gain local support and ownership. Women and youth-based organizations will receive targeted trainings and will be encouraged to access lending products that have been developed with rural productivity constraints in

mind. The project will also support select FSPs to establish and manage revolving funds that will supply credit lines which will support adaptation innovation proliferation.

500. Finally, in Component 4 all knowledge on best practices and technologies will be stored in the EPA's existing M&E database. Specifically, by adding a learning emphasis and by targeting gender inclusion, this will ensure that best innovations are used by all actors along the essential oil value chains. Storing this knowledge will enable innovations to be easily identified for further scale-up after project termination.

501. The GEF/UNIDO Adaptation Project is designed with the view to ensuring self-sufficiency and long-term sustainability of the acceleration and coordination mechanisms established in its framework specifically through:

*The established Adaptation Innovation Platform is expected to be continued after the end of the project.*

*Enhancing the capacity of the accelerators/incubators to provide the Pre-Accelerator, Accelerator, Advanced Accelerator, and Post-Accelerator services in a self-reliant manner after year 1. More specifically, the assistance will be gradually phased out in the subsequent years; therefore, the accelerators/incubators are expected to run all activities and coordinate with relevant stakeholders fully autonomously by the end of the project;*

*Building capacity of local experts (trainers, mentors, judges), so that they are able to offer their services on market terms (independently from this project) to entrepreneurs not supported by the project. Collaboration with Government stakeholders is particularly important;*

*Providing several tools that can be referred to and used by different adaptation innovation and entrepreneurship ecosystems stakeholders beyond the lifetime of the GEF/UNIDO Adaptation Project, such as guidebooks, systems, tools, guidelines, website, etc and these will be adopted and continue to be used by national institutions such as EPA, CCS, SLMet.;*

*Guiding entrepreneurs to incorporate sustainability considerations in their business models, such as meeting the needs of the present generation without compromising the ability of the future generations to meet their own needs; as well as ensuring that the technologies provided lead to adaptation and do not lead to maladaptation and ensuring business resilience to external shocks and stable growth potential (through a thorough analysis of the demand, competition, etc.);*

*Establishment and operationalization of the CAVF, that will facilitate early-stage investment, and thus enabling the entrepreneurs to bridge the valley of death in their scale-up journey, which in turn mitigates risks for future investors and increases chances for further rounds of finance.*

*In the final phase of the project, the PMU will develop exit strategies for the Sierra Leone Adaptation Incubator/Accelerator and CAVF, respectively. These will be based on the lessons learned, gained experience and capacity and will define the future modalities of the established mechanisms.*

*Capacity building in the web platform to continue to be also used after the project lifetime (as a marketplace, where entrepreneurs will continue to showcase their solutions, investors will continue to*

*scout for innovations, policymakers and regulators will continue to interact). The web platform will catalyse connectivity between different stakeholders in the long term.*

*Ensuring the uptake of the financial mechanisms, financial services and products and tools by FSP in Sierra Leone, through working with them in the definitions of these, support them in testing it and rolling it out during the project.*

*Providing tools for the private sector (MSMEs, start-ups and FSP), public sector (government institutions), and the vulnerable population to kick start the process of adaptation earlier in order to be able to save costs in adaptation in the future.*

502. In addition, social sustainability will be strengthened in the country due to the systematic gender mainstreaming throughout the project cycle.

Potential for scaling-up:

503. Taking into account (i) the global nature of the adaptation market and the severity of the climate change impacts that are already occurring nowadays and projected to get aggravated with the expected increase in global temperature in the future, (ii) the expected increasing need for adaptation finance (iii) the fact that MSMEs across the world, and in particular, in developing countries are the drivers for growth, it can be said that the replicability potential of the proposed GEF/UNIDO Adaptation Project is enormous, both at the national and international level.

504. To scaling up the market for climate adaptation solutions, the GEF/UNIDO Adaptation Project will work with private-sector, financial institutions and the development partners identified, to strengthen financial instruments to increase access to finance to vulnerable groups on the demand side and MSMEs for the deployment of adaptation solutions (supply-side).

505. Specifically, the project will support the scaling up of adaptation innovations by addressing two key issues:

*Lack of available funding and investment vehicles aimed at early-stage companies:*

*targeted training and capacity building for FSPs on financing climate adaptation innovation and deployment by MSMEs,*

*designing specific financial instruments adapted to the needs of MSMEs at different development stages of their businesses (the early-stage ?Technological Valley of Death? and the later-stage ?Commercialization and scaling-up Valley of Death?[237]<sup>206</sup>),*

*development of risk mitigation instruments to mobilize increased private sector financing for MSMEs distributing climate adaptation products and service*

*development of blended finance mechanisms that will provide risk-sharing structures and hence catalyse increased private sector investment,*



*provide a wide range of networking, matchmaking, and investment facilitation services to MSMEs.*

*Limited access to financing and risk mitigation products by stakeholders working along the value chains:*

*training and capacity building for FSPs on designing and deploying financial products and services adapted to the needs of the vulnerable populations in order to be able to access climate adaptation products and services.*

*development of innovative financial products and services for target customers of climate adaptation, products and services, including digitally-enabled solutions.*

*development of innovative financing structures, e.g., credit lines to aggregators. With support for MFIs and FSPs to establish and manage revolving funds, the project will support the most vulnerable to access credit lines in the agriculture, water and energy sectors. The credit lines will be essential for ensuring mass adoption of the technologies. Furthermore, the project will set the groundwork to introduce climate-risk insurance products by supporting climate data collection and making Sierra Leone insurance groups aware of such existing products.*

*Furthermore, at local/national scale, the experience gained by the PMU and the Accelerators/Incubators during the implementation of this project will be used to identify other geographical areas that need specific support or expand the technological scope where the project could be replicated.*

506. Additionally, the project seeks to support the creation of market linkages and spur the deployment of suitable TPS through cooperating with existing aggregator platforms to boost technology dissemination and deployment. Through establishing the required mechanism and an enabling environment, as well as link with national and regional partners, the project aims to reduce the barriers and systemic risk across the adaptation finance landscape in order to enable the private sector to deliver scaled deployment and greater impact in Sierra Leone and potentially across the region.

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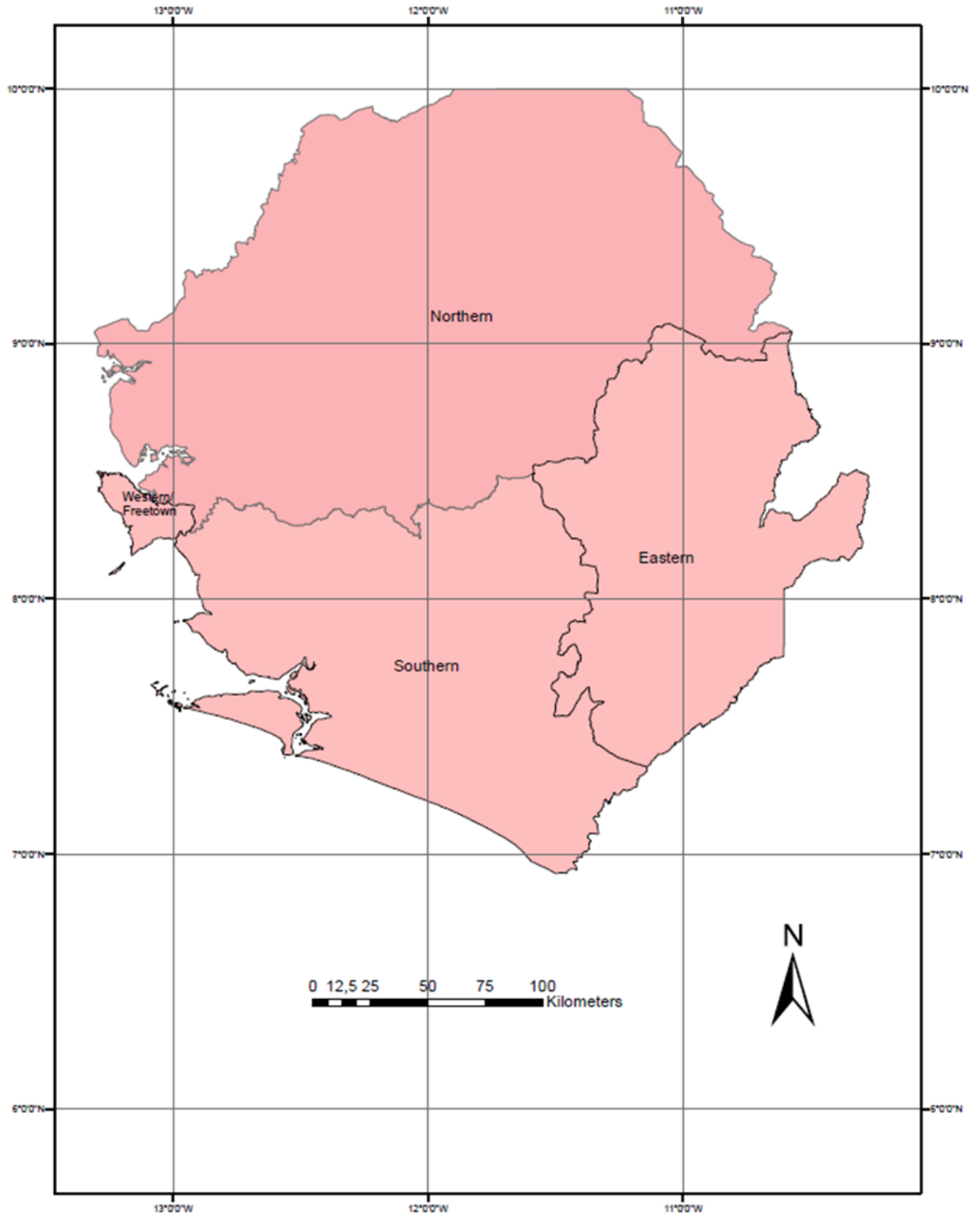
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#### **1b. Project Map and Coordinates**

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

507. The project will take place in the four (4) regions of Sierra Leone, i.e., the entire country (see Figure 43).



1c. Child Project?



**If this is a child project under a program, describe how the components contribute to the overall program impact.**

## **2. Stakeholders**

**Select the stakeholders that have participated in consultations during the project identification phase:**

**Civil Society Organizations** Yes

**Indigenous Peoples and Local Communities**

**Private Sector Entities** Yes

**If none of the above, please explain why:**

508. Adaptation to climate change across the WEF sectors through the engagement of the private sector requires effective collaboration for identification of the climate change risks and vulnerabilities, project interventions, the creation of the necessary synergies to approach and address the issue in an integrated way, as well as to identify how, when and to what extent the different stakeholders should be involved in order to get the maximum output as possible from the project and guarantee the ownership of the resulting products and outputs, so to as to ensure its sustainability once the project comes to an end. Stakeholder consultation and involvement is key for this, and it is at the heart of the PPG phase as well as of the project implementation phase.

During the preparation of the project (PPG)

509. Achieving the project objectives requires coordination and engagement of a wide range of stakeholders across sectors, including central and local government, the private sector, development partners, civil society, which the project has planned and included in its activities. Making the stakeholders aware of the climate risks and vulnerability, ways to address these by designing, disseminating and scaling up proven adaptation TPS, engaging the public and private sectors are a major part of engaging with the stakeholders in the project.

510. During PPG, people from Sierra Leone and international stakeholders were engaged in for i) the development of the baseline and the CRVA (included in the baseline report as well as in this document); ii) formulation the activities and iii) the identification of a preliminary set of MSMEs, business and project proposals, as well as incubators/ accelerators and FSP that the project envisage to engage and support during its implementation. This was carried out through (i) virtual and in-person meetings with different stakeholders; (ii) participation in the workshops/meetings with a larger number of stakeholders; (iii) an online questionnaire; and (iv) direct consultation by e-mail or phone. These were carried out throughout the project duration by the Consultant team, which includes international consultants and a national consultant allowing a constant engagement with the stakeholders.

511. The following were the stakeholders directly and indirectly involved in the project definition at PPG stage:

Public sector / Government Institutions: Environment Protection Agency (EPA), Sierra Leone Ministry of Energy, SMEDA, Ministry of Land, Housing and Country Planning (MHLHCP), Ministry of Trade and Industry (MTI), National Water Resource Management Agency, Ministry of Agriculture and Forestry, Agriculture Value Chain Development project, Ministry of Fisheries

Donors/International Cooperation: CTCN, International Fund for Agricultural Development (IFAD), FAO, PFAN, ASAP, Village Capital, GIZ GmbH, GIZ/Energising Development , Food and Agriculture Organization of the United Nations

Financial Institutions / Funds: Sierra Leone Agribusiness Development Fund (SLADF), Union Trust Bank (UTB), Rokel Commercial Bank, Apex Bank, Ecobank Microfinance, AECF, Grassroot Microfinance limited

Private Sector: SunCulture, Easy Solar, ESOKO, ColdHubs, SERL/Camserv, FLSPower and WAO, Power Mello Africa, Benimix Food Company, Agro Fish Farm Company Ltd., Kono District, Regeneration Investment, Eguema Agricultural Company Limited, Sierra Agric Industry and Services, Amazing Pure Water, Ever Life Water Company, Gee Fresh Pure Water Company, Shallon Pure Water and Agriculture, Spring Water Factory, Brookfield's Pure Water , Indigenous Sierra Leonean Pure Water, Sunbird Bioenergy, Solar Era Holdings SL, JMK FOODS LTD, AFRO WORKS IEMFCO, Mel-O Africa Limited, Talleh Agricultural Poultry Farm (SL) Ltd, VAL Energy and General Services, Kpange Agricultural Company Limited, LAMBANO SIERRA LEONE LIMITED, Power Mello Africa (SL) Limited, Yoormakua Agricultural Company Limited, Nanfo'o Trading Company (SL) Limited, Regeneration Investment Fund

Civil Society Organisations (CSO) / Non-Governmental Organization (NGOs) / Communities representatives (Cooperatives: The Energy Nexus Network (TENN), JQB services Farmers Association, Young Generation Farmers' Cooperative; Integrated Rural Development Association, Falaba Farmers' Cooperative, MOPADA-SL, Sierra Leone Farmers Market, Bundulai Farmers Agricultural Farmers Association, Youth Action for Rural Development, Health Education Advocacy Development - Sierra Leone, Sierra Leone Friends of Humanity (SLOFH), Community Agricultural Development Association, Women on Boards Network Sierra Leone (WOBNSL), Community Agricultural Business Center (ABC), Bondayila Farmers Cooperative Society Limited

Business associations: CAPP, SL Association of Microfinance Institutions (SLAMFI), Osfam

Incubators and accelerators/ universities: Innovation SL, Green Network for Youth Sierra Leone, DSTI, The University of Makeni,

512. The description and analysis of each of the mentioned and other Sierra Leone relevant stakeholders is shown in the Baseline Report (Annex P).

#### During project implementation

513. The project execution will be undertaken through multiple contractual arrangements between UNIDO and international organizations, national governmental entities and private operators.

514. Table 29 summarises the roles of the different stakeholders that will be involved during project implementation.

Table 29 SUMMARY OF THE ROLES OF THE DIFFERENT STAKEHOLDERS INVOLVED DURING PROJECT IMPLEMENTATION.

Stakeholder	Current role in the country	Envisaged role in the GEF/UNIDO Adaptation Project
Small and Medium Enterprises Development Agency (SMEDA)	SMEDA facilitates, assists and provides market access and business linkage opportunities to SMEs in SL in order to enable them to compete successfully in national and international markets.	<p>SMEDA is nominated as the Project Executing Entity (PEE) responsible for the overall project execution and for the execution of PC1, PC2 and PC3, including the management and disbursement of the funds associated with these project components.</p> <p>Being the lead PEE, SMEDA will enter into agreements with other Project Executing Partners (PEPs) to support the implementation of different project activities.</p> <p>PSC Member and will host the PMU.</p> <p>Participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment and instruments development under Output 1.2.1.</p> <p>Design and manage the Climate Adaptation Venture Fund under Output 2.2.3 under EPA supervision.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>

<p>National GEF Focal Point ? Environment Protection Agency (EPA)</p>	<p>EPA is responsible for supporting institutional and human resources capacity building in climate change as well as supporting the creation and production of informative material about climate change. And innovation (leaflets, guidebooks, documentaries, videos and others in SL.</p>	<p>Chair of the PSC</p> <p>Host and Chair the Adaptation Innovation Platform.</p> <p>In charge of overall coordination of activities as chair of the Innovation Adaptation Platform / PSC.</p> <p>Ensure coordination among ministries and stakeholders involved in the project.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Support the establishment of the Adaptation Innovation Platform and Adaptation Innovation Website as well as participate in the Adaptation Innovation Platform under Output 1.1.1</p> <p>Provide inputs for the training needs assessment under Output 1.1.4.</p> <p>Provide inputs for the policy needs assessment and instruments development under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support and oversee the design and management of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>
<p>United Nations Industrial Development Organisation (UNIDO)</p>	<p>It is a UN specialized agency that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability. It has a Field Office in Freetown, SL and have conducted several projects and programmes in the country.</p>	<p>UNIDO, as a GEF Implementing Agency, is responsible for the implementation of the project, which entails oversight of project execution to ensure that the project is carried out in accordance with agreed standards and requirements. UNIDO will also be in the PSC.</p>

<p>Ministry of Environment</p>	<p>The Ministry of Environment is responsible for supporting policy reviews and other statutory instruments on climate change adaptation / mitigation, ensuring coordination between resources during capacity building sessions as well as ensuring SL following international climate mandates.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform</p> <p>Provide assistance in matters related to environment in SL</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>
<p>National Water Resources Management Agency (NWRMA)</p>	<p>NWRMA protects, manages and regulates surface and ground water resources in SL. The agency is responsible for granting of water rights, water resources allotment among competing users, formulation of regulatory measures, information/data collection and sharing on water resources, with a view also to controlling pollution. Trans-boundary water resource issues also fall under the mandate of the NWRMA.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform</p> <p>Provide assistance in matters related to water resources in SL</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the training needs assessment under Output 1.1.4.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>

<p>Electricity and Water Regulatory Commission (EWRC)</p>	<p>Independent regulatory authority responsible for formulating, implementing, monitoring quality and compliance, providing tariff guidelines, licenses and implementing regulatory frameworks for the safe, secure, affordable and reliable supply of water and electricity in SL.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide assistance in matters related to regulations regarding electricity and water in SL.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
<p>Sierra Leone Meteorological Agency (SLMet)</p>	<p>The SLMet supports the collection and dissemination of weather / climate data into other sectors such as water, agriculture and energy.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide assistance in matters related to weather information.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the training needs assessment under Output 1.1.4.</p> <p>Provide guidance for the establishment of the centralised platform for climate data as well as collect data, make it available and maintain the platform under Output 1.1.5.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>

<p>Ministry of Trade and Industry (MTI)</p>	<p>The MTI is responsible for developing policies and programmes to stimulate local and export trade as well as to enhance private sector investment, industrial and economic growth.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment and instruments development under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
<p>Directorate of Science, Technology and Innovation (DSTI)</p>	<p>The DSTI is the main element of the SL National Innovation and Digital Strategy. It emerged in 2018 and is based on the philosophy of 'digitization for all.' Its primary mission is to use science and innovation to promote the Medium-Term National Development Plan, which strives to improve people's lives through education, inclusive growth and a strong economy.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide assistance in matters related to Science, Technology and Innovation in SL.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment and instruments development under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>

<p>Sierra Leone Investment and Export Promotion Agency (SLIEPA)</p>	<p>The SLIEPA is responsible to promote investment opportunities in SL, including providing information to potential investors on matters relating to investments; facilitating registration of business enterprises; assisting investors in obtaining permits, licenses, certificates or clearances needed for the commencement of business; assisting potential investors in identifying joint venture partners in SL as well as developing relationship between public and private sector for the growth of investment.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment and instruments development under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
<p>Ministry of Land, Housing and Country Planning (MLHCP)</p>	<p>The MLHCP is responsible for implementing policy as regards planning and the environment in SL, managing state lands; compulsory acquisition of land; surveying and mapping; planning; development; and establishment and enforcement of building codes.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>



<p>Ministry of Agriculture and Forestry (MAF)</p>	<p>The MAF is responsible to formulate agricultural development policies and to advise the Government on such policies relating to its administration and the management of the agricultural sector of the SL's economy. It also supports the institutional and human resources capacity building for the agriculture sector in SL.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
<p>Ministry of Water Resources (MWR)</p>	<p>The MWR is responsible to formulate and implement policies for the development and management of water resources in SL, in order to ensure all communities have improved access to safe drinking water, in a sustainable manner, for socio-economic development.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>

<p>Ministry of Fisheries</p>	<p>The Ministry of Fisheries is responsible to plan, develop, rationally manage and conserve all living aquatic resources of the country for the benefit of the country.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
<p>Ministry of Energy (MoE)</p>	<p>Ministry leading and coordinating energy sector development, also and responsible for policies and programs for the provision of affordable and sustainable energy services. It supports the creation and production of informative material about climate change and energy.</p>	<p>PSC Member and participant of the Adaptation Innovation Platform</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>

<p>Ministry of Local Government and Rural Development</p>	<p>The Ministry of Local Government and Rural Development is responsible to provide an effective link between national development priorities and local level development initiatives as well as build local councils? capacities to lead and coordinate key actors to leverage local economic growth and provide infrastructure for economic activities in their respective localities across SL.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
<p>Ministry of Social Welfare, Gender and Children's Affairs (MSWGCA)</p>	<p>The MSWGCA is charged with the responsibility of responding to the social needs pertaining to Gender inequalities, social depravity of groups like the disabled, women rights, child rights, Religious rights among others in SL.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide assistance in matters related to gender and youth promotion in SL.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>

<p>Ministry of Finance</p>	<p>Ministry responsible for the public debt and public finance management, approval of multiannual liabilities, liaising with multinational donor organisations on PPPs and issuing concurrence for PPP approval by Cabinet.</p>	<p>Potential PSC Member and participant of the Adaptation Innovation Platform.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
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<p><i>Business Associations</i></p> <p>? Commercial Agricultural Producers and Processors Association (CAPPA)</p> <p>? Sierra Leone Opportunities for Business Action (SOBA)</p> <p>? Sierra Leone Chamber of Commerce, Agriculture, and Industry (SLCCIA)</p> <p>? Sierra Leone Chamber for Agribusiness Development (SLeCAD)</p>	<p>Business associations with national coverage, which have access to local MSMEs across SL.</p>	<p>Selected ones will be potential PSC Members and participants of the Adaptation Innovation Platform.</p> <p>Engaged during consultative processes to be undertaken during project execution.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the policy needs assessment under Output 1.2.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Adaptation Incubator/Accelerator cycles under Output 2.1.3.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual DRC under Output 2.2.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Post-Accelerator cycles under Output 2.2.2.</p> <p>Involved in outreach and communication activities related to awareness-raising events under Output 3.1.1 and Output 3.2.1.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p> <p>Ease the connection with MSMEs and also have an understanding of the most common barriers and needs they face.</p> <p>Provide key insights to ensure that the project appropriately mainstreams and addresses vulnerable population needs.</p>
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<p><i>Farmers and vulnerable groups Associations, NGOs and CSOs</i></p> <p>? Community Agricultural Business Center (ABC)</p> <p>? MOPADA-SL</p> <p>? African Foundation for Development ? Sierra Leone (AFFORD-SL)</p>	<p>Farmers and vulnerable groups Associations, NGOs and CSOs acting across SL and have direct access to local farmers and vulnerable communities that will be involved in the project activities.</p>	<p>Selected ones will be potential PSC Members and participants of the Adaptation Innovation Platform.</p> <p>Engaged during consultative processes to be undertaken during project execution.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Adaptation Incubator/Accelerator cycles under Output 2.1.3.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual DRC under Output 2.2.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Post-Accelerator cycles under Output 2.2.2.</p> <p>Involved in outreach and communication activities related to awareness-raising events under Output 3.1.1, Output 3.2.1 and Output 3.3.2.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p> <p>Ease the connection with vulnerable groups and also have an understanding of the most common barriers and needs they face.</p> <p>Provide key insights to ensure that the project appropriately mainstreams and addresses vulnerable population needs.</p>
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<p><i>Women Associations, NGOs and CSOs</i></p> <p>? Organisation of Women's Networks for Entrepreneurs (OWNERS)</p> <p>? Women on Boards Network SL (WOBNSL)</p> <p>? Women's Action for Human Dignity (WAHD)</p> <p>? Campaign for Good Governance (CGG)</p>	<p>Women Associations, NGOs and CSOs acting across SL promoting development and equal rights to women. They have direct access to women groups that will be involved in the project activities.</p>	<p>Selected ones will be potential PSC Members and participants of the Adaptation Innovation Platform.</p> <p>Engaged during consultative processes to be undertaken during project execution.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Adaptation Incubator/Accelerator cycles under Output 2.1.3.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual DRC under Output 2.2.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Post-Accelerator cycles under Output 2.2.2.</p> <p>Involved in outreach and communication activities related to awareness-raising events under Output 3.1.1, Output 3.2.1 and Output 3.3.2.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p> <p>Ease the connection with women groups and also have an understanding of the most common barriers and needs they face.</p> <p>Provide key insights to ensure that the project appropriately mainstreams, and addresses women needs.</p> <p>The project will also deliberately mobilize interest from women entrepreneurs by targeting the involvement of their associations in the project process. This will be done by taking into consideration the cultural context that exists in SL. That way, the project would adequately address the</p>
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		gender imbalances in MSMEs and provide a solid basis for gender mainstreaming in climate change adaptation.
<p><i>.Youth Association, NGOs and CSOs</i></p> <p>? Youth Action for Rural Development</p> <p>? Children's Hope Initiative Sierra Leone (CHI-SL)</p>	<p>Youth Associations, NGOs and CSOs acting across SL promoting development and opportunities to the youth. They have direct access to youth groups that will be involved in the project activities.</p>	<p>Selected ones will be potential PSC Members and participants of the Adaptation Innovation Platform.</p> <p>Engaged during consultative processes to be undertaken during project execution.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Adaptation Incubator/Accelerator cycles under Output 2.1.3.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual DRC under Output 2.2.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Post-Accelerator cycles under Output 2.2.2.</p> <p>Involved in outreach and communication activities related to awareness-raising events under Output 3.1.1, Output 3.2.1 and Output 3.3.2.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p> <p>Ease the connection with youth groups and also have an understanding of the most common barriers and needs they face.</p> <p>Provide key insights to ensure that the project appropriately mainstreams and addresses youth needs.</p>



<p><i>Associations, CSOs and NGOs:</i></p> <p>? Sierra Leone Indigenous Business Association (SLIBA)</p> <p>? West Africa Coalition for Indigenous Peoples? Rights (WACIPR)</p>	<p>Associations, NGOs and CSOs acting across SL. They have direct access to vulnerable groups that will be involved in the project activities.</p>	<p>Selected ones will be potential PSC Members and participants of the Adaptation Innovation Platform.</p> <p>Engaged during consultative processes to be undertaken during project execution.</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Adaptation Incubator/Accelerator cycles under Output 2.1.3.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual DRC under Output 2.2.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Post-Accelerator cycles under Output 2.2.2.</p> <p>Involved in outreach and communication activities related to awareness-raising events under Output 3.1.1, Output 3.2.1 and Output 3.3.2.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
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<p><i>Universities</i></p> <p>? Njala University</p> <p>? University of Makeni</p> <p>? University of Sierra Leone - Fourah Bay College</p> <p>? Eastern Polytechnic</p> <p>? Freetown Polytechnic</p> <p>? Ernest Bai Koroma University of Science and Technology</p>	<p>Higher education institutions in SL across the country. They offer science and engineering courses that could promote the development of climate change technologies, products and services.</p>	<p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Provide inputs for the training needs assessment under Output 1.1.4.</p> <p>Support the establishment of testing labs showcasing innovative adaptation technologies as well as development and publication of papers under Output 1.2.3.</p> <p>Involved in outreach and communication activities related to the launch of the program and calls for applications for the annual SL Pre-Accelerator cycles under Output 2.1.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Adaptation Incubator/Accelerator cycles under Output 2.1.3.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Advanced-Accelerator cycles under Output 2.2.1.</p> <p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Post-Accelerator cycles under Output 2.2.2.</p> <p>Involved in outreach and communication activities related to awareness-raising events under Output 3.1.1, Output 3.2.1, and Output 3.3.2.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
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<p><i>Financial Institutions, Funds and Potential Investors:</i></p> <p>? Sierra Leone Agribusiness Development Fund (SLADF)</p> <p>? Sierra Leone Association of Microfinance Institutions (SLAMFI)</p> <p>? AfricInvest</p> <p>? Acumen</p> <p>? Autodesk Foundation</p> <p>? Ecobank Microfinance Sierra Leone</p> <p>? Grassroot Microfinance Limited</p> <p>? Munafa Social Microfinance</p> <p>? Rokel Commercial Bank</p> <p>? Union Trust Bank Limited</p> <p>? APEX Bank</p>	<p>Financial institutions, funds, banks, investment companies and credit cooperatives that act in SL providing financial products such as grants, loans, guarantees, equity, seed funding and blended funding for MSMEs, entrepreneurs and vulnerable populations. Some of them already have experience working in the climate change adaptation market.</p>	<p>Selected ones will be potential PSC Members and participants of the Adaptation Innovation Platform</p> <p>Support the establishment of the Adaptation Innovation Platform and Adaptation Innovation Website under Output 1.1.1</p> <p>Provide key insights for the mapping exercise under Output 1.1.1.</p> <p>Involved on the design of the Climate Adaptation Venture Fund under Output 2.2.3</p> <p>Involved on the establishment of network with financial institutions and funds under Output 3.1.2</p> <p>Provide support on the creation and adoption of risk mitigation instruments and climate-smart investment planning tools under Output 3.3.1.</p> <p>Involved in activities regarding the creation and adaptation of innovative financial products and services for vulnerable populations as well as communication activities under Output 3.3.2.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>
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<p><i>National Incubators/Professional Training Institutions</i></p>	<p>Incubators, accelerators and training institutions acting in SL providing crucial support to start-ups, small enterprises and entrepreneurs. They act as local intermediary institutions, strengthening the national ecosystem that nurtures entrepreneurship and the growth of small businesses. They facilitate linkages between entrepreneurs, other innovation actors and potential markets of suppliers and buyers, leading to the development of products that are marketable and enhance welfare. They also help entrepreneurs to connect with sources of finance, providing them with the means to innovate.</p>	<p>Support the establishment of the Adaptation Innovation Platform and Adaptation Innovation Website under Output 1.1.1</p>
<p>? Innovation SL (Innosl)</p>		<p>Selected incubators / accelerators will be responsible for some activities regarding organising national forums and forum proceedings under Output 1.2.2.</p>
<p>? Innovation Axis</p>		
<p>? Sensi Tech Hub</p>		<p>Selected incubators / accelerators will be involved in activities regarding the Pre-Accelerator Workshop and outreach and communication activities under Output 2.1.1.</p>
<p>? The Aurora Foundation</p>		
<p>? UNDP Accelerator Lab</p>		<p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Adaptation Incubator/Accelerator cycles under Output 2.1.3.</p>
<p>? World Bank Accelerator</p>		
<p>? Ghana Climate Innovation Centre (GCIC)</p>		<p>Selected incubators / accelerators will be involved in activities regarding training and coaching activities to MSMEs, entrepreneurs and start-ups through competition-based accelerators under Output 2.1.3.</p>
<p>? Nigeria Climate Innovation Centre</p>		<p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Advanced-Accelerator cycles under Output 2.2.1.</p>
		<p>Selected incubators / accelerators will provide business growth support and seed funding for MSMEs, entrepreneurs and start-ups under Output 2.2.1.</p>
		<p>Involved in outreach and communication activities related to the launch of and calls for applications for the annual SL Post-Accelerator cycles under Output 2.2.2.</p>
		<p>Selected incubators / accelerators will provide investment facilitation support for projects under Output 2.2.2.</p>
		<p>Organize national investment facilitation events (Investor Connect) for the SL Post-Accelerator alumni under Output 2.2.2.</p>
		<p>Selected incubators / accelerators will provide support for the establishment of the Climate Adaptation Venture Fund under Output 2.2.3.</p>

		<p>Selected incubators / accelerators will organise awareness-raising events under Output 3.1.1.</p> <p>Involved in outreach and communication activities related to awareness-raising events under Output 3.1.1, Output 3.2.1 and Output 3.3.2.</p> <p>Accelerators will support PFAN in delivering capacity building and training workshops under Output 3.1.2.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>
African Enterprise Challenge Fund (AECF)	The AECF is a development institution which supports businesses to innovate, create jobs, leverage investments and markets in an effort to create resilience and sustainable incomes in rural and marginalized communities in Africa, including SL.	<p>Participate in the Adaptation Innovation Platform under Output 1.1.1</p> <p>Connect with MSMEs/start-ups engaged in the Post-Acceleration Programme under Output 2.2.2</p> <p>Support the design of the Climate Adaptation Venture Fund under Output 2.2.3.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2.</p>
Private Financing Advisory Network (PFAN)	PFAN is a global network of climate and clean energy financing experts, which offers free business coaching and investment facilitation to entrepreneurs developing climate and clean energy projects in emerging markets, including SL.	<p>Participate in the Adaptation Innovation Platform under Output 1.1.1</p> <p>Connect with MSMEs/start-ups engaged in the Post-Acceleration Programme under Output 2.2.2</p> <p>Involved in the delivery of capacity building and workshops under Output 3.1.2</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>

<p>Climate Technology Centre and Network (CTCN)</p>	<p>CTCN is a body mandated by the UNFCCC to assist developing countries, including SL, in spreading environmentally sound technologies to address climate change challenges offering technical assistance.</p>	<p>Participate in the Adaptation Innovation Platform under Output 1.1.1</p> <p>Provide guidance in some activities under Output 2.1.2</p> <p>Involved in activity regarding pairing established enterprises with local entrepreneurs under Output 2.1.4.</p> <p>Connect with MSMEs/start-ups engaged in the Post-Acceleration Programme under Output 2.2.2</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p> <p>Provide key insights supporting the technology innovation within the GEF/UNIDO Adaptation Project.</p>
<p>Adaptation SME Accelerator Program (ASAP)</p>	<p>ASAP was developed by Lightsmith Group. It is an ecosystem-system building exercise that seeks to identify and support SMEs that offer technologies, products, and services, which can enhance the resilience and adaptation of their users and customers in response to a changing climate across Africa, Asia, and Latin America and the Caribbean. ASAP aims to enhance the availability and uptake of climate adaptation solutions by identifying, engaging and empowering SMEs providing such solutions in developing countries.</p>	<p>Participate in the Adaptation Innovation Platform under Output 1.1.1</p> <p>Provide guidance in some activities under Output 2.1.2, Output 2.1.3 and Output 2.1.4</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>

<p>Climate-KIC</p>	<p>Climate-KIC is the EU's largest public private partnership addressing climate change through innovation to build a zero-carbon economy. Climate-KIC is supported by the European Institute of Innovation and Technology (EIT), a body of the European Union.</p>	<p>Develop the tools to assess climate vulnerability and support the identification of appropriate adaptation solutions (TPS) for the WEF sectors, develop the guide and build capacity on the use of this tool under Output 1.1.1.</p> <p>Implement activity regarding adaptation clusters under Output 1.2.4. and contribute to the mapping exercise under Output 1.1.2.</p> <p>Provide guidance in some activities under Output 2.1.2</p> <p>Design the Pre-Accelerator Programme , carry out the training the trainers programme for incubators/accelerators and support the incubators/accelerators in launching this programme within Output 2.1.1.</p> <p>Develop the Sierra Leone Adaptation Incubator/Accelerator Programmes and train the incubators/accelerators in delivering it under Output 2.1.2.</p> <p>Involved in activity regarding pairing established enterprises with local entrepreneurs under Output 2.1.4.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>
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<p><i>Multi and bi-lateral agencies:</i></p> <p>? International Fund for Agricultural Development (IFAD)</p> <p>? Food and Agriculture Organization (FAO)</p> <p>? AfDB</p> <p>? World Bank</p> <p>? UNDP</p> <p>? GIZ</p> <p>? International Institute for Sustainable Development (IISD)</p>	<p>Multi and bi-lateral agencies are implementing projects in SL in the WEF sectors, and some of them, are also implementing projects that involved MSMEs</p>	<p>Participate in the Adaptation Innovation Platform under Output 1.1.1 when invited.</p> <p>Participate in the PSC when invited.</p> <p>Involved in the development and uploading of knowledge materials on the Adaptation Innovation website under Output 4.1.2</p>
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515. Stakeholder participation in the project activities will be recorded in registries, newsletters, newsflash etc. This will be important to measure the key performance indicators of the project during project execution.

**Please provide the Stakeholder Engagement Plan or equivalent assessment.**

516. A Stakeholder Engagement Plan is provided in Annex K.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

**Select what role civil society will play in the project:**

**Consulted only; Yes**

**Member of Advisory Body; Contractor;**

**Co-financier;**

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

**Executor or co-executor;**



## Other (Please explain)

### 3. Gender Equality and Women's Empowerment

#### Provide the gender analysis or equivalent socio-economic assessment.

517. The following paragraphs summarise the Gender Analysis Report included as **Annex I** to this Project Document. Please refer to Annex I for a more detailed analysis on how this project envisages contributing to gender equality and the empowerment of women, as well as ensuring gender mainstreaming through project execution.

518. Climate-related disasters have impacted human populations in many areas, including agricultural production, food security, water management, energy production and public health. The level of impacts and coping strategies of populations depend heavily on their socio-economic status, socio-cultural norms, access to resources, poverty, and gender. Research has also provided more evidence that the climate change effects are not gender-neutral. Although both men and women are experiencing similar extreme climatic events, the impact of such changes depends on their roles. According to the 2004 census, there are more female farmers in Sierra Leone (52.2%) compared to male farmers (47.8%). Nonetheless, women do not normally share direct benefits of additional income from their labour. In fact, the census reported that in agricultural activities men dominate the paid and self-employed category while women mostly belong to the unpaid family workforce.

519. Women also play a key role in the family and the community as caregivers, have the greatest control over family nutrition and are among the poorest. Women cook, fetch water and fuelwood, clean and launder clothes (often at relatively remote water sources) and take care of the sick in the family or children under the age of five. Rural women are also confronted by challenges in health facilities which are sometimes far, incredibly busy, and they are often told to come back the following day, which costs them dearly in terms of time. There are no childcare facilities for women in rural communities, so women take their young children with them to the farm. They usually have to go check on the children at intervals to make sure they are safe and are not bitten by snakes. This actually slows their work pace[1]. In undertaking productive roles, men rarely support women.

520. Climate change, with consistently higher temperatures, heavier floods and droughts, disrupts their lifestyle and overload them because it not only impacts their crops? productivity but also puts pressure on their daily chores since women play a major and leading role in household management, water collection and maintaining household hygiene. In the rural areas, women have to cover more distance to fetch water or wood for cooking[2]. As the majority of farmers and small tenure agricultural entrepreneurs, women are disproportionately impacted.

521. Furthermore, key factors that account for the differences between women?s and men?s vulnerability to climate change risks include gender-based differences in time use; access to assets and credit, treatment by formal institutions, which can constrain women?s opportunities, limited access to

policy discussions and decision making, as well as lack of sex-disaggregated data collection for policy change, among others.

522. Women from Sierra Leone face challenges due to continued imbalances in social norms and power relations. Statistics clearly show gender inequality in the country. For instance, the HDI for 2019 was 0.452 which puts the country in the low human development category positioning it at 182 out of 189 countries and territories[3]. Also, the national Gender Inequality Index (GII) was 0.644 in 2019[4] ranking 155 out of 162 countries. This index reflects the inequality in achievement between women and men regarding three dimensions: reproductive health, empowerment and the labour market.

523. Women also have very little or no access to credit and other financial services due to limited financial literacy, poor knowledge of administrative procedures, transportation difficulties and cultural barriers. Patriarchal norm and gender-based violence impact negatively women agency and their capacity to develop and benefit economic activities. In 2013, 31% of women did not participate in any household decisions which concerned their welfare. 62.8% of women believed that a husband is justified in beating his wife for various reasons while 28.6% of women aged 15-49 had been subjected to physical and/or sexual violence in the last 12 months. However, women-led households demonstrate better resilience to poverty than male-led households do (WB Poverty Profile 2013)238.

524. While policies and laws in Sierra Leone specifically address gender equality, gender difference remains a serious challenge. For instance, the three 'Gender Acts' (Laws) in 2007-09, (the Domestic Violence Act, the Devolution of Estates Act and the Registration of Customary Marriage and Divorce Act) provide protection to women and girls under all three types of law. Likewise, the law ensures that surviving spouses, female and male, equally have the right to inheritance. Moreover, the Devolution of Estates Act (also known as the 'Intestate Succession Act') provides protection for women in terms of land and estate inheritance in the event that her spouse dies intestate (without a will)[5]. However, while these protections are in place, customary and traditional practices continue to discriminate against women and girls in cases of inheritance. Daughters often are seen as temporary members of the family because they can be wedded off, while sons are seen as rightful heirs that will carry on the family line. Women face the risk of losing control over the land when their husband dies or if they divorce. Male children from the marriage inherit the land but if there are no children and if a woman remarries into her late husband's family, she cannot continue to cultivate the land. A woman who returns to her patrilineal family regains her rights to land for cultivation from the male head of her family.

525. Gender mainstreaming has been central in the PPG stage and will be during project implementation. A guiding principle of the project is to ensure that both women and men can equally lead, participate in and benefit from the project (UNIDO Gender Policy 2019). Particularly, in the Sierra Leone Pre-Accelerator, Accelerator, Advanced Accelerator, and Post-Accelerator Programmes, gender-responsive activities will be streamlined to ensure the achievement of this goal. Special efforts will be made to promote equal participation of women and men, both at managerial and technical levels, as consultants, participants, entrepreneurs, mentors, etc., in all the stages of the project implementation.

526. Specifically, gender questions were addressed during stakeholders' consultation through the online questionnaire, and a gender analysis was carried out following the methodology derived from the UNIDO Gender Mainstreaming tools developed for GEF projects[6] (see Gender Analysis in the

Baseline Report ? Annex P). A draft gender mainstreaming action plan has been developed (see Annex I Gender Analysis Report) in the framework of this project, which also influenced the ultimate project design. In the project design, UNIDO has ensured that the gender dimensions are considered and that the project results framework (PRF) reflects key gender dimensions in the respective outputs, activities, indicators and targets.

527. UNIDO's Guide on Gender Mainstreaming in Energy and Climate Change Projects was used to draft the gender mainstreaming action plan in the framework of this project (see Annex I), and this will serve as a framework for the project implementation to ensure that both UNIDO and GEF requirements are fulfilled. Based on the guidelines, the project will:

**Pursue a 40% women target** in all its activities;

Apply **gender-sensitive recruitment at all levels where possible**, especially in the selection of project staff. Gender-responsive terms of reference will be used to mainstream gender in the activities of consultants and experts. In cases where the project does not have direct influence, gender-sensitive recruitment will be encouraged. Furthermore, whenever possible, existing staff will be trained and their awareness raised regarding gender issues;

**Consider gender dimensions in all decision-making processes** (e.g. efforts to achieve gender balance/representation in such processes), including Project Steering Committee (PSC) meetings;

**Collect sex-disaggregated data;**

**Carry out consultations with stakeholders promoting gender equality and women's empowerment**, such as gender experts and organizations, CSOs and NGOs, e.g. for outreach purposes.

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[1] FAO of UN N 2018-National gender profile of agriculture and rural livelihoods-  
<https://www.fao.org/3/I9554EN/i9554en.pdf>

[2] Government of the Republic of Sierra Leone Ministry of Energy and Water Resources. The National Water and Sanitation Policy. file:///C:/Users/admin/Downloads/sie181226.pdf

[3] Global Gender Gap Report, 2021: [http://www3.weforum.org/docs/WEF\\_GGGR\\_2021.pdf](http://www3.weforum.org/docs/WEF_GGGR_2021.pdf)

[4] Gender analysis of the situation of women and children in Sierra Leone 2011.  
<https://assessments.hpc.tools/assessment/02d394f2-f65b-458f-ace4-be866b020452><https://www.statistics.sl/images/StatisticsSL/Documents/SDG/SDG-Result-Framework-20-01-2021.xls>

[5] Advocacy Brief: Assessing the impact of the three Gender Acts in Sierra Leone.  
<https://www.dfa.ie/media/missions/sierraleone/newsandevents/Advocacy-Brief.pdf>

[6]  
[https://www.thegef.org/sites/default/files/documents/UNIDO\\_Gender\\_Mainstreaming\\_Analysis\\_Tool.pdf](https://www.thegef.org/sites/default/files/documents/UNIDO_Gender_Mainstreaming_Analysis_Tool.pdf)

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

Yes

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

**Improving women's participation and decision making** Yes

**Generating socio-economic benefits or services or women** Yes

**Does the project's results framework or logical framework include gender-sensitive indicators?**

Yes

#### **4. Private sector engagement**

**Elaborate on the private sector's engagement in the project, if any.**

528. The LDCF project's catalytic grant funding and training and capacity building will create an enabling environment for private sector MSMEs, entrepreneurs and start-ups to become the motor for market transformation in the field of adaptation innovation. The private sector is considered the driving force for technology innovation in climate change adaptation and its large-scale deployment. It thus plays a pivotal role in transforming to an alternative economic growth model based on climate-friendly and resource-efficiency approaches that protect the environment and at the same time foster social and economic development and job creation.

529. The project will establish partnerships with private sector FSP, mainly microfinance institutions and banks, to mobilize financial resources to support adaptation innovation as well as work with them to develop financial products and services to be made available to both supply and demand of adaptation TPS. Financial support by various private sector parties will be provided at different stages of the innovation cycle. For instance, regional partners such as AECF can support MSMEs/entrepreneurs to have viable business models and their products commercially-ready and provide financing for business growth and expansion. The project will also actively engage with private sector financiers and investors to develop innovative blended finance structures that will unlock private sector capital for large-scale deployment of climate adaptation-oriented TPS. On the local level, the project will also work with local finance institutions to develop financial products adapted to the needs of rural populations that enable them to access climate adaptation products. All these products will be developed under the Climate Adaptation Venture Fund.

530. Furthermore, the project will ensure the engagement of the private sector at local level. The project will collaborate with Micro-finance institutions as well as communities' associations, such as the ABC centres and others, etc to create unique, lower interest products for rural populations working in the agriculture, water and energy sectors.

531. The NAPA report underscores the need for adaptation measures, including the use of appropriate technologies to address climate risks, including soil improvement and moisture storage technologies, promotion of technology sustainable and resilient water management and the efficient use

of water resources, improved planning and management technology of agriculture, promotion of renewable energy technology, improved management of natural resources, supply chains for resilient agriculture and improved access to climate data. By promoting innovation, transfer and wide-scale dissemination of adaptive TPS in the key areas identified in the NAPA, the project is in consistent with the NAPA.

532. Please refer to Annex K (Stakeholder Engagement Plan) for a more detailed analysis of how the private sector will be engaged through project execution.

## 5. Risks to Achieving Project Objectives

**Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):**

533. In order to secure the success of the project, it is important to carry out an assessment of the elements that could prevent the proposed project from achieving the expected results.

534. Obstacles can be different in nature, such as political, institutional, technical, environmental, and financial. Obstacles can also correspond to the different phases of the project: from the creation and the recruitment phase to the start of the project, the implementation of activities, the participation of stakeholders, monitoring and adaptive management during the project or the sustainability and impact of project actions after the end of the project duration. To minimize the anticipated risks, a wide range of stakeholders were engaged during the design phase of the project.

535. The potential risks that could hinder the successful implementation of the project and/or reduce the effectiveness of the project are detailed in Table 30, Table 31 and Table 32 below. To address these anticipated risks, the project will be designed to include an effective means to monitor to mitigate these risks. A project monitoring and evaluation plan has been prepared to track not only the stages of the project, but also the indicators that show potential risks that are if not eliminated - at least mitigated.

Table 30: potential risks and mitigation measures

Identified Risks	Risk ranking	Mitigation Measures
Political Risk I: Government priorities are not placed on climate change adaptation when urgent resources are required for crises such as pandemics	Medium	PC1 includes streamlining the importance of adaptation innovation into policies and coordinating the relevant actors across sectors. This includes reinforcing their capacities in understanding the cost-benefits of adaptation so that they prioritize adaptation initiatives. Also, support for the private sector on offering innovative financial products to ensure continued and sustained support for MSMEs, entrepreneurs, starts-ups and the vulnerable groups.  The PMU, MSMEs, FSPs and relevant stakeholders will be trained to identify outlying risks such as pandemics so that they can be prepared with appropriate adaptation measures.

<p>Political risk II: Change of political leadership</p>	<p>Medium</p>	<p>Sierra Leone is a post conflict country that has seen smooth and peaceful transfer of power several times. The project will engage both the high- level political leadership from the concerned ministries, but also technical and operational staff will drive the project activities. Therefore, change in leadership of the country should not have a strong impact on the project outcome, since all previous governments have consistently advocated the need to respond to climate change issues. Furthermore, the project involves many government departments that should changes happen in one department, the other departments will continue to support the project.</p> <p>While the project is focused on adaptation, its strategy of promoting innovation and entrepreneurship answers one of the key challenges that any new government will have to address i.e., creating employment. As such, the very project strategy and how it is linked to key development issues in the country is such that any new leadership will be enticed to support the project. Nevertheless, in order to mitigate possible low awareness of the host government, UNIDO will consistently engage with the government in place in order to promote the importance of adaptation technologies in the country. By engaging both high- level political leadership and operational ? civil service staff, the project will also ensure that the operational level will continue to drive the project work even in cases where the political levels may not be fully engaged for various reasons.</p>
<p>Political risk III: Local against national politics</p>	<p>Low</p>	<p>The project will support the development and improvement of policies and regulatory frameworks at the national level. In this process, the project will ensure adequate and extensive consultation of local governance structures, especially structures involved in the energy, food and water sectors and in the financial sector. This will minimize potential challenges at operational levels.</p> <p>The risk will also be minimized by the fact that PC2 and PC3 will be led by the private sector that will seek to operate despite political situation. Furthermore, the project will actively engage local leadership under output 3.1.1 in organizing roadshows so they are seed bringing solutions to their communities. Hence, they will see the political benefits of being actively engaged.</p>
<p>Institutional Risk I: Limited absorptive capacity by the national counterparts</p>	<p>Low</p>	<p>The project will provide capacity building to the key stakeholders as an ongoing process throughout the project implementation period to ensure that staff are comprehensively trained, and the sustainability of the project is ensured. In this, an institutional assessment was carried out in regard of the qualifications and capabilities of the main Project Executing Entity, SMEDA.</p>

<p>Institutional Risk II: Lack of effective coordination between various project partners</p>	<p>Low</p>	<p>Proper coordination will be ensured through the establishment of the PMU and the Adaptation Innovation Platform / Project Steering Committee (PSC) and ad-hoc working groups that will be created to support the development and implementation of some of the proposed project activities. Throughout the project implementation, support will be provided by PMU and UNIDO to ensure effective coordination between the key project stakeholders. Also, keeping the several parties informed about project progress through different communication channels, including the Innovation Adaptation Website that will be created as part of the project, is useful to aid the coordination of efforts and activities. In addition, at the project start, more specifically at the Inception Meeting, the roles and responsibilities that each party will play should be stated and recorded in the Inception Meeting Report.</p>
<p>Market Risk I ? Lack of interest by entrepreneurs and other stakeholders to participate in the project, especially women entrepreneurs/SMEs led by women</p>	<p>Low/Medium</p>	<p>Outreach and communications activities will be a key component of the project in the lead-up to the opening of the application process and throughout the project to attract entrepreneurs, potential sponsors and partners, and mentors and judges.</p> <p>On the other hand, bearing in mind that the project will be addressing one key barrier to entrepreneurship, which is access to financing, it is expected that there will be enough interest in participating. Women engagement activities and measures to encourage their participation will be continuously conducted to ensure a high percentage of women involvement.</p>
<p>Market Risk II - Technical expertise is not readily available due to the pandemic</p>	<p>Low</p>	<p>Necessary efforts will be made to identify alternative technical experts in case required. Planning will be flexible enough to reschedule activities on-site that require specific expertise.</p>
<p>Market Risk III ? Failure of businesses supported by the project</p>	<p>Medium</p>	<p>The Sierra Leone curricula/programmes (for the Pre- Accelerator, Accelerator, Advanced Accelerator, and Post-Accelerator) will be comprehensive documents that articulate the approach to promoting adaptation innovation TPS and entrepreneurship. As such, they will help ensure that the businesses supported have real market potential. In particular, the programme will define eligibility requirements and selection criteria for the participants. Moreover, there will be specific training topics addressing the most common mistakes that lead to business failure in the market so both trainers and trainees understand what needs to be done to reduce failure. Furthermore, under PC3, activities will be conducted to link TPS providers with users/consumers in order to support this market</p>

<p>Financial risks - Incentive and financial support systems are insufficient</p>	<p>Medium</p>	<p>The project seeks to strengthen the provision of appropriate funding instruments and mechanisms to enable the deployment of adaptation technologies and services.</p> <p>Training in capacity building programmes for FSPs will focus on risk assessment of climate adaptation technologies and on MSMEs active in this sector.</p> <p>The project will provide specific technical assistance with designing financial products and services adapted to the needs of MSMEs, including training to FSPs on risk assessment and structuring and on adequate risk mitigation measures.</p> <p>The project will provide extensive business development support to MSMEs, including business plan development, financial forecast, risk assessment, market analysis in order to reduce repayment risk.</p> <p>The project will include dedicated activities to assist financial service providers (FSPs) with developing and adopting financial products &amp; services adapted to the needs of vulnerable populations.</p> <p>Finally, the analysis of the policy gaps and provision of recommendations to improve the framework should include proposals of new incentives that would encourage investments in adaptation technologies.</p>
<p>Environmental Risk</p>	<p>Low</p>	<p>Any adaptation innovation TPS supported by the project will need to meet strict environmental screening criteria and follow the local environmental legislation (e.g., disposal of hazardous waste such as batteries of PV systems). In addition, an Environmental and Social Management Plan (ESMP) was prepared (Annex J) to mitigate the environmental (and social) risks as well as to avoid maladaptation.</p>
<p>Climate change risk:</p>	<p>Medium</p>	<p>In terms of climate change impacts, it is worth mentioning that droughts, floods, and coastal erosion are the risks that pose the greatest threat to the country. The sector that could be the most affected by climate impacts is the agricultural sector since almost all agriculture is still rain-fed. To safeguard against climate change risks, the screening of technologies to be supported by the Sierra Leone, the project will include an assessment of the climate risks with a time horizon of 30 years. Where risk is identified, it will be necessary for the entrepreneur to propose suitable adaptation or management measures. The GIZ's Climate Expert Tool could be used as a tool available to entrepreneurs in that context:  <a href="https://www.climate-expert.org/en/home/tools-trainings/introduction-to-tools/">https://www.climate-expert.org/en/home/tools-trainings/introduction-to-tools/</a></p>



Social risk ? Limited inclusion of vulnerable groups and gender dimensions	Low	To ensure gender inclusiveness of all project activities, UNIDO methodology for gender assessment and gender responsive communication showing the benefits of gender equality for both women and men will be applied. To mainstream women and youth entrepreneurship, adequate and gender responsive communication strategy will be implemented, and sensitization workshops will be organized. A full gender analysis was carried out and its recommendations were incorporated into the project design.
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Table 31: COVID-19 Pandemic risk analysis

Identified Risks	Risk ranking	Mitigation Measures
Technical expertise is not readily available due to the pandemic	Low	Necessary efforts will be made to identify alternative technical experts in case required. Planning will be flexible enough to reschedule activities on-site that require specific expertise.
Possible re-instatement of COVID-19 containment measures limits available capacity or effectiveness of project execution/ implementation	Medium	The capacity of stakeholders, and especially the beneficiaries, for remote work and online interactions, will be strengthened by securing access to commercially available conferencing systems. The current design of the curriculum for entrepreneurs is based on online interactions and deliverables using webinars and web platforms, and therefore COVID-19 is not expected to pose a significant risk to the conduct of the acceleration cycles. However it is important to refer that if COVID restrictions are lifted the project may not be able to reach out to all stakeholders.
Some project supporters, co-financiers or beneficiaries may not be able to continue with project execution/ implementation	Low	The situation will be closely monitored in order to find alternate supporters or co-financiers or to readjust the list of beneficiaries if needed.
Price increases for procurement of goods/services	Medium	The project team will undertake efforts needed to find alternative providers and make sure that competitive pricing is obtained.

Table 32: COVID-19 pandemic opportunity analysis

Opportunity	Opportunity level	Opportunity optimization measure
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New business opportunities created in response to COVID-19 related restrictions and measures	High	Response to COVID-19 restrictions, such as remote working arrangements and no-contact business modalities will require solutions that can be turned into new business models. These opportunities will be analysed at the national level and shared with the accelerators and incubators so that they can also share with MSMEs, entrepreneurs and start-ups. Additionally, based on spurred international trade due to COVID restrictions, this project will support the uptake of domestic markets to substitute missing products from global value chains.
New business opportunities to build back better for business continuity and economic recovery post-COVID-19	High	By design, the project engages the private sector (especially MSMEs) to promote adaptation technologies, business models with resilience to climate change, and circular business practices. New business opportunities and management suggestions will be provided to the new Adaptation Accelerator so that the entrepreneurs are fully informed of the market and environment trends. For example, directly related to reducing the spread of COVID, SARS or Ebola, this project will promote sustainable land uses and limit deforestation to reduce human-wildlife contact. In the long-term, adaptation MSME innovations will improve domestic productivity and thereby increase the resilience of the ecologic and socio-economy systems to weather emerging infectious diseases in the future.

**6. Institutional Arrangement and Coordination**

**Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.**

536. Figure 44 illustrates the overall implementation arrangement to be applied in this project.

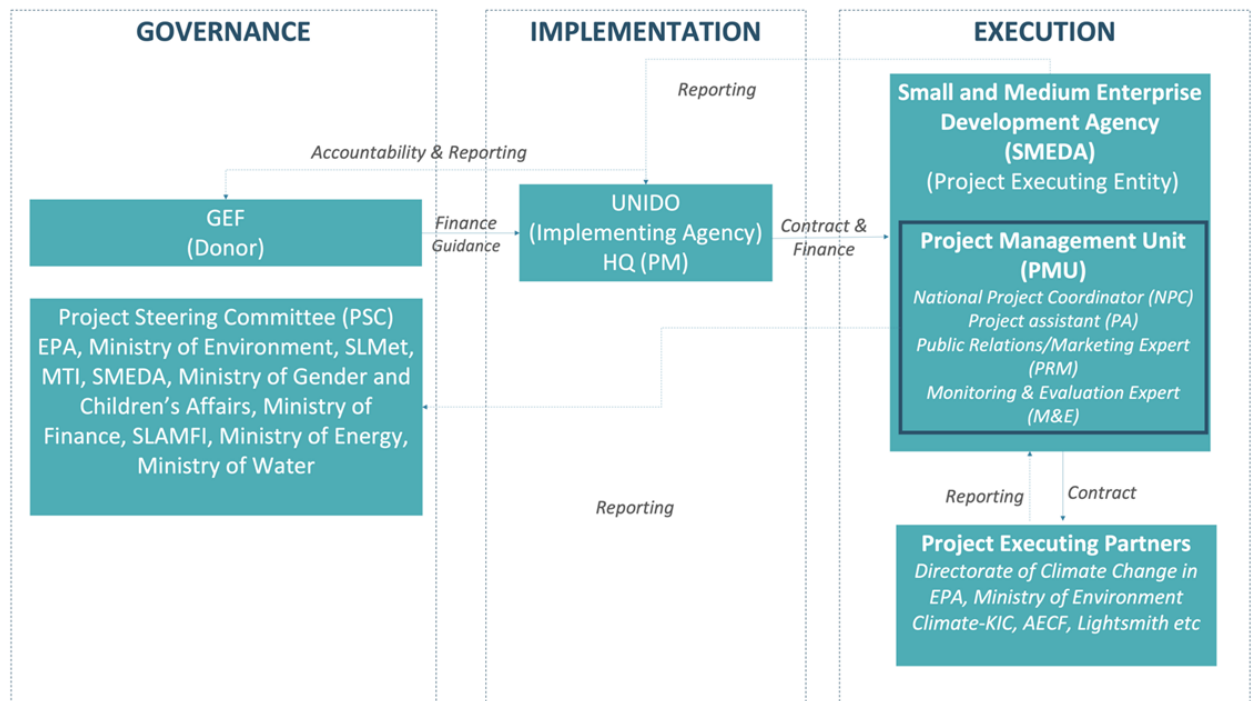


Figure 44: Implementation arrangement schematic

537. This project will be implemented by UNIDO as Project Implementing Agency (GEF Agency), which entails oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and requirements. UNIDO as the GEF Agency will also be accountable to the GEF Council for the GEF-financed activities, as well as it will be responsible for project cycle management services and corporate activities, including all enquiries regarding the project implementation progress, project-level reporting, mid-term review, terminal evaluation and the achievement of the project's impacts on the global environment.

538. The Project Executing Entity (PEE) for this project will be SMEDA. UNIDO will be issuing an implementing partner agreement to SMEDA for the overall project execution. The PEE will be responsible for the overall project execution and for the execution of PC1, PC2, PC3 and PC4, including the management and disbursement of the funds associated with these PC2 and PC3. SMEDA underwent a HACT assessment to verify its suitability as the executing agency for the project.

539. SMEDA core mandate is the promotion of a conducive business environment, including an efficient and effective service delivery network, to empower and develop MSMEs for growth, productivity and competitiveness. The agency operates within five strategic pillars: coordinating Government MSME interventions, developing MSME Observatory and Database through research and statistical data, providing Business Development Services, Facilitating Access to Finance, and Promoting Entrepreneurial Culture. SMEDA is working in the coordination of the programme/initiatives targeting MSMEs, to ensure that the companies in Sierra Leone are being supported and the country is making the best use of the funds that they have for the sector (such as the MUNAFA fund which they are managing).

540. SMEDA will contract other Project Executing Partners (PEPs) to support the implementation of different project activities. Some of the PEPs have already been identified during the PPG (e.g., EPA, Climate-KIC, AECF, Lightsmith Group) but others will be contracted during the implementation of the project. For that, an open and competitive process will be applied to select the service providers, following national legislation and rules as well as GEF and UNIDO rules, as applicable.

541. The PMU will be created and will sit at SMEDA. The PMU will include a National Project Coordinator (NPC), Project Assistant (PA), Public Relations/Marketing Expert (PRM); Monitoring & Evaluation (M&E) Expert and will be responsible for the day-to-day management of the project activities under PC1, PC2, PC3 and PC4, including follow-up with PEPs. SMEDA will be the main point of contact with UNIDO and will take care of reporting to UNIDO. The PMU will be responsible for overall coordination of the reporting on the project's status to the PSC, as well as monitoring and evaluation of project activities, as to be specified in the project workplan.

542. A Project Steering Committee (PSC) will be formed at project start and will be the core of the Adaptation Innovation Platform during the project. The PSC is formed in order to ensure project oversight, coherence and institutional ownership of the project, as well as to provide advisory inputs in key topics attaining the project. The PSC will be chaired by the Directorate of Climate Change in the Environment Protection Agency (EPA). Representatives from institutions involved in the different project Components as well as government representatives of key sectors and financial institutions will be members of the PSC. Also, UNIDO will be a member of the PSC. The complete list of stakeholders in the PSC will be identified

at the beginning of the implementation period. A priori, a set of institutions (in addition to SMEDA and UNIDO) have been identified as potential members of the PSC, namely:

*Ministry of The Environment (MoENV)*

*Ministry of Finance (MOF)*

*Ministry of Trade and Industry (MTI)*

*Environmental Protection Agency (EPA)*

*Ministry of Energy (MoE),*

*Ministry of Water (MoW)*

*Meteorological Agency*

*Sierra Leone Association of Microfinance Institutions SLAMFI*

*Representative of vulnerable populations, including farmers, women, youth and NGOs (these will be selected at the project inception phase by the PMU having into account their proximity with the vulnerable population on the four regions of Sierra Leone.*

543. The PSC, embedded in the Adaptation Innovation Platform, will meet at least twice per year to review the project implementation and execution progress and confirm the workplan for the subsequent year. Any amendments proposed to the workplans and budgets by the PSC will be done in accordance with the approved project document, the GEF policy, and UNIDO rules and regulations. Minutes of meetings should be recorded as part of the M&E plan, signed by UNIDO and the PSC chairperson(s).

544. At the start of the project the PMU will develop the Terms of Reference for the PSC, which will guide the selection and activities of the committee

#### **Coordination with other GEF-financed projects and initiatives**

545. This project will be conducted in coordination with ongoing GEF projects in Sierra Leone, as well as other projects and initiatives identified above in the baseline scenario (see Table 19) as to build upon lessons learned, increase synergies, and avoid duplication of efforts.

546. There are a number of planned activities and GEF-financed projects in Sierra Leone that present potential for synergies and collaboration with the proposed GEF/UNIDO Adaptation Project. The project will strongly link with the National Adaptation Planning (NAP) process with regards to capacity building on adaptation for cross-sectoral institutions. The project will also collaborate with all LDCF funded adaptation projects and build on the awareness campaigns of climate change already conducted. A brief summary on synergies is provided in Table 33.

Table 33: Coordination with GEF projects.

Project title	Time- frame	Financiers	Coordination Mechanisms
Adaptation MSME Accelerator Project (ASAP)	2019- 2021	GEF, the Lightsmith Group and Conservation International Ventures	<ul style="list-style-type: none"> <li>? Use of ASAP?s taxonomy and toolkit to identify, recruit and support adaptation MSMEs for Sierra Leone?s Adaptation Accelerators to be placed in existing accelerators</li> <li>? Regional and global marketing support for EO focused MSMEs identified such as through publicizing with company profiles</li> <li>? Sending Sierra Leone EO focused MSMEs to Regional Adaptation MSME Networks</li> <li>? Joint discussions with government representatives to pinpoint policies the government can take to help build the markets for adaptation and climate resilience solutions and local MSMEs</li> </ul>
CTCN[1]	2014- 2020	GEF and AfDB	<ul style="list-style-type: none"> <li>? Collaboration on promoting solutions to make agricultural water infrastructure climate resilient, to prevent flooding, facilitate irrigation, and employ strategies for agro-forestry and erosion control</li> <li>? Working together to improve market access for the EO Sector</li> </ul>
CRAFT	2017- 2021	GEF via CI	<ul style="list-style-type: none"> <li>? CRAFT was the first private sector climate resilience and adaptation investment fund and technical assistance facility for developing countries and invested in companies with climate resilience solutions in 20 market segments including agriculture, water, energy, transportation, and finance</li> <li>? CRAFT fund could be a potential funding resource for the selected MSMEs in Sierra Leone</li> </ul>
Adapting to Climate Change Induces Coastal Risk Management	2017- 2022	GEF via UNDP	Working together to introduce climate resilient livelihood options and approaches to address the climate risk facing coastal communities
Using systemic approaches and simulation to scale nature-based infrastructure for climate adaptation		GEF via UNIDO	<p>Within the framework of the accelerator and trainings, promoting innovative for Nature Based infrastructure and adaptation.</p> <ul style="list-style-type: none"> <li>? Supporting technologies and solutions that support biologically diverse forests, mangroves, wetlands, grasslands and agricultural lands to provide valuable ecosystem services and adaptation</li> <li>? Ensuring that adaptation focused MSMEs support topics such as carbon sequestration, nutrient removal, water storage, harvesting</li> </ul>
Sustainable Cities Impact Program (SCIP)[2]	To start implementation	GEF via World Bank	Working together to find adaptation technologies that will provide nature-based solutions and waste management solutions for Freetown?s development problems

### **Transfer of assets**

547. Full or partial ownership of equipment/assets purchased under the project may be transferred to national counterparts and/or project beneficiaries during the project implementation as deemed appropriate by the PMU and with the UNIDO Project Manager.

### **Legal clause**

548. The Government of Sierra Leone agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed on 27 May 1976 and entered into force on 12 May 1977.

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[1] <https://www.thegef.org/projects-operations/projects/10680>

[2] [https://www.thegef.org/sites/default/files/publications/GEF\\_Cities\\_ImpactProgram\\_Bifold\\_r12.pdf](https://www.thegef.org/sites/default/files/publications/GEF_Cities_ImpactProgram_Bifold_r12.pdf)

### **7. Consistency with National Priorities**

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

549. The proposed GEF/UNIDO Adaptation Project is fully consistent with all the relevant national strategies and policy documents outlined in the description of the baseline scenario. In line with these, the project will contribute to economic development and job creation, by fostering MSMEs sector growth and providing support to the FSP in the development and offering of financial products for both MSMEs and the vulnerable population to acquire innovative adaptation TPS. Those TPS will be identified and provided through the implementation of this project at the same time that will support climate change adaptation for Sierra Leone.

550. The proposed project leverages on Sierra Leone's strategic plans to build resilience and foster adaptation to climate change, as well as builds on the country's efforts to boost competitiveness to accelerate private sector-led growth and job creation. It is fully aligned with Sierra Leone's NCCP 2021, MTNDP 2019-2023 and NDC 2021 (which expands the NAP 2021). These are all the main (and most recent) plans guiding the country's climate change adaptation efforts. Table 34 summarises the alignment of the project with the most relevant national strategies and plans.

**TABLE 34: CONSISTENCY OF THE PROJECT WITH NATIONAL STRATEGIES AND PLANS**

National Document (strategy or plan)	Consistency of the project with national document (strategy or plan)
<p>- National Action Plan for Adaptation (NAPA) under LDCF/UNFCCC</p>	<p>Sierra Leone National Adaptation Programme of Action (NAPA) was first submitted in December 2007 to UNFCCC. The rationale for developing the NAPA was to adapt to climatic shocks as well as to man-made disasters, which renders the need of immediate and urgent support to start adapting to current and projected adverse effects to climate change. Alongside, the Sierra Leone National Adaptation Plan to achieve resilience across all sectors was developed in 2007 to ensure that the various sectors will work together to harmonize climate-related policies and laws, as well as improve coordination and cross-linkages between them. Later on, in 2020, three other key adaptation documents were issued:</p> <p>? The Sierra Leone Climate Change Adaptation Plan (SLCCAP), which offers a mechanism for implementing, tracking, evaluating, and communicating adaptation actions and results, which are critical to the climate change adaptation plan's overall success.</p> <p>? the Sierra Leone National Adaptation Plan to achieve resilience across all sectors, which ensures harmonization across sectors, as mentioned, and</p> <p>? Sierra Leone's Climate Change Communication Strategy under the National Adaptation Plan (NAP) developed under the United States in-country NAP support programme to provide a short and mid-term direction on how the GoSL can utilise information strategically and effectively to support the NAP process and enhance a better understanding of the country's climate change adaptation issues.</p> <p>In 2021, the NAP was updated and submitted to UNFCCC as Sierra Leone's initial National Adaptation Plan. The objectives of the NAP process are: i) to reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience; and ii) to facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programs and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate. The NAP aims to provide greater access to existing adaptation funds to enhance the longer-term building of the country's adaptive capacity.</p> <p>The proposed project design and objectives are fully aligned with all the strategic goals, objectives and actions under the listed Adaptation documents and would contribute to their achievement.</p>

<p>- National Action Program (NAP) under UNCCD</p>	<p>Sierra Leone has ratified The UN Convention to Combat Desertification in 1997. Although so far, the country has not submitted a NAP under the UNCCD[1], it has indeed developed a Drought Management Plan (DMP)[2] to the Convention in 2018. This contingency plan recognises drought as a potential problem for Sierra Leone that impacts water management, agricultural and food productivity, health, and environmental protection. The proposed DMP forms the basis of national efforts to establish and develop measures to minimise socio-economic and environmental impacts of drought-related conditions, prevent and alleviate effects in the context of broader climate management and economic development plans. The DMP for Sierra Leone is designed as a contingency plan to direct efforts to mobilise technical and financial resources for an effective nation-wide response to drought-related conditions. The proposed Adaptation Project design is fully in line with this approach since drought is one of the many impacts of climate change and therefore contemplated in the development of potential Adaptation TPS.</p>
<p>- ASGM NAP (Artisanal and Small-scale Gold Mining) under Mercury  And  - Mercury Initial Assessment (MIA) under Minamata Convention</p>	<p>Sierra Leone signed the convention in 2013 and ratified it in 2016. The Sierra Leone MIA was issued in 2019[3]. The Sierra Leone EPA is the government body responsible for implementing various projects aimed at improving mercury management, including extensive engagement of artisanal and small-scale gold miners nationwide on the dangers of using Mercury in the Gold mining sector, and the development of the MIA and the National Action Plan on the use of Mercury in Artisanal and Small-Scale Gold Mining (ASGM). Primary metal extraction (especially gold), consumer products, and waste incineration and deposition have been identified as significant contributors to mercury emissions and releases in the country. Also, at the moment the population very much rely upon and use mercury-containing devices and products in the health sector, laboratories, body lightening creams, etc. and hence the final disposal of these health and cosmetics products is of concern. As a nation, fish is an important source of protein. As a result, the likelihood of fish contamination with mercury poses a health risk. Therefore, steps towards its reduction will also impact positively in reducing mercury risk within marine species. Capacity building and awareness is needed to inform about the alternatives to mercury use, as well as there is a need for strengthening of the capacity of the relevant authorities so as to better monitor and manage the use of Mercury nationally. The preliminary desk study and sites? investigation helped identify the following as potential contaminated sites: dumpsites, the marine environment and ASGM sites.</p> <p>In principle, there is no specific link between the MIA/ASGM and the proposed climate change Adaptation project. Nevertheless, since both topics are core environmental concerns, any potential improvements in environmental legislation, environmental information dissemination, improved management practices to reduce environmental/health impacts may yield overall positive cross-effects. On the other hand, the proposed Adaptation project will ensure that any TPS analysed and supported by the project complies with environmental legislation and does not negatively contribute with Mercury emissions.</p>



<p>- National Biodiversity Strategies and Action Plan (NBSAP) under UNCBD</p>	<p>The country's latest NBSAP covers the 2017-2026<sup>[4]</sup> period and is based on the following five strategic objectives: 1) national biodiversity is well protected through sound and holistic national legislation and policy implementation across all sectors; 2) practical methods and mechanisms are enhanced and functioning to safeguard biodiversity, resulting in improved conservation status of threatened and rare species; 3) practical and robust conservation actions are significantly enhancing the status of species, habitats, sites and ecosystems in and outside protected areas; 4) improved living standards, ecosystem services and opportunities are provided to people, particularly local communities, through sustainable and inclusive biodiversity conservation actions; and 5) improved sectoral and public involvement, and enhanced capacities and awareness, are contributing to effective planning and result-oriented execution of conservation programmes. Cross-sectoral strategies and cross-cutting issues include: financial resources, policies, regulations and legislation, research and training, capacity building, public participation, gender, planning, monitoring, conservation of protected areas, sustainable use, incentive measures, public education, impact assessment, access to technology, information exchange, sharing of benefits and knowledge. The proposed Adaptation project is aligned with the overall approach, strategic targets and objectives of the revised NBSAP since it is itself based on many national policies including the National Programme of Adaptation. Of relevance is Target 15 that aims at enhancing ecosystem resilience and the contribution of biodiversity to carbon stocks through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.</p>
<p>- National Communications (NC) under UNFCCC</p>	<p>Sierra Leone's Third National Communication to the UNFCCC was submitted in March 2018. The TNC assesses climate change impacts for the key sectors of agriculture, water, health, coastal areas, human settlements, and to some extent tourism. Other activities in support of the Convention, such as awareness raising, a review of the national systematic observation systems, and a technology needs assessment, are also described in the document. The Adaptation project design takes into consideration information and findings of the TNC, especially those associated to sectors directly linked to WEF.</p>
<p>- Technology Needs Assessment (TNA) under UNFCCC</p>	<p>The TNA was done alongside and as integral part of the TNC to the UNFCCC. The TNA looked at adaptation issues as they relate to the coastal zone and water sectors in Sierra Leone. It was noted that technologies for adaptation should be: cost effective, proven, flexible, aid in vulnerability reduction, and easy to use. Technologies for adaptation should also look at technologies in the broadest sense. For improving coastal zone management, the following technologies were identified: Beach protection measures such as groynes and revetments; Reinstatement of the tidal gauge network (for obtaining data to feed into the Geographic Information System (GIS) and aid in planning and project designs, thus ensuring vulnerability reduction occurs; Beach profiling (to aid improved data collection); and Regeneration of mangroves. In the water sector, the following needs were noted: Improvement and rationalization of the hydrometric network; Additional river gauges and more automatic weather stations to aid in data collection and planning to reduce vulnerability; Additional flood warning systems; and Additional software such as water ware, river ware, and mike basin to aid in improvement of water management. The TPS identified during project design as part of the Baseline Assessment are fully in line with those identified in the TNA mentioned above.</p>

<p>- National Capacity Self-Assessment (NCSA) under UN CBD, UNFCCC, UNCCD</p>	<p>An NCSA[5] for Global Environmental Management in Sierra Leone was conducted in 2006 just before the 2007 NAPA. The report examines the cross-cutting capacity constraints and interventions that are suitable for capacity building for the implementation of the three Rio UN Conventions in Sierra Leone (i.e., biodiversity, climate change and land degradation/desertification). The identified needs at country level for the implementation of the UNFCCC include capacity building of communities, policy formulation/strengthening, institutional strengthening, and others. These are needs also identified during the design of the present Adaptation Project, thus this project is aligned with the NCSA for Sierra Leone.</p>
<p>- National Implementation Plan (NIP) under POPs</p>	<p>Sierra Leone has submitted two NIPs under the Stockholm Convention[6] (2006 and 2009) on Persistent Organic Pollutants (POPs). The NIP captures the current scenario in terms of POPs origin (where they are generated), handling and disposal, health impacts, policy framework and environmental concerns of their mismanagement. Of particular interest in relation to the proposed adaptation project is the fact that many pesticides (POPs) are used in the agricultural sector (and later on transferred to the food chain). Also, the report mentions that pesticides containers are sometimes used to collect water by rural population ignoring the potential negative effects on health of that practice. Therefore, and innovative TPS -generated under the present Adaptation Project- that supports better and more efficient agricultural and water management practices, may indirectly have a positive impact on POPs management. Nevertheless, this should be verified on a case-by-case basis during project implementation as part of a wider GEBs analysis.</p>
<p>- Poverty Reduction Strategy Paper (PRSP)</p>	<p>The PRSP for Sierra Leone was first developed in 2005 to run from 2005 to 2008. Afterwards an updated progress report was issued in 2011 covering the 2008-2010 period. The Sierra Leone Agenda for Prosperity developed for the period 2013-2018 serves as a Third Generation PRSP and outlines the country vision to 2035: "By 2035, Sierra Leone aspires to be an inclusive, green, middle-income country". Among many other topics, the strategy focuses on the Sustainable Management of Marine Resources, which includes setting up Adaptation Strategies to Control Coastal Erosion which mainly affect fishing communities (e.g., mangrove conservation). Moreover, it depicts the challenges of the Water Sector and Resources and proposes measures for its sustainable management and ensure access to potable water. The proposed Adaptation project is aligned with the proposed measures for climate change adaptation in the Agenda for Prosperity.</p>
<p>- Biennial Update Report (BUR) under UNFCCC</p>	<p>As of now, Sierra Leone has not submitted any BUR to the UNFCCC system.</p>
<p>Others: NDC ? Nationally Determined Contributions (July 2021)</p>	<p>The project is aligned with the updated NDC, which includes both mitigation and adaptation actions/measures to be rolled out covering all main emitters and vulnerabilities using a range of instruments, including financial and technological support.</p>

[1] <https://knowledge.unccd.int/countries/sierra-leone>

[2] [https://knowledge.unccd.int/sites/default/files/country\\_profile\\_documents/1%2520FINAL\\_NDP\\_Sierra%2520Leone.pdf](https://knowledge.unccd.int/sites/default/files/country_profile_documents/1%2520FINAL_NDP_Sierra%2520Leone.pdf)

[3] [https://www.mercuryconvention.org/sites/default/files/documents/minamata\\_initial\\_assessment/Sierra-Leone-MIA-2019.pdf](https://www.mercuryconvention.org/sites/default/files/documents/minamata_initial_assessment/Sierra-Leone-MIA-2019.pdf)

[4] <https://www.cbd.int/nbsap/about/latest/#sl>

[5] <https://unfccc.int/resource/docs/napa/sle01.pdf>

[6]

<http://chm.pops.int/Implementation/NationalImplementationPlans/NIPTransmission/tabid/253/Default.aspx>

## 8. Knowledge Management

### **Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.**

551. The proposed GEF/UNIDO Adaptation Project aims to build ongoing international and national efforts to promote adaptation to climate change risks and vulnerabilities in the WEF sectors of Sierra Leone through the engagement of the private sectors, namely start-ups, MSMEs and financial service providers. Knowledge management and sharing have been incorporated through the project activities in PC1, PC2 and PC3 and in a dedicated project component: PC4: Project Monitoring and Learning. The focus on learning takes on added significance in the context of the MSME's ecosystem in climate adaptation innovation in Sierra Leone, which is very limited. Learning in fact underpins adaptation and innovation; thus, designing for adaptation requires designing for learning[1]. During and after the project, the data and knowledge collected and developed will be constantly shared with a wide range of stakeholders to guarantee that specific activities can be sustained and scaled-up:

552. Within PC1, it is expected that the platform created (Adaptation Innovation Platform and the Adaptation Innovation Website) will not only be operational to share knowledge and information during the project but also after it.

553. The Adaptation Innovation Platform will bring together a transectorial group of stakeholders to discuss adaptation to climate change and guide the project implementation. This will allow transectorial discussion of the different needs in terms of adaptation as well as on the different possible contributions to address adaptation, being the discussion and resultant guidance, a knowledge product.

554. The Adaptation Innovation Website will be one of the main tools that will be used for dissemination of knowledge by the project. It will be hosted by the PMU during the first 5 years of the project, and it will be transferred to the Ministry of Industry in the last year of the project, to ensure its maintenance after the project ends. During that last year of the project capacity will be built at the Ministry of Industry the host and maintain the website.

555. The capacity building and training activities that will be put in place in PC1, PC2, PC3 and PC4, will contribute to build trainers, mentors, judges, and a critical mass of people with understanding and knowledge on climate change, climate change adaptation, climate change TPS for WEF sectors, on the Sierra Leone Adaptation Incubator/Accelerator, financial products and services available, etc.

556. The curricula and training materials developed will be integrated in university, vocational institutions and incubators/accelerators programmes, envisaged to be maintained after the project finishes.

557. PC4 will establish a Monitoring, Evaluation and Learning (MEL) system to be managed by the EPA and to link with their current M&E system. The focus on learning takes on added significance in the context that the ecosystem of MSMEs in climate adaptation innovation in Sierra Leone is very much limited. Learning in fact underpins adaptation and innovation; thus, designing for adaptation requires designing for learning[2]. The project will initiate and set up working groups of the key stakeholders of climate adaptation technologies, innovation as well as the MSME sectors and develop and share knowledge and lessons-learned for continuous capacity building. As such, PC4 will create a system for continuous learning and knowledge sharing throughout the project implementation cycle. This will be documented through creating knowledge products for dissemination and sharing with national stakeholders as well as with international fora. As such PC4 seeks to identify best-practice examples to address key barriers/challenges for unlocking the climate adaptation market and providing technical guidance for the project implementation. All the lessons learnt from the project implementation will be properly documented through periodic reviews and sharing. During the project execution, selected adaptation MSMEs will go through incubation and acceleration process. The project intends to gather all knowledge products to serve as a capacity building for the subsequent and future selected MSMEs. A dedicated page under the EPA's website will be created for the project, with user-friendly interface consolidating all lessons learned or any information for the project. SMEDA will also become the knowledge hub for training and outreach materials for adaptation MSMEs. SMEDA will be responsible for developing an on-line marketplace platform to highlight adaptation solutions offered in Sierra Leone. Furthermore, the project will organize networking and matchmaking events with a view to facilitate partnerships (e.g., with investors/financiers, distributors) as well as link to global fora. The project's webpage from EPA will be linked to other websites that provide knowledge products like the CTCN. Furthermore, information on project status, results and reports compiled within the project will be made publicly available on the Innovation Adaptation Website (PC1). Also, the project manager will share the results and knowledge of the project through participation in regional meetings, conferences and other events. All publications developed under this project will comply with GEF and UNIDO communication policies and with the project Monitoring, Evaluation and Learning Strategy.

558. The EPA will be responsible for establishing knowledge management indicators and metrics for the MEL due to their existing M&E database. They will be the ultimate owner of the data, statistics and knowledge products. They will also coordinate with ASAP that is simultaneously developing a curriculum, taxonomy, adaptation technology database and measurement metrics on best adaptation technologies/practices. A gender-disaggregated knowledge base will be developed to share best practices and lessons learned, as well as support information exchange with policy makers at global fora and regional events (such as those convened by ASAP) on climate adaptation innovation. The MEL will link with ASAP's global website to highlight entrepreneur success stories and lessons learned. As the project progresses and implementation results become demonstrable, the MEL knowledge management system will be used to develop benchmarks for innovations. A Knowledge Management Expert will conduct more frequent evaluations to iteratively improve the impact of the Adaptation Accelerators and the home-grown ideas that graduate from the Accelerators. Different communication channels to disseminate lessons learned and success stories will include training manuals, good practice guides, data sheets, posters, videos, radio programmes and regular updating on the UNIDO website. The results will be actively used to better

inform policy dialogue and to strengthen methods to build resilience for the most vulnerable rural populations through a learning process. The MEL will support future entrepreneurs and potential investors to learn from past successes and failures.

559. Under Component 5, the project will conduct an independent mid-term review and independent terminal evaluation. The evaluations will be used as a tool to assess project results. The independent terminal evaluation will feed into learning and knowledge sharing for other adaptation projects in Sierra Leone and abroad so that successes can be repeated.

560. Table 35 provides a general overview of the of the main deliverables relevant for knowledge management.

Table 35: Overview of deliverables related with knowledge management

Deliverables	Timeline
A pool of experts (trainers, mentors, judges) created	By the 1st year of the project implementation/execution with regular updates
The Sierra Leone Adaptation Project Communication Strategy (Output 4.1.2)	By the 6th month of project implementation/execution with regular updates each year
Materials produced during the implementation of the GEF/UNIDO Adaptation Project: including policy briefs, impact reports, brochures, webinars and other types of promotional materials distributed through briefing sessions, press releases, social media presence, advertising, etc.	From the 6th month of project implementation/execution and according to the timeline as to be specified in the Senegal Project knowledge management, communication, and advocacy strategy
The Adaptation Innovation Website created and operationalized	By the 6th month of project implementation/execution
Meeting of the Adaptation Innovation Platform will be used to share information and materials produced within the project with the stakeholders	By the 6th month of project implementation/execution
Organization of national fora and investor fora and participation on regional and international events	Annually / bi-annually

[1] STAP (2017). Strengthening Monitoring and Evaluation of Climate Change Adaptation: A STAP Advisory Document. Global Environment Facility, Washington, D.C.

[2] <https://gain.nd.edu/our-work/country-index/rankings/>

## 9. Monitoring and Evaluation

### Describe the budgeted M and E plan

561. The monitoring and evaluation (M&E) will be conducted in accordance with established UNIDO and GEF procedures. The overall objective of the M&E is to ensure successful and quality implementation

of the project by: i) tracking and reviewing project activities execution and actual accomplishments against targets; ii) providing visibility into progress as the project proceeds so that the implementation team can take early corrective action if performance deviates significantly from original plans; and iii) adjusting and updating project strategy and implementation plans to reflect possible changes on the ground, results achieved and corrective actions taken.

562. According to the M&E policy of the GEF and UNIDO, follow-up studies like Country Portfolio Evaluations and Thematic Evaluations can be initiated and conducted. All project partners and contractors are obliged to: (i) make available studies, reports and other documentation related to the project and (ii) facilitate interviews with staff involved in the project activities.

563. The Project Result Framework (Annex A) provides performance and impact indicators for project implementation/execution along with their corresponding means of verification (plus baseline and targets). The actual progress will be reported against the workplan approved by the PSC. In case there are significant deviations between the forecasted workplan and actual implementation, corrective measures will need to be taken.

564. The M&E Plan (developed as part of PC4) will include time-bound milestones and deliverables. The PMU will also draft progress review reports every six months and will update the PSC before each meeting.

565. There will be an external mid-term review of the project conducted halfway through project implementation, and a terminal evaluation to be started three months before project expected finalisation date (implemented as part of PC5).

566. The environmental and social consideration, gender and youth dimensions and baseline for gender related targets will be appropriately captured in the GEF/UNIDO Adaptation Project M&E plan, in the progress review reports, as well as in the collection and assessment of relevant data. The M&E plan will encompass monitoring of the Environmental and Social Management Plan, the Stakeholder Engagement Plan, the Gender Analysis Report, and a Risk Analysis.

567. The methodology for impact assessment of the adaptation project should be drafted as part of the M&E framework in PC4, to inform the estimation, tracking, and reporting activities of the project regarding impact. The methodology will enable assessment of social, economic, and environmental impacts, and at a minimum, it will account for global environmental adaptation benefits, job creation, gender mainstreaming, and investment leveraged. The data will be sex-disaggregated and gender-sensitive, and youth participation will also be recorded.

568. An overview of indicative costs of M&E activities is provided in Table 36 below.

Table 36: M&E Activities

M&E activity	Timeframe	GEF Budget (USD)	UNIDO in-kind co-financing (USD)	PEE in-kind co-financing (USD)	Responsible parties

M&E Framework and Plan	First 3 months after implementation start date	70,000	25,000	25,000	PEE
Periodic progress reports	Every 6 months	52,500	14,250	24,250	PEE
Project Implementation Review (PIR) reports	Every fiscal year the project is under implementation, to be submitted to GEF by 15 September each year.	52,500	24,250	14,250	PEE to provide feedback and UNIDO to finalize and submit the GEF
Mid-term review	At 3 years after implementation start date	80,000	75,000	75,000	External evaluator, submission to UNIDO
Terminal Evaluation	Start 3 months prior to estimated project end date	110,067	75,000	75,000	External evaluator, submission to UNIDO
<b>Total</b>		<b>365,067</b>	<b>213,500</b>	<b>213,500</b>	

## 10. Benefits

**Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?**

569. The proposed GEF/UNIDO Adaptation Project is built on fostering the engagement of the private sector to deliver TPS for the Sierra Leone WEF sectors to foster its adaptation to climate change risks and vulnerabilities. The project is expected to:

Create the legal and regulatory environment to support innovative adaptation MSMEs to develop and grow;

Result in more innovative adaptation start-ups and MSMEs being identified and supported, acting as a catalyst for entrepreneurship development and adaptation investment in Sierra Leone.

Results in the identification and delivery of financial products and services to support both the demand and supply side of the adaptation market: This will ensure that start-ups and MSME can access financial products and services to develop and grow their adaptation TPS offer and the vulnerable population and MSMEs, farmers can access finance to acquire the TPS necessary to adapt their activities in the WEF sector to climate change risks, especially in the WEF sectors of the targeted provinces by the project.

570. The proposed project, as a dedicated national platform for promoting and supporting adaptation innovation, which will result in an enhancement of human capital, thereby leading to job creation and poverty reduction as well as to an increased women and youth participation in the entire value chain of adaptation TPS development. Local development and production of adaptation TPS will very likely result in lower costs benefiting both the technology developers and end-users.

571. The proposed GEF/UNIDO Adaptation Project aims at actively involving the youth and encouraging women-led applications and businesses, which will receive training and mentoring that is expected to provide them with the tools to continue their successful way to the market and consolidation. This will result in a benefit for the reduction of youth unemployment, and women unemployment particularly.

572. In addition, the increased use of adaptation innovation TPS supported by the GEF/UNIDO Adaptation Project will also result in GHG emission reductions (as part of the GEBs).

573. The proposed GEF/UNIDO Adaptation Project will highlight the need for a stronger support at the national level for adaptation innovations and start-ups/MSMEs. In particular, it will provide added value by bridging the gap between adaptation innovators and investors, thereby paving the way for the creation of new businesses opportunities resulting in a value added for the domestic economy.

**11. Environmental and Social Safeguard (ESS) Risks**

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

**Overall Project/Program Risk Classification \***

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate	Medium/Moderate		

**Measures to address identified risks and impacts**

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

The project has been categorized as Category A at the time of its approval, due to potential risks related to biodiversity and natural resources that may arise from the activities of MSMEs. These MSMEs will be selected and supported at a later stage (referred to in the ESMP as "subprojects?"). The potential risks arising from subprojects will depend on the typology, sector, and scale of selected MSMEs. As the



subprojects and their natural and social contexts are still unknown at this stage, each MSME that will be selected and supported through this project will be screened during the selection process and assigned an individual ESS Category to differentiate between high, medium and low risk MSMEs. Any high and medium risk category subprojects will need to undertake site-specific ESS studies (ESIA and/or ESMP) and develop risk mitigation strategies. This approach will ensure that all subprojects supported through this project avoid, minimise, and/or mitigate any potential adverse E&S impacts that may emerge from their activities in their respective natural settings and social contexts.

Details on this environmental and social management framework for the assessment of subproject-specific risks and mitigation measures can be found in the attached ESMP.

**Supporting Documents**

Upload available ESS supporting documents.

Title	Module	Submitted
<b>Annex_J_SL_ESMP_final</b>	<b>CEO Endorsement ESS</b>	
<b>200260 ES Screening Cat A 25092020_signed</b>	<b>Project PIF ESS</b>	

**ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).**

<b>Project Strategy</b>	<b>KPIs/Indicator</b>	<b>Baseline</b>	<b>Target</b>	<b>Means of Verification</b>	<b>Assumptions and Risks</b>
<b>Objective: Reducing vulnerability and increasing resilience of vulnerable populations by supporting MSME*-driven innovation, transfer and large-scale deployment of adaptation technologies, products and services (TPS) in the water, agriculture and energy sectors in Sierra Leone</b>	# of Adaptation Innovation Platforms established	None	One (1) Adaptation Innovation Platform established and operational	Project progress reports  Final independent project evaluation report	National government scope of the project continues to support the mainstreaming of adaptation and the creation of a nurturing business environment  Business partners, incubators, accelerators, NGOs and other relevant actors continue to support emerging innovative MSMEs
	US\$ additional investment into adaptation technology due to increase interest in Sierra Leone project (million USD)	None	At least US\$25 million raised in co-finance (apart from GEF financing) supporting deployments of adaptation TPS	GEF Tracking Tools  Database and records maintained during and after project completion	
	# of new jobs associated with adaptation TPS in the WEF sector through the implementation of the project (gender and age disaggregated)	None	200 (at least 40% women employed and at least 20% youth)	Project institutional Website data	
	# of MSMEs with increased inclusion in value chains	None	30-50 (at least 40% women-led and at least 20% youth-led)		
	# of adaptation MSMEs supported by the project	None	35		

	# of vulnerable people targeted by the project (disaggregated by gender and age)	None	250,000 (at least 40% women and at least 20% youth)		beyond the scope of the project  Socio-economic and political conditions in the country remain stable, allowing the MSMEs to flourish and encouraging new investments and business ventures  Demand for adaptation TPS continues to rise due to the awareness raised by national and international actors
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**PC1: Strengthening institutional and policy frameworks and Coordination mechanisms supporting ?adaptation MSMEs? to develop and deploy their technologies, products and services into the water, agriculture and energy sectors**

**Outcome 1.1: An integrated mechanism with strong linkages to national adaptation planning processes is developed to support and engage adaptation MSMEs in delivering their mandates with gender mainstreaming.**

Output 1.1.1: The Directorate of Climate Change, SMEDA and support institutions in water, agriculture and energy sectors capacitated	# Tools for the assessment of climate change risks and vulnerabilities is developed	None	One (1) tool developed for the assessment of climate change risks and vulnerabilities in Sierra Leone	Project progress and evaluation reports  Project documents - Strategy documents training material, guidebooks	Continuous support from the Government and national partner institutions  Commitment from project
	# Guides describing how to use the modelling tool developed	None	One (1) guide developed describing how to use the modelling tool		

through improved tools, planning instruments (technology roadmaps and climate smart investment plans) and trained to support and engage adaptation MSMEs in their operations, through three (3) specialised education and training courses on climate change and climate change adaptation TPS for 60 stakeholders.	# Participants trained in the developed tool (gender and age disaggregated)	None	At least 10 people are trained 40% of women participation and at least 20% of youth participation) ? PMU and the group of stakeholders	Workshop minutes and attendance lists	partners (PMU)
	# Train-the trainers programme designed	None	One (1) train-the trainers programme designed	Feedback from those trained	Continuous support from business partners, incubators, accelerators, NGOs and other relevant actors
	# Specialised education and training courses on climate change adaptation TPS delivered	None	Three (3) specialised education and training courses on climate change adaptation TPS delivered	Attendance records from training	
	# Training module on gender lens and gender awareness	None	One (1) training module with the I-know-gender course or other gender training	Guidebooks	
	# Training modules on gender challenges to climate change and adaptation TPS		One (1) training module focused on gender challenges to climate change and adaptation TPS	Project institutional Website data	
	# of government stakeholders are trained (gender disaggregated)	None	60 government stakeholders are trained (at least 40% women and 20% of youth participation)		
Output 1.1.2: Inter-ministerial coordination mechanism established to promote the integration of adaptation and resilience through	# Stakeholders Mapping Reports on relevant stakeholders for the Adaptation Innovation Platform and on the- ongoing processes and projects operating in the Adaptation field	None	One (1) stakeholder mapping report on per year from 2 <sup>nd</sup> year of the project onward (total of 1 report and 5 updates of the report)	Project progress and evaluation reports  Project documents - Strategy documents	Continuous support from the Government and national partner institutions

engaging adaptation MSMEs in the water, agriculture and energy sectors alongside the establishment of an Adaptation Innovation Platform to implement national strategies and involving relevant stakeholders	# of Adaptation Innovation Platforms created	None	One (1) Adaptation Innovation Platform created contributing to the establishment of an Adaptation Innovation ecosystem actively supporting entrepreneurs MSMEs, entrepreneurs and start-ups with promising adaptation innovative technologies, products and services and business ideas in Sierra Leone	Meeting minutes and attendance record lists  Project institutional Website  Manual on the implementation and operationalization of the integrated mechanism	Commitment from project partners (PMU)  Continuous support from business partners, incubators, accelerators, NGOs and other relevant actors
	# of meetings of the Adaptation Innovation Platform	None	Two (2) meetings of the Adaptation Innovation Platform per year		
	# Institutions part of the Adaptation Innovation Platform (gender mainstreaming disaggregated)	None	At least 10 institutions are part of the Adaptation Innovation Platform with at least two (2) institutions acting in gender mainstreaming		
	# Representatives in the Adaptation Innovation Platform (gender and age disaggregated)		20 people (2 per institution, at least 40% are women and 20% are youth) are part of the Adaptation Innovation Platform		
	# of Adaptation Innovation Websites developed as part of GEF/UNIDO Adaptation Project	None	One (1) website developed as part of GEF/UNIDO Adaptation Project		
	# Integrated mechanism developed to drive innovation and entrepreneurship in adaptation to climate change in the WEF sectors of Sierra Leone	None	One (1) integrated mechanism developed to drive innovation and entrepreneurship in adaptation to climate change in the WEF sectors of Sierra Leone		

	# Manuals on the implementation and operationalization of the integrated mechanism developed	None	One (1) manual developed of the integrated mechanism		
Output 1.1.3: Climate data collection to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance	# Climate data collection platforms to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance implemented and operational at SLMet	None	One (1) Climate data collection platforms to facilitate the development of insurance schemes and awareness-raising for insurance companies on climate-risk insurance implemented and operational at SLMet		
<b>Outcome 1.2: Business environment for climate adaptation innovation is improved</b>					
Output 1.2.1: At least four (4) policy and regulatory recommendations to improve the climate adaptation business environment developed with a gender perspective	# Analysis report to identify gaps and barriers of existing policies and regulations in Sierra Leone to promote the business adaptation environment and adaptation TPS	None	One (1) analysis report	Project progress and evaluation reports	Continuous support from the Government and national partner institutions  Commitment from project partners (PMU)
	# Policy and regulatory recommendations to improve the climate adaptation business environment developed and presented to policymakers	None	Four (4) policy and regulatory recommendations to improve the climate adaptation business environment considering a gender approach developed and presented to policymakers	Project documents - Strategy documents  Meeting/workshops notes and participant lists  Policy briefs	
	# National workshops to collect feedback on the proposed policy instruments conducted (gender disaggregated)	None	One (1) national workshops to collect feedback on the proposed policy instruments are conducted (with at least 40% women and 20% youth participation)		

	# Stakeholders that participated in the national workshops (gender and age disaggregated)	None	Ate least 25 people participated in the national workshop (at least 40% women and 20% youth participation)		
Output 1.2.2: Two (2) national fora held for 70 national and subnational policymakers to raise awareness on climate adaptation innovation TPS, entrepreneurship , and sustainable and innovative financial mechanisms	# National fora to raise awareness of policymakers on entrepreneurship, innovation and financial mechanisms are organized	No similar forum held	Two (2) national fora to raise awareness of policymakers on entrepreneurship, innovation and financial mechanisms are organized	Project progress and evaluation reports  Project documents - Strategy documents, training material, training records	Continuous support from the Government and national partner institutions  Commitment from project partners (PMU)
	# Policymakers attending the national fora (gender disaggregated)	None	At least 70 policymakers attending national fora in total over the course of the project (with at least 40% of women and 20% of youth participation)	Workshop minutes and attendance lists  Feedback from those trained  Meeting/ Forum notes Project institutional Website data	Continuous support from business partners, incubators, accelerators, NGOs and other relevant actors
	# Forum proceedings and newsflashes developed and uploaded to the Adaptation Innovation Website	None	Two (2) fora proceedings and newsflashes developed and uploaded to the Adaptation Innovation Website		
Output 1.2.3: Technology show-casing laboratory at EPA office in Bo strengthened for	# of EPA Labs show-casing adaptation and reliance technology innovations	None	One (1) EPA Labs show-casing adaptation and reliance technology innovations	Panflets and pictures of the inauguration of the lab and of the	Continuous support from the Government and national

climate adaptation and resilience technology innovations	# of brochures on the adaptation technologies displayed at the EPA lab	None	At least two (2) brochures on the adaptation technologies displayed at the EPA lab	technologies displayed there  Project progress and evaluation reports  Press and social media releases	partner institutions  Commitment from project partners (PMU)  Continuous support from business partners, incubators, accelerators, NGOs and other relevant actors
Output 1.2.4: Four (4) adaptation clusters are created and nurtured in Sierra Leone	# of clusters created and nurtured in Sierra Leone	None	Four (4) clusters created and nurtured in Sierra Leone	Project progress and evaluation reports	Commitment from project partners (PMU)
	# of meeting per year of each cluster (gender disaggregated)	None	Two (2) meetings per year of each cluster (with at least 40% women and 20% youth participation)	Project documents - Strategy documents	Continuous support from business partners, incubators, accelerators, NGOs and other relevant actors
	# of general meeting per year with all clusters (gender disaggregated)	None	One (1) general meeting per year of each cluster (with at least 40% women and 20% youth participation)	Programmes and attendance list for regional and international events  Press and social media releases	
<b>PC2: Growth and scale-up support for adaptation MSMEs in water, agriculture and energy sectors</b>					
<b>Outcome 2.1 Adaptation MSMEs grow their businesses and operations</b>					
Output 2.1.1: 150 MSMEs, entrepreneurs, start-ups are trained on climate adaptation topics to increase their capacities to understand climate risks and vulnerabilities and to identify business opportunities for climate change	# Train-the-trainers? Pre-Accelerator Programme for incubators/accelerators delivered	None	Two (2) rounds of train-the-trainers? Pre-Accelerator Programme for incubators/accelerators are carried out	Project progress and evaluation reports  Project documentation	Continuous support from the Government and national partner institutions  Commitment from project partners (PMU, accelerators, others) and
	# Training module on gender lens and gender awareness		One (1) training module with the I-know-gender course or other gender training	Training records ? material and participant lists	
	# Training modules on gender challenges to climate change and adaptation TPS)		One (1) training module focused on gender challenges to climate change and adaptation TPS	Participant feedback on pre-	



adaptation during the Pre-Accelerator Programme (aiming at 40% women participation)	# Incubators/accelerators and institutions that participated in the Train-the-trainers? Pre-Accelerator Programme (gender and age disaggregated)	None	At least four (4) incubators/accelerators identified to run the Sierra Leone Adaptation Incubator/Accelerator Programmes and receiving this training (with 40% women staff and 20% youth staff)	accelerator and challenges Meeting notes/ records Tracking tools Project institutional Website data	committed participation of MSMEs, entrepreneurs and startups
	# Pre-Accelerator Workshop for MSMEs, entrepreneurs and start-ups delivered	None	At least one (1) Pre-Accelerators Workshops per year. A total of six (6) Pre-Accelerator Workshops launched over six (6) out of the seven (7) years of the project implementation.	Press and social media releases	
	# MSMEs, entrepreneurs and start-ups trained in each Pre-Accelerator workshop (gender and age disaggregated)	None	At least 150 MSMEs are engaged in the Pre-Acceleration Programme over six (6) out of the seven (7) years of the project implementation (with at least 40% women and 20% youth led enterprises)		
	# Focused training, mentoring and support for women entrepreneurs	None	Six (6) trainings during project implementation		
	# Gender responsive outreach activities	None	One (1) outreach activities in each province before each pre-accelerator workshop		
	# Partners involved that promote gender equality and women and youth empowerment	None	At least one institution in each of the four regions of Sierra Leone		

Output 2.1.2: Four (4) existing business development accelerators are trained to run the annual cycles of climate change adaptation-oriented technology innovation and entrepreneurship competition-based accelerators	# Selection criteria to choose MSMEs, entrepreneurs and start-ups for the different programmes developed	None	Three (3) different selection criteria will be developed and approved. One for each programme: (1) Incubator/Accelerator Programme; (2) Advance Acceleration Programme; and (3) Post Acceleration Programme	Project progress and evaluation reports Project documents Training material Attendance records from training Trainer/mentor/judge certificates	Commitment from project partners (PMU, accelerators, others)
	# Sierra Leone Adaptation Incubator/Accelerator Programmes developed	None	Each selection criteria, should include at least one (1) criterion related to the contribution to the empowerment of youth and women Three (3) programmes will be developed. One for each programme: (1) Incubator/Accelerator Programme; (2) Advance Acceleration Programme; and (3) Post Acceleration Programme	Project institutional Website data Mentorship platform inside the project institutional website	
	# Incubators/accelerators to run the annual competitions of the different programmes under Sierra Leone Adaptation Incubator/Accelerator or trained	None	At least four (4) incubators/accelerators identified to run Sierra Leone Adaptation Incubator/Accelerator Programmes		
Output 2.1.3: 150 MSMEs, entrepreneurs and start-ups with high-impact innovative climate adaptation-oriented TPS are trained and	# MSMEs, entrepreneurs and start-ups trained in the Incubator/Accelerator Programme (gender and age disaggregated)	None	At least a total of 150 MSMEs are trained during project implementation <sup>[1]</sup> (with a target to receive 40% women-led and 20% youth-led applications).	Project progress and evaluation reports Project documentation Guidebooks	Continuous support from the Government and national partner institutions

coached through the Incubator/ Accelerator Programme to overcome the Technological valley of Death (aiming at 35% women participation)	# Focused training, mentoring and support for women entrepreneurs	None	At least one (1) per year during project implementation	Training records ? material and participant lists	Commitment from project partners (PMU, accelerators, others) and committed participation of MSMEs, entrepreneurs and start-ups
	# Evidence of outreach activities (e.g., Press releases, social media, website, brochures)	None	At least one (1) evidence per cycle	Participant feedback on the Incubator/ Accelerator Programme and challenges	
	# Gender responsive outreach activities	None	At least one (1) outreach activities in each province before each cycle of the Incubator/Accelerator Programme	Company records  Meeting notes/ records	
	# Partners involved that promote gender equality and women and youth empowerment	None	At least one (1) institution in each of the four (4) provinces	Tracking tools  Project institutional Website data	
	# Regional & International incubators and accelerators invited to share experience	None	At least three (3) regional/ international incubators/accelerators are invited to share their experience	Press and social media releases	
Output 2.1.4: Business replication, expansion and partnership services provided to help regional and global adaptation MSMEs establish climate resilient business operations in Sierra Leone	# of MSMEs piloting climate change adaptation technologies	None	At least three (3) MSMEs pilot climate change adaptation technologies in Sierra Leone	Project progress and evaluation reports  Project documentation  Company records  Tracking tools  Project institutional Website data  Press and social media releases	Continuous support from the Government and national partner institutions  Commitment from project partners (PMU, accelerators, others) and committed participation of MSMEs, entrepreneurs and start-ups
<b>Outcome 2.2: Adaptation MSMEs secure funding to grow and scale-up their operations and projects</b>					

Output 2.2.1: 50 successful MSMEs, entrepreneurs and start-ups are trained and coached through the Advanced Acceleration Programme to receive early-growth financing and overcome the Commercialization Valley of Death (aiming at 35% women participation)	# MSMEs, entrepreneurs and start-ups trained in the Advanced Accelerator Programme (gender disaggregated)	None	At least 50 MSMEs receive training during the project implementation period[2] (with a target to receive 40% women-led and 20% youth-led applications).	Project progress and evaluation reports Project documentation Guidebooks	Continuous support from the Government and national partner institutions
	# Focused training, mentoring and support for women entrepreneurs	None	At least one (1) per year during project implementation	Training records ? material and participant lists	Commitment from project partners (PMU, accelerators, others) and committed participation of MSMEs, entrepreneurs and start-ups
	# Evidence of outreach activities (e.g., Press releases, social media, website, brochures)	None	At least one (1) evidence in each cycle	Participant feedback on the Incubator/ Accelerator Programme and challenges	
	# Gender responsive outreach activities	None	One (1) outreach activities in each province before each cycle of the Advanced Accelerator Programme	Company records Meeting notes/ records	
	# Partners involved that promote gender equality and women and youth empowerment	None	At least one (1) institution per region per cycle	Tracking tools Project institutional Website data Press and social media releases	
Output 2.2.2: 20 MSMEs, entrepreneurs and start-ups receive investment facilitation support in the Post-Acceleration Programme for projects that deliver climate adaptation technologies and solutions at scale (aiming at 40%	# MSMEs, entrepreneurs and start-ups trained in the Post-Accelerator Programme (gender and age disaggregated)	None	At least 20 MSMEs receive support during the project implementation period[3] (with a target to receive 40% women-led and 20% youth-led applications).	Project progress and evaluation reports Project documentation Guidebooks	Continuous support from the Government and national partner institutions
	# Focused training, mentoring and support for women entrepreneurs	None	At least one (1) per year during project implementation	Training records ? material and participant lists	Commitment from project partners (PMU, accelerators, others) and committed participation of MSMEs, entrepreneur
	# Evidence of outreach activities (e.g., Press releases, social media, website, brochures)	None	At least one (1) evidence in each cycle	Participant feedback on the Incubator/ Accelerator	

women participation)	# Gender responsive outreach activities	None	One (1) outreach activities in each province before each cycle of the Advanced Accelerator Programme	Programme and challenges Company records Meeting notes/ records	s and start-ups
	# Partners involved that promote gender equality and women and youth empowerment	None	At least one (1) institution per region per cycle	Tracking tools Project institutional Website data	
	# of MSMEs participating in investor connects events (gender and age disaggregated)	None	At least 20 MSMEs participating in investor connects events (with 40% of these companies being led by women and 20% by youth)	Press and social media releases	
	# Exit strategies for the SL Adaptation Incubator/Accelerator	None	One exit strategy developed and approved by the PSC		
Output 2.2.3: The Climate Adaptation Venture Fund is established and operationalized to financially support at least 20 climate change adaptation enterprises and to de-risk and leverage public/private investment	# Dedicated Climate Adaptation Venture Fund established	None	One (1) Climate Adaptation Venture Fund established and operational	Project progress and evaluation reports	Interest from impact investors in adaptation TPS  Continuous support from the Government and national partner institutions  Commitment from project partners (PMU, accelerators, others) and committed participation of MSMEs, entrepreneurs and start-ups
	# MSMEs, enterprises and start-ups that can access the Climate Adaptation Venture Fund (gender disaggregated)	None	At least 20 MSMEs are supported by the CAVF (at least 40% women-led and 20% youth-led)	Project documentation Fund reporting Budget documents	
	# co-finance leveraged/disbursed	None	At least USD 7 million are raised as co-finance for CAVF to support MSMEs	Company records Press and social media releases	
	# Exit strategies for the CAVF	None	One exit strategy developed and approved by the PSC		
<b>PC3: Vulnerable groups access financing to acquire climate resilience and adaptation technologies, products and services in the water, agriculture and energy sectors</b>					
<b>Outcome 3.1: Demand and accessibility to financing for adaptation services increased amongst vulnerable groups</b>					

<p>Output 3.1.1: Adaptation MSMEs participate in annual roadshows and are connected to aggregator platforms and cooperatives to raise awareness of the resilience and adaptation benefits of their technologies, products and services amongst vulnerable groups and communities in rural areas</p>	<p># Evidence of outreach activities (e.g., Press releases, social media, website, brochures)</p>	None	At least 50 evidence in total throughout the project implementation period	Project progress and evaluation reports	<p>Continuous support from the Government and national partner institutions</p> <p>Commitment from project partners (PMU, accelerators, others)</p>
	<p># Gender responsive outreach activities</p>	None	One (1) outreach activities in each province before each awareness raising event	Project documentation  Guidebooks, leaflets	
	<p># Awareness raising events / roadshows to target vulnerable groups (disaggregated by gender and age if possible)</p>	None	At least 50 awareness raising activities over the project implementation period. (target 40% of women and 20% for youth participation)	Training records ? material and participant lists  Participant feedback on the awareness raising events	
	<p># Training modules focused on Gender challenges to climate change and Adaptation TPS and on gender mainstreaming</p>	None	At least one (1) training module focused on Gender challenges to climate change and Adaptation TPS and on gender mainstreaming	Tracking tools  Project institutional Website data  Press and social media releases	
	<p># Vulnerable people targeted at awareness raising events / roadshows (disaggregated by gender and age and if possible)</p>	None	At least 250,000 vulnerable people will benefit from the awareness raising events during the project implementation period[4] (target of at least 35% women participants)		
<p>Output 3.1.2: Methodologies and guidebooks for assessing and quantifying adaptation and resilience benefits of projects developed and widely disseminated</p>	<p># of methodologies and guidebooks for assessing and quantifying adaptation and resilience benefits of projects developed and widely disseminated</p>	None	At least one (1) publication of a methodology and guidebook for assessing and quantifying adaptation and resilience benefits of projects developed	Project institutional Website data  Project progress and evaluation reports  Project documentation  Publication	<p>Continuous support from the Government and national partner institutions</p> <p>Commitment from project partners (PMU, accelerators, others)</p>

Output 3.1.3: Four (4) training sessions highlighting the actual and potentially additional positive financial, economic and social impacts of climate adaptation TPS to SMEDA and FSPs will be held	# Training session highlighting the actual and potentially additional positive financial, economic and social impacts of climate adaptation TPS to SMEDA and FSPs (disaggregated by gender)	None	At least four (4) training sessions highlighting the actual and potentially additional positive financial, economic and social impacts of climate adaptation TPS to SMEDA and FSPs (target of at least 40% women and 20% youth participants)	Project progress and evaluation reports Project documentation Guidebooks Training records ? material and participant lists Participant feedback on the training sessions	Interest from impact investors in adaptation TPS  Commitment from project partners (PMU, accelerators, others)
	# FSP trained / participating in awareness raising workshop (gender disaggregated)	None	At least 10 FSP are trained (at least 40% women investors and 20% youth investors)	Meeting notes/ records	
	# Training on gender-lens investment or gender sensitization for investors	None	At least 10 FSP trained (at least 40% women and 20% youth)	Tracking tools Project institutional Website data	
	# of national financial institutions network established	None	One (1) Financial Institution Network established	Press and social media releases	
	# of Financial institutions in network (gender and age disaggregated)	None	At least 10 FSP are members of the network (at least 40% women and 20% youth)		
<b>Outcome 3.2: FSPs provide lending to vulnerable groups to acquire adaptation technologies, products and services</b>					
Output 3.2.1: FSPs and MFIs supported to develop and improve de-risking and climate-adaptive guarantee instruments for lending to vulnerable groups	# Risk mitigation instruments and tools for FSPs developed	None	At least three (3) different tools and/or instruments developed	Project progress and evaluation reports	Interest from impact investors in adaptation TPS
	# Capacity building meetings to FSPs on the developed risk mitigation instruments and tools	None	Five (5) capacity building meetings conducted	Project documentation Fund reporting Budget documents	Commitment from project partners (PMU,
	# FSPs trained and supported	None	At least 10 FSPs supported		

	US\$ co-finance raised from FSP to be provided over the project duration	None	At least US\$10,000,000	FSPs records Press and social media releases Attendance records from training Training material Participant feedback on the training	accelerators, others)
Output 3.2.2 Innovative financial products and services adapted to the needs of the most vulnerable populations are made available through partner financial services providers, selected on a competitive basis	# Dedicated innovative financial products and services adapted to the needs of the most vulnerable populations developed (gender and age responsive)	None	At least three (3) direct or indirect financial instruments developed with one (1) specially designed to target women and youth.	Project progress and evaluation reports Project documentation Press and social media releases	Interest from impact investors in adaptation TPS  Commitment from project partners (PMU, accelerators, others)
	# FSPs participating in the establishment of these products	None	At least 10 FSPs participated	Leaflets	
	# Beneficiaries reached	None	At least 250,000 benefiting from the adoption of adaptation TPS	Project institutional Website data	
	# Evidence of outreach activities (e.g., Press releases, social media, website, brochures)	None	At least one (1) evidence of these events ? four (4) evidences in total	Meeting/ forum records	
	# Gender responsive outreach activities	None	One (1) outreach activities before each event		
<b>PC4: Project Monitoring and Learning</b>					
<b>Outcome 4.1. Regular project monitoring and documentation for learning and knowledge sharing</b>					
Output 4.1.1: Regular project progress monitoring and data collection to track project progress	# PMU Training on UNIDO standards for monitoring and reporting processes and procedures and the GEF Monitoring Policy	None	PMU received at least three (3) trainings over the project duration	Project progress and evaluation reports Project documentation	Continuous support from the Government and national partner institutions
	# M&E Framework consolidated ?M&E plan	None	One (1) M&E Framework consolidated / M&E Plan		Commitment from project partners



	# Training sessions for incubators/accelerators on the M&E Framework	None	At least five (5) training sessions every year (25 throughout project implementation)	Training records ? material and participant lists	(PMU, accelerators, others) and committed participation of MSMEs, entrepreneurs and start-ups
	# Incubators/accelerators trained	None	All seven (7) incubators/accelerators participating in the project trained	UNIDO guidelines Participants feedback on the M&E framework	
	# Progress reports (including monitoring of ESMP, and risks)	None	1 Progress report every 6 months (including monitoring of ESMP, gender mainstreaming and risks) Total of 14 reports in 7 years	Tracking tools Project institutional Website data	
	% of project activities implemented according to work plan	None	At least 75% of the project activities implemented according to Work Plan	Knowledge materials developed	
	% of achieved expected results	None	At least 75% of the project expected results are achieved		
Output 4.1.2: Knowledge materials developed and best- practices documented and disseminated widely	# Sierra Leone Adaptation Project communication strategy developed	None	One (1) Sierra Leone Adaptation Project communication strategy developed		
	# Supporting documents and knowledge materials developed for national stakeholders	None	At least seven (7) knowledge materials are developed and disseminated by the project		
Output 4.1.3. Capacity enhancements of the Project Executing Entity to ensure long-term sustainability, retention of institutional knowledge and ability to engage funding partners in a more harmonized and consistent manner	# of capacity building training sections on areas identifies	None	At least three (3) trainings over the project duration	Project progress and evaluation reports	Continuous support from the Government and national partner institutions  Commitment from project partners (PMU and PEEs)
	# of reports on the capacity building needs of PEEs	None	One (1) needs assessment report	Project documentation Training records ? material and participant lists UNIDO guidelines Participants feedback on the M&E framework Tracking tools	

PC5: Project Evaluation					
Outcome 5.1: Project evaluation					
Output 5.1.1: Mid-term evaluation	# Independent mid-term review conducted	None	One (1) Project mid-term review report conducted with the project classified as at least Moderately Satisfactory.	Mid-term review	Continuous support from the Government and national partner institutions
Output 5.1.2: Terminal Evaluation	# Independent terminal evaluation report conducted	None	One (1) Terminal evaluation report conducted with the project classified at least as Moderately Satisfactory;	Terminal evaluation report	Commitment from project partners (PMU, accelerators, others) and committed participation of MSMEs, entrepreneurs and start-ups

[1] This corresponds to an average of 166 enterprises trained per year from the 2<sup>nd</sup> year of the project onwards.

[2] This corresponds to an average of 33 MSMEs per year trained from the 2<sup>nd</sup> year of the project onwards.

[3] This corresponds to an average of 17 MSMEs per year receiving support under the Post-Accelerator Programme from the 2<sup>nd</sup> year of the project onwards.

[4] This corresponds to an average of 500 people attending these events .

**ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).**

	GEF Secretariat / STAP comments	Response
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1

***Comment by Edward Carr and Guadalupe Duron, STAP comments to the PIF***

**General Comment:**

STAP proposes minor issues to be considered during the project design. STAP acknowledges UNIDO's project "Promotion of climate adaptation technology and business model innovations and entrepreneurship in Sierra Leone". The project aims to reduce climate vulnerability, and increase resilience of vulnerable populations by supporting Micro, Small, and Medium Enterprises (MSMEs) in the water, agriculture and energy sectors in Sierra Leone.

1) STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical methodological issues, barriers, or omissions in the project concept. As currently written, the project is largely focused on supporting micro-small, medium enterprises (MSMEs), and not enough information is provided on how the MSMEs will develop opportunities for people to adapt to climate change. STAP offers a number of suggestions on how the causality between MSMEs and climate adaptation could be established, monitored and evaluated by developing a more rigorous causal pathway between the intended objective, outcomes, outputs, and activities.

2) STAP further proposes that the project more clearly specify the role of climate change in the challenges it proposes to address. The project attributes a number of complex challenges to climate change impacts without identifying or considering their other causes. For example, the landslides and flooding referenced in the PIF are heavily influenced by land use decisions that are not

1) This link is now strengthened in both the Baseline Report as well as in the GEF CEO Endorsement. The new theory of change also aims to show this relation in a nutshell.

2) A Climate Risk and Vulnerability Assessment (CRVA) was conducted as part of the Baseline Report. The CRVA methodology used for this is an innovative approach that uses existing methodologies and models, as well as captures new collected information and valuable insights from local stakeholders. In this CRVA the vulnerability to climate change and occurred and expected impacts were assessed using a series of tools (WB Group's Climate Change Portal (CCKP), Global Hotspot Explorer (developed within the GEF/UNIDO project ISWEL) and Think Hazard), verified and complemented with stakeholder's inputs. The consultation activities involved: (i) the deployment of an online questionnaire, to which 72 replies were received from stakeholders in the SL; and consultation of more than 24 individual interviews/meeting (virtual and physical), 3 focus group meetings and 2 focused workshops with MSMEs.

At the same time the adaptive capacity to climate change was also assessed. By combining all this information and validating all results the geographical focus of the GEF/UNIDO Adaptation Project was identified. The detailed CRVA can be found on the Baseline Report and a summary of it in the GEF CEO Endorsement.

**Comment by Edward Carr and Guadalupe Duron, STAP comments to the PIF**  
**Part I: Project Information**

3) Project Objective: ?The objective is clearly identified, but the relationship of the objective to the activities is problematic because the contribution of climate change to challenges like flooding and landslides relative to other drivers, such as land use, is not well-articulated. Other stressors, such as access to water, are also not well-supported by data. Finally, the project?s implicit theory of change does not clearly map how the innovations to be fostered through MSMEs might address these concrete challenges.

- 4) Project Components:
  - ?1) The project will strengthen institutional and policy frameworks around adaptation MSMEs to stimulate new technologies, products, and services and deploy them.
  - 2) It will support the growth and scale-up of adaptation MSMEs.
  - 3) It will facilitate access of vulnerable groups to financing for the acquisition of resilience and adaptation products and services?.

5) Outcomes: ?The outcomes encompass important environmental benefits and adaptation benefits for Sierra Leone. It is not clear how these would amount to global environmental benefits?.

6) Outputs: ?The outputs appear to contribute to the outcomes. However, outputs related to outcome 3.1 are mostly focused on improving financial service providers understanding of adaptation and resilience, with relatively little focus on the vulnerable groups who are the focus of this section?.

3) This is now better articulated both the Baseline Report and GEF CEO Endorsement, through the full CRVA that was conducted as a basis for this project. The Theory of Change (ToC) of the project was developed, discussed, and validated with a varied number of stakeholders in Sierra Leone. In all the meetings carried out with stakeholders, the ToC of the project was presented and discussed. It includes now all the underlying assumptions and was developed having into account the Climate Risk and Vulnerability Assessment (CRVA) carried out during the PPG stake. It clearly shows now the links between the climate change vulnerabilities and risks, the activities, outcomes, and impacts of the proposed project.

4) Yes, and continues to do so.

5) This is now clearer through the indicators and metrics were provided for each of the Outputs/Activities and are included as well in Annex A: Project Results Framework. These were also inserted in the LDCF SCCF Research Framework Core Indicators Spreadsheet (Annex F of the GEF CEO Endorsement) and in the GEF CEO Endorsement.

6) This has been revised and now there is a clear focus of PC3 on the development of financial products to be made available for the vulnerable groups as well as a series of targeted actions for the vulnerable groups to know what the technologies, products and services are available to them and what are the financial products and services that they can use to buy those technologies, products and services.

Comment by Edward Carr and Guadalupe Duron, STAP comments to the PIF

Part II: Project Information

7) Project Description/problem definition: ?The PIF describes possible changes in the climate for the timeframe 2040-2059. However, it only describes a single climate future (using RCP 8.5, the most extreme of the RCPs), when some consideration should be made for different outcomes related to different emissions pathways. The PIF references flooding and landslides as effects of climate change, but does not make this attribution clearly. Flooding and landslides are often the products of land use decisions, not climate change ? a point that becomes clear later in the PIF. Even using the extreme scenario, the PIF is pointing to changes twenty years from now, but attributing current flooding and landslides to climate change. To the extent the project considers flooding and landslides to be significant climate impacts to be addressed by the project, it will need to clearly attribute these events to a changing climate (or, more likely, establish a partial attribution bound up in changing land use, etc.), and thus allow for the assessment of the likely change in frequency and severity of floods and landslides.

There are no references for the projections of sea-level rise, and no concrete amounts of sea-level rise listed. It is therefore difficult to assess the degree to which this will produce the threats described in the PIF.

The PIF blames deforestation on poverty without references or evidence (a critical point, because the relationship between poverty and deforestation is complex ? in some situations, impoverished people are better land managers than wealthy people because the land is their only asset).?

8) Project Description / Barriers and threats: The climate risks to food security are presented without reference to any evidence. The argument that increased temperature will lead to increased proliferation of vector-borne diseases for livestock and crops seems generalized and should be specified for Sierra Leone ? what diseases are likely to be exacerbated? The claim that increased rainfall will cause nutrient leaching and fungal growth makes a very big deal out of a 4.85mm increase in annual precipitation (at the worst) in a country that receives between 2000 and 3000mm/year. This is an increase of 0.02% at the most, which would be an imperceptible change and unlikely to produce these impacts. The PIF does mention extreme rainfall events and the project would do well to focus on the probability of these events, which seem a more likely source of

7) The developed CRVA included the future climate predictions / impacts intensity for 4 climate change scenarios (RCP2.6 , RCP4.5, RCP6.0 and RCP8.5) and for the four regions of Sierra Leone (Freetown/Western, Northern, Eastern and Southern) expected in the three WEF sectors by climate impact driver. Please see both the detailed CRVA in the Baseline Report and the summary of the CRVA in the GEF CEO Endorsement.

Sea level rise projections are also included and considered in the CRVA.

Proofs and evidence of all statements are provided throughout the documents. Also, a series of sources and different types of information were used to triangulate and/or corroborate the findings.

It is also referred in the Baseline report as well as in section 1.2.3 of the RCE above. In fact, landslides are often a product of land use decisions, that associated with a weather event ? such as high intense precipitation ? in location of loose soil can lead to that specific hazard. Deforestation is a result of the human overexploitation of wood resources, for wood production and/or tree abatement to be used as fuel for heating and cooking purposes. High rates of deforestation, increase soil erosion and this soil in in the case of heavy / intense precipitation events, can be dislocated leading to a landslides. It is important to refer that the climate change event of 14<sup>th</sup> of August 2017 in Freetown, was a result of deforestation associated with bad land management decisions, that lead to 500 life?s being lost in a severe flooding event and landslide that occurred in the city. In fact this was recognised by several of the consulted stakeholders that referred ?*Flooding in Freetown on the 14<sup>th</sup> of August 2017 that was caused by heavy rain with which 500 lives were lost?*; ?*In the Eastern part of Freetown, climate change is seriously affecting the communities in terms of water shortages as a result of people cutting down the vegetation on the Peninsular tops and destroying the water catchments areas thereby lowering water levels in the water tables.*?

8) As explained above a detailed CRVA was conducted that addressed all the referred points.

Stronger connection between the climate change impacts and the COVID challenges

flooding, landslides, and crop damage than annualized changes.

The risks for water security are very weakly tied to climate change. Here, the PIF mentions periods of drought (which are not characterized in the overview of climate) which might be addressed by wells with solar pumps. The risks for energy security are completely about climate extremes. The project will need to clarify its climate focus here (more on variability than change) if it is to appropriately identify problems and potential solutions.

While Sierra Leone's COVID challenges are well-documented here, their connection to climate change impacts is tenuous. The project more or less argues that more food, safe water, and access to energy will allow for a more effective response to COVID, but this is quite vague.

The barriers section of the PIF is clear and much better supported with evidence and references. Barrier five, however, offers evidence without any references on the specific barriers women face. It is therefore difficult to assess their validity or prevalence.

9) Baseline scenario/ identification of the baseline scenario: ?The baseline appears to be almost entirely defined around the development of MSMEs. The climate component of the baseline references the NAPA, but does not present any climate-related data as a baseline. While this baseline does show that there are very few adaptation MSMEs, and suggests that without the project there are unlikely to be many more, the connection of these new MSMEs to a climate or environmental benefit is not clear because it is not clear what adaptation challenges these MSMEs would be taking on.

The same issue arises with regard to the baseline uptake of adaptation technologies by rural populations. As it is not clear what they are adapting to, it is hard to know what technologies they need, or whether MSMEs could meet that need.?

10) Baseline scenario / feasible basis for quantifying the project's benefits : ?No?

11) Baseline scenario / incremental cost reasoning: ?No. The table of additionality is detailed and useful, but it also lacks a clear connection to adaptation benefits more broadly, and even for MSMEs alone it is not clear how to quantify or otherwise measure the benefits.?

12) Baseline scenario / lessons learned from similar or related past GEF and non-GEF interventions described: ?The PIF states the project will build on lessons learned from the baseline projects described in table 1. STAP recommends

was carried out.

All documents/information used is clearly referenced and triangulated in all documents being submitted as part of the GEF CEO Endorsement Package, especially in the baseline report.

The expectation of more variable of extreme weather events to occur is explored under the RCP/ IPCC scenarios considered in the CRVA and across the different regions of Sierra Leone.

9) The CRVA carried out in the Baseline Report and summarised in the GEF CEO Endorsement provides all this links and includes a list of adaptation technologies to be used in the WEF sectors of SL to adapt to the adaptation vulnerabilities and risks identified. In addition, in the section Conclusion of the CRVA in the GEF CEO Endorsement a table highlighting the environmental benefits of the innovative adaptation solutions in short, medium and long term identified based on evidence (scientific assessments, papers, stakeholders) is also provided right after the table with the adaptation technologies, products or services (TPS).

10) This should be OK now.

11) A better definition of the indicators is now provided on the document. Data and information have been used to back up stated environmental benefits and statements and references for these were provided into the documents GEF CEO Endorsement and Baseline Report

12) Noted and added in both the Baseline assessment and the GEF CEO Endorsement.

13) The Theory of Change (ToC) of the project was revised, discussed, and validated with a varied number of stakeholders in Sierra Leone. It includes now all the underlying assumptions and was developed having into account the Climate Risk and Vulnerability Assessment (CRVA) carried out during the PPG stake. It clearly shows now the links between the climate change vulnerabilities and risks, the activities, outcomes, and impacts of the proposed project.

14) Yes. This is noted.

adding a column to table 1, and describe the lessons from the baseline activities and how they will inform this LDCF project?.

13) Proposed alternative scenario / Theory of change: ?STAP appreciates the inclusion of a formal theory of change in the PIF. The theory of change appears to be that with support to MSMEs, capacity- building in the finance sector and in government, and at least some support to rural/vulnerable populations to enable the purchase of new technologies developed by the MSMEs, access to adaptation will become more widespread. This will result in a diversified and climate-resilient economy, and inclusive and resilient energy, water, and agricultural sectors. This theory of change, however, is very general. Because it does not articulate the climate change impacts to which people are adapting in a direct manner and the climate change impacts noted in the barriers and threats discussion are either trivial (change in rainfall) or deeply intertwined with other issues (land use change), it is difficult to know what, exactly, the MSME?s would develop opportunities to adapt to. Table 2 specific about the technologies to be prioritized under this project, but the justification for this specificity is not grounded in a clear assessment of climate impacts, or indeed the root causes of the challenges (e.g. landslides and flooding) they seek to address. Therefore, the theory of change will be difficult to evaluate in practice?

14) Proposed alternative scenario / sequence of events: ?Improved institutional and policy framework for adaptation MSMEs will lead to a more hospitable innovation environment. This environment will then be catalyzed by support for growth and scaling up of MSMEs and improved access to financing for vulnerable populations, who will purchase the products of MSMEs. This, in turn, will disseminate needed technologies widely, yielding greater resilience across the economy and in the targeted sectors. ?

15) Proposed alternative scenario / what is the set of linked activities, outputs, and outcomes to address the projects objectives: ?the steps are to first to strengthen the institutional frameworks and coordination mechanisms to support adaptation MSMEs as they develop and deploy technologies/products/services into the water, agriculture, and energy sectors. Second, the project will provide growth and scale-up support to MSMEs in these sectors. Third, the project will work to allow vulnerable groups access to innovative financing the acquire resilience and adaptation technologies, products, and services in these sectors. The ToC argues that this will result

15) Noted. It is like that yes. That is now evident and more detailed in the GEF CEO Endorsement.

16) With the CRVA as a basis and more detail on the project Outcomes, Outputs and Activities this is now clearer.

17) This is now included in the Project Document. Both the Adaptation Innovation Platform and the Project Steering Committee will guide the project implementation, and thus address any issues that may arise, including adapt activities to changing conditions to achieve the desired outcomes.

18) Now this is provided in the GEF CEO Endorsement. The Baseline assessment that includes the CRVA grounds the entire project,

19) This is now all thoroughly explained in the GEF CEO Endorsement.

20) Noted.

21) Noted.

22) Better definition of the indicators is now provided on the document with the indication of how they should be monitored during the project.

23) The GEF CEO Endorsement has now a comprehensive section explaining all outputs and activities and how those aim to contribute to increase the resilience to climate change.

24) Noted.

25) Noted.

26) Noted.

27) Now provided in the GEF CEO Endorsement respective section and Annex.

28) As referred the CRVA methodology used for this is an innovative approach that uses existing methodologies and models, as well as captures new collected information and valuable insights from local stakeholders. In this CRVA the vulnerability to climate change and occurred and expected impacts were assessed using a series of tools (WB Group?s Climate Change Portal (CCKP), Global Hotspot Explorer (developed within the GEF/UNIDO project ISWEL) and Think Hazard), verified and complemented with stakeholder?s inputs. The consultation activities involved: (i) the deployment of an online questionnaire, to which 72 replies were received from stakeholders in the SL; and consultation of more than 24 individual interviews/meeting

in uptake of MSME innovations, which will yield a diversified and climate resilient economy, along with inclusive and resilient water, energy, and agriculture sectors?.

16) Proposed alternative scenario/ Are the mechanisms of change plausible, and is there a well-informed identification of the underlying assumptions: ?This is difficult to assess, because the activities proposed are not targeted to specific stresses (which are underspecified in this PIF). Certainly, increased innovation can bring about new technologies and opportunities that promote adaptation, but it is not clear that this project?s mechanisms of change go beyond that.

17) Proposed alternative scenario / Is there a recognition of what adaptations may be required during project implementation to respond to changing conditions in pursuit of the targeted outcomes? : ?No?

18) Incremental/additional cost reasoning / LDCF/SCCF: ?This is not clear. While the activities speak to specific adaptation efforts (i.e. flood prevention), the activities are not well-grounded in an assessment of climate impacts and therefore it is not clear if they will stimulate meaningful adaptation to either the named challenges, or climate change impacts more broadly?

19) Global environmental benefits / Are the benefits truly global environmental benefits/adaptation benefits, and are they measurable : ?It is possible there could be an adaptation benefit here, if this approach were to catalyze local solutions for climate change challenges. The approach itself might be scalable and therefore serve as a path to an adaptation benefit. However, the weak connection between activities and climate impacts makes this potential difficult to assess.

20) Global environmental benefits / Is the scale of projected benefits both plausible and compelling in relation to the proposed investment?: ?Yes?

21) Global environmental benefits / Are the global environmental benefits/adaptation benefits explicitly defined? : ?The adaptation benefits are clearly defined in the PIF .?

22) Global environmental benefits / Are indicators, or methodologies, provided to demonstrate how the global environmental benefits/adaptation benefits will be measured and monitored during project implementation? : ?No?

23) Global environmental benefits / What activities will be implemented to increase the project?s resilience to climate change? : ?There is no discussion of such activities ?

(virtual and physical), 3 focus group meetings and 2 focused workshops with MSMEs.

At the same time the adaptative capacity to climate change was also assessed. By combining all this information and validating all results the geographical focus of the GEF/UNIDO Adaptation Project was identified as well as the technologies products and services that can be adopted to adapt to climate change in the four different regions of Sierra Leone and in the WEF sectors. The detailed CRVA can be found on the Baseline Report and a summary of it in the GEF CEO Endorsement.

29) The roles of the different stakeholders continue to be clear in the GEF CEO Endorsement. The Stakeholders role in the project design is referred in the GEF CEO Endorsement document as well as detailed in the in the Baseline Report Annex, Evidence of Stakeholders Engagement Annex and Stakeholder Engagement Plan.

30) Noted.

31) Gender inclusion is address throughout the project document as well as in the Gender Annex.

32) That is now included on the risk section.

33) Noted.

34) Noted.

35) Also included in the GEF CEO Endorsement.

36) Noted.

37) Noted.

38) Yes and they are all included in the GEF CEO Endorsement.



24) Innovative, sustainability and potential for scaling-up / Is the project innovative, for example, in its design, method of financing, technology, business model, policy, monitoring and evaluation, or learning? : ?The business model has the potential to be quite innovative, fusing local knowledge and innovation with a global environmental challenge. It may be that technologies/products/services developed under this model could themselves be innovative, but that is impossible to evaluate at the project planning stage.

25) Innovative, sustainability and potential for scaling-up / Is there a clearly-articulated vision of how the innovation will be scaled-up, for example, over time, across geographies, among institutional actors? : ?There appears to be a clear vision of how innovations produced by this model might be scaled up to the level of sectors in the Sierra Leonian economy.?

26) Innovative, sustainability and potential for scaling-up / Will incremental adaptation be required, or more fundamental transformational change to achieve long term sustainability? : ?This is an incremental adaptation, strengthening existing institutions and markets, and drawing on existing knowledge and skills, to address climate change impacts.?

27) Project Map and Coordinates. Please provide geo-referenced information and map where the project interventions will take place: ?There is no map.?

28) Stakeholders/ Have all the key relevant stakeholders been identified to cover the complexity of the problem, and project implementation barriers?: ?While the PIF lists a reasonable set of consultations with civil society, government, and private sector entities, it does not reflect any engagement with indigenous peoples and local communities. Given that this last group are the intended consumers of the products coming out of this program, a robust TOC should rest on an understanding of what this ?market? sees as needed or interesting, and what barriers they see to engagement with these technologies/products/services. The project rests on an assumption that if technologies are available, and financing exists, people will buy and use the technologies. A substantial development literature exists that demonstrates this is a problematic assumption, as there are a host of local socio-cultural factors that shape the uptake of adaptation and development interventions. The engagement with women?s and youth organizations is commendable, but is not clearly linked to the goal

of understanding the end consumer of the products and services.?

29) Stakeholders/ What are the stakeholders' roles, and how will their combined roles contribute to robust project design, to achieving global environmental outcomes, and to lessons learned and knowledge?: ?The roles are clearly articulated in Table 3. It is not clear that any have a role in project design. They do have clear roles in project outcomes and could contribute to global environmental outcomes if this process proves to be scale-able. The stakeholder roles in lessons learned and knowledge is not articulated.?

30) Gender Equality and Women's Empowerment/ risks and opportunities identified: ?Yes?

31) Gender Equality and Women's Empowerment / Gender considerations hinder full participation of an important stakeholder group: ?The project notes that women and men often play different agricultural roles, and that women do not normally share direct benefits through income from their labor. However, the project has clearly identified this issue, and proposes to address it by modeling work conducted on gender empowerment and the environment in Sierra Leone.

32) Risks: ?The risks are valid and comprehensive, and reflect things outside project control.

The project does not answer how its objective or outputs might be affected by climate risks, nor has it assessed the sensitivity of the project to climate change impacts. In some ways, this makes sense, as the prescribed work in this project is not very sensitive to climate change. It is work on institutional and market capacity, which will produce products and services that address environmental issues. It does not, in and of itself, aim to address environmental issues directly.?

33) Coordination / project proponents: ?Yes?

34) Coordination / adequate recognition of previous projects: ?Yes?

35) Coordination / Have specific lessons learned from previous projects been cited: ?Yes, at various points in the PIF?

36) Coordination / Is there an adequate mechanism to feed the lessons learned from earlier projects into this project, and to share lessons learned from it into future projects: ?Yes?

37) Knowledge management / overall approach: ?The project will draw on the Sierra Leonian EPA's knowledge management indicators and metrics, as they have experience with such work and an existing database. ASAP will lead on the creation of curriculum, taxonomy, adaptation technology database and measurement metrics on

	<p>best adaptation technologies/practices. The project expects to develop benchmarks for innovations as the project proceeds and there is enough data to do so.</p> <p>38) Knowledge management / Plans for sharing information: ?The plans for dissemination seem extensive, including training manuals, good practice guides, data sheets, posters, videos, radio programs and regular updating on the UNIDO website?.</p>	
5	<p><b>STAP Advisory Notes</b></p> <p>39) Concur: ?STAP acknowledges that on scientific or technical grounds the concept has merit. The proponent is invited to approach STAP for advice at any time during the development of the project brief prior to submission for CEO endorsement .</p> <p>* In cases where the STAP acknowledges the project has merit on scientific and technical grounds, the STAP will recognize this in the screen by stating that <i>?STAP is satisfied with the scientific and technical quality of the proposal and encourages the proponent to develop it with same rigor. At any time during the development of the project, the proponent is invited to approach STAP to consult on the design.?</i></p> <p>40) Minor issues to be considered in the project design: ? STAP has identified specific scientific /technical suggestions or opportunities that should be discussed with the project proponent as early as possible during development of the project brief. The proponent may wish to:</p> <p>i) Open a dialogue with STAP regarding the technical and/or scientific issues raised;</p> <p>(ii) Set a review point at an early stage during project development, and possibly agreeing to terms of reference for an independent expert to be appointed to conduct this review.</p> <p>The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.</p> <p>Major issues: STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical methodological issues, barriers, or omissions in the project concept. If STAP provides this advisory response, a full explanation would also be provided. The proponent is strongly encouraged to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised; (ii) Set a review point at an early stage during project development including an independent expert as required. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.</p>	<p>39) Noted.</p> <p>40) Noted</p>

	<i>Council Comments</i>	
4	<p><b><i>Canada comments from December 2020</i></b></p> <p>41) The project is proposing the creation of an on-line marketplace, and Canada would like to confirm that the project will be accessible to all MSMEs (i.e. how might this platform be more accessible to those without internet access ? will it be available to access by mobile phone, other communication mechanisms, etc.)?</p> <p>42) It might be useful to provide a brief description on what types of livelihoods would be considered within agriculture-water-energy sectors, especially with respect to MSMEs.</p>	<p>41) The Innovation Adaptation Platform will be available through the use of all electronic devices with access to the internet. The project will also distribute information on the MSMEs through brochures, organised activities (meetings, workshops, roadshows etc) to be able to reach the widest audience possible.</p> <p>42) That has been carried out in the Baseline Report, and the TPS were identified for those livelihoods in specific and for the 4 different regions of Sierra Leone.</p>

***Germany comments from December 2020***

Germany approves the following PIF in the work program but requests that the following comments are taken into account:

Germany welcomes the proposal which aims to promote Micro, Small and Medium Entrepreneurs (MSMEs) for technological and business model innovations that address the adaptation needs of vulnerable groups in Sierra Leone. Germany supports the integrated approach comprising the water, agriculture, and energy sectors, as well as the specific focus on women and youth.

Germany requests that the following requirements are taken into account during the design of the final project proposal:

43) Local Communities: Germany recommends ensuring closer involvement of local communities, and a more detailed consideration of their vulnerabilities to climate change impacts as well as their adaptation needs. We agree with the GEF Secretariat that adaptation planning with communities and community groups should be added as a distinct project activity at the endorsement stage, as noted in the PIF review document (p.38).

44) Cooperation with other projects: Germany encourages incorporating lessons learned from the 'Employment Promotion Programme (EPP III)' in Sierra Leone, commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by GIZ, which concluded earlier this year. The third phase of the Programme focused on improving the work and income situations for young people who are employed in agriculture or MSMEs.

45) Theory of change: While Sierra Leone's contribution to global climate change is indeed minuscule, there are unsustainable economic activities that endanger ecosystems and require transformation. The theory of change is linear in same way as it assumes adaptation measures alone will lead to a sustainable and resilient economy. Hence mitigation must always be considered and should be integrated in the theory of change

46) Barriers for transformation: One of the root barriers for sustainable business operations is the cost-free utilization and degradation of the environment. In addition, there are institutional and organizational barriers for the developing of MSME businesses. Germany suggest to address both types of barriers.

47) Activities: Germany welcome the general direction for planned interventions. However, its specific areas of activities remain opaque.

Generally, Germany suggests a dual approach of implementation at local level and coordinated

43) This has been done. The project also envisions to reach out to NGOs and CSOs to implement the activities connected with the vulnerable population as a mean to easily reach out to them. Several organizations were already reached out during the PPG stage and more will be engaged in the project implementation.

44) Done.

45) The theory of change has been revised approved by STAP.

46) Done.

47) Bigger detail went on the definition of the activities with consideration of these suggestions.

	<p>monitoring through policy measures, should be a core element of this project. Germany suggests to consider:</p> <ul style="list-style-type: none"> <li>o Financial support for the implementation and dissemination of modern locally adapted and sustainable agriculture and forestry and as wells sustainable cooking methods</li> <li>o Information and advice for entrepreneurs on the introduction of new, proven and promising methods and technologies</li> <li>o Establishment of a platform for mutual exchange and learning processes</li> <li>o Advice to the government and the administration on any necessary changes in legislation and any measures to enable necessary adjustments.</li> <li>o Development of measures for the inclusion of medium and long-term costs of ecological damage and social harm in economic decisions and budgets.</li> </ul>
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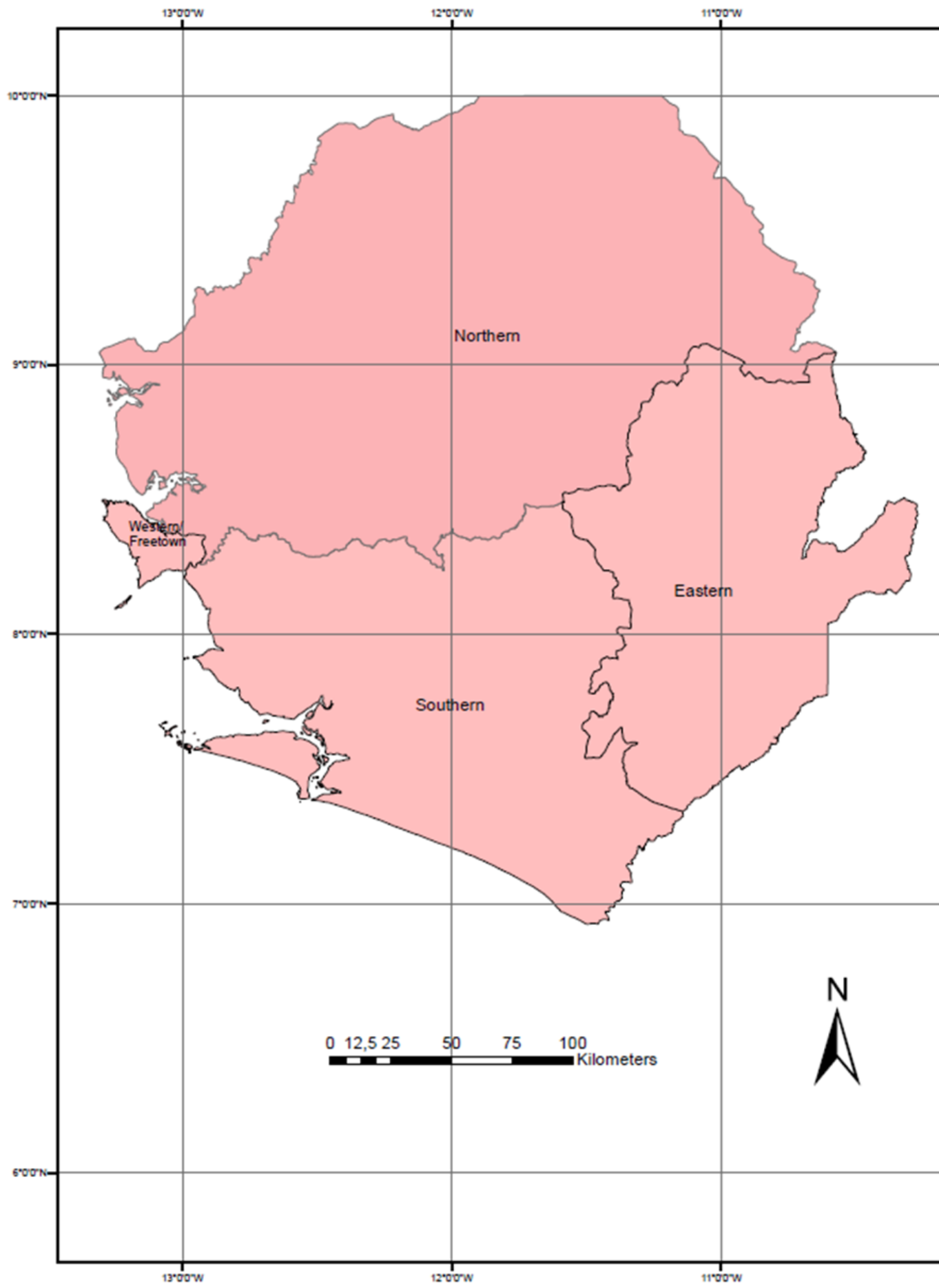
**ANNEX C: Status of Utilization of Project Preparation Grant (PPG).**  
**(Provide detailed funding amount of the PPG activities financing status in the table below:**

PPG Grant Approved at PIF:			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
Finalization of project documents including:	180,000	148,112	-
? gender analysis,			
? Stakeholder engagement activities during PPG (individual consultations and project validation workshops)			
? stakeholder engagement plan,			
? ESMP,			
? finalizing co-finance and			
? implementation and assessment of execution arrangements			
Micro-Assessment of Executing Entities	20,000.00	2,937	-
Other (to be spent on eligible expenditures, in line with GEF Guidelines)	-	-	48,950
<b>Total</b>	<b>200,000</b>	<b>151,050</b>	<b>48,950</b>

**ANNEX D: Project Map(s) and Coordinates**

**Please attach the geographical location of the project area, if possible.**

8°26'58.20" N -11°47'12.58" W





## ANNEX E: Project Budget Table

Please attach a project budget table.

Categories by Year	Total Project Components (USD)					Sub-total (USD)	PMC (USD)	T
	PC1	PC2	PC3	PC4	PC5			
Year 1								
Sub-total Consultants	-	-	10 000.00	122 500.00	-	132 500.00	35 000.00	1
Sub-total Contractual Services - Company	450 000.00	722 000.00	257 250.00	42 500.00	-	1 471 750.00	-	1
Sub-total Travel	-	-	-	-	-	-	16 000.00	
Sub-total Office Supplies	-	-	-	-	-	-	15 764.71	
Sub-total Training/Workshop/meeting	13 500.00	-	2 000.00	-	-	15 500.00	-	
<b>Total Year 1</b>	<b>463 500.00</b>	<b>722 000.00</b>	<b>269 250.00</b>	<b>165 000.00</b>	<b>-</b>	<b>1 619 750.00</b>	<b>66 764.71</b>	<b>1</b>
Year 2								
Sub-total Consultants	-	26 666.00	10 000.00	15 000.00	-	51 666.00	35 000.00	
Sub-total Contractual Services - Company	75 000.00	424 088.50	255 625.00	42 500.00	-	797 213.50	-	
Sub-total Travel	-	-	-	-	-	-	14 000.00	
Sub-total Office Supplies	-	-	-	-	-	-	10 764.71	
Sub-total Training/Workshop/meeting	10 500.00	24 745.00	272 000.00	-	-	307 245.00	-	
<b>Total Year 2</b>	<b>85 500.00</b>	<b>475 499.50</b>	<b>537 625.00</b>	<b>57 500.00</b>	<b>-</b>	<b>1 156 124.50</b>	<b>59 764.71</b>	<b>1</b>
Year 3								
Sub-total Consultants	-	26 666.00	10 000.00	15 000.00	80 000.00	131 666.00	35 000.00	
Sub-total Contractual Services - Company	75 000.00	424 088.50	255 625.00	42 500.00	-	797 213.50	-	
Sub-total Travel	-	-	-	-	-	-	14 000.00	
Sub-total Office Supplies	-	-	-	-	-	-	10 764.71	
Sub-total Training/Workshop/meeting	-	24 745.00	272 000.00	-	-	296 745.00	-	
<b>Total Year 3</b>	<b>75 000.00</b>	<b>475 499.50</b>	<b>537 625.00</b>	<b>57 500.00</b>	<b>80 000.00</b>	<b>1 225 624.50</b>	<b>59 764.71</b>	<b>1</b>
Year 4								
Sub-total Consultants	-	26 666.00	10 000.00	15 000.00	-	51 666.00	35 000.00	
Sub-total Contractual Services - Company	50 000.00	424 088.50	255 625.00	42 500.00	-	772 213.50	-	
Sub-total Travel	-	-	-	-	-	-	14 000.00	
Sub-total Office Supplies	-	-	-	-	-	-	10 764.71	
Sub-total Training/Workshop/meeting	10 500.00	24 745.00	272 000.00	-	-	307 245.00	-	
<b>Total Year 4</b>	<b>60 500.00</b>	<b>475 499.50</b>	<b>537 625.00</b>	<b>57 500.00</b>	<b>-</b>	<b>1 131 124.50</b>	<b>59 764.71</b>	<b>1</b>
Year 5								
Sub-total Consultants	-	26 666.00	-	15 000.00	-	41 666.00	35 000.00	
Sub-total Contractual Services - Company	27 500.00	424 088.50	255 625.00	42 500.00	-	749 713.50	-	
Sub-total Travel	-	-	-	-	-	-	14 000.00	
Sub-total Office Supplies	-	-	-	-	-	-	10 764.71	
Sub-total Training/Workshop/meeting	-	24 745.00	272 000.00	-	-	296 745.00	-	
<b>Total Year 5</b>	<b>27 500.00</b>	<b>475 499.50</b>	<b>527 625.00</b>	<b>57 500.00</b>	<b>-</b>	<b>1 088 124.50</b>	<b>59 764.71</b>	<b>1</b>
Year 6								
Sub-total Consultants	-	26 666.00	-	15 000.00	-	41 666.00	35 000.00	
Sub-total Contractual Services - Company	27 500.00	424 088.50	255 625.00	42 500.00	-	749 713.50	-	
Sub-total Travel	-	-	-	-	-	-	14 000.00	
Sub-total Office Supplies	-	-	-	-	-	-	10 764.71	
Sub-total Training/Workshop/meeting	-	24 745.00	272 000.00	-	-	296 745.00	-	
<b>Total Year 6</b>	<b>27 500.00</b>	<b>475 499.50</b>	<b>527 625.00</b>	<b>57 500.00</b>	<b>-</b>	<b>1 088 124.50</b>	<b>59 764.71</b>	<b>1</b>
Year 7								
Sub-total Consultants	-	26 670.00	-	15 000.00	110 067.00	151 737.00	35 000.00	
Sub-total Contractual Services - Company	27 500.00	424 087.50	255 625.00	42 500.00	-	749 712.50	-	
Sub-total Travel	-	-	-	-	-	-	14 000.00	
Sub-total Office Supplies	-	-	-	-	-	-	10 764.74	
Sub-total Training/Workshop/meeting	-	24 745.00	272 000.00	-	-	296 745.00	-	
<b>Total Year 7</b>	<b>27 500.00</b>	<b>475 502.50</b>	<b>527 625.00</b>	<b>57 500.00</b>	<b>110 067.00</b>	<b>1 198 194.50</b>	<b>59 764.74</b>	<b>1</b>
<b>Total Years 1 - 7</b>	<b>767 000.00</b>	<b>3 575 000.00</b>	<b>3 465 000.00</b>	<b>510 000.00</b>	<b>190 067.00</b>	<b>8 507 067.00</b>	<b>425 353.00</b>	<b>8</b>

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

**ANNEX G: (For NGI only) Reflows**

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

**ANNEX H: (For NGI only) Agency Capacity to generate reflows**

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).