Part I: Project Information

GEF ID
10908

Project Type
MSP

Type of Trust Fund
LDCF

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
Building adaptation and resilience to climate change in the essential oil sector in Madagascar (ARCHE)

Countries
Madagascar

Agency(ies)
UNIDO

Other Executing Partner(s)
National Coordination Bureau for Climate Change and REDD+ (BNCC-REDD+) - Ministry of Environment & Sustainable Development (MEDD)

Executing Partner Type
Government

GEF Focal Area
Climate Change

Sector
Climate Change Adaptation Sector

Taxonomy

Focal Areas, Climate Change, Stakeholders, Gender Equality, Capacity, Knowledge and Research, Climate Change Adaptation, Adaptation Tech Transfer, Least Developed Countries, Innovation, Climate resilience, Climate finance, Private sector, Livelihoods, Local Communities, Beneficiaries, Private Sector, SMEs, Gender Mainstreaming, Gender-sensitive indicators, Sex-disaggregated indicators

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

11/29/2022

Expected Implementation Start

2/1/2023

Expected Completion Date

2/1/2027

Duration

48In Months

Agency Fee($)

168,766.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
CCA-1	Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation	LDCF	1,776,484.00	11,141,095.00
		Total Project Cost($)	**1,776,484.00**	**11,141,095.00**

B. Project description summary

Project Objective

Reduce vulnerability and increase resilience to climate change of the essential oils (EO) value chain by promoting the deployment of innovative adaptation technologies and services

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
1 Institutional capacity building and mainstreaming climate resilience into Essential Oils value chain	Technical Assistance	1.1. New strategy provides direction to develop climate resilient EO value chains 1.2: MEDD / BNCC-REDD+-REDD+ and GEHEM have capacity to support integration of adaptation and resilience into the essential oils value chain	1.1.1: New Essential Oils (EO) Strategy developed integrating climate change adaptation and resilience 1.1.2. At least two (2) recommendations on regulatory instruments and measures to promote the uptake of innovative adaptation technologies and services into the EO value chains developed 1.2.1 Members of the Sustainable EO Coordination Platform trained in promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain	LDCF	179,600.00	1,453,385.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
2. Innovative adaptation technologies and services promoted and deployed along the EO value chain	Investment	2.1 Proven innovative adaptation technologies and services are promoted and piloted along the essential oils value chain 2.2 Innovative financing to support deployment of adaptation technologies and services along the essential oil value chains piloted	2.1.1: At least 21 MSMEs with proven and high-impact innovative climate change adaptation-oriented technologies and solutions for the essential oil value chain receive acceleration services (training, coaching, mentoring and business growth support) 2.1.2: Four (4) pilot projects implemented to deploy innovative adaptation technologies and solutions 2.1.3: Results and experiences from the four (4) pilot projects documented and widely disseminated 2.2.1: Model innovative financing mechanisms (FIR, FDA, MFIs), to provide dedicated (gender-responsive) catalytic financing, designed and piloted in collaboration with actors in the financing ecosystem	LDCF	934,170.00	6,588,680.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
3. Knowledge sharing and learning	Technical Assistance	3.1: Lessons from the project documented and widely disseminated	3.1.1: Distribution and support channels established, strengthened, and showcased to ensure that EO growers, distillers associations and cooperatives, including women and youth, of the identified vulnerable regions, access adaptation technologies and diversified livelihoods 3.1.2: Online platform to showcase adaptation technologies, their benefits and suppliers established and managed by the PMU 3.1.3: Lessons learnt documented and widely disseminated	LDCF	363,500.00	1,647,170.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
4. Monitoring and Evaluation	Technical Assistance	4.1: Monitoring of results and evaluation	4.1.1 Project effectively monitored 4.1.2 Mid-term review and independent terminal evaluation conducted	LDCF	137,716.00	439,033.00
				Sub Total ($)	**1,614,986.00**	**10,128,268.00**

Project Management Cost (PMC)		
LDCF	161,498.00	1,012,827.00
Sub Total($)	**161,498.00**	**1,012,827.00**
Total Project Cost($)	**1,776,484.00**	**11,141,095.00**

Please provide justification

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
GEF Agency	UNIDO	Grant	Investment mobilized	51,750.00
GEF Agency	UNIDO	In-kind	Recurrent expenditures	117,600.00
Recipient Country Government	Ministry of Environment and Sustainable Development (MEDD)	In-kind	Recurrent expenditures	1,500,000.00
Other	PIC Project / World bank	Grant	Investment mobilized	1,200,000.00
Private Sector	GEHEM-GIE	Grant	Investment mobilized	1,425,950.00
Private Sector	GEHEM-GIE	Equity	Recurrent expenditures	156,795.00
Private Sector	Climate-KIC	In-kind	Recurrent expenditures	250,000.00
Private Sector	MIARAKAP	In-kind	Recurrent expenditures	50,000.00
Private Sector	MIARAKAP	Grant	Investment mobilized	50,000.00
Private Sector	SAHALANA	In-kind	Recurrent expenditures	108,000.00
Private Sector	SAHALANA	Grant	Investment mobilized	58,000.00
Private Sector	VOLA MAHASOA, S.A	Loans	Investment mobilized	6,000,000.00
Other	ODEFI	In-kind	Recurrent expenditures	28,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Other	CNRIT	In-kind	Recurrent expenditures	145,000.00
			Total Co-Financing($)	**11,141,095.00**

Describe how any "Investment Mobilized" was identified

1. Investment for the project was identified at both PIF and PPG stages: At PIF stage: Initial investment mobilization has been conducted at PIF stage as part of the project design through virtual meetings conducted by the UNIDO country office (due to COVID travel restrictions) and physical meetings carried out by the UNIDO Country Office with stakeholders in close collaboration with the Recipient Government agencies referred in the table above. PFAN (REEP) will work with MSMEs supported by the project and provide them with business and 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 (https://pfan.net/climate-change-adaptation/). This can be seen in their regular call for adaptation proposals. Thus, the project will enable a select group of MSMEs to take part in the PFAN (REEEP) adaptation-focused workshops and mentoring programs. Private sector institutions (e.g., microfinance institutions, cooperatives and rural banks) will be engaged to leverage additional financing for sustainable adaptation technologies and practices. Private sector innovative platforms like YAPU will be engaged to support the mobilization of financial instruments targeting the MSMEs and the stakeholders involved in the essential oils (EO) value chain. These institutions and platforms will be encouraged to develop dedicated products and services to increase access to finance to the vulnerable populations in the EO value chain while protecting natural resources and adapting to climate change. 2. During PPG stage: the identified contributions at PIF stage were revised and additional contributions from other partners were identified, such as for example Climate-KIC as key knowledge partner, MIARAKAP as an accelerator, ODEFI as an NGO and SAHANALA as a pilot project. The government through the MEDD confirmed and increased its co-finance contribution to the project. Financing was raised from GEHEM ? GIE (Association of Essential Oils Exporters, Extracts and Oleoresins from Madagascar, and Economic Interest Group established in 2019 that represents the interests of 60 companies in the EO value chain of Madagascar), the private banking sector (VOLA MAHASOA SA), accelerators (MIARAKAP) and research institutions (CNRIT). Descriptions of these entities and their roles in the implementation of the project can be found in the Section 2. Stakeholders.

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNIDO	LDCF	Madagascar	Climate Change	NA	1,776,484	168,766	1,945,250.00
			Total Grant Resources($)		**1,776,484.00**	**168,766.00**	**1,945,250.00**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

50,000

PPG Agency Fee ($)

4,750

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNIDO	LDCF	Madagascar	Climate Change	NA	50,000	4,750	**54,750.00**
			Total Project Costs($)		**50,000.00**	**4,750.00**	**54,750.00**

Meta Information - LDCF

LDCF true
SCCF-B (Window B) on technology transfer false
SCCF-A (Window-A) on climate Change adaptation false

Is this project LDCF SCCF challenge program?
false

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. false

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%**

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

To calculate the core indicators, please refer to Results Guidance

Core Indicators - LDCF

CORE INDICATOR 1	Total	Male	Female	% for Women
Total number of direct beneficiaries	34,000	17,000	17,000	50.00%

CORE INDICATOR 2	
Area of land managed for climate resilience (ha)	3,600.00

CORE INDICATOR 3	
Total no. of policies/plans that will mainstream climate resilience	3

CORE INDICATOR 4		Male	Female	% for Women
Total number of people trained	4,572	2,286	2,286	50.00%

OUTPUT 1.1.1

Physical and natural assets made more resilient to climate variability and change

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		Male	Female
Total number of direct beneficiaries from more resilient physical assets	**0**	**0**	**0**

Ha of agriculture land	Ha of urban landscape	Ha of rural landscape	No. of residential houses
3,600.00			**0**

No. of public buildings	No. of irrigation or water structures	No. of fishery or aquaculture ponds	No. of ports or landing sites
0	**0**	**0**	**0**

Km of road	Km of riverban	Km of coast	Km of storm water drainage

Other	Other(unit)	Comments
0		

OUTPUT 1.1.2

Livelihoods and sources of income of vulnerable populations diversified and strengthened

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		Male	Female
Total number of direct beneficiaries with diversified and strengthened livelihoods and sources of income	**34,000**	**17,000**	**17,000**

Livelihoods and sources of incomes strengthened / introduced			
Agriculture	Agro-Processing	Pastoralism/diary	Enhanced access to markets
true	**true**	**false**	**true**
Fisheries /aquaculture	Tourism /ecotourism	Cottage industry	Reduced vulnerability of supply chain
false	**false**	**false**	**false**
Beekeeping	Enhanced opportunity for employment	Other	Comments
false	**true**	**false**	

OUTPUT 1.1.3

New/improved climate information systems deployed to reduce vulnerability to climatic hazards/variability

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		Male	Female
Total number of direct beneficiaries from the new/improved climatic information systems	**0**	**0**	**0**

Climate hazards addressed

Flood	Storm	Heatwave	Drought
true	**true**	**false**	**true**

Other	Comments
false	

Climate information system developed/strengthened

Downscaled Climate model	Weather/Hydromet station	Early warning system	Other
true	**true**	**true**	**false**

Comments

Climate related information collected

Temperature	Rainfall	Crop pest or disease	Human disease vectors
true	**true**	**true**	**false**

Other	Comments
false	

Mode of climate information disemination

Mobile phone apps	Community radio	Extension services	Televisions
true	**true**	**true**	**true**

Leaflets	Other	Comments
true	**false**	

OUTPUT 1.1.4

Vulnerable natural ecosystems strengthened in response to climate change impacts

Types of natural ecosystem

Desert	Coastal	Mountainous	Grassland
false	**true**	**true**	**true**

Forest	Inland water	Other	Comments
true	**false**	**false**	

OUTPUT 1.2.1

Incubators and accelerators introduced

		Male	Female
Total no. of entrepreneurs supported	**0**	**0**	**0**

		Comments
No. of incubators and accelerators supported	**4**	

		Comments
No. of adaptation technologies supported	**0**	

OUTPUT 1.2.2

Financial instruments or models to enhance climate resilienced developed

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Financial instruments or models

PPP models	Cooperatives	Microfinance	Risk insurance
false	**true**	**true**	**true**

Equity	Loan	Other	Comments
true	**true**	**false**	

OUTPUT 2.1.1

Cross-sectoral policies and plans incorporate adaptation considerations

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Will mainstream climate resilience	Of which no. of regional policies/plans	Of which no. of national policies/plan
0	**0**	**3**

Sectors

Agriculture	Fishery	Industry	Urban
true	**false**	**true**	**true**

Rural	Health	Water	Other
true	**false**	**false**	**false**

Comments

OUTPUT 2.1.2

Cross sectoral institutional partnerships established or expanded

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No. of institutional partnerships established or strengthened	**20**

Comments

OUTPUT 2.1.3

Systems and frameworks established for continuous monitoring, reporting and review of adaptation

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No. of systems and frameworks	**1**

Comments

OUTPUT 2.1.4

Systems and frameworks established for continuous monitoring, reporting and review of adaptation

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No. of systems and frameworks **1**

Comments

OUTPUT 2.2.1

No. of institutions with increased ability to access and/or manage climate finance

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No. of institution(s) **3**

Comments

OUTPUT 2.2.2

Institutional coordination mechanism created or strengthened to access and/or manage climate finance

No. of mechanism(s) **1**

Comments

OUTPUT 2.2.3

Global/regional/national initiatives demonstrated and tested early concepts with high adaptation potential

No. of initiatives or technologies **4**

Comments

OUTPUT 2.2.4

Public investment mobilized

Amount of investment (US$) **0**

Comments

OUTPUT 2.2.5

Private investment mobilized

Amount of investment (US$) **0**

Comments

OUTPUT 2.3.1

No. of people trained regarding climate change impacts and appropriate adaptation responses

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Total no. of people trained	**4,572**	Male **2,286**	Female **2,286**
Of which total no. of people at line ministries	**30**	Male **15**	Female **15**
Of which total no. of community/association	**4,464**	Male **2,232**	Female **2,232**
Of which total no. of extension service officers	**6**	Male **3**	Female **3**
Of which total no. of hydromet and disaster risk management agency staff	**10**	Male **5**	Female **5**
Of which total no. of small private business owners	**46**	Male **23**	Female **23**
Of which total no. school children, university students or teachers	**16**	Male **8**	Female **8**
Other	Comments		

OUTPUT 2.3.2

No. of people made aware of climate change impacts and appropriate adaptation responses

		Male	Female
No. of people with raised awareness	**4,668**	**2,334**	**2,334**

Please describe how their awareness was raised

OUTPUT 3.1.1

National climate policies and plans enabled including NAP processes by stronger climate information decision-support services

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No. of national climate policies and plans

Comments

OUTPUT 3.1.2

Systems and frameworks established for continuous monitoring, reporting and review of adaptation

---

No. of systems and frameworks

Comments

OUTPUT 3.1.3

Vulnerability assessments conducted

No. of assessments conducted

Comments

OUTPUT 3.2.1

No. of institutions with increased ability to access and/or manage climate finance

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No. of institution(s)

Comments

OUTPUT 3.2.2

Institutional coordination mechanism(s) created or strengthened to access and/or manage climate finance

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No. of mechanism(s)

Comments

OUTPUT 3.2.3

Global/regional/national initiative(s) demonstrated and tested early concepts with high adaptation potential

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No. of initiative(s) or technology(ies)

Comments

OUTPUT 3.3.1

No. of people trained regarding climate change impacts and appropriate adaptation responses

		Male	Female
Total no. of people trained	**0**	**0**	**0**
		Male	Female
Of which total no. of people at line ministries	**0**		
		Male	Female
Of which total no. of community/association	**0**		
		Male	Female
Of which total no. of extension service officers	**0**		
		Male	Female
Of which total no. of hydromet and disaster risk management agency staff	**0**		
		Male	Female
Of which total no. of small private business owners	**0**		
		Male	Female

Of which total no. school children, university students or teachers	**0**

Other	Comments

OUTPUT 3.3.2

No. of people made aware of climate change impacts and appropriate adaptation responses

---

		Male	Female
No. of people with raised awareness	**0**		
Please describe how their awareness was raised			

Part II. Project Justification

1a. Project Description

1. During the PPG phase the set-up of the project was further detailed and has been adapted in accordance with the findings and priorities of the country. The structure and nature of the proposed project does not have significant changes if compared with the project design at PIF level, the table below describes the main differences between the Request for CEO Endorsement (herein after called RCE) document and the approved PIF.

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

1.1.1 National Committee of Essential Oils, Vegetable Oils, Extracts and Oleoresins (CNHEO) develops a new Essential Oils (EO) strategy that integrates climate adaptation and resilience	1.1.1: New Essential Oils (EO) Strategy developed integrating climate change adaptation and resilience.
1.2 CNHEO has capacity to support integration of adaptation and resilience into the essential oils value chain	1.2: MEDD / BNCC-REDD+ and GEHEM have capacity to support integration of adaptation and resilience into the essential oils value chain
3.1.2 Online platform to showcase adaptation technologies, their benefits and suppliers established and managed by CNHEO.	Output 3.1.2: Online platform to showcase adaptation technologies, their benefits and suppliers established and managed by the PMU.

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 170,000.00 Co-finance: USD 700,000.00	PC1: GEF: USD 179,600.00 Co-finance: USD 1,453,385.00
PC2: GEF: USD 1,000,000 Co-finance: USD 3,050,000.00	PC2: GEF: USD 934,170.00 Co-finance: USD 6,588,680.00

PC3: GEF: USD 280,000.00 Co-finance: USD 750,000.00	PC3: GEF: USD 363,500.00 Co-finance: USD 1,647,170.00
PC4: GEF: USD 137,715.00 Co-finance: USD 337,750.00	PC4: GEF: USD 137,715.00 Co-finance: USD 439,033.00

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. Madagascar is the fourth largest island in the world (covering an area of 587,295 km)[1][1], with a population of 20.696 million (latest census). It is situated in the Indian Ocean 400 km off the Eastern African coast[2][2], separated from the mainland by the Mozambique Channel. Given its geographical location, Madagascar is one of the worst affected countries by the impacts of climate change. Key country statistics can be found in Table 1.

3. Madagascar is also one of the world?s poorest countries economically and yet known for being the richest in biodiversity. It contains at least 13,000 plant species, of which more than 80% are endemic and 3,500 are reported to have medicinal properties. In accordance with the collected information, 74% of its population lives in rural areas, and 78% of the rural population lives in poverty. Madagascar is also best known for is tropical rainforests and is among the richest countries in essential oils (EOs).

Table 1: Key country statistics

Republic of Madagascar General Data

Location	East African coast
Area (km2)	Total: 587,295 [3][3] (2018 data)
Population (2021)[4][4]	28.4 million (population growth 2.6%) 50.1% female 49.9% male
GNI per capita (2021), Atlas method (current USD) [5][5]	500.0
GNI, Atlas method (2021) (current USD) [6][6]	14,189,350,703
Ease of Doing Business Ranking (global), 2020[7][7]	161 (out of 190)
Human Development Index (HDI), 2019	0.528 (164 out of 189).
Corruption Perceptions Index 2021[8][8]	Rank (position): 147/180 Score: 26/100[9][9] (+1 since 2020)

4. Madagascar?s rural economy is based upon subsistence-oriented agriculture. According to 2020 WB statistics on the economy of Madagascar, agriculture accounts for 24.8% of GDP[10][10]. EO cultivation is part of the agricultural sector of Madagascar. Madagascar?s EO market potential rests on the long-standing tradition for plant-based medicine, and their use as aromatic substances. More than 35 varieties of aromatic and medicinal plants can be found in Madagascar, conferring the sector relevance for both the domestic and export markets[11][11]. The domestic market is on a growth trend because of combined government and civil society efforts to mainstream traditional and herbal medicine. With exports in 2020 of US$ 72 million, Madagascar is the biggest exporter of EO located in Africa, and in the top 20 of the world exporters responsible for 1.33% of the EO world exports[12][12].

According to the latest trade data on EO, in 2020 EO were the (454th) world?s most traded product totalling at US$5.41 billion. Meaning that trade in EO represents 0.032% of the total world trade[13][13].

5. EO plants are very sensitive to climate changes, such as increases in temperature, sudden climate variability and changes in season duration as well as precipitation, as this impacts the EO plants development and growth. They are also particularly vulnerable to cyclones and floods, that destabilize lands and crops, resulting in loss of harvest when those happen.

1.1.2. The Essential Oil Sector and Market for Madagascar

6. Madagascar, from its climate, presents an enormous potential for its EO sector with more than 35 varieties of aromatic and medicinal plants. The Malagasy flora is home to highly demanded species of plants, such as Ylang-ylang, clove and Palmarosa, that are globally traded within the global EO value chain. Essential oils are exported to largest international brands and increasingly generate demands on the global market. Evaluated as endemic at 80%[14][14] with therapeutic virtues, around 80%[15][15] of the production of these oils are intended for exports. Madagascar presently exports five key EO products. Three are relatively scarce EO: ylang ylang, niaouli, and ravintsara. The other two are spices: cinnamon and clove. The potential for growth lies in organic aromatic EO, not only ylang ylang, niaouli, ravintsara and cinnamon, but also from new, endemic plants.

7. The EO field constitutes one of the economy?s country pillars, as it represents the 3rd most important sector in terms of exports for Madagascar and it generates and the number of created jobs[16][16]. The domestic market is on a growth trend because of combined government and civil society efforts to mainstream traditional and herbal medicine. The EO sector in Madagascar has been marked as an important part of the agricultural sector and has created a new interest for non-traditional oils within the sector and it has done so for the past 3 years, thanks to the support from USAID and UNIDO. Furthermore, the essential oils sector is considered the 3rd most important sector in the National Green Export Review in terms of export revenue.

8. With exports in 2020 of US$ 72 million, Madagascar is the biggest exporter of EO located in Africa, and in the top 20 of the world exporters, responsible for 1.33% of the EO world exports (total EO export value in 2020 was US$5.41 billion) [17][17]. According to GEHEM-GIE, the EO production is one of the fastest growing sectors for Micro and Small to Medium sized Enterprises (MSMEs[18][18]) in rural areas in Madagascar. The Government describes the EO value chain as the pillar of the rural green economy[19][19]. According to USAID, EO production and processing is referred as the ?only option?

for rural economic development.[20][20] The industry provides several hundred thousand jobs (for cultivators, tradesmen, exporters, etc.).[21][21]

9. Pressure to increase productivity will continue because the global market for essential oils is expected to grow by 9.6 % beyond 2022 reaching a value of USD 27.49 billion. Demand from major markets remains strong, particularly in the United States, Europe and India, with France?s demand growing 20% annually. Currently, Madagascar exports essential oils to around 40 countries[22][22]. Madagascar holds 25% of the essential oil market of ylang-ylang whose flower prices have increased by 317% in the last two years. Madagascar also supplies half of the world?s need for clove essential oil (Detours Madagascar, 2019). Other sought-after types of EOs found in Madagascar include lemongrass and cinnamon.

10. The domestic end-market consists of three types of retail outlets: small consumers of medicinal plant products, pharmacies and specialty wellness outlets including spas. There are more than 100 pharmacies in the capital, and five wellness spas in the country. A multitude of small-scale sellers operate from kiosks, small tables, or blankets in community markets. There are no reliable numbers on these informal retailers. Knowledge of natural medicine is widespread in Madagascar, and its use is integrated in everyday life. As an isolated, poor island nation, Madagascar traditionally relied on its own resources for health care. As a result, it developed over time an intricate pharmacopeia based on plants and their derivatives.

11. The EO sector value chains involve five levels of actors:

Producers. *Three groups comprise the ?production? function: wildcrafters, cultivators and plantation operators. These groups include the largest number of individuals (almost all part-time) and Micro, Small and Medium-Size Enterprises (MSMEs). Producers are aware of climate change impacts and resulting biodiversity issues but have limited knowledge and incentives to apply adaptation practices at the ground level. This group includes small scale growers/cultivators as well as medium-size growers and producers? cooperatives****[23]***[23].

Collectors. *Collectors and sub-collectors (aggregators or intermediaries) collect harvested plant material from wildcrafters and, to a lesser degree, from cultivators. This group is less aware of climate change adaptation practices.*

Processors (distillers). *There are approximately 37 large processors****[24]***[24] *and hundreds of small distilleries (formal and informal) that convert vegetative material into bulk or consumer grade products. The informal distilleries drag down product quality. A principal concern is the fact that they use non-efficient stills, that consume wood from neighbouring forests exacerbating the impacts of climate change*

Wholesalers *(domestic and export markets). Twenty-six of the 37 large distillers are also exporters. Formal exporters have learned that sustainable production practices are important to developing and expanding competitiveness with key European and U.S. importers. Exporters are smaller in number and are concentrated in the capital city and the seaport town of Toamasina.*

Domestic retailers*. They comprise three types of outlets: pharmacies, specialty wellness centres and spas, and informal vendors of medicinal plant products. All three categories are stakeholders of and understand the need for improving conservation measures.*

12. In the EO value chains and production process, water is used in irrigation of cultivated EO plants and in the distillation process, as water or vapour. There are no available figures on the water consumption for both irrigation of EO plantations or the one consumed at the distilleries in Madagascar. From the distillation process both wastewater and solid waste are generated, which need to be managed. In distilleries that use boilers, the wastewater results from (i) the distillation process and (ii) from cleaning equipment and the distilleries. No figures were found for wastewater generation in Madagascar distilleries.

13. Furthermore, distilleries need energy for heat generation to produce EO. The main source of energy to produce heat used by local and more traditional distilleries is firewood, which is used in open fires. This firewood is often taken from the forest by these operators, contributing to deforestation. It is important to refer that EO like the ylang ylang are produced from local distilleries and some industrial operators (roughly 80%) that use the referred traditional methods of distillation, and in order to meet the growing demand of EO, the number of small plantations and distilleries have increased in recent years. This means that the growing number of distilleries and, hence, their need for firewood, imply additional deforestation and negative impact on the forests.

14. However, more sustainable means of producing EO in Madagascar have been developed, and there are organisations that have stepped away from the conventional means of producing EO. Examples of those are Agri Resources Madagascar[25][25], located in the Sava region, who utilizes a pressure boiler powered by solar panels. The pressure boilers are fuelled by distillation residues (recycled water) as well as sustainable wood material that is produced in the company?s 5 hectares of trees used for sustainable production of firewood; and Jacarandas[26][26], who uses biomass boilers in their stills powered by recycled fuels, such as bamboo used by farmers to build temporary rafts; raw material residues after distillation (from their EO production line, in this case, from Cloves, cinnamon or Niaouli leaves) and residues from plant materials from surrounding companies.[27][27]

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

15. A Climate Risk and Vulnerability Assessment (CRVA) was conducted as part of the PPG stage. The following paragraphs provide a summary of the CRVA findings and conclusions, and the full document with the detailed analysis can be found in Annex P: Baseline Report, submitted alongside the project document.

16. The CRVA applies an innovative approach for baseline analysis since it takes into account information retrieved from different sources: the Global Hotspots Explorer (GHE)[28][28] developed through the Integrated Solutions for Water, Energy and Land (ISWEL) Project, the WB CCKP[29][29], ThinkHazard![30][30] and information gathered from the stakeholders? consultation as well as from secondary data (news, review articles, papers, others). When assessing vulnerability and climate change risks, it is important to take the local community input/experience into account, to obtain local knowledge and perceptions about how climate change has been impacting the EO value chains and who are the most vulnerable. Furthermore, the CRVA looks into the Adaptive Capacity of the different actors within the EO value chains. In conclusion, by conducting the CRVA, the geographical focus of the GEF/UNIDO Adaptation Project (the ARCHE project) was identified. Sections below describe succinctly the analysis and its conclusions.

1.2.1 Climate Baseline and Trends

17. Madagascar is one of the worst affected countries by the impacts of climate change. The country is ranked 167 in the ND-GAIN index[31][31] (higher value indicates higher vulnerability) and 29 in Germanwatch?s Climate Risk Index for 2021[32][32] (lower value indicates higher risk).

18. Madagascar has four main climatic zones: the humid East Coast, that has a sub-equatorial climate driven by the easterly trade winds, that bring along the heaviest and most consistent rainfall, with a maximum of 3,700 mm annually[33][33] (this area is also located in the path of destructive cyclones of the Indian Ocean); the Northwest coast that is dryer and subject to coastal erosion; the semi-arid Southwest that receives very little rainfall (less than 800 mm annually); and the central Highlands where the lowest temperatures are registered. The climate of Madagascar has two typical seasons: (i) a hot, rainy season (November to April) with maximum rainfall between January and February; and (ii) a cooler, dry season (May to October) with minimum rainfall in September and October. The mean annual temperature ranges from 14?C to 24?C and the average annual rainfall is between 500 mm and 2,750 mm.

19. **Temperature:** the analysis of the historical trends and the evolution of the climatic parameters show a significant rise in temperatures between 1951 and 2020. In fact, the mean average temperature has increased 0.79?C[34][34] in that period, or an average of 0.02?C per decade[35][35]. The Madagascar NAP of December 2021 corroborates this, as it states that between 1961 and 2017, evidence was found that minimum and maximum temperatures have increased by 0.04?C/year and 0.05?C/year, respectively. At the same time, the temperature indicators show an upward trend in extreme events.

These increases in temperature (mean, maximum and minimum) have been observed throughout the country and across the four (4) climatic zones, as reported in the Madagascar NAP[36][36] as well as in the WB CCKP[37][37].

20. **Precipitation:** Madagascar has been experiencing insufficient or irregular rainfall and is frequently subject to extreme climatic events, such as cyclones, drought and floods[38][38]. A very light decreasing trend in rainfall is seen in the average annual precipitation that was observed between 1901 and 2021, especially in recent years (between 2001 and 2021), throughout the country, and more particularly in winter and spring[39][39]. A steady decline in rainfall was observed in the central and east coastal regions between 1961 and 2005, accompanied by increases in the length of dry spells[40][40].

1.2.2 Climate Future:

21. The projected climate change future described in the CRVA and here summarised is based on the information available on the WB CCKP, that was generated using the CMIP5 (Coupled Model Intercomparison Project - Phase 5) Multi-Model 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) Working Group II. The CMIP5 was chosen instead of the CMIP6, because the CMIP5 was used for the Madagascar NAP, thus ensuring alignment of the CRVA with national adaptation polices.

22. The climate futures are thus presented for four (4) Representative Concentration Pathways (RCP2.6, RCP4.5, RCP6.0 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 intermediary emission scenarios, the first called medium-low emission scenario and the second medium-high emission scenario. Figure 1 and Figure 2 show the historical and projected increase in mean temperature and annual rainfall under the mentioned four (4) emission scenarios until 2099.

23. **Temperature**: across all four emission scenarios, temperatures are expected to continue to rise in Madagascar through the end of the century. In terms of geography, the highest temperature increases are expected to occur in the Highlands of Madagascar, with the highest increase expected in Ihorombe from mid-century onwards independently of the emission scenario.[41][41]

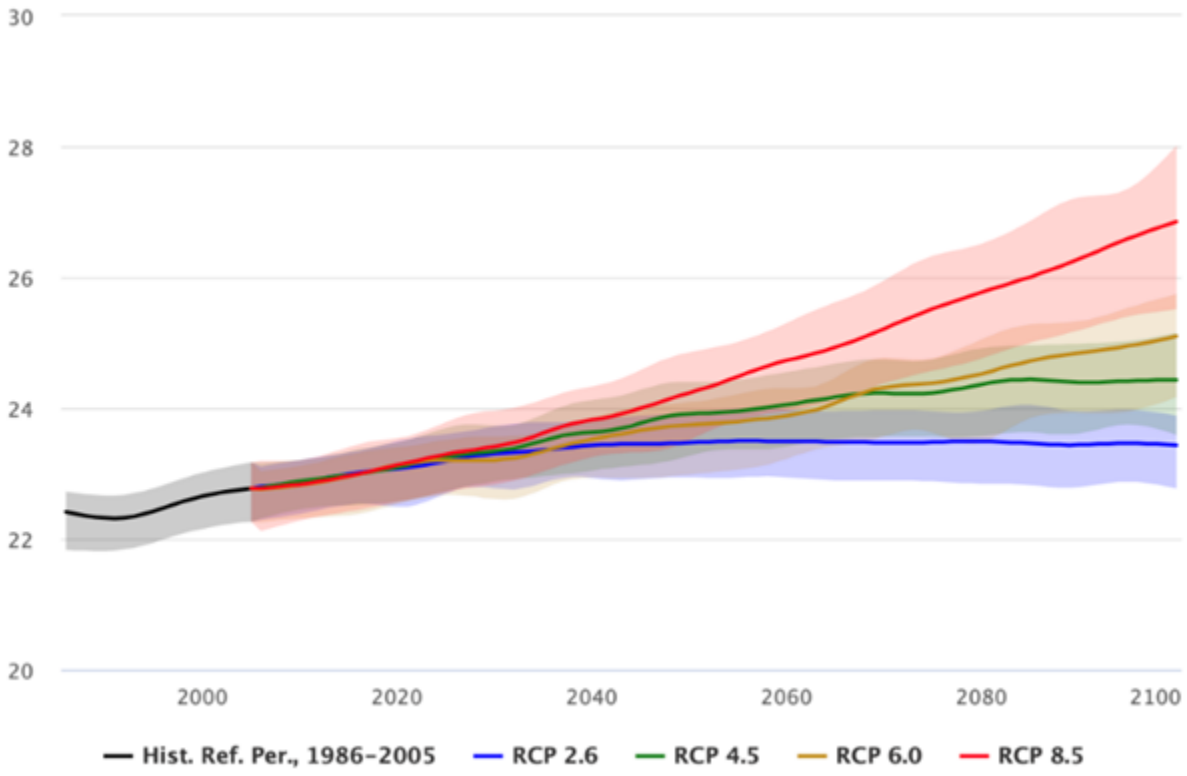


Figure 1: Projected changes in temperature in the four (4) RCP scenarios for the reference period 1986-2005 (Multi-Model Ensemble)[42][42]

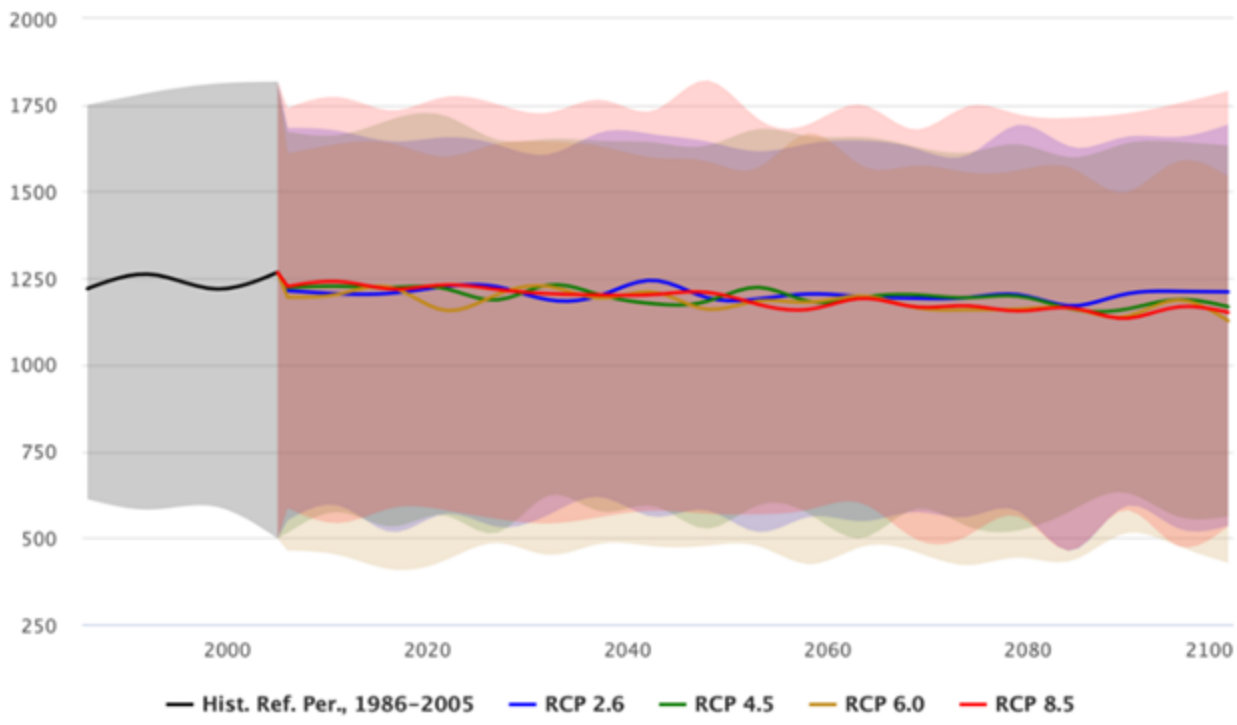


Figure 2:Projected changes in precipitation in the four (4) RCP scenarios for the reference period 1986-2005 (Multi-Model Ensemble)[43][43]

Figure 3 shows the expected upward trends in temperatures across Madagascar for the RCP4.5 and RCP8.5.

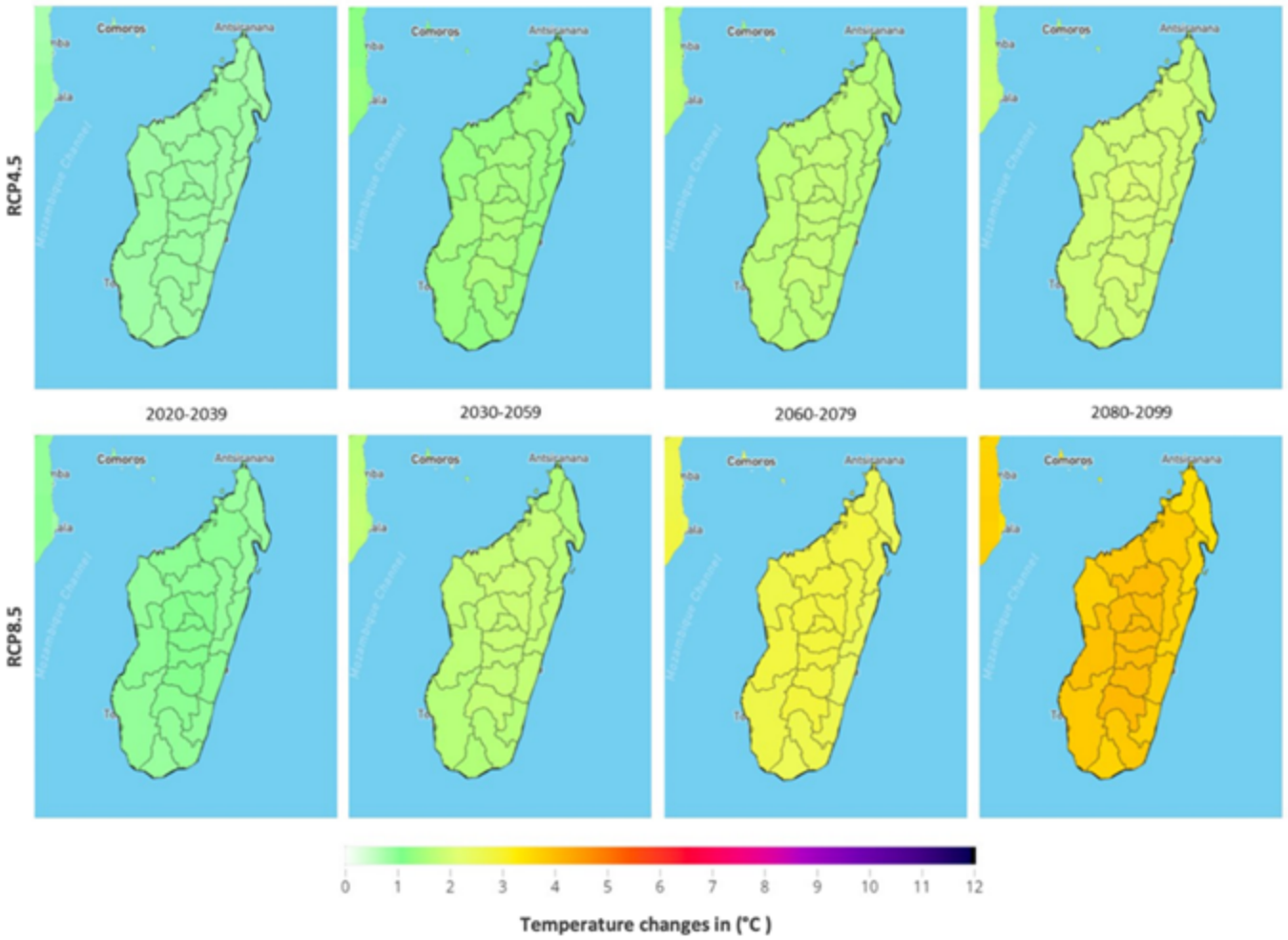


Figure 3: Annual mean temperature change under the RCP4.5 and RCP8.5 when compared with the reference period 1986-2005 from 2020 to 2099 (Multi-Model Ensemble)**[44]**[44]

24. The maximum temperature and minimum temperatures are expected to increase too. In the RCP8.5 (Ensemble), both minimum and maximum temperatures are expected to increase between 3.5?C and 4.2?C, with a slightly higher increase for the annual maximum temperatures[45][45], particularly between November and January. The number of tropical nights (nights with temperatures above 20?C) are expected to increase dramatically all over the territory. In the RCP8.5, above 150 tropical nights[46][46] are expected to be registered in Madagascar Northeast coast ? Analanjirofo with an additional 174 hot nights ? and in the Highlands ? Betsiboka (151 tropical nights), Bongolava (157 tropical nights), Haute Matsiatra (156 tropical nights), Ihorombe (147 tropical nights). This means that heat waves are likely to happen more often and last longer, with impacts on human health ? heat cramps and heat stroke, and even death - animal health, agriculture, water resources and ecosystems.

25. **Precipitation:** there is a general trend for a decrease in annual mean precipitation in all the scenarios, with a slighter highlight degree in the RCP8.5. A decrease in precipitation is expected all over the territory, but especially in the East and North coasts of Madagascar. The highest reductions are expected to occur in Sava and Analanjirofo regions, between October and December[47][47]. In addition to this, the number of days with extreme rainfall in one day is generally also decreasing[48][48]. Throughout Madagascar it is expected increased variability in the distribution of rainfall as well as a reduction in the length of the dry season and longer periods of drought in the central and western parts[49][49] (see Figure 4).

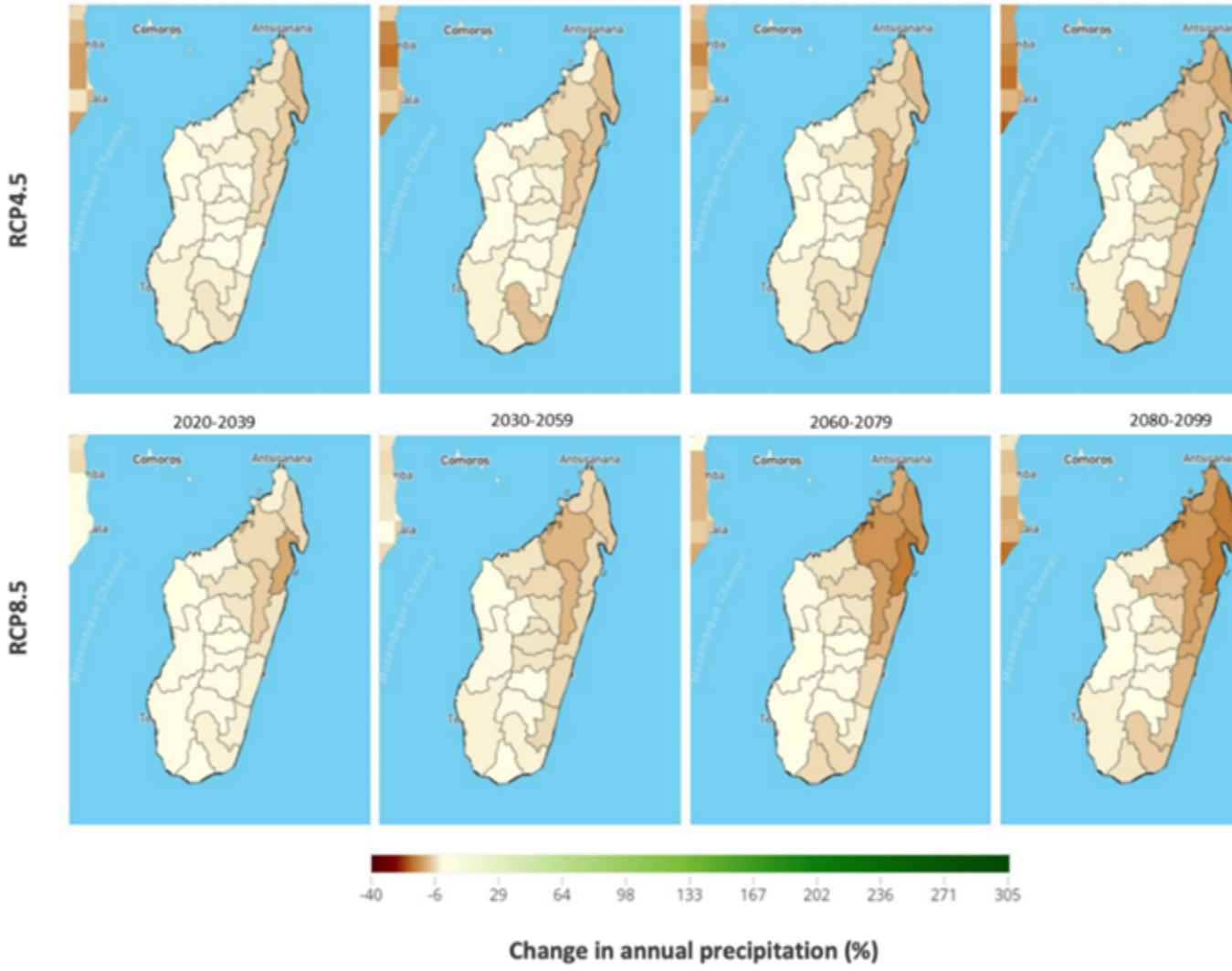


Figure 4: Change in annual precipitation (%) under the RCP4.5 and RCP8.5 from 2020 to 2099 (Multi-Model Ensemble) **[50]**[50]

1.2.3 Main Climate Related Hazards in Madagascar:

26. Madagascar has experienced 53 natural hazards (drought, earthquake, epidemics, floods, cyclones and extreme temperatures) between 1980 and 2010, causing economic damage of over USD 1 billion[51][51].. Meteorological data from the past 30 years has shown an increase of recurrence of these natural hazards, driven by large-scale disruptions in atmospheric circulation and heavy rainfall events caused by strong storms and tropical cyclones. Coupled with poor land use practices and increasing deforestation, these lead to significant and damaging floods across the country[52][52]. Of these, cyclone-related damage was the most significant. Just between 1961 and 2018, cyclones caused 1,566 deaths, destroyed and damaged 0.7 million homes, directly and indirectly affected more than 5 million people and damaged 887 thousand ha of crops[53][53]. Floods were the second highest impact disaster, affecting 0.4 million in the same period, followed by droughts[54][54]. The areas of Madagascar most affected by these natural disasters are the East and Southwest Coast of the country.

27.

Figure 5: Climate change events most frequently witnessed by stakeholders consulted at PPG stage

Madagascar has the highest risk from cyclones in Africa: 94% of deaths and economic losses related to natural disasters have been attributed to cyclones.[55][55] Cyclones season begins in November and ends in May, with an average of three (3) to four (4) cyclones per year[56][56], and it can cause significant damage across the island, including loss of crops/biodiversity, increased incidence of disease outbreaks, degradation of coastal and marine ecosystems, disruption of critical urban services such as electricity and water, damage of infrastructure (e.g., roads) and sometimes human casualties. As the global average tropical cyclone wind speed is likely to increase in the future, it can be predicted

that the frequency of the most intense tropical cyclones in Madagascar will increase substantially[57][57]. This was also one of the most frequently mentioned climate hazards by the consulted stakeholders at the PPG stage (see Figure 6).

28. **Floods and storms**, resulting from strong storms and tropical cyclones, coupled with poor land practices and increasing deforestation, can lead to significant and damaging floods across the country. Madagascar has high risk for flood ? river, urban and coastal[58][58]. On average, losses from flooding and cyclones are approximately US$40-50 million per episode. Cyclone Enawo in 2017 affected 14 of the country?s 22 regions and total losses were estimated at US$400 million, equivalent to roughly 4% of Madagascar?s GDP[59][59].

29. **Droughts**, driven by large-scale disruption in atmospheric circulation and exacerbated by poor land use practices, are common to occur in the South of Madagascar, which is the hottest and driest part of island. Insufficient rainfall and variations in rainfall distribution led to drought. Droughts pose severe strain on subsistence livelihoods, leading to water shortage and crop loss[60][60].

30. **Sea surface temperature** in the western Indian Ocean, over Kenya, Mozambique, Tanzania, Madagascar, Reunion, Mayotte and the three archipelagos of Comoros, Mauritius and Seychelles, has increased 0.60?C between 1950 and 2009[61][61]. Sea temperature increases have been impacting coral reefs and marine ecosystems, as well as affecting fish distribution[62][62]. Sea temperature is expected to continue to increase in the Southern Indian Ocean, and thus, the same impact is expected on the sea waters around Madagascar.

31. **Sea level in Madagascar has been rising** and is projected to continue to rise reaching on average between 34 cm and 48 cm towards the end of the 21st century (2099), threatening the low-lying coastal regions of Madagascar[63][63]. Not all regions would be exposed in the same way: the coast of Morondava (Middle-West) would be very exposed to an accelerated rise in mean sea level, of the order of 7.4 mm/year, including a retreat of the coasts between 5 cm/year and 6 cm/year[64][64]. On the coast of Mahajanga (North-West), the rise in sea level is expected to be slower, and between 3 mm/year and 4 mm/year[65][65].

32. The projected decrease in rainfall, coupled with projected increases in the length of the dry periods in the future is expected to pose additional stress on the already vulnerable livelihoods of southern Madagascar. Additionally, projections have shown that temperature increases foresee to disrupt unique and critical micro-climates and lead to significant changes to local farming systems,

with implications for food security[66][66] as well as for value chains whose products depend on the existent plants and biodiversity of the country, like EO ones.

33. Climate-sensitive natural resource-based agriculture, including EO production, is highly vulnerable to climate change and variability, especially heavy rainfall, cyclones, and droughts whose frequencies of occurrence are on the rise. **According to Madagascar?s NAPA and NAP of 2022**, rains brought on by cyclones have repeatedly destroyed biodiversity, intensified soil erosion and flooded EO crop fields. During years with the most severe cyclonic events over the past 12 years, intense rainfall has been correlated with a significant reduction in EO productivity by as much as 55%[67][67]. There has also been market instability when natural hazards impacted EO production. For example, a cyclone in 2000 ruined natural vanilla production and promoted importers to use artificial vanilla. The fact that the importers started to import artificial instead of natural one caused prices to plummet. In effect, already poor farmers could not sell their produce and spiralled deeper into poverty. Despite these temporary market instabilities, global demand for EO has recovered and is expected to increase, as elaborated earlier in this document.

34. On a survey conducted in 2014 to analyse ?*Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar?*[68][68], such as the EO producers, it was reported that frequent risks to their agriculture exist and were notable since 2010, including disease outbreaks, pest damage, crop loss during storage and occurrence of extreme weather events.

35. This was also confirmed by the EO value chains stakeholders consulted during the PPG stage. The stakeholders referred that rising temperatures, extreme weather events such as cyclones, variability of the rainfall patterns, droughts and floods are the climate change impacts that have been impacting the EO value chains, the most with more than 75% of the 41 consulted stakeholders referring to them (see Figure 6). This confirmed what was also found at PIF stage.

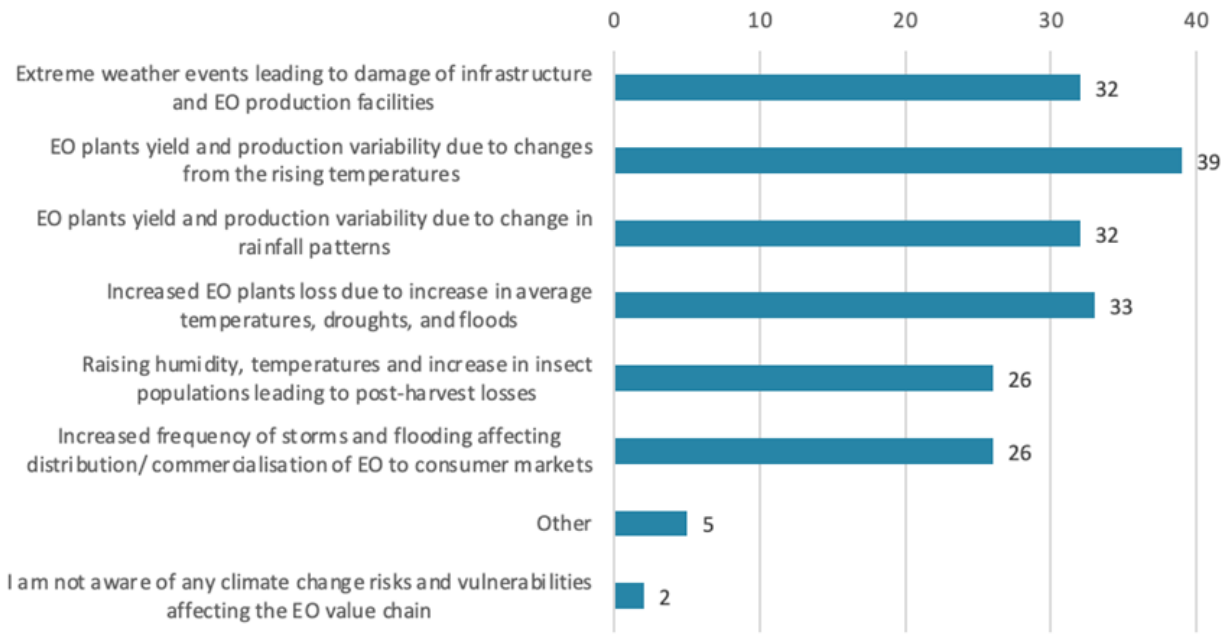


Figure 6: Climate change risks and vulnerabilities experienced by the EO value chains stakeholders

36. Besides being impacted by the change in climate and weather events, some of the EO value chains operations put pressure on the environment, exacerbating climate change impacts on the ground. These are mainly associated with the use of traditional planting and collecting techniques that are not sustainable and put at risk the soil integrity and production capacity; the use firewood for heating purposes that contributes to increase the deforestation problem already felt in the country.

1.2.4 Selection of EO Value Chains Most Vulnerable Regions and their Adaptation Capacity

37. To identify the most vulnerable regions where EO value chains in Madagascar operate, it is important to simultaneously consider:

What the most vulnerable people of the EO value chains are, where they operate, how they are expected to be affected by the expected change in climate, including variability and extreme events, and their ability to cope with those, and

How climate change is expected to affect the EO plants, and where these plants are cultivated or grow, as well as how the value chains are putting more pressure on the environment.

1.2.4.1 Characterisation of the vulnerable people in the EO value chains:

38. The identified vulnerable people of the EO value chain are: i) Small-scale growers, collectors, producers; ii) Traditional small-scale distillers; iii) Women, indigenous people and the youth engaged in EO value chains activities.

39. The EO value chains in Madagascar depend on EO producers, as those are the ones responsible for planting and collecting the raw materials for EO production (i.e., plants) and that, like other smallholder farmers in Madagascar, face numerous risks, including climate change ones. Malagasy

farmers are particularly vulnerable to any shocks to their agricultural system owing to their high dependence on agriculture for their livelihoods, chronic food insecurity, physical isolation and lack of access to formal safety nets[69][69]. Malagasy farmers are frequently exposed to pest and disease outbreaks and extreme weather events (particularly cyclones), which cause significant crop and income losses and exacerbate food insecurity. Only a few farmers have adjusted their farming strategies in response to climate change, which included mainly planting new crops or new varieties, better water management, implementation of practices to improve agriculture sustainability such as soil conservation practices, by farmers with greater sources of income, higher educational levels, households located in villages and less food insecure[70][70].

40. As in Madagascar, 80% of women work in agriculture, including the EO sector, and thus are the ones most vulnerable to climate change impacts and hazards. They are also the ones responsible for collecting water, sourcing wood for cooking, and cooking food. In Madagascar, women are worse off than men when facing up to poverty since their domestic responsibilities limit their contribution to economic value chains like EO. In particular, women and youth face multiple barriers, such as access to training and coaching, access to finance and land, which prevent them from protecting their activities and improve their knowledge and adaptative capacity. In addition to women and youth, indigenous population that may work on the essential oil sector might face the same barriers.

41. The small-scale EO producers are the most vulnerable people of the EO value chains, because they are the ones whose livelihoods directly depend on and are affected by changes in EO plants yields, production, etc. Thus, if these areas and their EO crops/plants are affected by climate change, the entire value chains are affected downstream. In addition, they are the ones with less adaptive capacity within the value chains, as are generally located in rural areas, have limited access to education, health and basic services and face poverty-related challenges, as previously described.

42. EO producers, particularly those located in the regions where climate change risks and hazards are higher, are particularly prone to suffering reductions in their crop/plant production due to a series of reasons[71][71]:

They often work on small parcels of land and obtain low crop/plant yields.

They are part of the food insecure population, and thus any impact in income generating activities has a huge impact on their health, which makes them extremely vulnerable to any climate or non-climatic shocks. In normal years, three-quarters of the farming households lack sufficient food to feed their families and spend, on average, 3.8 months without sufficient food.

Are often poorly organized and, in many cases, work with traditional, highly inefficient crop cultivation and processing technologies.

Are located in remote farm villages and lack access to adequate road infrastructure (with roads being also affected by rain during the rainy season making it difficult and even impossible to circulate) making it difficult for them to actually take their products to EO processor or to sell their products in the local market (in raw state of traditionally handcrafted into EO).

Have reduced profit margins on their products, due to the remoteness and time/cost of taking their products to market, which then exacerbates their poor living conditions.

*Lack access to formal safety nets to which they could turn to in case of need. In the study carried out**[72]**[72], it was found that most of the smallholder farmers remain outside a formal credit or banking system, lack capital and are unable to access credit or loans (less than 2% of the surveyed farmers had either a personal savings account or village savings accounts). There are no developed insurance markets and, instead, farmers rely on informal support systems, borrowing money or food from family or friends.*

Are constrained by having limited access to agrometeorological or market information (only 19% of the households have mobile phones), which could help inform farm management decisions, such as the choice of crops, planting dates and management strategies, and which could serve as early warning systems for floods and cyclones.

43.

?The regions of Atsinana (East Coast) and Atsimo-Atsinanana (Southeast) were hit by two cyclones in 2022. The consequences of these disasters have caused numerous floods in EO producing areas as well as the total or partial destruction of many infrastructures and crops of the EO sector?.

?Cyclone and flood in the Fitovinany and Amoron'i Mania Regions?

?In Haute Matsiatra region, the passage of two (2) cyclones destroyed wild aromatic plants and crops. Also, drought reduces harvests to 60% and affects the quality of the EO products?

(Stakeholders comments)

The EO producers in the identified regions (Vakinankaratra, Amoron?i Mania, Haute Matsiatra, Vatovavy Fitovinany, Atsimo Atsinanana and Ihorombe), are very prone to experiencing cyclones and floods, as the East Coast of Madagascar is the one more affected by those climate events.

44. Also, these regions are the ones expected to be mostly affected by the increase in temperatures, and sea level rise, making these crops/plants and their ecosystems particularly vulnerable to climate events. Recently, between 2021 and 2022, and according to information provided by the consulted stakeholders at PPG stage, these areas were severely affected by drought and cyclones, that led to destroyed crops and habitats, severely affecting the EO plants yield.

45. As part of the stakeholders? engagement plan, the project will try to involve not only vulnerable groups such as women and youth, but also indigenous people that work in the EO value chains, during project implementation, to make sure that they are not excluded from potentially obtaining the same benefits as other stakeholders, therefore equality of opportunities is offered to all project participants.

1.2.4.2 Climate change adverse impacts on the EO plants and crops:

46.

?The case of the wind plant Tajet: there was a reduction of 75% of harvest due to delay in maturity, destruction of plants by passage of cyclones in the Haute Matsiatra region. Also, droughts affect the geranium plants by destroying the green leaves used for EO production?

(Stakeholders comments)

EO plants are very sensitive to climate changes, such as increases in temperature, sudden climate variability and changes in season duration as well as precipitation. For example, clove growth and yields are affected by: (i) excess of rain, that can affect plant growth and prevent clove tress from flowering, turning buds into leaves; (ii) increased dry season, that contributes to drying the plants and eventually kills them; (iii) excessive heat can inhibit cloves from getting water and nutrition (the clove root is short so that if it is hot it will be difficult to get water[73][73]). In addition to clove, others such as Ylang Ylang, ginger and tajet are also affected by the same changes in climate. All EO plants are particularly vulnerable to cyclones and floods, that destabilize soil and crops, resulting in loss of harvest when they occur. All this information has been confirmed by the consulted stakeholders during the PPG consultations.

1.2.4.3 Selection of the most vulnerable regions across EO value chains:

47. When looking into the Multi-Sector Risk (MSR) map developed by IIASA under the ISWEL project[74][74] (see **Figure 7**), it can be seen that the areas more prone to climate change risks are along the Madagascar Highlands toward the Eastern Coast. These are also the areas where most of the exported EO plants are grown/cultivated (raw materials for the EO production).

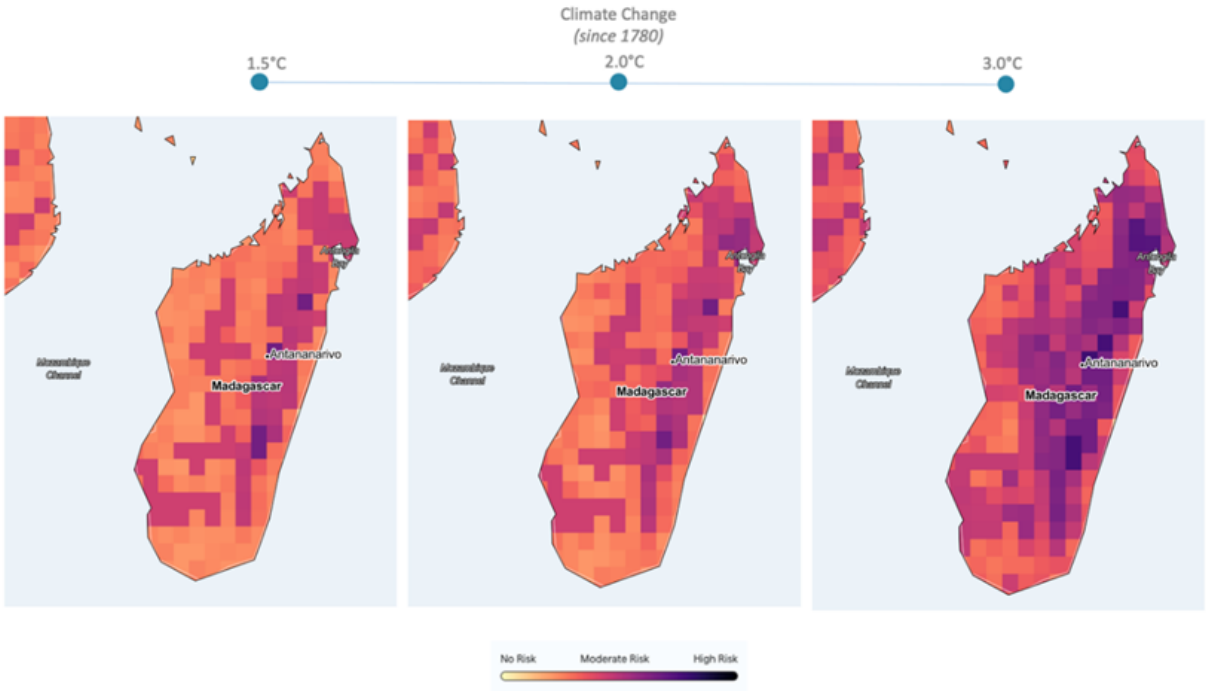


Figure 7: Multisector risk analysis for Madagascar under the SSP2[75][75] in the three climate change emission scenarios (1.5?C, 2.0?C and 3.0?C)[76][76]

48. Results of the consultations held with the stakeholders during both the PIF stage and the PPG stages, indicate that the regions of **Vakinankaratra, Amoron?i Mania, Haute Matsiatra, Vatovavy Fitovinany, Atsimo Atsinanana** and **Ihorombe** are the most vulnerable to climate change within the EO value chains. Those areas were referred by the stakeholders as the ones where the effects of climate change have been suffered more significantly. These are the regions where the ARCHE project will be focused (see Figure 8, since: i) They are the ones where a high variety of EO plants, including the more exported ones (Clove and Ylang Ylang) are grown and collected; ii) They are the regions (where EO producers are located) expected to be amongst the ones to be more severely affected by the changing climate conditions and extreme events (increase in temperature, cyclones, floods, sea level rise), as shown in ***Table 2***. The table summarizes the degree of impact expected and risks, and the climate impacts expected on the EO value chains; iii) They have approximately 34,000 small-scale producers of EO, and this number is expected to increase by 25% in the next three years, based on the growing EO market in Madagascar.

Region	Planted EO plant	Collected EO plants
Vakinankaratra	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger
Amoronimania	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger
Haute Matsiatra	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger
Vatovavy Fitovinany	Clove, Ylang Ylang,	Niaouli, Cinnamon, Helichryse Faradifani, Ginger
Atsimo Atsinanana	Clove;	Niaouli, Cinnamon, Helichryse Faradifani, Ginger
Ihorombe	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger

Figure 8: Selected regions for the ARCHE project and EO plants grown in each

Table 2: Summary of the potential climate stressors and risks in the EO value chains 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 for the EO value chains
		RCP 2.6	RCP 4.5	RCP 6.0	RCP 8.5	
Increased temperature	Vakinankaratra					1) Yield changes, including potential increases, reductions; plant crop failure/loss 2) More pests, and crop diseases that can affect the EO plants/crops 3) Reduced biodiversity and productivity, resulting in lower EO yields 4) Reduces soil moisture and increased erosion 5) Water sources dry up or become intermittent with impacts on crops 7) Reduced water quantity and quality (in areas where groundwater pollution is occurring) in shallow wells and springs due to increased rates of evaporation.
	Amoron?i Mania					
	Haute Matsiatra					
	Vatovavy Fitovinany					
	Atsimo Atsinanana					
	Ihorombe					
Decreased precipitation and increased variability	Vakinankaratra					1) Crop water stress in some areas due to seasonal and increased intensity of droughts 2) Reduced terrestrial biodiversity and productivity 3) Impact in plant growth and thus crop yield production 4) Lack of water can impact the
	Amoron?i Mania					
	Haute Matsiatra					
	Vatovavy Fitovinany					

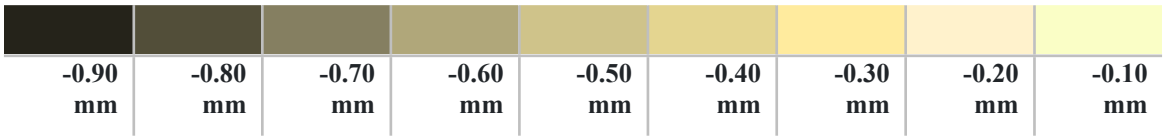
	Atsimo Atsinanana					production of EOs 5) Growing water scarcity and growing dependence on irrigation 6) Increased variability, both seasonal and inter-annual, making shortages of water more acute, less easy to predict and increasing the risk of crop failure
	Ihorombe					
Sea Level Rise	Vakinankaratra			NA		1) Coastal erosion 2) Contamination of freshwater aquifers / groundwater (water table) with impact crop production near the shores 3) Quantity of freshwater aquifers available for EO activities reduced
	Amoron?i Mania			NA		
	Haute Matsiatra			NA		
	Vatovavy Fitovinany			NA		
	Atsimo Atsinanana					
	Ihorombe			NA		
Cyclones	Vakinankaratra					1) Destruction of crops/ infrastructure (transport, storage facilities, distilleries, ports etc) 2) Increased intensity of rain due to cyclones, that can lead to floods 3) Water logging / crop damage 4) Increased run-off and siltation of crops
	Amoron?i Mania					
	Haute Matsiatra					
	Vatovavy Fitovinany					
	Atsimo Atsinanana					
	Ihorombe					
Floods (river + coastal)	Vakinankaratra					1) Soil nutrient leaching 2) Flood disruption in transportation systems and reduce access to market, disrupt fuel transportation for energy
	Amoron?i Mania					

	Haute Matsiatra		production 3) Soil erosion 4) Crop damage and infrastructure damage due to flooding 5) More diseases and fungal attacks due to high air humidity 6) Flash floods may impact growth of cultures and even destroy them
	Vatovavy Fitovinany		
	Atsimo Atsinanana		
	Ihorombe		

Notes:

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.

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

Cyclones and Floods (including river and coastal flood) assessment is based on the level of risk according to ThinkHazard![77][77], and not on RCPs.

49. In addition, the identified regions are also under environmental pressure, noted as the key constraint that is increasing the disruption in productive agriculture and the EO value chains in

particular. In fact, these regions are part of the areas where tree cover is being lost, due to the uncontrolled and unsustainable deforestation for firewood and production of charcoal, making these areas even more vulnerable to climate change risks. Forests are crucial for soil protection and climate regulation, acting as carbon sinks. Particularly for EO value chains, significant amounts of wood are necessary for the EO distillation process: every alembic (distiller) consumes approximately 145 m^3 of wood/year. Therefore, more sustainable production techniques are necessary to reduce the impact and forests and increase the sectors adaptive capacity without compromising productivity.

50. Madagascar?s NAPA has identified several adaptation activities in the agriculture and water sectors that are relevant to EO production including i) improve and conserve soils, ii) production and use of organic fertilizers, iii) drought-tolerant plants, iv) reforestation to cope with soil degradation, vi) capacity-building for use and maintenance of water management systems, vi) improve EO stakeholders? knowledge about the proper use of weather information to reduce climate risk, vii) develop and introduce policy measures, and viii) small dams for flood water control or water-saving infrastructure for different types of water used for irrigation and control flood inundating and damaging the EO crop farm.

51. The EO producers are facing various barriers and challenges in their efforts to address their adaptation needs, being lack of information and knowledge on climate change, poor regulatory framework and institutional setup, including low capacity and lack of finance as the major barriers to adaptation identified during consultations during both the PIF and PPG stages. This is further elaborated in the Barriers section below, in this document.

52. There are examples of adaptation-oriented technologies, products and services (TPS) that could be applied in the EO value chains to increase resilience and reduce vulnerability, such as the use of optimised solar powered irrigation systems, adapted water usage for distillation systems, use of biomass briquettes made of crop waste instead of fuelwood, land use planning integrating flood risk management, water recycling technologies such as using grey water and harvesting rainwater, for crops or distillation in places where water is scarce. The provision of financial mechanisms (insurance, risk financing, compensation and tax relief) is also very important to help those at risk to offset their financial risk from flooding, drought and cyclones. Table 15 and Table 16 included in Annex P: Baseline Report provide a thorough list of possible climate change (innovative) adaptation solutions (including both climate adaptation intelligence and climate adaptation TPS) that could be adopted in Madagascar to adapt to the identified projected climate change impacts across the EO value chains.

1.2.5 Conclusions of the CRVA

53. From the vulnerability assessment it can be concluded that several climate risks will result from increased temperatures, decreased precipitation and increased variability of precipitation, sea level rise and cyclones, floods and drought. Sea level rise already threatens coastal areas of Madagascar, and this is expected to be intensified in the future. In addition, if the current trend of increased temperatures and cyclones occurrence continues, Madagascar will see more destruction and flooding leading to soil erosion, reduction in EO plant yields, destruction of roads and other infrastructure across the country. All these impacts will have significant consequences for the EO value chains, the environment, human and animal health, food security and biodiversity, along the coast and the wider economy.

54. Also increase in temperatures, variability in rain, reduced amount of rain, and drought, have serious impacts in the development of the EO plants, and thus consequences on the entire value chains. It is important that the sector adopts nature-based solutions as well as sustainable production and collection techniques, in order to ensure adaptation to climate change and little impact on the environment. Furthermore, it is crucial to adopt more efficient and resilient distillation processes.

55. Although the entire EO sector 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 to sea level rise along coastal Madagascar is essential for the EO value chains segments located in those areas. Moreover, the implementation of early warning systems for cyclones/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 sector is also to be considered.

56. In addition, with regards to the characterisation of the most vulnerable people across the EO value chains, the analysis shows that small-scale growers, collectors, producers; traditional small-scale distillers; and women, indigenous people and the youth engaged in EO value chains activities are the ones whose adaptive capacity is very low, and face numerous risks, including climate change ones. Their livelihoods depend on agriculture and also suffer food insecurity, are located in remote areas and have difficulties to access formal safety nets and basic services. This makes them subject to diseases, pests, extreme weather events, and increased poverty-related challenges which are associated with climate change. This was also validated by the stakeholders consulted during the PPG stage, as they highlighted those small-scale growers and cultivators should be the ones to be first targeted with innovative TPS, followed by the distillers.

57. The CRVA assessment therefore identified the most vulnerable regions within the country across the EO value chains. The results showed that six regions are more prone to suffering the adverse impacts of climate change and are regions where vulnerable people of the EO value chains are also located. These are Vakinankaratra, Amoron?i Mania, Haute Matsiatra, Vatovavy Fitovinany, Atsimo Atsinanana and Ihorombe.

58. Independently of the emission scenarios ? low emission or high emission ? climate change impacts are being already felt, will continue and get worse. The severity / degree of these impacts is what may vary depending on the combined adoption of mitigation and adaptation solutions. Several adaptation solutions should be adopted in order to adapt the EO value chains to climate change impacts and should be implemented in the short term to ensure that their effects are felt in the short to long term and ensure resilience of the EO value chains of Madagascar. Additional information and details of the TPS that could be applied in the EO sector across Madagascar is provided in Table 15 and Table 16 of the Annex P: Baseline Report.

1.3 Main barriers to be addressed

59. The detailed review of the policy and regulatory frameworks applied to climate change adaptation in Madagascar; the overview of Madagascar?s climate change adaptation market; all related climate change adaptation projects that are under development in the country; combined also with the inputs

provided by the consulted stakeholders through the online questionnaire and meetings, allowed for the identification of the main barriers for the development of the climate change adaptation market across the EO value chains in Madagascar.

60. The EO producers are facing various barriers and challenges in their efforts to address their adaptation needs, being lack of information and knowledge on climate change, poor regulatory framework, and institutional setup and coordination, including low capacity and lack of finance as the major barriers to adaptation.

61. The overall results of the consultation conducted at PPG stage (Figure 9) show that the **financial barrier** is the most significant one for the EO sector to prosper by adopting a climate-resilient approach, followed by **capacity building, knowledge and awareness** about climate change TPS.

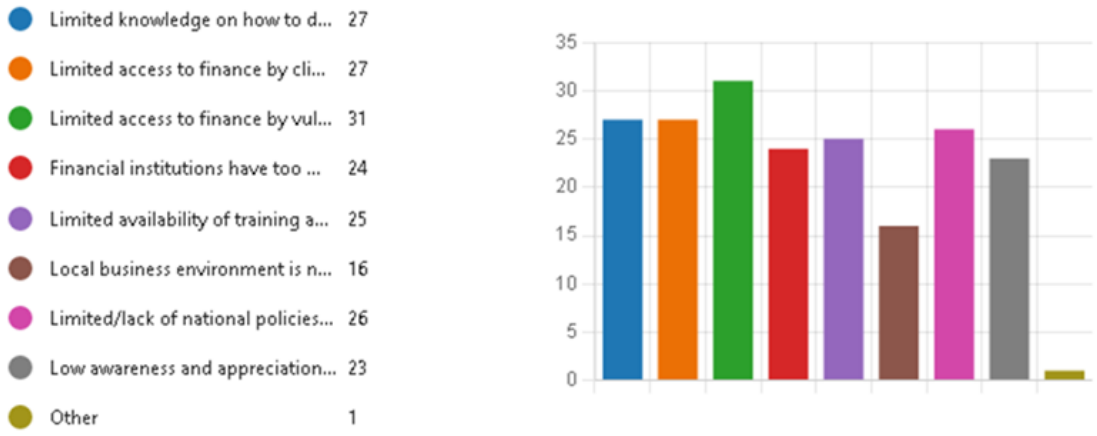


Figure 9: The barriers that MSMEs or entrepreneurs face when growing or sustaining a successful business in climate change adaptation in Madagascar

62. The adoption and deployment of climate change adaptation technologies and services along the EO value chains face the barriers captured in the previous picture and summarised in Table 3 below. A more detailed explanation is provided after the table.

Table 3: Overview of the climate change adaptation BARRIERS OF THE EO VALUE CHAIN

Low Priority	Moderate Priority	High Priority
Barriers	**Description**	**Priority**
1) Weak institutional coordination mechanism to ensure sustainable,	Weak institutional capacity and knowledge about the sector to drive innovation, incubation and entrepreneurship in the EO value chains	?
	Insufficient or not properly enforced policy and regulatory frameworks as well as support mechanisms; high level of informality	?

climate-resilient growth and formalized entrepreneurship development frameworks to unlock adaptation-oriented innovation along the essential oil value chains	No sector focused policy or strategy with clear rules applicable to the specific EO sector	?
	Weak institutional framework and burdensome procedures (e.g., bureaucracy of company?s registration procedures; high taxes on MSMEs, complicated processes for obtaining permits) for the EO sector	?
	Lack of coordination among the institutions involved in the sector generates confusion among actors and increases bureaucracy (ministries and agencies managing the forest, agriculture, water, industry and environment sectors)	?
2) Limited information, awareness, and skills development and support for entrepreneurs (especially those led by youth and women-led) to transform their early-stage innovations into adaptation-focused technology enterprises	Lack of awareness within MSMEs regarding the risks of climate change, its negative impacts on the EO value chains and the opportunities that may arise to tackle it through innovation	?
	Contrasting perceptions about EO market size for the implementation of climate change adaptation TPS evidence limited understanding and need to increase knowledge and capacities	?
	Lack of awareness at the government and institutional level about climate change impacts and adverse effects on the EO value chains	?
	Limited availability of capacity building and training opportunities to develop businesses and foster entrepreneurship country-wide, especially for early-stage MSMEs/entrepreneurs and for smaller farmers/growers of the EO value chains	?
	Poor access of entrepreneurs/MSMEs to knowledge, information and technology, especially in the case of the youth, women, and vulnerable groups	?
3) Insufficient business growth services to support MSMEs, to deploy adaptation-oriented technologies and services and transform ideas into business opportunities along the essential oil value chains	Lack of capacity by MSMEs to develop solid and validated business plans and marketing strategies to reduce risk of failure, especially in the early-stage of their business development	?
	Limited administrative and management capacities of MSMEs (business operations optimisation, legal and financial compliance and monitoring, marketing, distribution, business plan development skills)	?
	Lack of knowledge of the climate change adaptation market, target clients and market potential; especially in the vulnerable groups (women, rural youth, smallholder farmers)	?
	High level of informality and limited availability of professionals that received formal training reduces the chances of MSMEs to find and retain qualified and well-trained experts	?
	Lack of specialized education (technical colleges), training and research programmes (universities) in climate change adaptation and related technologies	?
4) Lack of access to financing for	Traditional financial products and banking sector have restrictive applicability conditions that exclude the most vulnerable ones	?

MSMEs, to deploy adaptation-oriented technologies and services and transform ideas into business opportunities along the EO value chains	Lack of financial products and services oriented to vulnerable groups, where small producers, growers and cultivators are often included	?
	Limited experience of the financial sector in providing financial products for the EO value chains and even less specifically addressing climate change adaptation	?
5) Limited awareness and accessibility of small producers to climate-smart technologies and finance mechanisms to exploit essential oil value chains	Limited mainstreaming of climate change adaptation solutions, knowledge transfer, available technologies and products that can be applied to the EO sector and value chains	?
	Lack of coordination amongst value chains actors (especially small growers /cultivators) to better identify business opportunities, share knowledge, and foster technology transfer	?
	Lack or difficult access to markets and distribution channels across the EO value chains to insert the MSMEs and entrepreneurs? products	?
	Limited access to equipment, state of the art technology that can increase productivity, and limited access to insurance, more particularly, climate change insurance	?
6) Limited value placed on the resilience of ecosystem services and their link to climate resilience as well as improved and sustained productivity along essential oil value chains	Limited knowledge about the impact of unsustainable agricultural practices (*tavy*) that threaten the ecosystem balance	?
	Limited or lack of knowledge about potential ecology-based and nature-based solutions that can support sustainable exploitation of EO natural resources and increasing the sector?s resilience	?
	Lack of demonstration or pilot projects that can show tangible benefits of implementing adaptation oriented TPS across the EO value chains	?

63. As mentioned previously, **limited access to finance** by vulnerable population/across the value chains to purchase climate-adaptation oriented TPS offered by climate change adaptation MSMEs is the most significant barrier. In addition, it is relevant to point out that, in general, all barriers are relevant to MSMEs or entrepreneurs when attempting to grow or sustain their successful businesses. What?s more, is that for those farmers that are aware of the risks of climate change; they do not have the resources to access adaptation technologies and solutions to change their processes and practices to adapt to climate change. The literature on the private sector of Madagascar addresses the access to finance by both vulnerable populations and MSMEs as a significant problem. According to the country private sector diagnostic report conducted by the International Finance Corporation (IFC) and WB for Madagascar[78][78], **only 18% of households have access to a financial account, which is significantly lower than the average of 43% for Sub-Saharan Africa.** This is because Madagascar is

almost characterised by: a) a high degree of exclusion of the informal sector to which many entrepreneurs, women, and the rural population belong in; b) a low level of financial literacy among the population; c) the lack of financial registry; and e) difficulties in getting collateral. One way to support farmers is to develop a subsidization mechanism in the form of a ?pay-as-go? model to alleviate financial burdens and this can be achieved from a soft loan that farmers can access to credit and reduced rates. EO MSMEs frequently lack access to financing because MFIs financing products charge high interest rates and do not target either the EO value chains or sustainable production practices like Ecology-based Adaptation (EbA) or Nature-based Solutions (NbS). Additionally, MSMEs lack access to effective distribution and marketing channels to facilitate market penetration. They rely on informal agreements with exporters who often exploit their stronger positions financially. The financial sector, including MFIs, seldom invest in agricultural activities, particularly those led by small landholders, because of the perceived high risks in agricultural lending[79][79].

64. On the other hand, when financial incentives are created, loans and guarantee programs are targeted to cash crops, such as rice, coffee and cocoa. Staple food productions such as rice and corn are emphasized because food security is a major concern in Madagascar. Approximately 25% of the country?s rural population is classified as food insecure[80][80], therefore other type of crops receives less attention and incentives. For example, the PEM seeks to promote business creation and the development of entrepreneurship and innovation in the agriculture sector and, although MSMEs make a significant contribution to economic development, yet their production and export rates remain low due to lack of access to capital, markets and lack of awareness and technical supports to build their EO business climate resilient. Youth are not well integrated into the MSME sector despite the fact that young adults comprise more than 50% of the total population.

65. Madagascar finances the Agricultural Development Fund (FDA) to support farmers access to essential farming equipment. However, the FDA?s supports to farmers is limited to staple and cash crop production only. 92% of the private sector in Madagascar consists of informal micro- or small enterprises in agriculture, trade or services, with low salaries (less than $50 per month) and low literacy rates (25%). There are limited investments in innovation to address local needs and requirements, particular to small-scale agriculture. Microfinance products typically charge interest rates of 35% or more to take out loans. Coordination is limited among the existing structures, such as connecting the private sector with agriculture associations/cooperatives.

66. Lack or **limited access to training opportunities to improve business skills** is also a challenge for vulnerable population and for the first segments of the EO value chains (small growers, collectors, cultivators). MSMEs can also face challenges regarding technical capacity to implement adaptation options if for instance farmers do not know how to develop business plans that support adaptation.

67. Most entrepreneurs in Madagascar have not received formal training in business management or entrepreneurships and most MSMEs are informal. For instance, MSMEs lack the knowledge on how to maintain sound financial administration or optimize their business operations. There is also a lack of

business education that targets MSMEs employees and owners and as a result MSMEs find it difficult to attract skilled staff. As a result of these barriers, any long-term development of MSMEs end up running in an *ad hoc* fashion which can also limit MSMEs from accessing baking services and scaling up their finance. Knowledge of even general entrepreneurship in universities and vocational institutes is limited, thus the need for the government to play a significant role in the providing technical support for MSMEs. It should also be noted that large private companies and NGOs can also play a role in providing technical support directly to smallholder MSMEs. This can be done through the dissemination of information on climate risks and impacts, research institutions and technical support hubs which are targeted specifically for the most vulnerable groups.

68. Although there is a political and regulatory framework in Madagascar that deals with climate change adaptation and there are initiatives that aim at encouraging entrepreneurship and starting a business (e.g., the PEM), many times the framework **is not enforced**. Moreover, results from the stakeholders? consultation conducted at PPG stage show a **limited understanding and awareness about climate change policy framework**. It is the stakeholders? general opinion that the current regulatory and institutional framework is insufficient to encourage the creation and adoption of innovative adaptation technologies in the EO value chains. Stakeholders who answered that the policy and regulatory framework was not sufficient referred the need to address the following topics: i) Provide training and capacity building, improve access to information and raise awareness of MSMEs, especially rural ones (e.g., appropriate practices and technologies, available and applicable regulations); ii) Enact new legislation for EO sector and make it consistent with overall frameworks (e.g., such as the environmental policies and regulations); quality control and assurance procedures should be revised also; iii) Make administrative procedures for obtaining production, exploitation, marketing and export permits and authorizations more straightforward; iv) Develop an EO sector-specific strategy and action plan.

69. Currently, there is no strategy or policy to promote the sustainable and climate resilient development of the EO sector. Equally, there is also a lack of framework that formalizes the employment sector. Talks have been had to establish a National Committee of Essential Oils, Vegetables Oils Extracts and Oleoresins (the ?CNHEO?), however it has yet to be fully created and formalised to serve as a platform for dialogue between the actors involved in the EO sector.

70. Figure 10 shows the main areas of action as identified by the consulted stakeholders during PPG to develop the climate change adaptation market in Madagascar. That shows that the creation of capacities, training and skills development is one key topic that needs to be addressed, with finance access in second place.

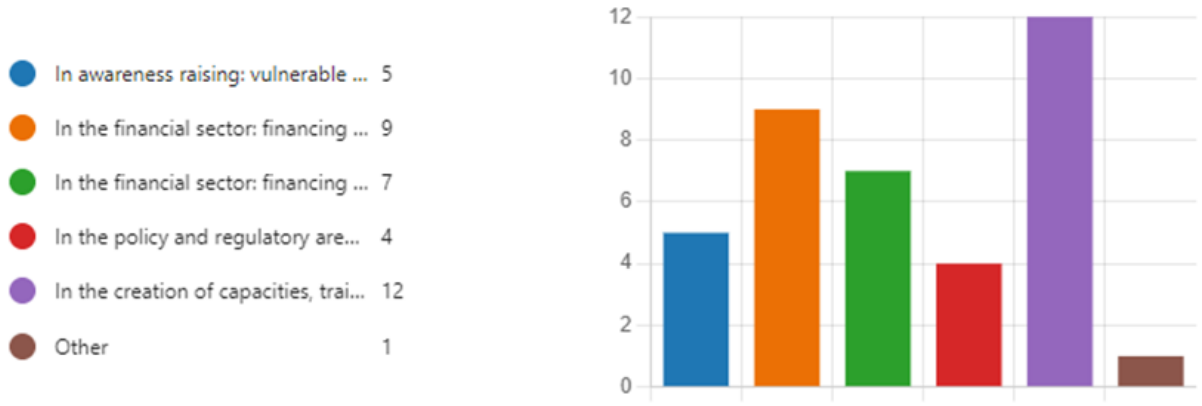


Figure 10: Opinion of consulted stakeholders regarding the main area of action to develop the climate change adaptation market in Madagascar

71. Actions towards strengthening capacities and skills would aid MSMEs in building and developing better business models, understanding market needs, and demand trends to develop/grow their businesses. Although in second place (see **Figure 10**) stakeholders believe that the most needed action is through the financial sector; believing that financing institutions should improve their financing products offered to those vulnerable along the EO value chains by increasing their access to the TPS for adaptation to ensure climate change resilience. Similarly, financing institutions should improve their financing products to increase access to for MSMEs working in the climate change adaptation market.

2) THE BASELINE SCENARIO AND ANY ASSOCIATED BASELINE PROJECTS

2.1 Baseline Scenario

72. There is a call for increasingly diversified products - particularly those that are new and exotic, natural and organic - as consumers become more and more interested in EO. Madagascar has potential competitive advantage for some specific (e.g., endemic, scarce) plant products. If the average annual growth rate of Madagascar EO exports registered between 2010 and 2020 of 21% continues to be registered in the coming years, in 2030 Madagascar EO exports are estimated to totalise more than US$450 million, provided that the market can sustainably grow.[81][81] Organic EO products for the export market and quality medicinal and herbal products for the domestic market have the greatest potential for growth now and into the future.

73. Nevertheless, the EO sector, including its value chains, are increasingly vulnerable to climate change impacts. To create competitive advantage, the value chains must become more flexible, innovative, efficient and resilient. Thus, the expansion and development of the Malagasy EO sector leverages further opportunities to address interlinked development and conservation challenges.

74. Improving efficiency requires: better vertical and horizontal integration among actors in the value chains adoption of a clear regulatory framework and sets of product norms and standards; building

capacity for certification standards; and promoting sustainable natural resource and production practices.

75. In addition, the EO sector must establish effective channels of communication among value chains actors to allow them to respond quickly to shifting market demands. Madagascar?s ability to respond to these market trends is founded on: its unique and varied plant base; an experienced EO processing sector, which realizes its need to upgrade; an emerging awareness among actors of the inefficiency of the present organization of the EO value chains; increased awareness among actors in the value chains, the Malagasy government, certain importers, NGOs and development projects of the need to tie environmental sustainability to market demands, not only to expand the income generating base, but also to reduce tavy cultivation practices.

76. Experience with EO has shown that economic value does not automatically create incentives for sustainable management of the resource base. Linking EO value chains development to biodiversity conservation, sustainable Natural Resource Management (NRM) and rural poverty reduction requires deliberate action. The export sector has applied pressure through importer requirements for environmental considerations in the harvesting and production of aromatic and medicinal products. Malagasy-led programs, institutions and interest groups are putting additional pressure to apply stricter regulations to safeguard the plant production base and promote sustainability at the processing level.

77. In the baseline scenario, it would be difficult for Madagascar to accompany the growing need for EO products in a more demanding market if care for the environment, resilience to climate change and the communities? socioeconomic development are not integrated in an overarching sector strategy and direction. Improving resilience to climate change impacts to support the EO sector growth, would imply the adoption of climate change-adaptation oriented technologies, products and services (TPS). The proposed GEF/UNIDO ARCHE Project contributes to the identification of these TPS and to make them available to those stakeholders working across the EO value chains.

2.2. Policy Baseline

78. The Madagascar Policy and Regulatory Framework related to climate change includes:

The Plan Emergence Madagascar (PEM) 2019-2023

The National Climate Change Adaptation Plan from December 2021

The Revised National Climate Change Policy from 2021 (PNLCCR),

Third National Communication to the UNFCCC from 2017

Nationally Determined Contribution from 2016

National strategy for disaster risk management from 2016

79. In addition to the climate change adaptation policy framework, Madagascar is signatory to several environmental conventions that impact its EO sector:

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Convention on Biological Diversity (CBD)

80. There are also international agreements and directives that concern the aromatic and medicinal plants (AMP) sector, and which cover areas that promote health, safety, and sustainable practices at the production, harvesting and processing levels:

Fair Trade Federation (FTF) provides guidelines and regulations for determining a product?s classification of a Fair-Trade label.

As a member of World Health Organisation (WHO), Madagascar is asked to respect the Directive on Good Agricultural and Collection Practices (GACP) for medicinal plants.

Exporters to Europe must be mindful of the directive from the Committee on Herbal Medicinal Products (HMPC) of the European Medicines Agency (EMEA).

There is also an international standard of relevance for the EO sector, namely the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP), from 2007.

2.3 Baseline Projects

81. The proposed ARCHE Project will be complementary and leverage the results achieved from a set of climate change adaptation projects that were identified and will try to create synergies with ongoing projects focusing on building resilience and adaptation to climate change in the EO value chain sector in Madagascar. An in-depth review of on-going and planned programmes and projects in relation to climate change and adaptation technology in Madagascar 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 a few and 18 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 2 lists the most relevant projects that should be considered under the baseline scenario.

TABLE 4: PROJECTS RELATED TO CLIMATE CHANGE ADAPTATION OR TARGETING EO VALUE CHAINS IN MADAGASCAR

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
PROSPERER (Support Programme for Rural Microenterprises and Regional Economies)	2007-2021 (14 years)	Objective: Promote income growth by consolidating rural micro-enterprises at local and regional levels in 9 regions (Analamanga, Haute mascara, ltasy, Sofia, Vatovavy Fitovinany, Atsinanana, Analanjirofo, Boenyand Bongolava). Component 1 - identifying, mobilizing SMEs, and pairing the producer organizations with exporters. It also aims to provide extension services support. Component 2 - providing professional training in marketing and management. The component also supported over 6,000 youth and their integration into entrepreneurship Component 3 - improving rural finance and risk management. The project worked with partner MFIs (VOLA MAHASOA) to provide working capital for vulnerable rural MSMEs. Through its Rural Investment	IFAD Financing: US$ 46.04 M Total Project Cost: US$ 67.83 M https://www.ifad.org/en/web/operations/-/project/1100001401 and Programme PROSPERER - Home | Facebook	This project is well aligned with the proposed Adaptation project since its overall objectives and the objectives of the adaptation project are very similar. For instance, its intent to promote the growth of rural micro-enterprises and its focus on some of the regions that the project has also identified as vulnerable to climate change. This project has also partnered with MFIs (such as VOLA MAHASOA) that the adaptation has also identified as contributing to the adaptation project. Building on PROSPERER, GEF funds will also be used to establish market linkages between producers and exporters. This project will ensure that exportation is

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Integrated Growth Poles and Corridors Project PIC	PIC1: 2005-2014 PIC2: 2015-2019 / 2019-2023 (Total 18 years)	The Integrated Growth Poles and Corridors Project 2 (PIC2) is one of the actions of the Malagasy Government to implement the General Program of the State and the "Madagascar Emergence Plan" (PEM). The Project aims to support the dynamization of areas and corridors with high growth potential, by **stimulating the private sector and developing promising economic sectors such as agribusiness and tourism. EO sector support will take place in Nosy Be and in Ambanja within the northern Diana Region. It will benefit small-holder farmers active in the EO sector in collaboration with Fihariana. They have conducted an inventory of distillation technologies and have identified 1 alembic technology that reduces the use of fuel wood by 80%**. The technology was expected to be first piloted in July 2020. They	World Bank Grant Amount PIC2: US$ 50 M Projet P?les Int?gr?s de Croissance et Corridors (PIC2) and Development Projects : Integrated Growth Poles and Corridor Project 2 - P113971 (worldbank.org)	This project is very much aligned with PC2 of the ARCHE project, namely output 2.1.2 to have Four (4) pilot projects implemented to deploy innovative adaptation technologies and solutions. It would be useful to learn about the distillation technologies solutions adopted through the (PEM) as well as learn from the inventory of distillation technologies created, specifically the alembic technology which reduces the use of wood fuel by 80% as it could be one of the 4 pilot projects.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Madagascar: Promotion and Adaptation of channels of agricultural value to climate change (PrAda)	2017-2022	PrAda is working in the south and south-east of Madagascar (Androy, Anosy and Atsimo Atsinanana regions) to promote adaptation in agricultural value chainss. Relevant value chains to this project include ginger, cloves, and vanilla. The project aims to 1) improve access to agrometeorological advisory services with a crop calendar that can be accessed by a 3-2-1 hotline by actors in the value chainss, 2) train more than 2,000 small producers in business management and nutrition (Farmer Business School), 3) work with insurers and regulators to reform insurance codes and introduce climate risk insurance for at least 1,000 people involved in the value chainss, 4) facilitate direct contracts between producers and the private sector, so that 5,000 farmers get better prices for their products and have more income security.	Total Grant BMZ: EUR 23.3 M (including EUR 7.5 M from the EU) Adaptation de l?agriculture au changement climatique (giz.de) And Projet PrAda - Home | Facebook	This project is also very much aligned with the ARCHE project since it focuses on regions that have been identified in the CRVA as vulnerable to climate change. It has also focused on relevant value chains which include cloves and vanilla. All of the project aims would be well aligned with the ARCHE project, and it would be useful to understand any potential learnings from this experience and confirm if the crop calendar that can be accesses by a 3-2-1 hotline may be supported by the farmers that the ARCHE project will target. It would also be useful to learn more about the progress of the Farmer Business School to see if ideas can be

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Adaptation Accelerator Program: Building Climate Resilience through Enterprise Acceleration (AAP)	2021-2023	The proposed project addresses the key binding constraint of limited access to credit for SMEs in developing countries, with a focus on enterprises that are relevant to the goal of advancing adaptation and resilience. By building the information base needed to inform investors; linking enterprises to investors with appropriately matched risk appetites and portfolio interests; and providing technical support to strengthen enterprise-level ability to attract investors, the project will address the principal barriers identified. AAP foresees to build on the expertise of CI?s impact investing fund Conservation International Ventures (CIV) and its Conservation Investment Partners (CIP) network, which have extensive financial expertise in enterprise development and impact investing. The implementing entity is Conservation International	GEF Grant: US$ 1.02 M Co-financing: US$ 1.3 M https://www.thegef.org/projects-operations/projects/10435	It would be useful to learn from this project on how it built its base of information to inform investors, linking enterprises to investors and portfolio interests. Especially on how to it provides technical support to strengthen enterprise-level ability to attract investors. It would also be useful to learn from the project what the key binding constraints are for SMEs in developing countries to have access to such credits.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Adaptation SME Accelerator Project (ASAP)	2019-2021 (still under execution)	The overall purpose of this global project is to catalyze the markets for climate resilience and adaptation solutions in developing countries and promote greater use of these solutions by customers. The project will do this by building the ecosystem of SMEs involved in adaptation and climate resilience in developing countries through a program of market mapping, convening and network building, and incubation/acceleration. Project activities will include refining the taxonomy of the range of climate resilience solutions and segments, mapping companies and markets, sharing market information with market participants, building networks and holding convenings of adaptation-focused SMEs regionally, and enabling existing incubator and accelerator programs to begin enrolling and supporting	GEF Grant: US$ 1.99 M Co-financing: US$ 0.5 M https://www.thegef.org/projects-operations/projects/10296	The aim of this project is to enlarge the markets for climate resilience and adaptation solutions in countries such as Madagascar. Although the project is still under execution, it would be interesting to learn more about its programs, namely: - The program of market mapping - Convening and network building - And incubation and acceleration. It would be interesting to learn about the strengths and weaknesses found in this project so that lessons can be learnt since the information that this project generates would be very useful in understanding in how to better support adaptation focuses SMEs.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
GCCA+ Madagascar: Building Capacity on Sustainable Climate Change Adaptation	2016-2020	The GCCA+ is the Global Climate Change Alliance Plus Initiative, funded by the European Union, started in 2008 and has become a major climate initiative that has funded over 80 projects of national, regional and worldwide scope in Africa, Asia, the Caribbean and the Pacific. The scope of the Madagascar project is to address the vulnerability that Madagascar faces to climate change. Efforts to tackle this issue have been undertaken to address the effects of short-term climate variability, and the focus of this project is to build sustainable adaptation to climate change. It aims to do so by highlighting interventions that could be adapted at the central institutional and decentralized levels.	Total budget EU: EUR 9,50 M https://www.gcca.eu/programmes/gcca-madagascar-building-capacity-sustainable-climate-change-adaptation	The overall focus of this project is relevant also since it is aligned with the overall objective of the ARCHE project, to build resilience and adaptation to Climate Change through adaptation. It would be useful to learn more about the interventions that this project has highlighted that could be adapted at the central institutional and decentralised levels of governance since the ARCHE project is also focused on building adaptation at both these two levels, highlighted in PC1 and PC3.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Sustainable Landscapes in Eastern Madagascar	2016-2026	Conservation International Foundation is the accredited entity. Addresses smallholder vulnerability to access private sector investment. The project is pioneering Green / Climate Bond with all returns and profits being re-invested to capitalize a Climate Change Trust Fund for Madagascar. Public sector interventions (managed by CI) are not-for-profit adaptation, mitigation, capacity building and mainstreaming activities to reduce smallholder farmer vulnerability and reduce GHG emissions from deforestation. Private sector interventions (managed by EIB) are for-profit activities, including traditional loans, equity investment, profit participation loans (PPL) to deploy financial support to communities, farmer organizations and sustainable companies.	GCF Grant: US$ 18.5 M. Co-financing: US$ 0.8 M https://www.greenclimate.fund/project/fp026	This project is not only of relevant because it is still under execution, but because it also collaborating with this GCF project that will build on lessons learned, particularly referring to the development of a sustainable financial mechanism to support EO smallholder farmers in Madagascar.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Madagascar Agricultural Rural Growth and Land Management Project	2016-2022	The objective of this project for Madagascar is to improve rural land tenure security and access to markets of targeted farming households in selected agricultural value chains in the projected areas, and to provide effective response to an eligible crisis or emergency. The project is split into 3 components. The relevant ones are enhancing access to agriculture finance support land policy and land rights registration.	WB committed: US$ 53.27 M https://projects.worldbank.org/en/projects-operations/project-detail/P151469	It would be useful to synergise with this project since rural land tenure security and access to market are problems that Malagasy women are especially vulnerable to as identified in both the Baseline Report and the Gender Annex. Thus, it would be interesting to find out if this project has also focused on this demographic and to explore what its findings were and find out in a deeper way the barriers that vulnerable targets are faced with when concerning rural land tenure and access to markets.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Country Strategic Opportunities Programme (COSOP) from IFAD (International Fund for Agricultural Development)	2022-2026	This Strategy targets rural areas, food systems, and nutrition security for vulnerable rural people, while building their resilience to climate change. It does this by: Improving climate resilient productivity of family farms and rural micro enterprises and strengthens agricultural value chains and improving access to target rural producers and organisations. The COSOP contains a portfolio of 18 projects in different stages of implementation from planned to closed projects. Three are currently ongoing: **Inclusive Agricultural Value chains Development Programme**. Cost: US$250.00 M. Duration: 2017-2028. The programme?s investments will help strengthen and secure the production base of family farms in a context of climate change. It will connect them to production and marketing support services in order	Project budget (see left column) https://www.ifad.org/en/web/operations/w/country/madagascar Inclusive Agricultural Value chains Development Programme (DEFIS) (ifad.org) Project to Support Development in the Menabe and Melaky Regions ? Phase II (AD2M-II) (ifad.org) Vocational Training and Agricultural Productivity Improvement Programme (FORMAPROD) (ifad.org)	This project is focused on rural areas, the agricultural sector, and is focused on building resilience to climate change. Thus, it shares the same focus as the ARCHE project. It would be useful to learn more on the projects that are ongoing and share findings on climate resilience productivity, strengthening value chain and on improving access to target rural producers.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Transforming Financial Systems for Climate	2019-2026	Implemented in 17 developing countries, including Madagascar and seeks to scale up climate finance in the targeted countries, to redirect financial flows, and reinforce the capacity of local partners in sustainable energy, energy efficiency, housing, agriculture, forestry and water and waste management. The Program will i) provide credit lines with tariffs/incentives tailored to climate investments needs, (ii) provide technical assistance grants, and (iii) feed into the public policies of the governments concerned. It aims to alleviate the lack of innovation/risk aversion and liquidity constraints/interest rates that are too high for the final beneficiaries. The AFD and GCF credit lines will mobilize funding brought by LFPs (20% of the AFD?s and GCF?s credit line), and end-borrowers will bring another	GCF: US$ 243 M Co-financing: US$ 419 M Accredited entity: AFD FP095: Transforming Financial Systems for Climate | Green Climate Fund	This project is very much in line with PC2 in providing finance to MSMEs being coached and in providing finance for adaptation pilot projects. Again, Malagasy women often cannot access financial means as easy so it would be interesting to find out if this project takes this into consideration. It would also be interested in learning more about on its approach to alleviate/risk aversion and liquidity constraints/interests that are too high for the beneficiaries.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Adaptation planning support for Madagascar - Readiness and Preparatory Support Proposal, with UNDP	2019 (date of proposal received by GCF). Anticipated duration: 18 months	The Readiness and Preparatory Support aims to enable the country to reduce its vulnerability to climate change by strengthening the integration of adaptation into development planning and mid-term planning and budgetary frameworks. It will also leverage emerging local and external funding opportunities. This objective will be achieved through three outcomes: (i) Climate risks and vulnerabilities in the water sector are assessed, and economic costs and adaptation options of the most vulnerable sectors are appraised; (ii) Coordination mechanisms and technical capacities for integration are strengthened to facilitate climate change adaptation mainstreaming into development; (iii) Institutional skills to access climate finance, and private sector engagement on climate change adaptation are enhanced. The present project will foster	Requested amount: US$ 1.46 M https://www.greenclimate.fund/document/adaptation-planning-support-madagascar-through-undp	This project is focused on reducing vulnerability to CC by strengthening the integration of adaptation into development planning, mid-term planning, and budgetary frameworks. It would be useful to find out if these objectives have been achieved with the desired outcomes, i.e., it would be interesting to know what institutional skills have been incorporated to increase access to finance and if this has been achieved It would also be interesting if from the lessons learnt, that this project has aligned with can be shared with the proposed ARCHE project.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Proposal for Programme: ?Transforming the financial system to support the development of sustainable energy solutions through technical assistance and investment in Madagascar ?	Submission: April 2022 Duration : 48 months	UNIDO under the lead of UNDP and in collaboration with UNCDF is currently developing a Joint Programme for submission to the SDG Fund to support the Government of Madagascar in creating a financial ecosystem that supports the development of sustainable energy projects by providing technical assistance and investment capital. The objective of this joint proposal is to support the Government of Madagascar in creating a financial ecosystem that supports the development of sustainable energy projects by providing technical assistance and investment capital. This will be achieved by i) creating a Sustainable Energy Incubator (SEI); ii) introducing a de-risking facility, which will provide a diversified investment capital to private led small/medium	SDG Fund: US$ 1.2 M (inc. support costs) UNIDO: US$ 0.15 M Source: provided by UNIDO	This project?s main aim is to support the GOM in creating a financial ecosystem that supports sustainable energy projects. More could be learned on its creation of a Sustainable Energy Incubator, its de-risking facility and for the Sovereign Fund it has introduced. Thus, synergies could be explored.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Madagascar ? SME Business Linkages Program	2020-2023	The African Development Bank is actively working to promote entrepreneurship and has launched this program which targets 300 MSMEs from the textiles, mining, agro-industry, manufacturing, and service sectors. The focus is to help MSMEs access to skills, the market and finance.	Commitment: U.A 1,000,000 Madagascar - SME Business Linkages Program (afdb.org)	The overall goal of this project is to support MSMEs and promote entrepreneurship which will target 300 MSMEs. It would be interesting to learn more about how the project helps MSMEs, in what skills they have access to, what programmes are run, i.e., Training, coaching, mentoring and business support growth. Would also be interesting to learn about its achievements so far, what has worked, and not worked so well, and if the project supports women and youth participation.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Using systemic approaches and simulation to scale nature-based infrastructure for climate adaptation	2021-2026	This project being implemented by UNIDO, aims to enhance adaptation to climate change by establishing the business case, building capacities, and enabling increased investment in Nature Based Infrastructure. For that, the project will: ? Support technologies and solutions that support biologically diverse forests, mangroves, wetlands, grasslands and agricultural lands to provide valuable ecosystem services and adaptation ? Ensure that adaptation focused MSMEs support topics such as carbon sequestration, nutrient removal, water storage, harvesting	GEF Grant: US$ 2.0 M Co-financing: US$ 3.8 M Source: https://www.thegef.org/projects-operations/projects/10632	The ARCHE project will build synergies with the project through the activities in PC2.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Upscaling Ecosystem-based Adaptation for Madagascar ?s Coastal Zones	Concept approved in May 2022	This project aims to enhance the resilience of local communities, livelihoods and ecosystems in four coastal regions of Madagascar to the adverse impacts of climate change, and it will be implemented by the MEDD.	GEF Grant: US$ 7.1 M Co-financing: US$ 21.1 M Source: https://www.thegef.org/projects-operations/projects/10939	The ARCHE project will seek to build synergies with this project through the MEDD.

Name of the Programme / Project	Duration Period	Short Description of the Programme / Project	Budget Funding Source	Contribution (lessons learnt) / synergies with the proposed ARCHE Project
Adapting to Climate Change Induces Coastal Risk Management	2017-2022	systematically manage climate change risks and impacts on physical infrastructure and economic livelihoods, by: Enhancing the availability of high-quality climate risk information that is critical for development decision-making in the coastal zone Develop appropriate protection measures and integrated coordination mechanism to improve / support policy design and implementation in dealing with current and long-term coastal challenges Piloting adaptation investment in high-risk areas to protect coastal infrastructure and communities? assets while enhancing public awareness for better adhesion of communities and policy makers on adaptation.	GEF Grant: US$ 9.9M Co-financing: US$ 31.8 M Source: https://www.thegef.org/projects-operations/projects/5902	Working together to introduce climate resilient livelihood options and approaches to address the climate risk facing coastal communities

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

82. The proposed alternative scenario is to implement a series of project components and activities that seek to catalyse a market for adaptation technologies, products and services (TPS) by nurturing and promoting innovations that address climate adaptation needs of the vulnerable groups in Madagascar while conserving natural resources and ecosystem services.

83. 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 EO value chain as identified in the NAPA for Madagascar, thus providing a rationale for GEF involvement. The GEF financing will provide the necessary catalytic support to enable the groundwork for the establishment of a market providing affordable and reliable climate change adaptation TPS to vulnerable populations and key stakeholders engaged in the EO value chain through a threefold approach including:

(1) improving the institutional and legal framework to support adaptation innovation in the EO value chains;

(2) supporting transformation and growth of innovative climate change adaptation TPS and business models implementation across the EO value chain through: (i) private sector (MSMEs) engagement across the EO value chain and the provision of training, coaching, mentoring and business growth support; (ii) implementation of high-impact innovative climate change adaptation TPS pilots for concept demonstration; and (iii) provision of co-finance for business replication and scale-up of successful best practice examples;

(3) improving the provision of financial and insurance services, to ensure accessibility and affordability of adaptation solutions for the vulnerable population/actors across the EO value chain.

84. All of these supported with activities of capacity building, awareness raising and information dissemination, to ensure that EO value chain stakeholders of Madagascar can make and take informed decisions and start adapting to climate change.

85. The proposed ARCHE 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 above listed barriers by engaging the private sector and tap 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 across the EO value chain. The expected outcomes and impacts aim to contribute to build a diversified, inclusive and climate-resilient EO value chains in Madagascar.

86. In order to reach the project?s objective, four project components (PC) are proposed to be implemented:

Project Component 1 (PC1): Institutional capacity building and mainstreaming climate resilience into Essential Oils (EO) value chain

Project Component 2 (PC2): Innovative adaptation technologies and services promoted and deployed along the EO value chain

Project Component 3 (PC3): Knowledge sharing and Learning

Project Component 4 (PC4): Monitoring and Evaluation

87. The following figure shows the Theory of Change (TOC) underlying the proposed Project. It shows the climate change risks and the existing barriers to climate change adaptation, innovation and entrepreneurship in the EO value chains of Madagascar that the project aims to mitigate. The expected outcomes and impacts aim to contribute to build inclusive and resilient EO value chains in the country.

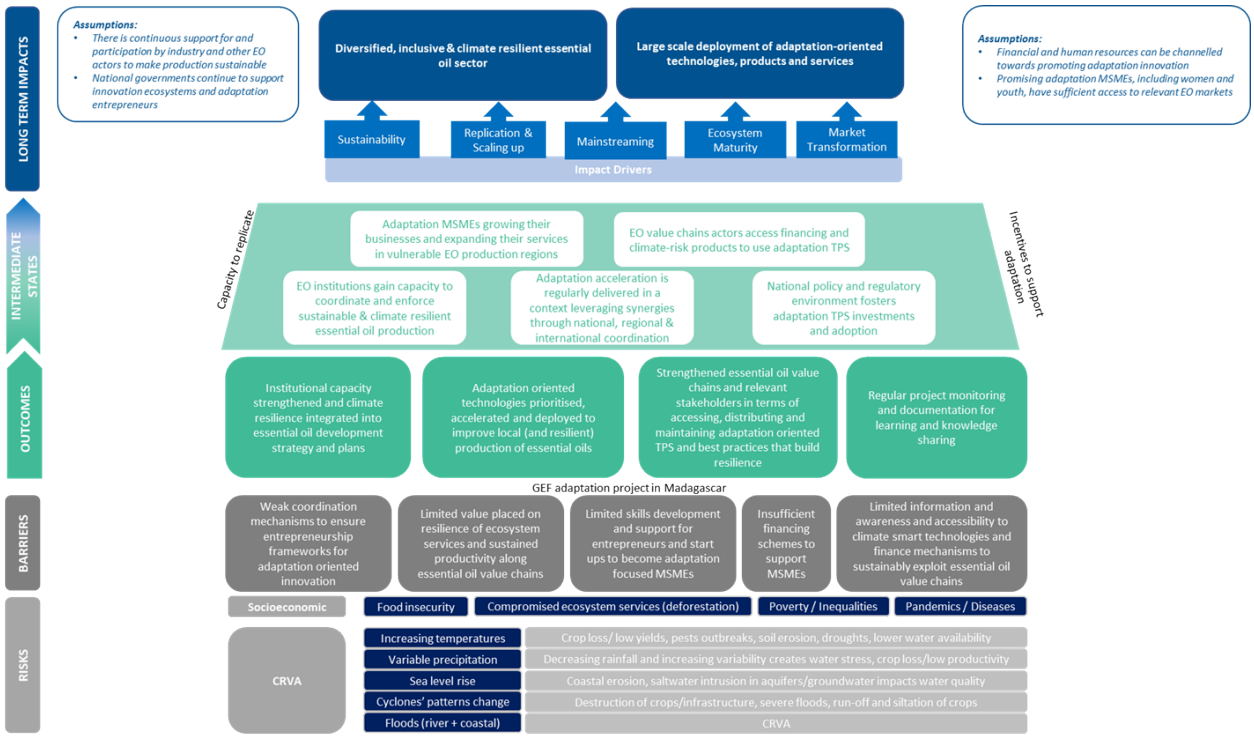


Figure 11: ARCHE Project Theory of Change (TOC)

PC1: Institutional capacity building and mainstreaming climate resilience into Essential Oils value chain

88. The (i) weak coordination mechanism to ensure sustainable, climate-resilient growth and formalized entrepreneurship frameworks for adaptation-oriented innovation along the EO value chains and the (ii) limited value placed on the resilience of ecosystem services and their link to improved and sustained productivity along the EO value chains are barriers that hinder the development and sustenance of the EO value chain in Madagascar. Along with lack of access to finance, which was identified as the key constraint to developing climate-oriented businesses in Madagascar, the lack of information, awareness and knowledge on climate change, the poor regulatory framework and institutional coordination setup have been highlighted as key barriers by the consulted stakeholders at PIF and PPG stages.

89. As referred in the Baseline Report (Annex P), climate change adaptation requires increased flows of private capital and more effective leverage of public capital, especially to and within developing countries such as Madagascar. In fact, Madagascar 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 are areas on which policymakers and financial institutions have largely been focused, they still 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[82][82]. 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.

90. ?Legal readiness? is required in Madagascar (as in other developing countries) to attract both public and international funds, including private sector finance. That includes[83][83]: (i) laws and regulations that have been carefully considered and enacted based on comprehensive assessment, analysis and consultations and can enable access to climate finance and investments and realise NDC targets; and (ii) building legal and institutional capacity through knowledge and technical expertise.

91. 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 Madagascar (such as the NAPA and the NDC), however, those are only effective when accompanied by well design, clear, coherent, flexible and enforced legislation.

92. Although a new EO decree has been drafted, the ?Draft EO Decree?, that governs all activities relating to exploiting essential oils, vegetable oils, extracts and oleoresins, it lacks the integration of climate change innovative adaptation TPS and measures/techniques that can contribute to increase climate change resilient of the sector, which is key to ensure its sustainability and growth. In fact, there is a need to build the capacity of the GEHEM to mainstream resilience and innovation along the EO value-chains and enforce sustainable development. This will be key to support the national policy and regulatory environment to foster adaptation technology investment and adoption, and to contribute to adaptation acceleration in a context of leveraging synergies through national, regional and international coordination.

93. PC1 aims to contribute towards the development of a legal and enabling framework focusing on financing mechanisms to promote adaptation TPS/measure/techniques across the EO value chains for Madagascar. This will be done, by setting up a mechanism that will (i) contribute to the development of a Sustainable EO Development Strategy, as well as foster legislation and regulations necessary to promote the uptake of innovative adaptation TPS/measure/techniques; (ii) provide a platform for collaborations across a wide range of stakeholders in both the public and private sectors; (iii) build capacity and provide information on climate change, adaptation and resilience; and (iv) catalyse innovation. This, and the collaborative platform ? the Sustainable EO Coordination Platform ?, will guarantee that the proposed interventions are closely linked to: (a) National Adaptation Planning Processes; (b) the implementation of the Draft EO decree; and (c) help to fill gaps and make use of synergies with other on-going initiatives in the country.

94. 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 Madagascar, with a view to develop a thriving and conducive innovation ecosystem for climate-resilient TPS/techniques and mainstreaming these across the EO value chains. 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 Madagascar, but none of them target adaptation MSMEs of the EO value chain in particular, and the enabling environment in which they need to be created, nurtured, and developed.

Outcome 1.1: New strategy provides direction to develop climate-resilient EO value chains

Output 1.1.1: New Essential Oils (EO) strategy developed, integrating climate change adaptation and resilience

Activity 1.1.1.1: Mapping of EO stakeholders and their priorities as well as programmes/projects/activities targeting directly or indirectly innovation, entrepreneurs and MSMEs across the EO value chains

95. To ensure the resilience of the EO value chains it is key to adapt to climate change extreme events that are expected to happen more frequently and with higher intensity in the future and that have already been impacting the Madagascar EO value chains. Thus, **it is necessary to have a clear understanding of the: (a) EO value chains in the country with clear identification of products and products derivates and (b) the different stakeholders and their activities (disaggregated by gender and youth) in the EO value chains, as well as in the adaptation, entrepreneurial and**

financing sectors, in order to ensure that integrated approaches on climate change adaptation technology and finance innovation in the EO value chains are adopted and implemented. Knowledge and information on ?who is who?, ?who is doing what?, ?how that is contributing to adaptation and contributing to increase the resilience of the EO value chains to climate change? and ?what results are expected and when? is key to the design and implement of cross-sectoral projects, such as the proposed ARCHE Project.

96. It is important to identify what the on-going processes are, as well as projects that addressing adaptation in the EO value chains. Thus, at the start of the proposed ARCHE Project a mapping exercise of the national adaptation and EO value chains planning process, as well as policies, strategies, plans, programmes and projects that target innovation, entrepreneurs and MSMEs, 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. A special focus will be put on the most vulnerable stakeholders operating in the EO value chains, such as cultivators, growers, women and youth. This will be important so that the project can create necessary synergies, in order to cooperate with on-going activities, confirm/identify the gaps that need to be addressed and provide added value to those. In addition, the capacities of the different institutions to implement the necessary policies and regulations will be assessed to identify capacity building needs to be addressed.

97. Based on findings of the Baseline Report (see Annex P) and under the guidance of Sustainable EO Coordination Platform (Activity 1.1.1.2) this mapping exercise will be conducted by the Project Management Unit (PMU).

98. **The mapping exercise will be published as a report on the ARCHE Online Website** and will allow the 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 and the EO value chains, what results are being generated and existent gaps as well as a tool to inform and guide the PSC decisions.

99. The PMU will be responsible for compiling and updating the information annually and uploading it on the ARCHE Online Platform (Output 3.2.1).

Activity 1.1.1.2: Establishment of an inclusive Sustainable EO Coordination Platform

100. The EO value chains are regulated by the Ministry of Industrialisation, Trade and Consumption (MICC), the Ministry of Environment and Sustainable Development (MEDD), and the Ministry of Agriculture and Livestock (MINAE) that they will be responsible for the implementation of the recently ?Draft EO decree? that will govern all activities related to the exploiting EO, vegetable oils, extracts and oleoresins. In addition, the decree involves a series of other public and private sector stakeholders that develop their activities/business across the value chain and has clear synergies with existing platforms of relevance, such as the Initiative Emergence Madagascar and the PEM (2019-2023)[84][84]. However, there is a need to further enhance coordination and disseminate information

across the multiple stakeholders, in order to promote the sustainable development of the sector and ensure its resilience to climate change.

101. Thus, the proposed ARCHE Project will create the **Sustainable EO Coordination Platform, hosted and co-chaired by the MEDD and the GEHEM** that will meet on a regular basis and will bring together representatives of:

National public sector institutions ? BNCC-REDD+, MINAE, MICC, National Office for the Environment (ONE), Ministry of Economy and Finance (MEF), Ministry of Water, Hygiene and Sanitation (MEAH), Ministry of Transport and Meteorology (MTM), Madagascar Bureau of Standards (BNM);

Academic and research institution ? CIRAD, CNRIT, FOFIFA;

National private sector institutions ? NGOs, CSOs representing the private sector, entrepreneurs, MSMEs and financial institutions;

International organizations ? CTCN, PFAN, CRAFT, AECF, ASAP, IFAD, WB, GIZ, GCF, AFD, UNDP; and

Vulnerable groups ? IEM, adaptation TPS consumers, such as growers? associations and cooperatives, and vulnerable population working in the EO value chains.

102. As this involves a very large number of possible stakeholders, initially and following the results of the stakeholders mapping exercise done at PPG stage, fixed members for the Sustainable EO Coordination Platform will be identified. TOR will be developed to identify these fixed members and organisations that will comprise the Sustainable EO Coordination Platform, as well as the business plan to guide their activities within the ARCHE Project. Depending on the issues to be discussed and analysed, other stakeholders will be invited to attend to meetings or discussion fora.

103. This Platform will coordinate and support the following activities:

Promote dialogue between the EO public and private sector stakeholders, ensuring coordination.

Disseminate information and knowledge on climate change and climate change adaptation TPS, and how resilient can be built within the sector and how that will contribute towards its development and sustainability.

Promote Malagasy standards on essential oil, vegetable oils, extracts and oleoresins.

Support research and development to enable technological innovation in the sector.

Encourage the integration of gender equality and youth support in the EO value chains, as well as of environmental and social considerations

Contribute towards the implementation of the proposed ARCHE Project activities, with part of its members being part of the Project Steering Committee (PSC).

104. A strong coordination effort will be needed in order to organise and guide the Sustainable EO Coordination Platform work towards the contribution to the creation of the necessary enabling legal and regulatory framework that is necessary for the proposed ARCHE 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:

105. Conducting scheduled meetings/fora among Sustainable EO Coordination Platform members (fixed and invited), having in mind the following suggestions:

Each participating institution/entity should select two representatives to attend the Sustainable EO Coordination Platform meetings, as well as one or two replacements. This will ensure that there is continuity of the people assigned to the platform throughout the project duration, as to avoid losing knowledge, information and context due to changes of representatives.

The Sustainable EO Coordination Platform work will be coordinated by MEDD and GEHEM with support from the PMU and will be responsible for scheduling meetings and informing members about upcoming dates. During the meetings, activities and tasks to be conducted will be identified and assigned to the corresponding members, indicating objectives, critical path activities, milestones and deadlines to be fulfilled. The results will be discussed in the following meeting to identify any possible delays, challenges faced, or needed adjustments.

Meeting minutes / forum proceeding will be created for each the Sustainable EO Coordination Platform meeting, including details of the discussions held and next steps, as well as a list of participation, and respective photo documentation. This is useful to avoid future misunderstandings on allocated responsibilities. They should be distributed to all members.

Creating a computer-based information sharing and storage tool within the Project?s Webpage ? ARCHE Online Platform ? 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 Sustainable EO Coordination Platform Coordinators & PMU.

Creating a communication protocol (administrative procedures and guidelines) to be followed by the Sustainable EO Coordination Platform members (e.g., who is appointed as the focal point of each organisation represented in the Platform).

Sharing the outcomes/actions of the Sustainable EO Coordination Platform with the public through the ARCHE Online Platform and through fora.

106. 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.

107. Women of the respective institutions and entities participating in the Sustainable EO Coordination Platform will be encouraged to participate in it, in order to promote equal gender opportunities. Also, the Ministry of Population, Social Protection and Women?s Empowerment and IEM as part of the Sustainable EO Coordination Platform should provide recommendations at any time on how to better integrate gender equality and youth into the project activities and respective deliverables.

108. 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 EO value chains, are created and maintained. The platform will bring together the public sector (government institutions acting within the EO value chains and adaptation, as well as International Development Agencies involved in the national adaptation planning process), the private sectors (entrepreneurs, MSMEs, financial institutions) and vulnerable groups. With MEDD co-chairing the Sustainable EO Coordination Platform and stakeholders involved in the NAP development process in Madagascar also participating in the Platform, sharing of experience and information from both the ARCHE Project and the NAP process is ensured. Also, the Platform will reach out to the Global Commission on Adaptation to enhance the country?s expertise on adaptation.[85][85].

109. The Sustainable EO Coordination Platform will meet once a year during the proposed ARCHE Project to oversee and provide inputs to ensure that the actions under the ARCHE Project are in alignment with the overall climate change adaptation strategy at national level as well as with other national actions of relevance (e.g., the PEM).

110. Towards the end of the project an assessment on the possibility of conversion of this platform into the CHNEO that is to be established until 2026 as a cooperation between the two co-chairs of the Sustainable EO Coordination Platform (MEDD and the GEHEM) will be undertaken, ensuring its sustainability after the ARCHE Project finishes.

Activity 1.1.1.3: Identification and development of a tool to assess climate vulnerability and support the identification of appropriate adaptation TPS for the EO value chains, including mapping of EO sustainable production zones

111. A better understanding of climate-related risks and vulnerability assessment throughout the EO value chains will inform the identification of adaptation TPS and innovations to receive acceleration services. Hazard and vulnerability mapping and monitoring will help identify hotspots and plan appropriate adaptation and disaster risk reduction solutions, including uptake of weather and climate services to increase resilience. Through this activity **a tool to conduct CRVAs and recommend adequate adaptation measures will be developed and made available to stakeholders in Madagascar**. The developed tool will identify TPS and innovations to be applied to the EO value

chains, including adaptation responses that promote sustainable management of biodiversity, ecosystem and ecosystem services and those will be prioritized according to the Madagascar EO value chain needs.

112. 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[86][86] and LEAP-WEAP[87][87]. 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[88][88]. Also, institutions working in the adaptation field, such as Climate-KIC are developing their own tools for that.

113. This activity aims to develop a tool that allows assessment of climate change sectors risks and vulnerabilities of the Madagascar EO value chains. The tool should:

Allow spatial analysis and identification of climate change risks and vulnerabilities across the sector 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.

Provide a catalogue of possible adaptation TPS, including sustainable production techniques and nature -based solutions, that could be adopted to adapt the sector to the different climate change risks and events, in close coordination with ASAP and their taxonomy project on adaptation solutions as well as with the General Directorate of Meteorology (DGM), Universities/Research Institutions that are conducting research into the agriculture and EO value chains (CIRAD, CNRIT, FOFIFA).

Map MSMEs, start-ups, accelerators, financial institutions that will be supported through the ARCHE Project.

114. 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.

To guide the identification/selection process by the PMU on ?what? entrepreneurs, start-ups and MSMEs, 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).

The tool can be used by the Madagascar government institutions (MEDD, BNCC-REDD+, GEHEM, MEDD etc), including research institutions and universities, and other stakeholders identified by the Sustainable EO Coordination Platform to build capacity on climate change vulnerability and risk analysis tools, with a particular focus on the EO value chains.

Systematically identify, flag and address risks of maladaptation of the EO value chains.

115. Additionally, to the tool, training material on how to use the tool and complement it/improve it with time will also be developed. The tool and the materials developed will be used to build capacity of government stakeholders and other institutions in the country, identified by the Sustainable EO Coordination Platform (see Output 1.1.2).

116. In addition, a **GIS map of the EO production zones** will be developed to be integrated into the Sustainable EO Development Strategy (Activity 1.1.1.4) with clear identification of the different sustainable exploitation methods that should be adopted taking into account the ecological balance to ensure the climate change resilience of the sector. The mapping exercise should take into consideration the existing production zones, the climate change risks and vulnerabilities identified for the sector and the proposed sustainable exploitation methods that will ensure the adaptation of the sector to the identified climate change risks and vulnerabilities.

117. It is envisaged that the CRVA tool and the EO sustainable production zone map will be then used not only on the development of the Sustainable Essential Oil Development Strategy but also to: (i) monitor the implementation of such strategy; (ii) provide online / on-time information on these zones through the ARCHE Online Platform; (iii) allow decision making during the ARCHE project implementation. The CRVA tool will be developed through a participatory process during the first year of the project. MINAE will take the lead and guide the Climate-KIC in developing the GIS map of the EO production zones. Climate-KIC will develop the CRVA tool/model and the EO sustainable production map. The CRVA tool and the EO sustainable production map will be available to all Madagascar stakeholders interested in using it. At the end of the project, these will be passed to MEDD, BNCC-REDD+, GEHEM and others interested in using it.

Activity 1.1.1.4. Development and validation of a proposal for a Sustainable Essential Oil Development Strategy

118. Under the guidance of the Sustainable EO Coordination Platform and taking into account the recent Draft EO decree and the results of activities 1.1.1.1 and 1.1.1.3, a proposal for a Sustainable Essential Oil Development Strategy will be developed. This national strategy is foreseen to provide the framework and recommendations for integrating climate adaptation into the recently published Draft EO decree, and thus fostering sustainable production of essential oil in the country. The proposal will integrate:

Identification of the EO value chains priority and its vision for the future, including its competitive advantage

Identification of the EO stakeholders, their priorities and needs (including gender-related concerns)

Identification of the EO value chains Climate Change Risks and Vulnerabilities (Activity 1.1.1.3)

Identification of the climate change adaptation TPS relevant for the EO value chains and its stakeholders, identification of EO sustainable production zones including adoption of sustainable EO production standards (Activity 1.1.1.3)

Identification of the necessary enabling conditions to adopt climate-smart adaptation technologies/measures in the sector (Output 1.1.2)

Recommendation on how to catalyse green investments and create a market pull in the climate adaptation space for priority EO value chains (Output 1.1.2)

Recommendations on the necessary policy support for key issues such as strengthening and rehabilitating forest ecosystem services, particularly through Nature-based Solutions, such as EbA, which is a prerequisite for the successful and sustainable production of EO (Output 1.1.2)

Roadmap for achieving EO sustainability and climate-change resilience

Monitoring framework for strategy implementation

119. The Sustainable Essential Oil Development Strategy will be led by the GEHEM using a participatory approach so to ensure ownership of the proposed strategy, during the first year of the project. It will integrate among other things lessons learned from the PIC, AAP and other GEF and GCF projects implemented and build on the developed taxonomy for adaptation solutions, lessons learned and best practices from the GEF SCCF Adaptation SME Accelerator Project (ASAP), in order to ensure strategic complementarity and alignment for the government officials on policy development that promotes adaptation oriented MSMEs.

120. Once drafted, the **Sustainable Essential Oil Development Strategy will be validated through a national workshop** for which MSMEs providing adaptation TPS and the various stakeholders involved in the EO value chain will be invited to. The PMU will support the GEHEM in the organization of the validation workshop as well as in the compilation of the workshop proceedings that will then be made available on the ARCHE Online Platform. It is envisaged that 50 people will participate in this workshop (of which at least 50% will be women).

Output 1.1.2: At least two (2) recommendations on regulatory instruments and measures to promote the uptake of innovative adaptation technologies and services into the EO value chains developed

Activity 1.1.2.1. Needs for regulatory instruments to incentivize investment in innovation and deployment of climate change TPS in the EO value chains assessed

121. The operational legal and regulatory framework established to promote innovation in Madagascar, as well as the legal and regulatory framework underlying the EO value chains developed will be analysed in order to identify the gaps and/or existing barriers and challenges that should be addressed in order to guide stakeholders in the adoption of climate change adaptation TPS in their business activities. This assessment will result in the development of a list of recommendations on the necessary policies, regulations, incentives and tools that should be developed addressing: (i) clear guidelines and requirements for the stakeholders to comply with (e.g., EO production standards); ii) the registration of all size producers of the EO value chains, iii) the adoption of climate-resilient technologies, products and services throughout the EO value chain.

122. The needs assessment report will also include analysis of EO market studies in order to identity how to improve EO product diversification along the value chains. In addition, it will identify needs to foster women and youth participation in the climate change adaptation market and in the EO value

chains with clear identification of what their specific needs are to innovate and carry out adaptation entrepreneurial activities for the EO value chains.

123. The **needs assessment analysis** will build on the Baseline Report findings (see Annex P). It will be carried out at the start of the proposed ARCHE project to allow the project to identify and develop some of the recommendations early in the process as well as to feed into the development of the Sustainable Essential Oils Development Strategy. It will be led by the GEHEM that is also responsible for the development of the Sustainable EO Development Strategy. The results will be presented and discussed at one of the Sustainable EO Coordination Platform meetings.

124. The results of this activity will inform the development of Activity 1.2.1.2. as well as Activity 1.1.1.4.

Activity 1.1.2.2: Develop two (2) policy/regulatory recommendations for improvement of the business environment for adaptation TPS to be integrated into the EO value chain in Madagascar considering a gender and ESS perspective approach and validate those in a national workshop

125. Based on the list of analysed policies, regulations, and tools currently in force, and following the advice of the Sustainable EO Coordination Platform, and the Sustainable Essential Oil Development Strategy, at least two (2) policy recommendations will be developed (including sustainable EO production standards). These will be developed by a Subcontracted team of experts through a consultative process. The key stakeholders from the government (MEDD, BNCC-REDD+, GEHEM and others identified) as well as agencies and associations that can provide information and expertise will be involved in this process.

126. Once the recommendations are drafted, one (1) national workshop will be organised to present them to key stakeholders (~50 people). The event will be used to discuss and validate the developed proposals before submitting them for consideration for adoption by the local authorities. The PMU will facilitate the organization of the event, and the Subcontractor will be responsible for the preparation of all the materials and presentations to be delivered in the event, including workshop proceedings summarising attendance, issues discussed and agreed actions.

Outcome 1.2: MEDD/BNCC-REDD+ and GEHEM have capacity to support integration of adaptation and resilience into the essential oils value chain

Output 1.2.1: Members of the Sustainable EO Coordination Platform trained in promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain

Activity 1.2.1.1: Needs assessment to identify the needs in terms of training on climate change and climate change adaptation TPS

127. 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 the Madagascar EO value chains. Stakeholders referred that:

There is a need to assess Universities and Training Institutions 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 across the EO value chain. 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 EO business / activities. Thus, there is a need to provide this information to create successful market for adaptation TPS for the EO value chains 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 in general and for the EO value chain, 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. The ARCHE Project ensures and the added value for developed adaptation TPS should include management/maintenance assistance, and that it 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.

128. From the analysis conducted at the PPG stage, the training should target, amongst other:

Public sector institutions that promote/regulate the climate change and the EO value chains, innovation, businesses and MSMEs as well as climate change adaptation issues: institutions represented in the Sustainable EO Coordination Platform, such as the EPA, BNCC-REDD+BNCC-REDD+, GEHEM, MEDD between others, should have knowledge and information on the climate change, climate change vulnerabilities, risks and opportunities adaptation needs for the EO value chains and on other transversal sectors to the EO one, 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 and provide it to the EO value chains.

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.

Growers, small/medium producers, vulnerable population acting on the EO value chains, including associations/cooperatives: 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, training institutes and research institutes: The education, training and research institutes should be able to know and understand climate impacts and project risks in order to educate and train on the identification and integration of climate change adaptation issues.

129. 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 stakeholders 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 1.2.1.2.

130. Climate-KIC will carry out the needs assessment that involves consultation with Universities, Training Institutions and Research Institutes (FOFIFA, CNRIT) in the country as well as with the potential beneficiaries of these training courses, including GEHEM, BNCC-REDD+, MEDD and members of the Sustainable EO Coordination Platform. This activity will be carried out at the beginning of the project implementation.

Activity 1.2.1.2: Development of the curricula and training materials for the several target groups

131. Once the target beneficiaries (government institutions, universities/training/research institutions and accelerators) and their training needs are identified, curricula for training programmes, as well as modules to include in existing Universities/ Training /Research Institutions curricula will be developed, including the necessary materials for the trainings.

132. A **train-the-trainers programme** will be developed to capacitate (i) government institution and the GEHEM; (ii) Universities/Training/Research institutions and the hubs selected in PC3 to conduct awareness raising and information sharing activities and (iii) the accelerators selected in PC2, on delivering training on climate change adaptation for the EO value chains and entrepreneurship and business development**.** These training courses will be then delivered in Activity 1.2.1.3.

133. It is envisaged that amongst other subjects, the training modules/addition to the curricula will include:

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

change adaptation mandates, including in the implementation of the newly developed Essential Oils Development Strategy

Tool developed and available to identify climate change risks and vulnerabilities (Activity 1.1.1.3)

Identification of the adaptation TPS that can be adopted in the EO value chain

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

The tools / existent mechanism that the ARCHE Project is putting in place to support entrepreneurship, innovation and the financial instruments developed in the project for both the supply and demand side of adaptation TPS for the EO value chains

Business identification, development and management

Gender and youth mainstreaming

Environmental and social safeguards mainstreaming

134. This task will be carried out by Climate-KIC. It is envisaged that Madagascar stakeholders, such as the MINAE and ONE with knowledge on sustainable agriculture, EbA and innovations are engaged in the design and delivery of these training courses by Climate-KIC?s team.

Activity 1.2.1.3: Delivery of three (3) training courses to Sustainable EO Coordination Platform to train them in promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain (with a 50% of women and 30% of youth participation target)

135. The ARCHE project will strengthen the capacities of all relevant institutions, to accelerate innovation related to sustainable production and climate-resilient technologies in the EO value chain. For that it will **organize three (3) capacity building/training courses**: (i) government institution and the GEHEM; (ii) Universities/Training/Research institutions and the selected hubs under PC3 and (ii) the accelerators that will be involved in the delivery of the activities in PC2. Other key institutions that the Sustainable EO Coordination Platform indicates will also be capacitated.

136. These courses will provide training on the developed tools in Activity 1.1.1.3 as well as provide information and raise awareness on entrepreneurship, innovation and sustainable financial mechanism related to climate change adaptation. They will use the modules proposed and developed in Activity 1.2.1.2, as well as modules developed in PC2.

137. The main aim of these training courses is to prepare selected representatives from the different institutions to use the developed tools and become qualified trainers on these subjects, contributing to creating a critical mass of knowledge and qualified people in Madagascar with knowledge and information on adaptation TPS applied to the EO value chains as well as on entrepreneurship, innovation and available financial mechanisms.

138. These training courses will be a mixture of virtual and physical meetings, allowing for the participation of national and subnational stakeholders across Madagascar. As internet connection might be an issue, and to ensure that stakeholders outside Antananarivo can be involved in the training, existing NGOs/CSOs facilities will be used as connection points across the country.

139. This activity will be led and implemented by a Climate-KIC with support from the PMU. These events are supposed to take place in the second year of the ARCHE Project and are supposed to cater to at least 15 people per course, a total of 45 people (with a 50% of women and 30% of youth participation target).

140. The following table summarises the outcomes, outputs, and activities of PC1.

PC1: Institutional capacity building and mainstreaming climate resilience into Essential Oils value chain	
PC1 is directed at contributing to at contributing to the creation of the legal and regulatory ecosystem necessary to foster the development of the adaptation market for the Madagascar EO value chains through: creating a platform for (i) coordination and discussion of issues related with climate change adaptation in the EO value chains (ii) bringing together the government, MSMEs, vulnerable groups and financial institutions; and (iii) guiding project implementation; contributing to the development of and capacity for assessing and identifying climate change risks and vulnerabilities as well as adaptation TPS applied to the EO value chains to address the identified climate change risks and vulnerabilities of the sector, hence making it more sustainable and contributing to increase its resilience to climate change; supporting the development of the Sustainable Essential Oil Development Strategy proposal; and identifying and developing recommendations for necessary policy incentives for green investment for innovation and deployment of climate change TPS across the EO value chains.	
Outcome 1.1 New strategy provides direction to develop climate-resilient EO value chain	
Output 1.1.1: New Essential Oils (EO) Strategy developed integrating climate adaptation and resilience	
Planned and Envisioned Activities	***Responsibility***
Activity 1.1.1.1. Mapping of EO stakeholders and their priorities as well as programmes / projects / activities targeting directly or indirectly innovation, entrepreneurs and MSMEs across the EO value chain	PMU
Activity 1.1.1.2. Establishment of an inclusive Sustainable EO Coordination Platform	MEDD and GEHEM with support from the PMU Public and private sector organizations, academia and research institutions, accelerators, MSMEs, FSPs, CSOs, NGOs
Activity 1.1.1.3. Identification and development to assess climate vulnerability and support the identification of appropriate adaptation TPS for the EO value chains, including mapping of EO sustainable production zones	Climate-KIC with guidance from the PMU and the DGM
Activity 1.1.1.4. Development and validation of a proposal for a Sustainable Essential Oil Development Strategy	GEHEM with guidance from the Sustainable EO Coordination Platform and support from the PMU

Output 1.1.2: At least two (2) recommendations on regulatory instruments and measures to promote the uptake of innovative adaptation technologies and services into the essential oil value chains developed	
Planned and Envisioned Activities	***Responsibility***
Activity 1.1.2.1**.** Needs for regulatory instruments to incentivize investment in innovation and deployment of climate change TPS in the EO value chains assessed	GEHEM
Activity 1.1.2.2. Develop two (2) policy/regulatory recommendations for improvement of the business environment for adaptation TPS to be integrated into the EO value chain in Madagascar considering a gender perspective approach and validate those in a national workshop	Subcontractor with guidance from the GEHEM and the Sustainable EO Coordination Platform
Outcome 1.2: MEDD/BNCC-REDD+ and GEHEM have capacity to support integration of adaptation and resilience into the essential oils value chain	
Output 1.2.1: Members of the Sustainable EO Platform trained in promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain	
Planned and Envisioned Activities	***Responsibility***
Activity 1.2.1.1. Needs assessment to identify the needs in terms of training on climate change and climate change adaptation TPS	Climate-KIC
Activity 1.2.1.2. Development of the curricula and training materials for the several target groups	Climate-KIC
Activity 1.2.1.3. Delivery of three (3) training courses to the Sustainable EO Coordination Platform to train them in promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain (with a 50% of women and 30% of youth participation)	Climate-KIC with support from the PMU

PC2 Innovative adaptation technologies and services promoted and deployed along the EO value chain

141. This component will promote the development, commercialization, and deployment of adaptation TPS along the EO value chain by supporting adaptation MSMEs to develop their innovations, improve their businesses and better access finance. For that, and through calls for proposals with clearly defined selection criteria will be launched and widely disseminated to attract local adaptation MSMEs that have already successfully piloted their solutions to receive specialized training and technical assistance to help them understand and access financial services such as microfinance products for improving their innovations. At least 21 successful adaptation MSMEs will receive specialized business growth support 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 EO value chains. More specifically, Outcome 2.1 focuses on MSMEs/entrepreneurs? identification, training and business incubation/acceleration support while Outcome 2.2 on investment facilitation services for MSMEs/entrepreneurs 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 across the EO value chain. To enable this, the PMU, in coordination with existing accelerators, will establish and run a dedicated EO Adaptation Accelerator with the following stepwise approach:

(i) Pre-Accelerator:

i) will build the capacity of existing institutions (e.g., existing accelerators, research institutions, universities) to mainstream climate change adaptation into their programmes through a four (4) to six (6) weeks training course and to become accelerators within the ARCHE Project. Dedicated trainings will be provided to enable these 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[89][89], adaptation TPS and maladaptation and identify business opportunities of innovative technologies for climate change adaptation across the EO value chains of Madagascar, among others (see Activity 2.1.1.2).

ii) will support around 45 MSMEs/entrepreneurs acting in the EO value chains (Activity 2.1.1.4):

ii.a) by building their capacity on how to assess climate risks and vulnerabilities, learn about climate change and ASAP taxonomy, adaptation TPS applicable to the EO value chain and maladaptation, and by identifying business opportunities for innovative technologies for climate change adaptation applicable to the EO value chains and how that will contribute towards the implementation of the Sustainable EO Development Strategy, among others.

ii.b) by providing developing/validating initial adaptation business concepts (i.e., proof of concepts) through workshops, hackathons, start-up camps, etc. This will contribute to increase the quality of the applications submitted to the Accelerator.

(ii) Accelerator ? will contemplate an Acceleration, Advanced Acceleration and Post Acceleration programmes which adaptation MSMEs/entrepreneurs can benefit from. The EO Adaptation Accelerator, such as the Pre-Accelerator will be established during the first year of the ARCHE Project (including the development of the necessary materials for the Adaptation Acceleration Programme, preparation of the ARCHE Online Platform to release the calls and receive the proposals and training of the selected accelerators to run the competitions) and the competitions will run from the Y2 to the Y4 of the ARCHE Project (see Activity 2.1.1.5).

The EO Adaptation Accelerator will have in total three (3) different types of annual competitions/acceleration programmes, that will run sequentially:

ii.1) Acceleration ? is a two (2) to three (3) months programme designed to support high-impact innovative adaptation entrepreneurs/MSMEs to develop viable business models and transform their ideas into fast-growing scalable and investable enterprises. Through the EO Adaptation Accelerator, a cohort of adaptation entrepreneurs/MSMEs with a high-impact potential is identified and invited to receive intensive business and entrepreneurship training (as a group training), mentoring, and coaching based on the state-of-the-art international expertise, in particular with the aim to a) improve their business skills and investor pitch, b) connect them to potential business partners, financiers, and investors, and c) maximize the expected net climate benefits of their solutions.

ii..2) Advanced-Acceleration ? is a service primarily offered to selected innovators/entrepreneurs/MSMEs that have participated in the Accelerator Programme or entrepreneurs/MSMEs that already have an established business but are looking for further support. It

is focused on providing tailored and needs-based individual support, and will also provide some group training, mentoring, and coaching. The Advanced Acceleration Programme is time-bound and outcome-focused, i.e., there are concrete milestones that need to be achieved within a specific timeframe, that are defined according to the applicant needs. The support is provided by one or several Executives in Residence (EIR) that are senior practitioners (executives or entrepreneurs) with hands-on experience in scaling up adaptation enterprises, and it is focused on problem-solving, i.e., tackling very specific operational, financial, and strategic issues. Also, in the advanced acceleration stage, entrepreneurs/MSMEs will receive training/assistance in four related but not necessarily linear dimensions: (a) advanced business growth and commercialization, (b) investment readiness, (c) market readiness, and (d) technology readiness.

ii.3) Post-Acceleration ? will provide tipping-point investment facilitation support services to the selected adaptation MSMEs/entrepreneurs. As in the previous step, these could be MSMEs or entrepreneurs they have gone through all the advanced acceleration process or others that enter the programme directly. Also, as part of the post-acceleration, MSMEs/entrepreneurs will be connected to financers (through PFAN, MIARAKAP (I&P), and other).

142. It is envisaged that the Accelerator will assist at least 21 MSMEs / entrepreneurs over the project duration (an average of 7 per year from Y2 to Y4). The MSME/entrepreneurs that enter the Accelerator may be companies that come from the Acceleration Programme or that have applied directly and did not participate in the previous stage of the EO Adaptation Accelerator. However, these companies should have gone through the Pre-Accelerator, 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 indicators for business performance and climate change adaptation benefits. In particular, these MSMEs/entrepreneurs will fill out the application forms and the questions will be designed in a way that it becomes evident whether the MSMEs are mature enough to classify for the Accelerator Programme. At this point in time, it is not possible to refer how many MSMEs/entrepreneurs out of the 21 will be engaged in each of the three Accelerator?s programmes as that will depend on the applications received and the necessary support that they require.

143. In any of the three stages of the Accelerator the MSMEs/entrepreneurs will have the possibility to request assistance in finding financial support. Two distinct financial barriers impede MSME/entrepreneurs 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?**[90]*[90]. 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 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. Although, the EO Adaptation Accelerator will not be providing direct financing to the MSMEs/entrepreneurs that go through the Accelerator programmes, it will support the ones entering the Advanced Acceleration and Post-

Acceleration Programmes with business facilitation service, connecting them with potential investors/financiers through PFAN, MIARAKAP (I&P), CRAFT, and others.

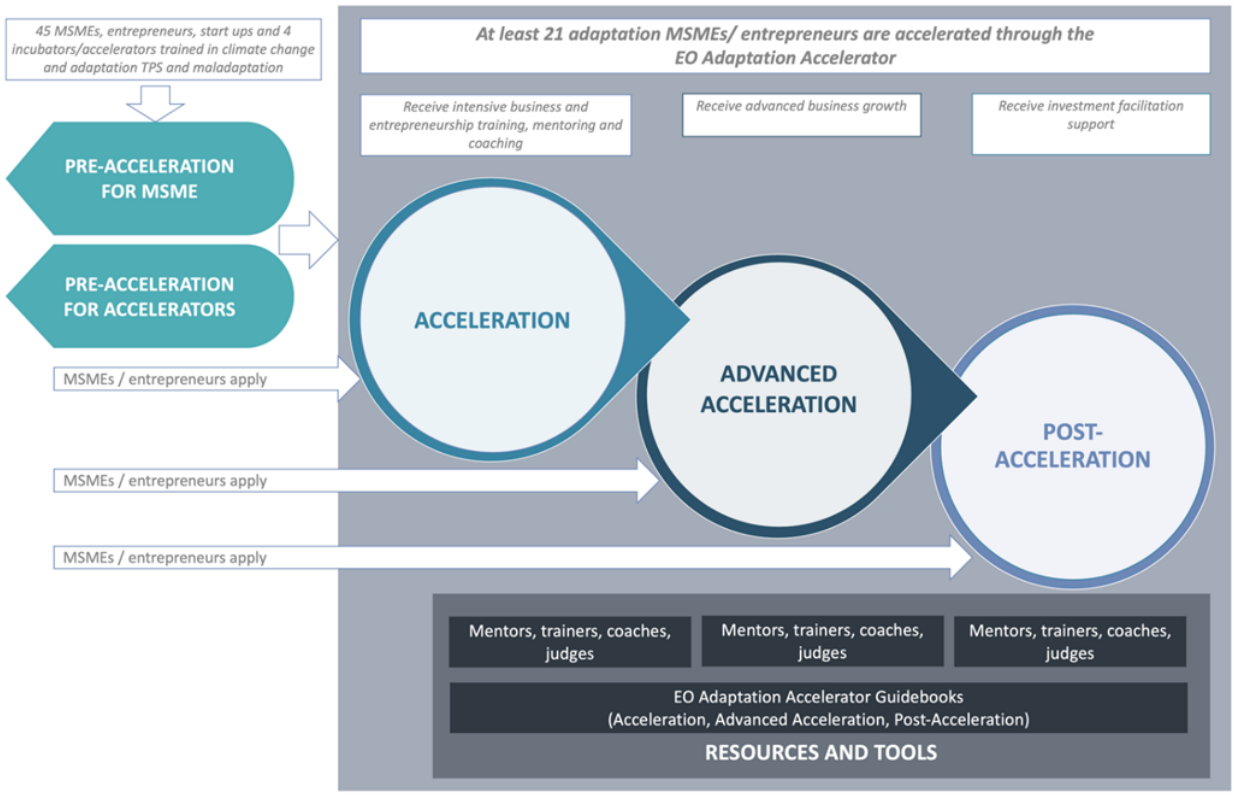


Figure 12: overview of msmes/entrepreneurs acceleration support

Note: The programmes of ?Acceleration? and ?Advanced Acceleration? within the EO Adaptation Accelerator aim to address the ?Technological Valley of Death? and the ?Post-Acceleration? programme the ?Commercialization and scaling-up Valley of Death?

144. For the design of the training modules/ mentoring and for the provision of business facilitation services the ARCHE Project will partner with:

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 as well as it 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 AFCIA (Adaptation Fund Climate Innovation Accelerator) programme funded by the Adaptation Fund., with which the EO Adaptation Accelerator established through the ARCHE Project will establish links with.

Climate Resilience and Adaptation Finance & Technology Transfer Facility ***[91]***[91] *(CRAFT): CRAFT was the first private sector climate resilience and adaptation investment fund and technical assistance facility for developing countries. It has invested in companies with climate resilience solutions in 20 market segments including agriculture, water, energy, transportation, and finance. CRAFT (developed by Lightsmith Group) is a growth equity fund (that has received funds from the Global Environment Facility (GEF) and from Nordic Development Fund that, together with an accompanying Technical Assistance Facility, support companies ? through conduction of weather analytics, catastrophe risk modelling services, among others ? to expand into new sectors and geographic markets. CRAFT target companies in countries already experiencing substantial economic losses from climate change.*

Adaptation SME Accelerator Project (ASAP) ***[92]***[92]*. The ARCHE 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 the EO Adaptation Accelerator and adapt those to have an adaptation focus. Successful MSMEs/entrepreneurs which are identified at the EO Adaptation Accelerator implemented by the ARCHE project will be indicated to be integrated in the ASAP database. 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 13).*

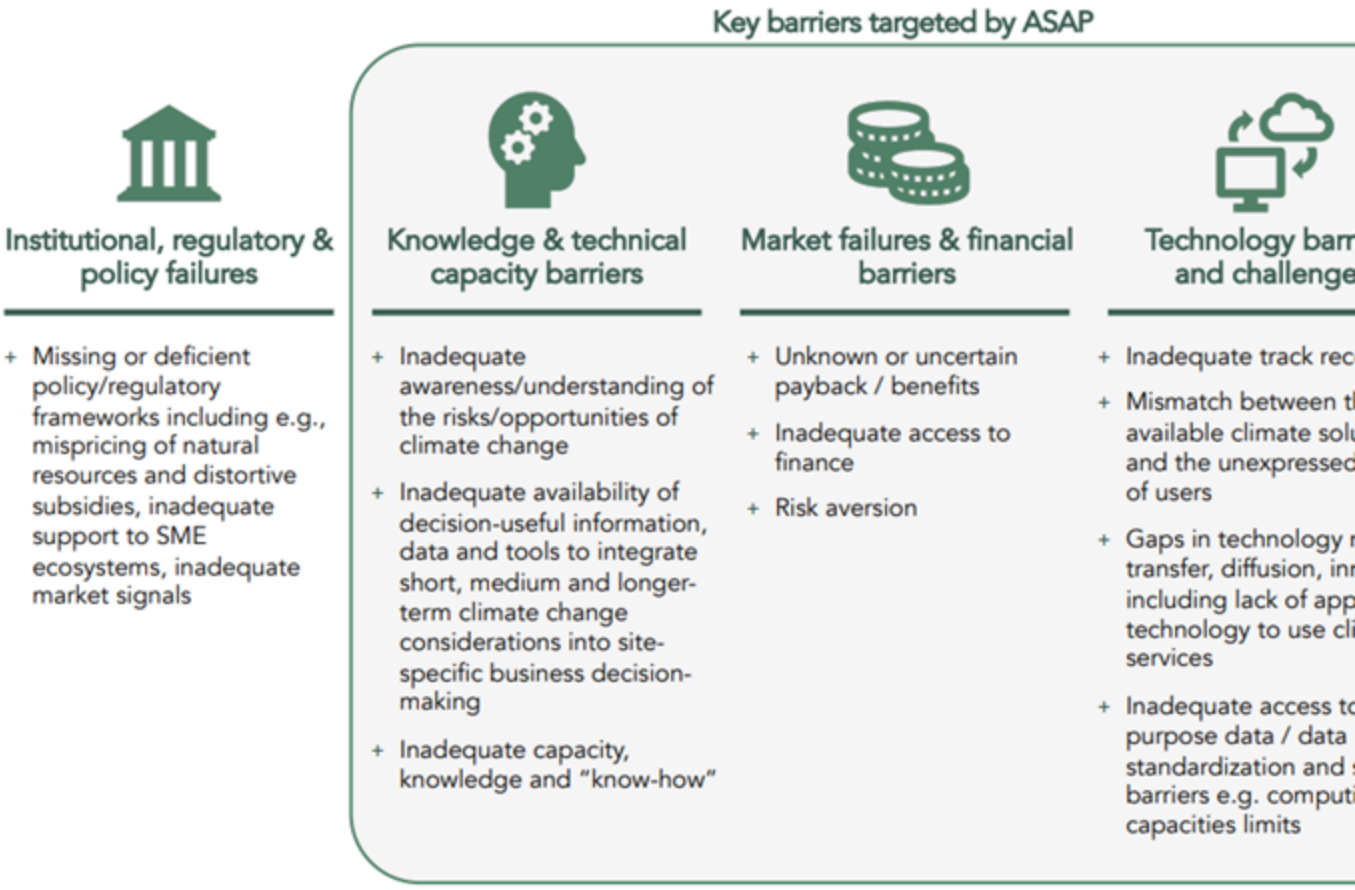


Figure 13: Barriers targeted by ASAP

Adaptation Accelerator Programme (AAP)[93][93] is an adaptation technology accelerator developed and implemented by Conservation International (CI) to provide mentorship, training, and capital investment focused on maturing climate change adaptation business models being developed by local enterprises by improving fundamental business and entrepreneurial skills; facilitating market expansion; and providing catalytic investment which facilitates access to larger private sector investment for Madagascar and Liberia. The ARCHE Project will establish strong links with the AAP: in one hand AAP will complement the ARCHE Project by providing sector expertise and mentoring on agri-business development based on climate-resilient technology and sustainable production practices; and on the other hand, adaptation MSMEs/entrepreneurs from the AAP that have TPS that can be provided to the EO value chains will be invited to participate to the calls launched by the proposed project.

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

Outcome 2.1 Proven innovative adaptation technologies and services are promoted and piloted along the essential oils value chain

Output 2.1.1: At least 21 MSMEs with proven and high-impact innovative climate change adaptation-oriented technologies and solutions for the essential oil value chain receive acceleration services (training, coaching, mentoring and business growth support)

Activity 2.1.1.1: Design the EO Adaptation Accelerator Programmes ? Pre-Accelerator and Accelerator

145. The objective of this activity is to design the EO Adaptation Accelerator programmes, which include the Pre-Accelerator and Accelerator Programmes, as well as all the materials underlying its delivery.

Activity 2.1.1.1(a) Design the Pre-Accelerator Programmes

146. Within the Pre-Accelerator, two (2) programmes will be designed:

(a) Train-the-trainers programme for accelerators? to build the capacity of selected institutions to become the accelerators to support the delivery of all EO Adaptation Accelerator Programmes that will run throughout the ARCHE Project implementation period.

(b) General programme for the MSMEs/entrepreneurs. The training will include the programmes developed under Output 1.2.1 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 EO value chains and in the regions of Madagascar where the EO value chain is most prone to experiencing climate risks.

A training module in the Adaptation Taxonomy so that accelerators know what adaptation technologies are and are able to identify MSMEs/entrepreneurs to participate in the EO Adaptation Accelerator programme. The Adaptation Taxonomy[94][94] *developed by ASAP, that, as explained above, is an initiative led by the Lightsmith Group, is used 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 TPS 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 example, drought tolerance crops, water-efficient irrigation systems, water storage and harvesting, mini-grid based on renewable energy sources). This tool will be used in the ARCHE Project for the identification of possible adaptation TPS that can be used in the EO value chains of Madagascar and allow the project to identify the MSMEs that will be accelerated. Table 15 and Table 16 of the Baseline Report (Annex P) provide a list of Climate Adaptation Intelligence and Climate Adaptation TPS already identified for the EO value chains and the climate events that these technologies can be applied to.*

A training module to raise awareness of MSMEs on suitable and available technologies and practices that reduce climate risk and vulnerability in the EO value chains of Madagascar. The training module

will allow them to learn about specific adaptation solutions and potential business opportunities in the Madagascar EO value chains. For example, they will be trained to improve soil and water management and sustainable EO production.

Training on the developed tools in Output 1.1.1 (under PC1).

Specific training modules as part of the acceleration curriculum to address gender and youth 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, increased vulnerability to climate change, or diminished welfare, now or in the future [95][95]*.? 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. See Annex J: ESMP 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 (see Annex J: ESMP)

A training module on basic business concepts and support in the development of initial concepts.

147. The CRVA in the Baseline Report can be a resource to design the first two modules (see Annex P). The report provides information and includes a full range of best-practice examples and best available adaptation technologies for Madagascar EO value chains that could be used in these training sessions.

148. These training programmes will be designed to be taught virtually and physically, allowing the programmes to reach wider audiences within Madagascar. The design of the programmes will be carried out by a subcontractor (e.g., Climate-KIC).

149. At this stage the procedures and guidelines for launching a call for the Pre-Acceleration Programmes and selecting the institutions to become accelerators / and the MSMEs/entrepreneurs will be defined. Details on the drafted selection criteria to be used for the accelerators can be found in Activity 2.1.1.2. For the MSME/entrepreneurs, there will be no 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 EO value chains and are interested in learning and venturing into

adaptation TPS. This phase is very important since it will help the selected accelerators that will run the EO Adaptation Accelerator to identify companies that can go through the Acceleration process.

Activity 2.1.1.1 (b) Design of the Accelerator Programmes

150. The goal of the **Accelerator Programme** is to enhance the talent in the country (particularly among young and women), and to formalize the MSMEs/entrepreneurs. To ensure that successfully accelerated adaptation MSMEs/entrepreneurs that can provide their TPS in the EO chain are 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. 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 affecting the sector and to maladaptation.

151. This process will create a pipeline of MSMEs/entrepreneurs in Madagascar that will provide suitable and localized adaptation-oriented TPS to stakeholders acting in the EO value chain. Chosen technologies and innovative ideas will demonstrate that they can improve productivity and boost employment opportunities in the EO value chains. These top innovators will be showcased at national and regional fora and participate at roadshow demonstration to the EO value chains stakeholders across the country. Women and youth led and focused MSMEs will be highlighted in annual competitions for adaptation innovation. Awards such as ?Best Woman Entrepreneur in Adaptation in the EO value chain? will be created and awarded. Furthermore, the collaboration with ASAP Project will provide an opportunity for successful MSMEs/entrepreneurs accelerated through the EO Adaptation Accelerator, to integrate ASAP Adaptation Database, plugging into regional and global network of businesses.

152. Within the Accelerator, three (3) programmes will be designed to be implemented: (a) Acceleration; (b) Advanced Acceleration; and (c) Post-Acceleration.

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

154. The rules and procedures that will be used in the competitions as well as the curricula/programmatic content will be designed for each Accelerator programmes (Acceleration, Advanced Acceleration and Post-Acceleration Programmes). As above referred the Acceleration programme is expected to last between two (2) to three (3) months. The duration of the other two programmes will depend on the needs of each MSME/entrepreneur but are expected to last approximately one (1) to two (2) months each, depending on the type of support required.

155. During the design of the different curricula/programmes, the programmes and curricula already offered by the selected accelerators will be taken into account and when possible adapted to be used as materials. Additional subjects and materials will then be prepared to complement and/or update existing materials as necessary.

156. The project will ensure that the MSME operations / infrastructure in the EO value chains are resilient: business plans will be mandated to reflect the realities that climate shocks can and will disrupt adaptation technology proliferation. Training to be provided 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 in the Madagascar EO value chains.

157. The EO Adaptation Accelerator programmes 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 in the EO value chains. Through the Accelerator programmes local adaptation MSMEs/entrepreneurs will be trained to adapt technologies and services developed in other countries and replicate them in line with local markets and adaptation needs.

Foster the creation of business partnerships with international and regional MSMEs. 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.

*Use the methodology for accelerating adaptation MSMEs defined by 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 in the EO Adaptation Accelerator programmes to ensure alignment and consistency. ASAP?s three- pronged intervention strategy entails**[96]***[96]*:*

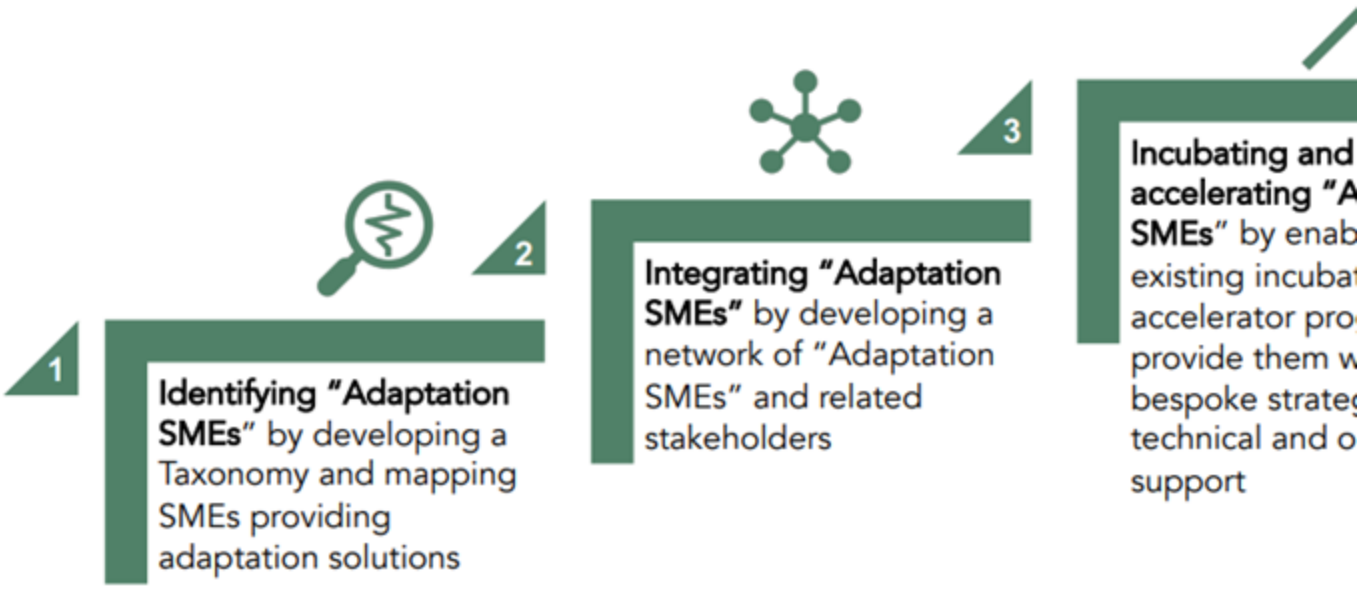


Figure 14: **ASAP?s three-pronged intervention strategy**

Highlight and reward the best Nature-based Infrastructure innovations, such as, restoring soil quality with crop rotation schemes and adopting sustainable EO production techniques and sustainable techniques where appropriate.

Collaborate with CTCN in the development of the guidelines for identification and evaluation of the different types of assistance when looking for adaptation solutions. The EO Adaptation Accelerator will establish links with the CTCN Incubator Programme as well as with CTCN Adaptation Fund, that can provide financial assistance for adaptation upon the country?s request (in this precise case, through the Madagascar National Designated Entity.

158. Building the EO Accelerator Programmes 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.

159. During the PPG stage the **selection criteria for MSMEs/entrepreneurs** entering each of the different programmes were drafted, based on the identified climate change risks and vulnerabilities of the EO value chains and the adaptation TPS that can help address those and make the sector more resilient to climate change. Furthermore, the selection process will be guided by the E&S standards of the MSMEs and the respective ESIA if necessary. These criteria include:

Any MSMEs/entrepreneurs offering innovative climate adaptation TPS with strong adaptation solutions to address climate change hazards and risks in the Madagascar EO value chains. They should provide adaptation TPS that are affordable and accessible solutions to be implemented in the EO value chains by stakeholders, especially the most vulnerable ones (MSMEs of the agro-value chain, women farmers/crop growers, ethnic) in the targeted regions of the ARCHE Project. Section 1.2 of this

GEF CEO Endorsement Document identified the vulnerabilities, including the most vulnerable across the EO value chains, as well as their adaptative capacity to 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 TPS that will support the sector to adapt and build resilience to climate change adaptation will be selected to be accelerated. A comprehensive list of innovative adaptation TPS was compiled during the PPG stage and can be found in Table 15 and Table 16 of the Baseline Report (Annex P)

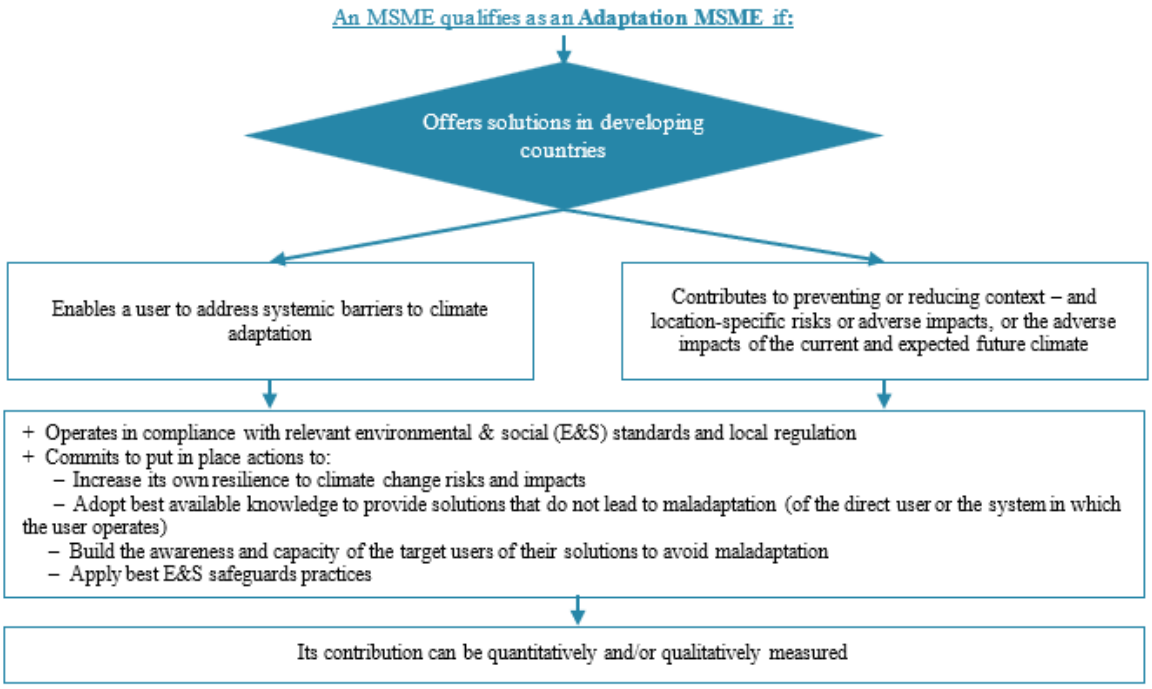
*MSMEs/entrepreneurs that provide adaptation TPS and qualify under the Adaptation Taxonomy framework**[97]**[97] developed by ASAP as an adaptation MSME. If the applications of adaptation MSMEs/entrepreneurs present their clear understanding of adaptation taxonomy, linking to climate change risks and vulnerability of the Madagascar EO value chains but are not included in Table 15 and Table 16 of the Baseline Report (Annex P), they should still be considered to be included in the EO Adaptation Accelerator programmes. Box 1 present the definition of MSME and Figure 15 the screening criteria according to ASAP.*

Priority will be given to innovative climate adaptation TPS and business models with strong catalytic and multiplier effects, hence maximizing the impact for resilience building across the EO value chains. For example, nature- based Infrastructure solutions due to their integrated approaches and cross-sectoral benefits.

MSMEs/entrepreneurs that demonstrate that their solution applies E&S criteria and that they address the risk of maladaptation: it is important to make sure that the MSMEs supported to be promoting a TPS that leads to adaptation, do not lead to maladaptation. Maladaptation Assessment Frameworks are described in the ESMP (see Annex J) to help select MSMES/entrepreneurs that promote adaptation that do not lead to maladaptation.

BOX 1: DEFINITION OF ADAPTATION MSME

An **Adaptation MSME** is a company providing technologies, products and/or services that[1]:
Addresses systemic barriers to adaptation strengthening user's ability to understand and respond to physical climate risks and related impacts and/or capture related opportunities
AND/OR
Contribute to preventing or reducing material physical climate risks and/or the adverse associated impacts on assets, economic activities, people or nature
AND
Does no harm and generates long term value



Enables a user to address systemic barriers to climate adaptation

Contributes to preventing or reducing context ? and location-specific risks or adverse impacts, or the adverse impacts of the current and expected future climate

+ Operates in compliance with relevant environmental & social (E&S) standards and local regulation

+ Commits to put in place actions to:

? Increase its own resilience to climate change risks and impacts

? Adopt best available knowledge to provide solutions that do not lead to maladaptation (of the direct user or the system in which the user operates)

? Build the awareness and capacity of the target users of their solutions to avoid maladaptation

? Apply best E&S safeguards practices

Its contribution can be quantitatively and/or qualitatively measured

Figure 15: Screening criteria for identifying ?adaptation MSMEs?**[98]**[98]

160. In addition to the selection criteria described above, which are the ones suggested to be used to select the MSMEs/entrepreneurs to go through the Acceleration Programme (first stage of the EO Adaptation Accelerator), the following are the ones to be used to select the MSMEs/entrepreneurs to go through the other two subsequential programmes (Advanced Acceleration Programme and the Post-Accelerator Programme):

MSMEs/entrepreneurs that have innovative climate adaptation solutions for the EO value chains with strong catalytic and multiplier effects; business models with potential for replication and scaling-up and hence maximizing impact for sector resilience building 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 that (i) promote women and youth innovators /entrepreneurs; and (ii) that have a significant impact on gender-responsive employment creation.

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.

Priority will be given to the MSMEs/entrepreneurs whose TPS can provide benefits in the short, medium and long term according to Table 17 of the Baseline Report (Annex P).

161. The **Acceleration Programme** will support high-impact innovative adaptation entrepreneurs/MSMEs to develop viable business models and transform their ideas into fast-growing scalable and investable enterprises. In terms of content, the Acceleration Programme is envisaged to include the following contents:

The generation of viable business ideas and formulation of business plans to launch adaptation TPS that can be incorporated into the EO value chain. At start-up, there are commonalities among all entrepreneurship process even though the adaptation 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 **[99]**[99] *depicted in Figure 16.*

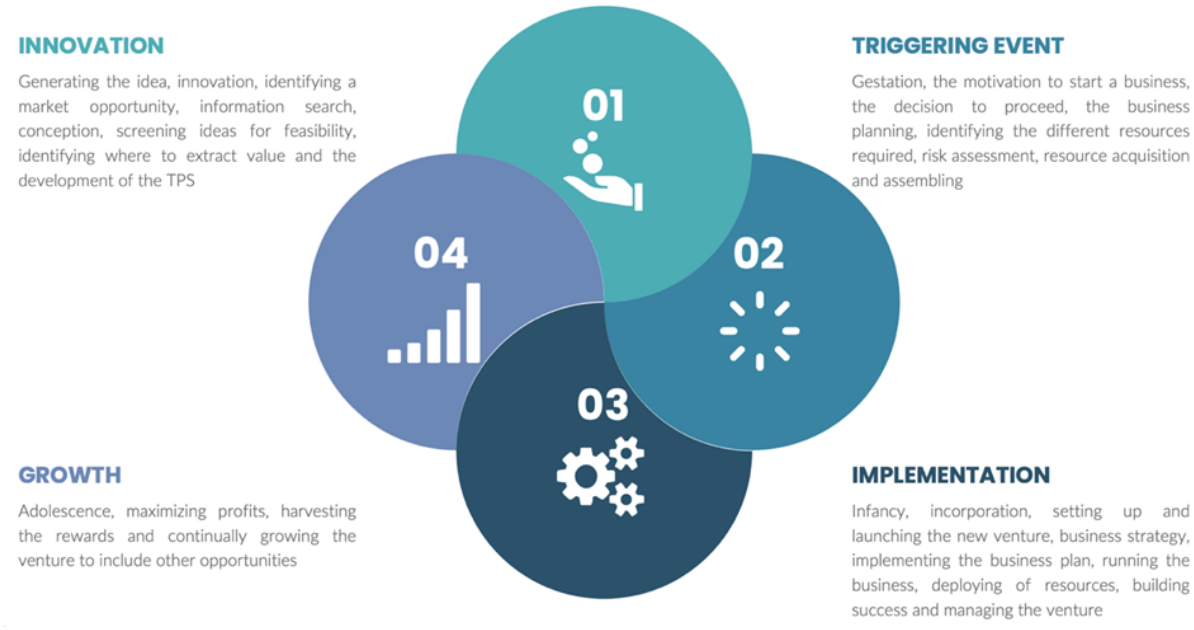


Figure 16: The Entreperneurship Process**[100]**[100]

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) across the EO value chain

Communication skills to help MSMEs/entrepreneurs to gain visibility in Madagascar and internationally (this will include skills in social media and learning the benefits and usefulness of having a business website).

Training and technical assistance workshop will help them understand and access financial services such as microfinance products for improving their innovations. This will also provide them support on how to prepare quality business plans that are consistent with existing financing mechanisms

Specific training modules about gender mainstreaming (see Annex I Gender Analysis) and youth mainstreaming will be integrated. The project will also seek to ensure women empowerment through (i) specific training and mentoring to promote women innovators, entrepreneurs in the EO value chains; and (ii) design of specific prizes and follow-up support programmes for innovative MSME/entrepreneurs that have a significant impact on women?s entrepreneurial development and gender responsive employment creation.

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.

162. The **Advanced Acceleration Programme** will support MSMEs/entrepreneurs to progress 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[101][101]. The Advanced Acceleration programme will help them overcome these barriers by training MSMEs/entrepreneurs in the last stage of the Entrepreneurial process (see Figure 16) and provision of investment facilitation services.

163. Although the Advanced Acceleration Programme is supposed to provide tailored and needs-based individual support, including some group training, mentoring and coaching, the programme will provide training on advanced business growth and commercialization support, investment readiness, market readiness, and technology readiness which will help address the last stage of the stage of the Entrepreneurial process depicted in Figure 16. 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 regarding 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.

164. Depending on the needs of the selected MSMEs/entrepreneurs, on the above referred areas and so materials will be developed for that. The **Post-Acceleration Programme** will:

Provide tipping-point investment facilitation support services to the selected adaptation MSMEs/entrepreneurs.

Provided one-on.one support to improve their business skills and investor pitch and connect 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 financial services available in the country.

Support and foster the establishment of partnerships to grow their business.

Provide 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

165. 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 TPS to the EO value chains. The project will leverage UNIDO?s strong connection of adaptation MSMES and their projects to PFAN 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.

166. Although the details on the submission of the applications will be detailed at the start of the project, it is envisaged that for the MSMEs/entrepreneurs to apply to any of the EO Adaptation Accelerator programme they will have to register an account on the ARCHE Online Platform and provide its basic information and optional information such as website address, co-founder picture, social media link, and an introduction video. Most importantly, entrepreneurs with 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 (*How Do Accelerators Select*

Startups? Shifting Decision Criteria Across Stages)[102][102] with a list of questions that could be used for this project. Once these MSMEs/entrepreneurs have registered and completed the form, the selection process will consist of two stages:

1st 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 Sustainable EO Coordination Platform and the selected accelerators in Activity 2.1.1.2., and the 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.

2nd stage: In person or online interview will be carried out to shortlist the best applications to select the enterprises that will participate in the different Accelerator programmes based on the selection criteria described above and their growth path. Additional information might be requested in order to make this final selection.

167. Also, when drafting the guidelines and procedures underlying each of the Accelerator programme, the guidelines and procedures to request and received finance under each of the three programmes will also be clarified. Details on that are

168. 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 and the chosen accelerators and relevant stakeholders (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 2.1.1.2: Select at least four (4) accelerators (from existing accelerators, research institutions and/or universities) and train them to run the EO Adaptation Accelerator programmes

169. The objective of this activity is to select at least four (4) accelerators, research institutions and/or universities and train them through a train-the-trainers programme on the different programmes under the EO Adaptation Accelerator (designed in Activity 2.1.1.1), with the objective of having the trained institutions providing these trainings from Y2 to Y4 of the ARCHE Project, and beyond it, to selected adaptation MSME/entrepreneurs with TPS that can supplied to the EO value chains.

170. Thus, in this activity capacity of the selected institutions will be built to implement the EO Adaptation Accelerator programmes, and so, to assist adaptation MSMEs/entrepreneurs to assess their business exposure to climate risks and vulnerabilities as well as the identify business opportunities for climate change adaptation across the EO value chains and /or grow their business.

171. **The accelerators will be selected by the PMU** during project implementation **through a call for proposals** to undergo training. A list of accelerators was compiled at PPG stage and is included as Table 4 in the Baseline Report (Annex P). Of this list MIARAKAP (I&P) express interest to be one of the accelerators delivering the programme. Three additional ones will be selected at the start of the

project. It is expected that Activity 1.1.1.1 under PC1 will support the further identification of accelerators that exist in Madagascar, the type of services they provide and to what type of businesses, which will help to complement this list and provide further detail on each of them. It is important to note that, from the investigation carried out during the PPG stage, the existent accelerators in Madagascar do not have the knowledge and/or information on climate change adaptation in general and in the EO value chains and/or climate change adaptation TPS in general or for the EO value chains. The existent ones provide general acceleration services that are not palatable to the specific need of adaptation MSMEs. Besides MIARARKAP, three (3) different institutions will be chosen as accelerator to ensure that there is a diversity in the Madagascar EO Adaptation Accelerator programmes offered. This will also contribute to minimize delivery risk.

172. The **criteria used for the selection of these accelerators** will be established by the PMU and discussed and agreed with the Sustainable EO Coordination Platform at the start of the project. These selection criteria should include, but are not limited to:

Expertise to train adaptation MSMEs/entrepreneurs in the different programmes (Accelerator, Advanced-Accelerator and Post- Accelerator) (see the different curriculum/ programmes indicated in Activity 2.1.1.1).

Geographical scope of intervention: accelerators located in the selected Madagascar regions should be selected to run the annual EO Adaptation Accelerator competitions. Still, some accelerators that may not be located in the targeted regions but are interest in establishing business in those could be selected based on their expertise.

Requirement that they have gone through the train the trainers' programme on promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain (see Activity 1.2.1.3).

How they will tailor/adapt their existing accelerator programmes to contemplate specific calls for adaptation MSMEs/entrepreneurs that can provide their services to the EO value chain.

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 EO value chains

Experience working with adaptation MSMEs/entrepreneurs.

Knowledge on national regulation requirements to support MSMEs/entrepreneurs in quality/safety standards and in the environmental and social risks on their technologies. Stringent monitoring of innovations will be carried out post-ARCHE 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 EO Adaptation Accelerator. Throughout all EO Adaptation 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. The EO Adaptation Accelerator should target at least >50% of women-led enterprises.

173. For each criterion, scoring will be given to make the assessment and selection process as clear as possible. These will be defined by the PMU and the Sustainable EO Coordination Platform. The selection criteria will be made available to all institutions invited to present proposals to become accelerators. The selection process will be carried out by the PMU, which will prepare a report evaluating all the received proposals and selecting the accelerators that are envisaged to carry out the competition?s cycles.

174. Once selected through a competitive process, MIARAKAP and the other selected accelerators will **undergo an accelerators train-the-trainers programme**, in which they will be trained in delivering the established EO Adaptation Accelerator programmes. For that, Climate-KIC will identify the capacity building needs of the selected 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 / MSMEs. It is envisaged that the accelerators capacity will be built on:

The process that should be followed to open the calls under the EO Adaptation Accelerator, to identify the MSMEs/entrepreneurs to go through the different programmes of the Accelerator. This will also include the needs and formats of publicity campaigns to attract adaptation MSMEs / entrepreneurs to submit their ideas and to be accepted as a cohort of companies in the different programmes.

The process that needs to be implemented for the selection of the adaptation MSMEs/entrepreneur applicants to participate into the different programme cycles within the EO Adaptation 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 EO Adaptation Accelerator.

175. The **capacity building will be done in an intense 1-week training session** for the selected accelerators running the competitions cycles by Climate-KIC after the establishment of the EO Adaptation Accelerator programmes (Activity 2.1.1.2), estimated to happen in the last quarter of first year of the ARCHE Project. Yearly refreshers will also be provided during the course of the project by Climate-KIC.

Activity 2.1.1.3. Communication and outreach activities of the EO Adaptation Accelerator

176. The outreach and communication activities related to the launch of the different programmes and respective calls for applications for annual cycles of the EO Adaptation Accelerator will be led by the PMU and the selected accelerators with the involvement of local business associations / cooperatives (especially those dedicated to encouraging women-led businesses and entrepreneurship to achieve fair share of female-led and/or gender balanced MSMEs) and universities/research institutions that would like to get involved, to enlarge and improve the potential businesses 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 the ARCHE Online Platform (as already mentioned, special efforts will be made to have this platform/webpage translated in some of the local languages spoken in Madagascar to increase the success of outreach and communication activities).

177. It is foreseen that the different institutions engaged in the Sustainable EO Coordination Platform will provide support to the PMU on advertising and communication activities.

Activity 2.1.1.4: Train at least 45 MSMEs/entrepreneurs on climate adaptation topics to increase their capacities to understand climate risks and vulnerabilities and to identify business opportunities for climate change adaptation in the EO value chains within the Pre-Accelerator Programme (aiming at 50% women and 30% youth participation)

178. From Y2 to Y4 of the ARCHE project, the **Pre-Accelerator programme for MSMEs/entrepreneurs will be launched through an open call for proposals,** that will be advertised on the ARCHE Online Platform as well as using other media to try to reach out to as many MSMEs/entrepreneurs with adaptation related TPS and or interested in providing adaptation related TPS to the EO value chains. The ARCHE Online Platform will host the registration for the Pre-Acceleration Programme.

179. After receiving the applications, the accelerators will select the cohort of MSMEs/entrepreneurs that will go through the programme and announce it on ARCHE Online Platform. The accelerators will be responsible for launching/closing/selecting the cohort of MSMEs/entrepreneurs with supervision from the PMU. The PMU will be responsible for guaranteeing that the ARCHE Online Platform is operational for advertising the open calls and to receive the applications as well as for supporting communication and outreach activities relative to the programme (Activity 2.1.1.3).

180. **The Pre-Accelerator Programme will run every year, from Y2 to Y4 of the ARCHE Project**, before the launch of the Accelerator Programmes. A total of three (3) Pre-Accelerator Programmes will be conducted over the ARCHE Project implementation period and it is estimated to **train at least 45 MSME/entrepreneurs in total** (15 MSME/entrepreneurs per year) that registered for it and have been selected. The training provided will be organised to be taught virtually/physically in order to reach out to as many MSMEs/entrepreneurs, and also to comply with e.g., COVID-19 restrictions if required. Climate-KIC, who designed the Pre-Accelerator Programme will provide ad-hoc support to the selected accelerators in delivering this programme, especially the first time in which it will be delivered. Importantly, this Programme should target at least 50% of women-led enterprises and target at least 30% of youth participation.

Activity 2.1.1.5: Accelerate at least 21 MSME/entrepreneurs through the Accelerator Programmes (aiming at 50% women and 30% youth participation)

181. Similarly, to the Pre-Accelerator Programme, from Y2 to Y4 of the ARCHE project the Accelerator Programmes ? (i) Acceleration Programme; (ii) Advanced Acceleration Programme; (iii) Post-Acceleration Programme for MSMEs/entrepreneurs will be launched through open calls for proposals, that will be advertised on the ARCHE Online Platform as well as using other media to try to reach out to as many MSMEs/entrepreneurs with high-impact innovative climate adaptation-oriented

TPS that can be applied to the EO value chains that need acceleration support. The ARCHE Online Platform will host the registration for the Accelerator Programmes.

182. After **receiving the applications, the accelerators will select the cohort of MSMEs/entrepreneurs that will go through** the Accelerator Programmes and announce them on ARCHE Online Platform, using the established selection criteria as explained in Activity 2.1.1.1. The accelerators will be responsible for launching/closing/selecting the different cohort groups of MSMEs/entrepreneurs that go into each programme with supervision from the PMU. The PMU will be responsible for guaranteeing that the ARCHE Online Platform is operational for advertising the open calls and to receive the applications as well as for supporting communication and outreach activities relative to the programmes (Activity 2.1.1.3).

183. All MSMEs/entrepreneurs that apply to any of the three (3) Accelerator Programme should have gone through the Pre-Accelerator Programme, so that they have acquired the climate change adaptation basic skills and knowledge necessary to report on the performance of their business ideas. If they did not participate in the Pre-Accelerator Programme, 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 any of the three (3) Accelerator Programmes). This application form will be designed as part of the guidelines and procedures of the EO Adaptation Accelerator (Activity 2.1.1.1).

184. The Accelerator Programmes will provide the selected innovative high-impact adaptation MSMEs/entrepreneurs with rigorous and competitive curriculum training, mentors, connect entrepreneurs to key strategic partners, and potential financiers/investors. The three (3) Accelerator Programmes will be executed by the selected accelerators using the curricula and materials made available to them with support from key partners identified when designing the programmes in Activity 2.1.1.1

185. As referred the Acceleration and Advanced Acceleration Programmes aim to help the selected MSMEs/entrepreneurs to face *?Technological Valley of Death?* that normally 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/products in order to prove to private funders that these technologies/products 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[103][103]. Business facilitation services will be provided to support the selected MSMEs/entrepreneurs to overcome this.

186. The **Post-Acceleration Programme will help enterprises overcome the *?Commercialization and Scaling-up Valley of Death*?**. This means that the selected MSMEs/entrepreneurs will be supported 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[104][104]. The MSMEs/entrepreneurs selected to go through this programme will be introduced to potential financiers/investors through existing business facilitation structures ? PFAN, AECF etc.

187. **The Accelerator Programmes will run every year, from Y2 to Y4 of the ARCHE Project**, subsequentially, after the launch and closure of the Pre-Accelerator Programme. A total of three (3) Accelerator Programmes ? each composed of one (1) Acceleration Programme, one (1) Advanced Acceleration Programme, and one (1) Post-Acceleration Programme ? will be conducted over the ARCHE Project implementation period, and they are estimated to **accelerate at least 21 MSME/entrepreneurs in total**. The training provided will be organised to be taught virtually and/or physically in order to reach out to as many MSMEs/entrepreneurs, and also to comply with e.g., COVID-19 restrictions if required. The selected accelerators will be responsible for delivering the respective training programmes under each of the Accelerator Programmes as well as to establish links with international and regional partners as identified in the design of the different programmes that will be undertaken in Activity 2.1.1.1. Importantly, this Programme should target at least 50% of women-led enterprises and target at least 30% of youth participation.

188. As MIARAKAP and the other selected accelerators are the ones responsible for running the Accelerator Programmes, from start to finish, they are also responsible for reporting to the PMU on the implementation of the different Accelerator Programmes, including information on the achieved skills by the cohort groups as well as the different adaptation TPS that the cohort group is looking to provide to the Madagascar EO value chain.

Output 2.1.2: Four (4) pilot projects implemented to deploy innovative adaptation technologies and solutions

Activity 2.1.2.1: Selection and implementation of four (4) innovative adaptation pilot projects in the EO value chains

189. Within this activity four (4) key enterprises will be selected to deploy innovative adaptation projects within the ARCHR project targeted regions as pilots. At the PPG stage one (1) pilot project was identified to be deployed. The identified pilot project is a new EO distillation unit that will use an energy efficient distiller to produce EOs that will be implemented by SAHANALA Madagascar in Vatovavy Fitovinany. This unit will also install renewable energy equipment to face its energy needs,

and thus, be independent from the electricity grid. This project will allow SAHANALA to produce 2,200 kg of EO a year, employ 210 people (of which 70% are women and 35% are people with ages until 25), allowing them to save 4,800 kg of biomass per year (when compared with traditional distillers) and to reduce the emissions on 3tCO_2eq/year. This project is envisioned to start its implementation in 2023, in Y1 of the ARCHE project.

190. The remain three (3) will be identified by GEHEM during the Y1 of the ARCHE Project and selected through a call for proposals. The accelerators implementing the Accelerator Programmes will support the GEHEM in its selection by recommending MSMEs/entrepreneurs with adaptation TPS with high replication potential and high benefits.

191. The business proposals submitted to the GEHEM will be evaluated against a set of criteria that will be validated by the Sustainable EO Coordination Platform at the start of the project, envisaged to include:

Detailed design and specific features, operations, and implementation plan of the proposed adaptation innovation TPS and the identification of the extent to which the solution directly addresses the identified climate hazards and shocks and how it is expected to impact the EO value chains in the short, medium and long-term.

Viability of the proposal: the proposed business/project should be technically, financially, and operationally viable and should present a clear assessment of the business-as-usual scenario (BAU), risks and mitigation options, sustainability of the project and clear strategy on how to avoid maladaptation.

Replicability of the proposal: extent to which the proposed innovative adaptation TPS can be broadly deployed and replicated in the EO value chains in order to serve vulnerable populations (especially youth and women).

Location of the proposed projects.

Expected impacts of the proposal: social, economic and environmental impact of the proposed TPS (with for example and assessment on how it is expected to improve quality of life, economic prosperity, reduce the environmental damage and negative impacts on pre-existing stresses on communities).

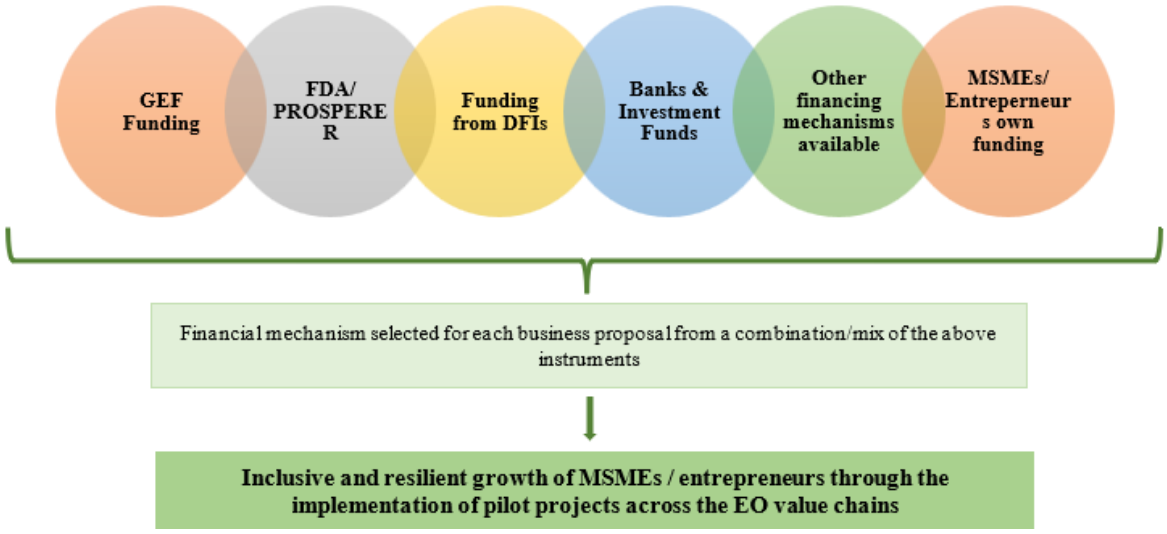
Financials and investment structure.

Identification and mitigation of risks, etc.

192. For the analysis of the pilot proposals, weights will be attributed to each of the criteria above listed and to others that might be added to those at the project start, to enable a clear and transparent evaluation. Specific focus will be given to the location of the pilots (located in the most vulnerable regions identified in the CRVA) and ensuring that the selected TPS to be deployed will yield high environmental and social benefits (specially to the most vulnerable engaged in the EO value chain ? poor, youth and women). The identification of pilots will be conducted by the GEHEM and the results will be presented and approved by the PSC. The selected pilots will be posted on the ARCHE Online Platform.

193. The selected MSMEs/entrepreneur proposals will then receive financial support through the ARCHE project to pilot their TPS. A specific financial mechanism will be identified for each of the selected pilots to support it financially.

194. The idea is that the financial mechanism for each of the projects will make use (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 MSMEs/entrepreneurs own funding. Figure 17 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 MSMEs / entrepreneurs through the implementation of pilot projects across the EO value chains

Figure 17: Relationship of the diFferent source of funding to be considered in as financial mechanism for each of the pilots

195. For each of the pilots, depending on the business proposal needs, the financial mechanism/mix of financial products will be adjusted. In general, it is expected to comprise the following:

MSMEs/entrepreneurs to contribute at least with 8% of the total investment of their business proposal (sourced from their own funds or through a loan from a bank).

GEF grant: can contribute up to 40% of the total investment, and its contribution can be in the form of a grant or technical assistance services to support the development/establishment of the project/business proposal.

Grants and loans provided by other institutions (such as banks and Investment funds, such as FDA/PROSPERER, MIARAKAP (I&P), AECF etc): the ARCHE project will support the MSMEs/entrepreneurs in raising additional investment from other existing financial structures in the forms of grants and/or loans.

196. The three (3) pilots are expected to be identified between Y2 and Y3 of the ARCHE Project to enable its deployment and follow up during the ARCHE Project, as they will be used as case studies for the development and tracking of adaptation impact indicators at the various levels: business/productivity in the EO value chain; employment creation; environmental indicators and social indicators.

197. The tracking of these indicators will be carried out by the MSME/entrepreneur implementing the selected pilots and will be reported to the PMU to share and widely disseminate the information (Output 2.1.3).

Output 2.1.3: Results and experiences from the four (4) pilot projects documented and widely disseminated

Activity 2.1.3.1: Compilation of the results and experiences from the four (4) pilot projects widely disseminated

198. The results and experiences gained from the adaptation TPS piloted under Output 2.1.2, will be documented (through brochures, a page on the ARCHE Online Platform and videos also uploaded in the project?s platform) and widely disseminated after being validated by the Sustainable EO Coordination Platform. The results will include not only the experience of these companies in going through the acceleration support provided to them within the EO Adaptation Accelerator but as well their experience in raising the capital and in implementing and monitoring the implementation of their business/proposal, including the impact that it is having the EO value chains of Madagascar. Specific focus will be given to the role of the EO farmer cooperatives on the deployment of these adaptation TPS. Besides making the information available in the ARCHE Online Platform the PMU will showcase these projects on local demonstration/showcase fairs that will be carried out across the country under PC3. Regional and international exposure will be ensured through ASAP that also showcase the technologies and place them on their global website.

199. It is expected that the compilation of results and its update will be done continuously once the adaptation pilot TPS to be supported under Output 2.1.2 have been selected until the end of the ARCHE Project. This will be carried out by the PMU with support from subcontractors that will help them to produce the documentation materials. Once the ARCHE Project comes to an end, the entity chosen to keep the ARCHE Online Platform will be the one responsible for updating the information based on the monitoring data provided by the supported MSMEs/entrepreneurs.

Outcome 2.2 Innovative financing to support deployment of adaptation technologies and services along the essential oil value chains piloted

Output 2.2.1: Model innovative financing mechanisms to provide dedicated (gender-responsive) catalytic financing designed and piloted in collaboration with actors in the financing ecosystem

Activity 2.2.1.1: Design and pilot innovative financial products and services adapted to the needs of the most vulnerable actors on the EO value chains

200. In these activity innovative financial mechanisms will be developed and piloted to support the demand side actors across the EO value chain, especially the most vulnerable groups, to acquire the appropriate adaptation-oriented TPS with existent FSP. This will open up **access to producers (both micro and small) and distillers, women and youth to targeted micro-finance so that they can acquire or rent the innovative adaptation oriented TPS identified and supported in Outcome 2.1**.

201. The ARCHE Project will work with Fihariana, Vola Mahasoa BNI Madagascar and GIZ, that have experience in developing and providing credit lines and guarantee to the stakeholders involved in the EO value chains, as well as with other existing financial institutions and financing instruments and MFIs that are active in the country, to **provide targeted lending instruments to rural people and associations/cooperatives that depend on the EO value chain for their livelihoods**. Fihariana, Vola Mahasoa and BNI Madagascar provide credit lines and banking services to the most vulnerable in Madagascar and will enhance/adapt their products to be provided to the EO value chains. Thus, existent microfinance schemes will be strengthened/adapted as well as existent financial products improved to provide access to funding for the vulnerable groups/actors, so that adaptation oriented TPS become viable, affordable and adequate to them.

202. In this activity MINAE will also look into the of expanding the FDA and FIR funds to cover all actors in the EO value chain.

203. According to IFAD, lack of upfront capital can be a major drawback for farmers to adopt climate-resilient practices[105][105]. This project **will support MFIs in improving existent (or even designing new) revolving funds to provide credit lines to cooperatives / associations in EO value chains that require financial support in acquiring adaptation TPS** and or, for example, ensuring that the existing financial mechanism include spreading / redistribution of risk (flexible grace periods, individual-liability contracts, etc).

204. The PMU will subcontract specialised services to work with a selected group of FSP and MFI for the development of these financial products and services to be offered to the vulnerable groups across the EO value chain acquiring climate adaptation TPS. FSPs and MFIs will be selected on a competitive basis to establish and manage revolving funds. **Loans will be provided based on the condition that the technologies acquired are deemed supportive of adaptation and resilience building, taking into account the sustainable management of natural resources**. The selected FSPs and MFIs will be trained to enable flexible payment schedules based on the timing of plant harvests/distillation or exporting before demanding repayment.

205. Special attention will be given to farmers/EO growers, women and youth. Similarly, the designed financial products and services will ensure that farmers/EO growers, women and youth can equally access the financial support. In fact, specialised financial services will be provided to cater to them.

206. Besides working with FSP and the MFIs in the improvement of financial products, the ARCHE project will also explore the use of innovative financial solutions such as lease models and digitally enabled solutions to improve consumer finance services.

207. The innovative financial products and services will be designed in Y1 of the ARCHE Project so that they become available, tested and improved from the Y2 of the project onwards. Information on the financial products and services will be made available and updated on the ARCHE Online Platform as well as disseminated through PC3 activities. Developing these products and services together with the FSP and supporting them to make those products and services available for the stakeholders across the EO value chain (and possible others interested in acquiring adaptation TPS) will ensure the uptake of these services by these institutions, their ownership, guaranteeing their sustainability after the end of the ARCHE Project.

208. The following table summarises the outcomes, outputs, and activities of PC2.

PC2: Innovative adaptation technologies and services promoted and deployed along the EO value chain	
Under PC2, adaptation oriented MSMEs/entrepreneurs 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/entrepreneurs 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 TPS on the EO value chains. Furthermore, PC2 also seek to improve and facilitate accessibility for vulnerable groups within the EO value chain to the identified and nurtured adaptation TPS through the development of innovative financing products and services for climate change adaptation TPS to help build the resilience of these target groups and, consequently, of the entire value chain.	
Outcome 2.1: Proven innovative adaptation technologies and services are promoted and piloted along the essential oils value chain	
Output 2.1.1. At least 21 MSMEs/entrepreneurs with proven and high-impact innovative climate change adaptation-oriented technologies and solutions for the essential oil value chain receive acceleration services (training, coaching, mentoring and business growth support)	
Planned and Envisioned Activities	***Responsibility***
Activity 2.1.1.1. Design the EO Adaptation Accelerator Programmes ? Pre-Accelerator and Accelerator	Climate-KIC
Activity 2.1.1.2. Select at least four (4) accelerators (from existing accelerators, research institutions and/or universities) and train them to run the EO Adaptation Accelerator programmes	PMU and Climate-KIC
Activity 2.1.1.3. Communication and outreach activities of the EO Adaptation Accelerator	PMU, selected accelerators, Sustainable EO Coordination Platform

Activity 2.1.1.4: Train at least 45 MSMEs/entrepreneurs trained on climate adaptation topics to increase their capacities to understand climate risks and vulnerabilities and to identify business opportunities for climate change adaptation in the EO value chains within the Pre-Accelerator Programme (aiming at 50% women and 30% youth participation)	MIARAKAP and other selected accelerators with support from the PMU and Climate-KIC
Activity 2.1.1.5: Accelerate at least 21 MSME/entrepreneurs through the Accelerator Programmes (aiming at 50% women and 30% youth participation)	MIARAKAP and other selected accelerators
Output 2.1.2: Four (4) pilot projects implemented to deploy innovative adaptation technologies and solutions	
Planned and Envisioned Activities	***Responsibility***
Activity 2.1.2.1. Selection and implementation of four (4) innovative adaptation pilot projects in the EO value chains	SAHANALA and other pilot MSMEs/entrepreneurs
Output 2.1.3 Results and experiences from the four (4) pilot projects documented and widely disseminated	
Planned and Envisioned Activities	***Responsibility***
Activity 2.1.3.1. Compilation of the results and experiences from the four (4) pilot projects widely disseminated	SAHANALA and other pilot MSMEs/entrepreneurs and PMU
Outcome 2.2: Innovative financing to support deployment of adaptation technologies and services along essential oil value chains piloted	
Output 2.2.1: Model innovative financing mechanisms (FIR, FDA, MFIs) to provide dedicated (gender-responsive) catalytic financing designed and piloted in collaboration with actors in the financing ecosystem	
Planned and Envisioned Activities	***Responsibility***
Activity 2.2.1.1. Design and pilot innovative financial products and services adapted to the needs of the most vulnerable actors on the EO value chains	Subcontractor, PMU, FSP and MFIs MINAE, GIZ, Fihariana, VOLA MAHASOA

PC3: Knowledge sharing and learning

209. The activities to be undertaken under PC3 focus on raising the awareness of essential oil growers, distillers? associations/cooperatives on the selected innovative adaptation TPS, including sustainable production practices that can be adopted across the EO value chains as well as on the innovative financial products available to them to be able to acquire or rent these adaptation TPS. These activities aim at addressing the limited awareness and access to climate smart TPS and financial mechanisms to sustainably grow EO value chains and the limited value placed on resilience of the ecosystem services and their link to improved sustained productivity along the EO value chains.

210. This will be done by creating Regional EO Adaptation hubs in Madagascar to convene and organize awareness raising workshops to advertise adaptation TPS and available financial instruments to the different stakeholders. In addition, exhibitions/ roadshows featuring adaptation TPSs, their

benefits and case studies as well the financial instruments will be organised in existing associations/community centres, Business Associations, NGOs, CSOs and other entities connected to the EO value chains, so to reach out to as many stakeholders as possible to enable the project to reach out directly and indirectly to at least 34,000 EO stakeholders.

Outcome 3.1: Lessons from the project documented and widely disseminated

Output 3.1.1: Distribution and support channels established, strengthened and showcased to ensure that EO growers, distillers associations and cooperatives, including women and youth, of the identified vulnerable regions, access adaptation technologies and diversified livelihoods

Activity 3.1.1.1. Establishment of regional hubs bringing together all EO value chains stakeholders, including stakeholders that promote GEEW, to support sustainable, inclusive and gender-responsive EO development research and capacity building on adaptation technologies

211. Among other barriers identified during the PPG stage, the weak market linkages for the provision of affordable and reliable climate change adaptation-oriented TPS to the EO value chains stood as important. Thus, the main objective of this activity is to address this gap by **creating regional hubs across Madagascar ? Regional EO Adaptation Hubs ? to convene EO value chains stakeholders and organize joint activities to understand the stakeholders? adaptation needs, link them to possible adaptation-oriented TPS suppliers (MSMEs/entrepreneurs identified and supported in PC2) and financial service providers**. This is key as for any market to exist, it is important to listen to the needs of the stakeholders and then create connections between the supply and the demand, and of these with FSP and MFI that can support both sides.

212. The final number of Regional EO Adaptation Hubs to be created will be identified and selected at the start of the project by the PMU and approved by the PSC, but as a minimum, there will be two (2) hubs that will be created in Madagascar making use of existing structures. CNRIT was identified as one of the research institution to deploy these hubs, one in Amoronimania and the other in Haute Matsiatra. By engaging research and development institutions such as CNRIT as hubs, the ARCHE Project will be facilitating the adoption of adaptation technologies to local context. The engagement of the associations/cooperatives, NGOs and CSOs as hubs will facilitate access to the different stakeholders on the EO value chains, especially the most vulnerable ones that the project aims to target directly and indirectly. At the start of the ARCHE project the PMU and the Sustainable EO Coordination Platform will analyse the need to select additional institutions as hubs appart from CNRIT. If they decide to select additional ones, these will be carried out through a competitive process, that will have into account, amongst other criteria decided at the start of the project: the location, the number and variety of EO value-chain stakeholders; number of associates that are vulnerable EO value-chain stakeholders; space; logistic support to hold awareness raising and information sharing events, existent capacity etc.

213. The capacity of these hubs in climate change vulnerability and risks across the EO value chains, as well as on adaptation TPS and available financing instruments will be strengthened in the ARCHE Project, by the **train-the-trainers course that will be provided to them as part of Activity 1.2.1.3**. This will enable the Regional EO Adaptation Hubs to build their capacity on the referred subjects as well as allow them to raise awareness and share this information with similar institutions and the EO value chains stakeholders.

214. The selected Regional EO Adaptation Hubs will be responsible for conducting awareness raising and information sharing events targeting the EO value chains stakeholders (with special focus on the most vulnerable ones). **These awareness-raising and information sharing events**, will gather information from the EO value chains stakeholders on their needs, inform them on climate change risks and vulnerabilities of the sector; possible suitable adaptation TPS to adapt to those and available innovative financial instruments to support their adoption. It is envisaged that **one (1) awareness raising / information sharing event will take place per year, from Y2 to Y4 of the ARCHE Project, in each of the Regional EO Adaptation Hubs, totalising at least 6 events.**

215. These events will be the first mean used by the project to reach out to the 34,000 EO stakeholders, as they will target 500 participants each. Through this**, these events will reach out directly and indirectly to at least 13,800 EO stakeholders** (directly to 3,000 EO stakeholders, and indirectly to 10,800[106][106])

216. For these events and although printing material is not recommended because it is not environmentally friendly, a Brochure should be developed with the main messages and contacts of the events, for the target groups to have something physical to refresh their memories on concepts and technologies. These Brochures should be available in French and Malagasy to better reach the target audience.

217. Although the Regional EO Adaptation Hubs will be the ones responsible for deploying and delivering these events, support will be provided to them on a case-by-case basis by selected accelerators engaged in the delivery of the Pre-Accelerator Programme contents, FSP and MFI, the PMU and other invited stakeholders.

218. Before each event outreach and communication activities related to the awareness-raising/information dissemination events will be led jointly by the PMU, the Regional EO Adaptation Hubs, the selected accelerators and other key stakeholders identified during the project implementation. The members of the Sustainable EO Coordination Platform will also support the dissemination of this information. As per the communication and outreach activities of the EO Adaptation Accelerator in PC2, 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 the ARCHE Online Platform. In this case, as the aim is to reach out specially to the most vulnerable stakeholders across the EO value chains, local radio stations will be very important since they will help reach out to communities that are not reachable through internet. Also, leaflets in Malagasy will be developed and hand out at the local associations

219. After each event the Regional EO Adaptation Hub that hosted it will prepare and supply to the PMU a newsflash / summary proceeding of the carried-out event, clearly highlighting the number of participants, the type of stakeholders within the EO value chains, with clear indication of the number of women and youth that participated in the event (with a view to have 50% women participation and 30%youth participation) and respective photo documentation. This will then be used to report on the event on the ARCHE Online Platform.

220. Besides technical training, information dissemination, and in the specific cases R&D, these Regional EO Adaptation Hubs will also act as repair centres. As repair centres they will ensure that specific equipment can be continually maintained, repaired and used. For that, the hubs will create a network of repair extension service suppliers to whom they will reach out for repair and maintenance activities. This will be key, as in developing countries in general there are a lot of projects that are not sustainable once a project reaches its end, because the TPS supported runs into problems and there are no people qualified to repair it and or ensure its proper maintenance. The fact that these hubs will act as repair centres and serve as a bridge between the EO value chains stakeholders and repair/maintenance service providers will ensure sustainability in the use of the supported adaptation TPS for the EO value chains.

Activity 3.1.1.2. Identification a network of extension services to aid in the maintenance and repair of deployed adaptation TPS in the EO value chains

221. Once the Regional EO Adaptation Hubs are selected they will identify a series of companies that can provide possible extension services necessary for maintenance and for fixing deployed adaptation TPS. For that they will issue a call for proposals on the ARCHE Online Platform as well as advertise that on newspapers and media of the regions that they are targeting. The selection process will take into consideration the company?s staff composition/capacity, regions of operation, services supplied, quality procedures and their adoption of environmental and social safeguards. The selection will be done by the Regional EO Adaptation Hub with oversight from the PMU. With this the Regional EO Adaptation Hubs will build a network of companies to which they can reach out to when a certain adaptation technology / product needs to be repaired or requires maintenance assistance.

222. When doing this analysis, it is possible that the existent companies don?t know specific adaptation technologies or products but operate in an area that with training on what these technologies are they can quickly add that capacity / service to their list of services. For that, and once the adaptation TPS start to be supplied to the EO value chains, the adaptation TPS providers will be invited **to annual technical training workshops that will take place in the Regional EO Adaptation Hubs to explain the technical parts of their technologies/products, how they should be maintained as well as explain possible issues that may occur and how they can be repaired/sorted.** It is envisaged that at least six (6) technical training events of one (1) day each will be carried out back-to-back to the awareness raising events also organized by the Regional EO Adaptation Hubs, to enjoy economies of scale.

223. This list of extension service providers will be used to complement/update the mapping exercise carried out in PC1 and will be also advertised in the ARCHE Online Platform.

Activity 3.1.1.2. Organise exhibitions and roadshows demonstrations featuring benefits and case studies

224. Through exhibitions and roadshows, enterprises will be able to feature adaptation TPS and their potential use in supporting activities and improving the resilience of the EO value chains to climate change. FSPs and MFIs will also be able to present their products for both the demand and supply side. If needed, leaflets will be also developed in local languages to help them better understand the role and function of these adaptation TPS. The greater understanding of the benefits of the technologies and the

availability of financing instruments (e.g., revolving funds) from FSPs and MFIs, the higher will be the willingness to pay for adaptation TPS.

225. Exhibitions and roadshow demonstrations featuring adaptation TPS, their benefits and case studies on its use in the EO value chains (such as the pilots implemented under PC2) as well as the use of the innovative financing instruments developed and made available by the project will be carried out. For that the PMU will reach out business associations, community associations, community centres, research centres, research centres and research groups, etc, to carry out as many exhibitions as possible between Y2 and Y4 of the ARCHE Project. At the PPG stage, besides the GEHEM, one (1) association (ODEFI) and a company (SAHANALA) ? were already identified as interested in displaying the exhibitions. In addition to these, two (2) more will be identified at the start of the project by the PMU together with the EO Coordination Platform.

226. These **exhibition/roadshows** will be the second mean used by the project to reach out to the 34,000 EO stakeholders, being envisaged to reach out to around 1,464 EO actors per year from Y2 to Y4. Through this**, these exhibitions will reach out directly and indirectly to at least 20,200 EO stakeholders** (directly to 4,392 EO stakeholders, and indirectly to 15,808[107][107])

227. The PMU (**Project Coordination and the Communication Expert) will:** (i) devise the necessary strategy for its deployment in order to reach out to as many stakeholders of the EO value chains as possible; (ii) provide guidance on the communication and outreach activities that should be carried out to advertise those, making sure that they will reach out to the most vulnerable EO value chains stakeholders (like growers/cultivators etc); (iii) make recommendation on how to track the impact (gender and youth disaggregated) of these exhibitions/roadshows.

228. For each of the entities, association, NGO, CSO selected to present the exhibition/roadshow, training will be provided to at least one of their staff to explain the exhibition to the visitors and collect information on the impact of these events (number of visitors, disaggregated by sex and age).

229. Along this exhibitions/roadshows, brochures and leaflets with the displayed information and contacts of the Regional EO Hubs will be made available to all visitors. Also, this exhibition will take a virtual floor on the ARCHE Online Platform, to which anyone with access to an electronic device can access to, provided that they answer a couple of questions when accessing it, so that the PMU can track as well this numbers.

230. Feedback will be collected by asking people to fill out a short electronic form on the physical/electronic exhibition.

231. All materials prepared for it will follow the ARCHE Communication Strategy and will need to be approved by the PSC before disseminated/uploaded. The Communication Expert together with the other experts of the PMU will put all the necessary exhibition/roadshow materials together in a package. As with the implementation of the ARCHE project MSMEs/entrepreneurs will be identified and there will be progress made in the implemented pilots, the exhibition materials will be revised and

updated annually to take all the new information into account. All these materials will be made available in French and Malagasy locally, and the ones on the ARCHE Online Platform will also be made available in English.

Output 3.1.2: Online platform to showcase adaptation technologies, their benefits and suppliers established and managed by the PMU

Activity 3.1.2.1 Establish and maintain the ARCHE Online Platform

232. ARCHE Online Platform ? a webpage ? will be the primary mean used by the ARCHE Project for dissemination of information and knowledge, as well as a tool to support the implementation of several project activities. It is envisaged that this platform will be part of the BNCC-REDD+ website. It will serve varied functions:

Raise awareness of the general public on climate change adaptation in the EO value chains and the roles of entrepreneurs and MSMEs and how:

Climate change risks and vulnerabilities in Madagascar, climate change expected impacts in the Madagascar EO value chains, 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 ARCHE Project

Advantages of adaptation to climate change risks and vulnerabilities and how that will build resilience of the EO value chains.

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 ARCHE 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, accelerators that exist in the country and their activities etc) ? sharing the main outcomes of Activity 1.1.1.1. Thus, this should provide information on ?who is who??, ?who is doing what?? and ?how is that contributing to adaptation and building resilience of the EO value chains?.

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 EO value chains.

Advertise available financial options for: (i) entrepreneurs and MSMEs and (ii) small scale and independent cultivators and growers as well as other stakeholders within the EO value chains.

Advertise discussion fora, workshops and other events being put in place by the proposed ARCHE Project.

Advertise competitions run by the ARCHE Project within the EO Adaptation 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 EO value chains ? 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 stakeholders of the EO value chains.

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.

233. The ARCHE Online Platform will be key to connect all stakeholders necessary to increase the resilience of the EO value chains to climate change, as it will be used:

By the Adaptation MSMEs/ entrepreneurs to advertise their TPS;

By the EO value chains stakeholders to identify adaptation TPS providers that they can contact to acquire their needed goods

By both, Adaptation MSMEs/entrepreneurs and the EO value chains stakeholders to identify FSP and MFIs that can address their financial needs in this particular market.

234. Special efforts will be made to have this webpage in English, French and Malagasy to increase the success of outreach and communication activities.

235. The **ARCHE Online Platform 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 Output 3.1.3. Special efforts will be made to have this webpage translated in some of the local languages spoken in Madagascar so that outreach and communication activities are successful in reaching the target audience. The design of the ARCHE Online Platform will be done by a National IT Consultant and the maintenance and 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 Communication Expert 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 ARCHE Online Platform. It is envisaged that the ARCHE Online Platform will be hosted by the PMU during the first three (3) years of project implementation and then transferred to an institution chosen by the Sustainable EO Coordination 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, ensuring its sustainability. For this, the PMU will build the capacity of the selected institution(s) in the administration of the platform.

Output 3.1.3: Lessons learnt documented and widely disseminated

Activity 3.1.3.1 Develop the ARCHE communication strategy to increase the visibility of the project?s success stories lessons learnt on adaptation TPS across the EO value chains

236. At the start of the project, the PMU will subcontract a Communication Expert that will be responsible for the design of the ARCHE Communication Strategy and the ?brand? that the project will adopt in all its communication as well as for overseeing and making sure that all disseminated content follow the strategy. The Communication Expert 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 of the ARCHE Online Platform (Output 3.1.2).

237. The developed strategy should also include clear guidelines and procedures for the communication and dissemination action plans, products and news from the ARCHE Project, the platforms for 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 ARCHE Communication Strategy and guidelines.

238. The communication strategy will be reviewed and approved by the PMU and UNIDO. The Communication Expert in the PMU will be the main person responsible for the implementation of this strategy. The PMU will inform all the stakeholders engaged in project activities and the production of materials to be disseminated by the project about the ARCHE Project Communication Strategy and guidelines and provide access to upload information on the ARCHE Online Platform following the guidelines.

Activity 3.1.3.2. Widely dissemination of materials and documented lessons learnt

239. Several are the information and knowledge materials that will be generated from the implementation of the different project activities. Those will include reports, videos, tutorials, manuals, newsflash, reports. All the generated materials will be shared through the ARCHE Online Platform with anyone that is interested in it.

240. Annual reports will be compiled by the PMU that showcase the different activities carried out in the ARCHE Project and its impact as well as the lessons learnt through the process. These reports and information contained therein will be shared with the public in general and with the communities of practice, such as AdaptationCommunity.net, CoP for Resilience, the Global Commission on Adaptation etc. These materials will be compiled and revised by the different experts within the PMU and disseminated by the Communication Expert.

241. The following table summarises the outcomes, outputs, and activities of PC3.

PC3: Knowledge sharing and learning
PC3 activities aim at raising awareness and disseminating information of essential oil growers, distillers? associations/cooperatives on the selected innovative adaptation TPS, including sustainable production practices that can be adopted across the EO value chains as well as on the innovative financial products available to them to be able to acquire or rent these adaptation TPS, through the creation of Regional EO Adaptation Hubs, awareness raising events, exhibitions and roadshows and the ARCHE Online Platform.
Outcome 3.1: Lessons from the project documented and widely disseminated

Output 3.1.1: Distribution and support channels established, strengthened and showcased to ensure that EO growers, distillers associations and cooperatives, including women and youth, of the identified vulnerable regions, access adaptation technologies and diversified livelihoods	
Planned and Envisioned Activities	***Responsibility***
Activity 3.1.1.1. Establishment of regional hubs bringing together all EO value chains stakeholders, including stakeholders that promote GEEW, to support sustainable, inclusive and gender-responsive EO development research and capacity building on adaptation technologies	PMU, EO Coordination Platform & Regional EO Adaptation Hubs (CNRIT)
Activity 3.1.1.2. Identification a network of extension services to aid in the maintenance and repair of deployed adaptation TPS in the EO value chains	Regional EO Adaptation Hubs (CNRIT)
Activity 3.1.1.3. Organise exhibitions and roadshows demonstrations featuring benefits and case studies	PMU, HEHEM, identified associations (e.g., ODEFI, SAHANALA), community organizations, business associations, NGOs and CSOs
Output 3.1.2: Online platform to showcase adaptation technologies, their benefits and suppliers established and managed by the PMU	
Planned and Envisioned Activities	***Responsibility***
Activity 3.1.2.1. Establish and maintain the ARCHE Online Platform	PMU, IT Subcontractor
Output 3.1.3 Lessons learnt documented and widely disseminated	
Planned and Envisioned Activities	***Responsibility***
Activity 3.1.3.1. Develop the ARCHE communication strategy to increase the visibility of the project?s success stories lessons learnt on adaptation TPS across the EO value chains	PMU (Communication Expert within the PMU)
Activity 3.1.3.2. Widely dissemination of materials and documented lessons learnt	PMU (Experts and Communication Expert within the PMU)

PC4: Monitoring and Evaluation

242. PC4 focuses on Project Monitoring and Evaluation (M&E). As recommended by the GEF STAP,[108][108] Component 4 Monitoring and Evaluation is a continuous learning process from what has been implemented (both success and failure) and acquiring new knowledge.

Outcome 4.1: Monitoring of results and evaluation

Output 4.1.1 Project effectively monitored

Activity 4.1.1.1. Effective monitoring of the project

243. The proposed project will follow UNIDO standards for monitoring and reporting processes and procedures consistent with the GEF Monitoring Policy.

244. 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. The project will update the PROSPERER M&E system, which ended in 2020, will link it with the FDA M&E system that has been developed to track best practices for general IFAD projects and will work with MICA to capture lessons learned based on their extensive experience in knowledge management. **The M&E will include monitoring and evaluation of project activities, economic, environmental, social benefits, including capacities improvement of women and youth in the EO value chains. The project will collect gender-disaggregated data and indicators, and decision metrics will be used to track progress (see Annex A Project Results Framework).** Indicators will be identified and used to track intended changes resulting from the project intervention. Qualitative and quantitative indicators will be used to quantify in numbers and descriptive information such as the effectiveness of adaptation measures to the impact of climate shocks during essential oil scaling up.

245. Monitoring of the adaptive capacity of small-scale farmers with Ecosystems-based Adaptation (EbA) focus will also be sought through indices previously developed and which can be systematically applied by MFIs or technical partners. A series of tools developed by Microfinance for Ecosystem-based Adaptation (MEbA[109]) that can be used through partner MFI will be included. (e.g., USD disbursed in EO demonstration farms; EO producers trained; number of targeted EO farms; number of loans disbursed; loans granted to women)

246. A Reporting process refers to the systematic and timely provision of essential and useful information showing how the 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.

247. The M&E system will be developed and implemented by the PMU.

Activity 4.1.1.2. Build national capacity on the implementation of the M&E system

248. Training on M&E will be provided to enhance the national capacity in the BNCC-REDD+, MEDD, GEHEM and other partners involved in the implementation of the ARCHE Project activities to

help systematic collection of data on the indicators on the extent of progress and achievement of the Project objectives, as well as to make sure the synergies are created with on-going project targeting adaptation in the country. This will help to further improve the implementation of the Project and assess its degree of success, as well as to assess its contribution towards the country?s adaptation efforts.

249. Training on the implementation of the M&E system will include gender perspectives to ensure that the impact of the project on vulnerable groups such as women (and the youth) is effectively tracked.

Output 4.1.2: Mid-term review and independent terminal evaluation conducted

250. Apart from the on-going project monitoring and evaluation carried out by the PMU on a regular basis described in Output 4.1.1, two formal project evaluations will be carried out during the project implementation stage by independent evaluators: one at the middle of the project ? Mid-term Review ? and the second at the end of the project ? Terminal Evaluation. While the Mid-term Evaluation will be used as a tool to assess project progress and propose necessary revisions of project activities in the project framework if required, to ensure the implementation of project results, the Final Evaluation, will be used to assess the overall implementation of the project and to extract recommendations and lessons learnt to inform future project development and implementation.

Activity 4.1.2.1: Project Mid-term Review

251. The Mid-term Review 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.

252. For the Mid-term Review, the PMU will prepare the Terms of Reference (TORs) to recruit an Independent Evaluator to perform the Mid-term Review 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 Mid-term Review 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 Review 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.

253. The PMU will support to the Independent Evaluator during the Mid-term Review by providing the necessary information and clarifications during the process.

Activity 4.1.2.2: Project Terminal Evaluation

254. 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.

255. In this particular project, the Terminal Evaluation will review the expected and achieved accomplishments in building a resilient EO value chain by critically examining whether the project outputs helped to get the outcomes and that ultimately achieve the project objectives, especially assessing the relevance, impact, effectiveness, sustainability, scalability and replicability of the adaptation solutions. The data collected will evaluate adaptation options, such as EbA, based on their potential to provide evidence of response to climate risk for medium and long-term effects according to the GEF?s requirements and enrich lessons learned.

256. 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 Terminal Evaluation 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 Terminal Evaluation will be carried out by the UNIDO Headquarters.

257. The PMU should support the Independent Evaluator through the Terminal Evaluation by providing the necessary information and clarifications during the process.

258. The following table summarises the outputs and activities of PC4.

PC4: Monitoring and Evaluation	
PC4 is directed at contributing at making sure that the project is on track to achieve its objectives, outcomes and outputs throughout its implementation.	
Outcome 4.1: Monitoring of results and evaluation	
Output 4.1.1 Project effectively monitored	
Planned and Envisioned Activities	***Responsibility***
Activity 4.1.1.1: Effective monitoring of the project	PMU with support from the different partners implemented the project activities

Activity 4.1.1.2: Build national capacity on the implementation of the M&E system	PMU
Output 4.1.2 Mid-term review and independent terminal evaluation conducted	
Planned and Envisioned Activities	***Responsibility***
Activity 4.1.2.1. Project Mid-term Review	Independent Evaluators (Project Manager at UNIDO HQ will subcontract the evaluators)
Activity 4.1.2.2. Terminal Evaluation	Independent Evaluators (Project Manager at UNIDO HQ will subcontract the evaluators)

4) ALIGNMENT WITH GEF FOCAL AREA AND/OR IMPACT PROGRAM STRATEGIES;

259. The project is designed in compliance with the objective of the GEF/LDCF programmatic direction, GEF/LDCF Climate Change Adaptation Strategy 2018-2022: Objective 1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation. The project directly supports innovation and technology transfer through the identification of innovative adaptation technologies for the EO value chains. It also supports MSMEs with an accelerator and training to extract and support the growth of home-grown or locally adapted technologies that will make the EO chain more productive.

260. The project will focus on fostering innovation and investments for scaled dissemination of adaptation-oriented TPS related technologies with significant adaptation benefits ultimately contributing to reducing the vulnerability and increasing climate resilience in the EO value chains of Madagascar.

261. The project will further contribute to Objective 2: Mainstream Climate Change Adaptation and Resilience for Systemic Impact, through the support of the sustainable EO development strategy, and Objective 3: Foster Enabling Conditions for Effective and Integrated Climate Adaptation, by fostering the engagement of MSMEs with the private sector stakeholders, MDBs, financial actors, MFIs and accelerators.

262. 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 engaged in the EO value chains. Through the initial GEF funding, the project seeks to establish the required mechanism in Madagascar to catalyse large-scale deployment of climate adaptation-oriented TPS and reduce systemic risk across the adaptation finance landscape.

5) INCREMENTAL/ADDITIONAL COST REASONING AND EXPECTED CONTRIBUTIONS FROM THE BASELINE, THE GEFTF, LDCF, SCCF, AND CO-FINANCING;

263. Total GEF contributions to the project amount to USD 1,746,484 and will be used to prove concepts, finance catalytic activities and provide strategic inputs to achieve adaptation benefits and

increase resilience of the EO value chains in Madagascar. The additional cost of this project will be to address climate change adaptation through transfer and deployment of adaptation-oriented TPS, with a special focus on nature-based solutions, at the local level cutting across the climate vulnerabilities of the targeted sector. In fact, there is an urgent need to support vulnerable rural populations to adapt to existing and projected climate change impacts, and the ARCHE Project will be the first in Madagascar to support adaptation innovation proliferation and replication, in the EO value chain, contributing to its sustainability and resilience.

264. While adopting an integrated approach supporting the delivery of climate adaptation TPS that can create multiple adaptation benefits across the EO value-chains, the Project will also deliver clear cost benefits as the following:

Enabling a global shift in investment and operational decision-making within the EO value-chains, contributing to integration of adaptation across the EO value chains, promote coordination amongst the different actors of the value-chains and provide targeted support to the most vulnerable of the value chains ? EO producers. The project will contribute to the development of the Sustainable Essential Oil Development Strategy as well as support the development of policies, regulations and incentives to foster the private sector investment for adaptation TPS to mitigate identified risks and vulnerabilities.

By specifically targeting the most vulnerable in the EO value-chain and making them more resilient to climate change impacts and hazards, through the provision of training and adaptation TPS showcasing as well as the provision of financing instruments to access and safeguard these innovations, the ARCHE Project will contribute to reduce the impact of climate on the EO production and exports (by reducing decreases of EO plant supply to distillers) and to increase the quality of the products offered. Consequently, this will increase the value of the EO produced in the country, the value of the sector, and consequently contribute positively to Madagascar economic development.

Investing adaptation TPS in the EO value chains 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 TPS and lessons through the outreach and communication activities is likely to promote the market for adaptation TPS in Madagascar and possibly open up regional and international interests.

*Addressing climate risks and vulnerabilities in the EO value chains of Madagascar 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 of the 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**[110]***[110]. This is also supported by the Global Commission on Adaptation (GCA), that refers

that, *early action to address climate risks would bring a ?triple dividend? of avoided losses, economic benefits, and social and environmental benefits**[111]***[111]

265. The ARCHE 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 to the EO value chains.

266. The project will also be the first to provide technical assistance (TA) through the acceleration of adaptation MSMEs ? EO Adaptation Accelerator ? and by supporting the implementation of selected proven and high-impact TPS for the EO value chain while ensuring the conservation and sustainable management of natural resources through the EbA approach. The project hence offers a market opportunity for these MSMEs that otherwise will be missed. Due to agreed collaborations during the PPG with AAP and ASAP, the project will maximize capacity building efforts for MSMEs by tapping into regional adaptation expertise and marketing efforts for business model scale-up and replication. By coordinating with PIC, ASAP and AAP, the proposed project will maximize and target business growth funding for the EO value chains. The ASAP toolkit and AAP curriculum will be used as a basis to develop the EO Adaptation Accelerator programmes as well as to select the MSMEs that will be accelerated. AAP will complement the proposed project by providing sector expertise and mentoring on agro-business development based on climate-resilient technology and sustainable production practices.

267. The ARCHE Project has been designed with a view to maximize the positive impact on the most vulnerable population across the EO value chains, that in fact are the ones responsible for the production of the EO plants that is the raw material in which the entire value chains depends on, 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 the acceleration of innovative MSMEs) as well as the demand side (by establishing and providing access to financial mechanisms for the most vulnerable people to acquire adaptation innovations), both under PC2. 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 products and services adapted to the needs of vulnerable populations impedes them from adopting climate adaptation TPS. The proposed interventions focus on developing a conducive market for climate adaptation-oriented TPS for the EO value chains of Madagascar 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.

268. 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 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 Madagascar 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.

269. 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 establishment of financial mechanisms to be supplied to both the MSMEs and the most vulnerable across the EO value chains. In the definition of these financial mechanism, products and services the ARCHE project will work with GIZ, FDA, FIR and other multilateral financial institutions such as VOLA MAHASOA, thus ensuring that the designed/adapted products are integrated in the financial sector as well as ensuring their sustainability.

270. Without the LDCF funding, the deployment of innovative TPS for reducing climate-related risks to improve adaptation to climate change will be largely limited across the EO value chains This is due to the main barriers noted earlier in this document, 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 contribute to address the main barriers for achieving adaptation targets and simultaneously support green jobs creation, income generation and contributing to economic development of the country.

271. To ensure accessibility and affordability of the adaptation TPS to the most vulnerable populations, the project will raise awareness about climate risks, vulnerability and how to address using suitable adaptation solutions, including EbA related technologies and practices has proven successful in previous experiences, and some tools developed by the MEbA project[112]., and improve available financing mechanisms to get suitable and localized climate adaptation TPS 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.

272. To reach out to the most vulnerable, the project will create Regional EO Adaptation Hubs and engage with existing CSOs, NGOs and community associations (including women and youth associations) that are located in the regions being targeted by the project and act in the EO value chains, making sure that this information / knowledge reaches out to the main targeted beneficiaries of the project. Communities will be provided training on how to use adaptation innovations and how to access credit lines to purchase or rent the innovations. With this approach, the project will enable a shift from having a patchwork of projects in different regions to providing scalable innovations in all EO value chains and geographies. Special attention will be given to climate-resilient technology (e.g., innovative water harvesting schemes, water/energy-efficient irrigation systems, solar dehydrators,

efficient biomass stoves/ovens, renewable energy technologies ? RETs) and sustainable land management practices (e.g., agroecology, agroforestry, organic fertilization) as part of the technological packages offered through a variety of financial intermediaries and funding mechanisms.

273. In addition, the project will also expand the capacities of existing research institutes to focus on adaptation in the EO value chains. For example, FOFIFA has had few mandates to support the EO value chains. In 2017, they were mandated by PROSPERER to develop a technical datasheet for geranium cultivation. The ARCHE project will engage with FOFIFA and CNRIT, in the development of the tools to climate change impacts/hazards across the sector as well as the adaptation TPS to address that, in the development of the EO sustainable production zone, in the development of the Sustainable Essential Oil Development Strategy, as well as see if one of them would like to become one of the Regional Adaptation Hubs to be established by the project. The research institutes can perform specialized activities such as preparing technical booklets on processing, conservation and storage of EO plants, and they can be engaged in training technicians and farmers on best adaptation technologies and practices.

Co-Finance

274. The LDCF project will mobilize additional co-financing from national stakeholders that include line ministries and other institutions. It will furthermore leverage co-financing from national, regional and international stakeholders including the MEDD and BNCC-REDD+, PFAN, Climate-KIC, GIZ, MIARAKAP, VOLA MAHASOA S.A, SAHANALA, ODEFI, CNRIT and others.

275. The MEDD/BNCC-REDD+ will provide co-finance the project for an estimated amount of US$1,500,000. This will mainly be in the form of in-kind, by making their tools, methodologies, market infrastructure, staff available for the implementation and monitoring of the project.

276. GEHEM will provide co-finance up to US$1,582,745, in terms of guiding the project implementation by co-chairing the Sustainable EO Coordination Platform, being part of the Project Steering Committee, providing contacts and engaging EO value chain actors on the ARCHE Project activities. GEHEM will also be responsible for the training, awareness raising and capacity building on adaptation and adaptation TPS, for the identification and deployment of pilots projects within the EO value chain as well as for the integration of climate change resilience into the EO value chain through the development of the Sustainable EO Strategy.

277. The Integrated Growth Poles Project (PIC) will provide intents to allocate US$1,200,000 to support activities within the ARCHE project related with technical assistance to the EO Coordination Platform, assessment, implementation and provision of financial mechanism for innovative adaptation technologies for the EO value chains, as well as for capacity building and training.

278. VOLA MAHASOA will provide up to US$6,000,000 co-financing in financial products and services to the project..

279. ODEFI will provide US$28,000 in co-finance by receiving the adaptation TPS exhibition/roadshow in their premises, as well as by reaching out to their associates with

information/materials disseminating adaptation TPS available for them and advocating for the importance of integrating those on their daily activities.

280. SAHANALA will provide US$168,000 of co-finance towards the implementation of the pilot project and for the implementation of the exhibitions and roadshows on climate change adaptation TPS for the EO value chains.

281. Climate-KIC will provide US$250,000 in co-finance (in-kind) to support the implementation of several activities of the project, focusing on its approach and methodologies to develop climate change risk and vulnerability assessment, applying its Gender Toolkit as well as supporting the development and implementation of the EO Adaptation Accelerator.

282. MIARAKAP will provide US$100,000 as co-finance to support the deployment of the EO Accelerator Programme as well as to provide financial business growth support to at least one of the MSMEs championed through the implementation of the ARCHE project.

283. CNRIT will provide US$145,000 in co-finance towards the establishment of the regional hubs and implementation of adaptation TPS across the EO value chain.

6) GLOBAL ENVIRONMENTAL BENEFITS (GEFTF) AND/OR ADAPTATION BENEFITS (LDCF/SCCF); AND

284. The project will support development and adoption of clean and climate smart TPS that will reduce post-harvest losses, improve processing and conservation techniques, in the following areas:

Nature-based solutions, including EbA solutions, including the adoption of sustainable EO crop production techniques/methods.

Sustainable soil and land management.

Energy efficiency and energy generation solutions (use of more energy efficient distillation technologies, adoption of RET for energy use in distilleries, use of solar pumping and solar powered irrigation enabling more water and energy security for EO producers during flood and drought periods).

Integrated Water Resources Management reducing flood damage and promoting infiltration to ensure more sustainable water resources for irrigation.

Generation of climate data and dissemination of climate-related information, such as Climate Early Warning Systems and Climate Information dissemination systems, to amongst other things, provide information on expected climate conditions and their variability, allowing the EO producers to adopt protection measures in case of climate events.

285. This will be achieved by empowering MSMEs and expanding markets for climate adaptation TPS, generating jobs and supporting overall economic growth and building and increasing the resilience of the EO value chains, with a special focus on the most vulnerable of the value chains. The ARCHE Project?s objective is to reduce the vulnerability and increase the resilience to climate change of the EO

value chains through the deployment of adaptation TPS and by addressing a number of market barriers already described, by:

Mainstreaming climate change adaptation into the institutional and legal framework of the EO value chains, through the development of the Sustainable Essential Oil Development Strategy and proposals for new regulatory instruments, which will provide the legal/regulatory basis and guide towards adoption of climate-resilient production of EO at the national level, generating multiple and beyond project scale climate benefits.

Supporting the identification and acceleration of potential adaptation MSMEs providing TPS to the EO value chains, including business facilitation services through the establishment and operationalisation of EO Adaptation Accelerator.;

improving and facilitating accessibility for the different EO value chains actors (with a special focus on the most vulnerable ones) to the identified and nurtured TPS through the provision of information as well as by making available financial mechanisms to support the acquisition of adaptation TPS as well as their development and growth,

286. The ARCHE Project will transform the EO value chains to generate benefits from the climate change adaptation TPS by reducing climate risks such as flood and drought and sustaining more production of the EO. As a result, the EO value chain and the livelihoods of people involved in its production will be less vulnerable to extreme weather events, and their income is expected to increase. 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 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.

287. The project supports sustainable land management, at least 3,600 hectares. It has been assumed that throughout the project 4,564 actors across the EO value chains will be trained, including 50% women and 30% youth. Additionally, by adopting climate-adaptation oriented TPS and practices, the pressure on the ecosystems will be reduced and promotes sustainable land management. For example, the adoption of an alternative to firewood will allow to reduce pressure on forest and help to regenerate degraded forested areas. In addition to the share of financing of the project that is directly tied to climate actions, the project also generates climate co-benefits. Shifting to alternative energy sources for firewood allows regenerating degraded forested land, resulting in the reduction of GHG emissions and enhancing carbon sequestration. The use of drought and pest resistant EO plants seeds, or implementation of ecosystem-based farming will require lower fertilizer levels and less labour inputs (current EO plant cultivation is labour intensive), resulting in higher productivity and low net emission vector output from the cultivation of the EO plants.

288. In addition, the project will raise awareness from lessons learnt and knowledge sharing on environmental issues, ecosystem-based adaptation, and climate risk reduction. Incentives ? subsidies, insurance, index-based weather insurance and catastrophic bonds are potential financial instruments for risk mitigation ? which will be analysed and tailored to enhance climate resilience and loans and grants for adaptation solutions within the EO value chains.

289. Additionally, the project is expected to promote entrepreneurship, including for women and youth in vulnerable communities, with income diversification and off-farm employment opportunities. This is likely to generate direct benefits to approximately 34,000 small-scale EO producers and growers involved in the EO sectors, of which 50% are foreseen to be women (see Annex I). Through its planned cross-cutting gender activities, the project will give a special focus on fostering and improving resilience and adaptive capacity of local vulnerable groups and in particular women groups. An emphasis will be put on the collection of sex-disaggregated data and indicators throughout the project monitoring in order to ensure the achieving of the set balance and foster gender balance in the EO sector.

7) INNOVATIVENESS, SUSTAINABILITY AND POTENTIAL FOR SCALING UP.

Innovativeness:

290. The ARCHE Project offers an innovative approach to unlock private sector investments to tackle the growing climate risks and provision of adaptation TPS applicable to local needs and priorities of the EO value chains. Through the establishment of Sustainable EO Coordination Platform and competition based accelerator ? the EO Adaptation Accelerator ?, the project supports the creation of an conducive environment to identify MSMEs/entrepreneurs with innovative adaptation TPS, including business models for generating climate adaptation benefits, and nurture these MSMEs/entrepreneurs into viable business delivering large-scale deployment across the EO value chains, and simultaneously ensuring availability and affordability of these adaptation solutions to the vulnerable populations.

291. The ARCHE Project has adopted an innovative approach during the PPG in its design and aims to adopt an innovative approach in its implementation.

292. At the design stage, the project adopted an innovative approach by preparing the project Baseline Report and the CRVA, included on it, that supported the identification: (i) of the climate change risks and hazards to which the EO value chains are /have been/ are expected to be subjected to; (ii) of the adaptation TPS that can be adopted by the different actors across the value chain to adapt to these climate events and hazards; (ii) identification of the Madagascar most vulnerable regions / and most vulnerable, on which the ARCHE Project will be focusing on. 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. In this assessment, the information retrieved from different sources (the GHE developed through the ISWEL Project, the WB CCKP and ThinkHazard!) was verified/complemented with information gathered from the stakeholders? consultation as well as from secondary data (data collected from existing sources such as: news, review articles, papers, others).

293. The design of start-to-end stepwise process allows cross-innovation between the three types of accelerator programmes, mainstreaming women, and engaging youth in a transformative manner. The stepwise process helps to select, develop, and promote MSMEs/entrepreneurs, and their consistent growth in the development, deployment and scale-up of adaptation TPS. Along with AAP and ASAP,

the ARCHE Project will support deployment of adaptation-oriented TPS innovations jointly through categories instead of supporting single track technology deployment. For example, members of the Sustainable EO Coordination Platform will be trained in promoting the adoption of gender responsive climate resilient technologies and services along the EO value chains, at least 21 MSMEs/entrepreneurs with proven and high impact innovative climate change adaptation oriented TPS applicable to the EO value chains receive acceleration services (coaching, mentoring and business growth support), innovative financing will be piloted to support deployment of a couple of selected adaptation TPS for demonstration purposes, and at least 2 Regional EO Adaptation Hubs will be established to convene EO value chain players and organize joint activities linking adaptation oriented TPS suppliers with EO value chains actors, with a specific focus on the most vulnerable ones. Finally, an online platform (the ARCHE Online Platform) to showcase adaptation TPS, their benefits and suppliers will be established and managed by the PMU.

294. Partnerships with the private sector financial institutions (e.g., microfinance institutions, cooperatives, and rural banks) will leverage additional financing for sustainable adaptation technologies and practices. UNIDO will explore linkages with new innovative platforms like YAPU[113][113] for possible avenues to support the mobilization of financial instruments targeting the MSMEs/entrepreneurs and the stakeholders involved in the EO value chains. Such innovations will be highlighted by the ARCHE project.

295. The project will support the extension of existing financial products and or support the definition of new ones, to be provided to MSMEs/entrepreneurs as well as to the most vulnerable across the EO value-chains.

296. The strategy that the project aims to adopt in its implementation is also quite innovative. From the assessment of the current policy framework, the development of an overarching document to guide the development of the EO value chains (the Sustainable Essential Oils Development Strategy), the identification of innovative TPS, the implementation of adaptation pilots to showcase technology, the establishment of financial mechanisms to support both supply (MSMEs/entrepreneurs) and demand (EO value chains actors), to the establishment of an EO Adaptation Accelerator to accelerate MSMEs/entrepreneurs and adoption of varied approaches (EO Adaptation Hubs / engagement of NGOs, CSOs and community associations in exhibition/roadshow of adaptation TPS) to connect both supply and demand across the EO value chains. 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, selected MSMEs/entrepreneurs within the EO Adaptation Accelerator 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 TPS to the EO value-chains, building its resilience. 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 and linking the supply and demand of the adaptation TPS, the project also aims to contribute to close the adaptation gap existent in Madagascar. 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 contribute to eradicate poverty.

Sustainability and Exit Strategy:

297. The proposed project will empower MSMEs/entrepreneurs and expand markets for climate adaptation TPS, generating diversified productive livelihoods and supporting overall resilience building of the EO value chains, with a special focus on the most vulnerable.

298. PC1 aims to contribute towards the development of a legal and enabling framework, by setting up a mechanism that will: contribute to the development of a Sustainable EO Development Strategy as well as legislation and regulations necessary to promote the uptake of innovative adaptation TPS/measure/techniques. This, and the collaborative platform ? Sustainable EO Coordination Platform ?, will guarantee that the proposed interventions are closely linked to: (a) National Adaptation Planning Processes; (b) the implementation of the Draft EO decree; and (c) help to fill gaps and make use of synergies with other on-going EO and adaptation related initiatives in the country. The creation of these institutional and regulatory frameworks, fostering exchanges and the creation of linkages in between public, private sectors (including industry associations, representations of the most vulnerable), regional and international platforms, by building the capacity of the involved institutions and its staff on these regulations as well as on climate change, adaptation and adaptation innovation TPS the ARCHE Project will ensure national ownership, national private sector engagement and, thus, its sustainability.

299. As the result, the ARCHE Project will establish an integrated and sustainable mechanism to support MSMEs/entrepreneurs develop and grow their business as well as establish financial instruments to support the development and acquisition of climate change adaptation TPS, ultimately contributing to the development of the EO value chains as well as to the country?s national development.

300. PC2 will identify and accelerate innovative adaptation MSMEs/entrepreneurs, promote the deployment of adaptation pilot projects along the EO value chains and provide access to finance. For that, calls for proposals with clearly defined selection criteria will be launched and widely disseminated to attract local adaptation MSMEs to be accelerated through specialized training and technical assistance to help them understand and access financial services such as microfinance products for improving their innovations. From the 21 successful adaptation MSMEs four (4) will be selected to be implemented as pilots and receive co-finance from the project to do that. Through these interventions, adaptation MSMEs can improve their businesses and secure funding to scale-up the delivery of TPS in the EO value chains. Furthermore, the establishment of linkages to partner networks (such as PFAN) to provide business growth services to MSMEs will ensure the long-term sustainability of the MSMEs beyond the project duration.

301. In addition, PC2 will work together with national microfinance institutions and funds in the development of financial mechanisms /products to be made available to the most vulnerable. The project will link existing and new financing streams with credit lines to support adaptation innovation proliferation, such as the FDA, which channels funds (grants, loans, guarantees) to multiple financial institutions. Existing credit lending and risk insurance services will receive capacity development on adaptation innovation and adaptation, in general, to tap into their respective market opportunities and continue to offer and adapt such service after project termination. These interventions will enable the most vulnerable growers and producers to access the most sustainable production practices and energy-efficient and robust technologies that will build their overall resilience to climate change.

302. The project also aims that through engaging national accelerators for the delivery of the EO Adaptation Accelerator programme and by engaging FSP, microfinance institutions and existing funds in making available financial products, that it will guarantee ownership and sustainability of these actions after project ends.

303. Component 3 will focus on raising the awareness of EO producers, distillers? associations/cooperatives on the selected innovative adaptation TPS, including EbA and sustainable production practices that can be adopted across the EO value chains as well as on the innovative financial products available to them to be able to acquire or rent these adaptation TPS. These activities aim at addressing the limited awareness and access to climate smart TPS and financial mechanisms to sustainably grow EO value chains and the limited value placed on resilience of the ecosystem services and their link to improved sustained productivity along the EO value chains. This will be done by creating Regional EO Adaptation Hubs in Madagascar to convene and organize awareness raising workshops to advertise adaptation TPS and available financial instruments to the different stakeholders as well as through the deployment of exhibitions/roadshow in identified NGOs, CSOs and community associations in the targeted regions. Furthermore, technical training and repair centers will be funded so that equipment can be continually maintained, repaired and used. Women and youth-based organizations will receive targeted training and encouraged to access products suited for productive outputs in the local context to sustain their livelihoods.

304. In addition, in PC3, lessons from the project will be documented and widely disseminated through the ARCHE Platform that will be established within the BNCC-REDD+ website as well as in national and regional platforms and events and distribution support channels established, strengthened, and showcased to ensure that EO growers, distillers associations and cooperatives, including women and youth, of the identified vulnerable regions access adaptation technologies and diversified livelihoods. As the ARCHE Platform will be established as part of the BNCC-REDD+ website, its sustainability will be ensured, as all documents and information generated by the projects will be kept by the BNCC-REDD+.

305. Finally, while the ARCHE Project?s activities will focus on the duration of the support, all project components are expected to continue beyond the closure of the project, ensuring their sustainability. For instance, the established Sustainable EO Coordination Platform is foreseen to continue operating after the project completion, the Sustainable EO Development Strategy developed will (continue) to be implemented after project completion etc. Furthermore, as referred all knowledge on best practices and technologies will be stored in the BNCC-REDD+ website. Specifically, adding a learning emphasis and

targeting the inclusion of gender dimensions will ensure that the best innovations are used by all actors along the essential oil value chains. Storing this knowledge will ensure national ownership and enable innovations to be easily identified for future support after project termination.

Potential for scaling-up:

306. 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 and are able to provide locally-specific adaptation solutions, it can be said that the replicability potential of the ARCHE Project is enormous, both at the national and international level.

307. To scaling up the market for climate adaptation solutions, the ARCHE 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).

308. 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: the project will support establishing the required financing mechanism to ensure the successful graduation of MSMEs/start-ups into commercial businesses. Strategic alliances with identified partners, such as Fihariana will be established to set up suitable mechanisms to provide tailored technical and financial services to MSME?s. The project will work with other innovation and adaptation innovation programmes such as AAP for financing the scaling up and deployment of MSME ideas in sectors even outside the EO value chains. In addition, the innovation support will be provided via blended finance through ASAP, AAP and PFAN programmes, for commercial investment to scale up mature products/technologies. Blending will be achieved through the provision of grants alongside development finance and commercial capital. The blended finance will reduce the implementation risk of adaptation-oriented TPS and is expected to create a conducive investment climate to attract large-scale investments and galvanize funding for large-scale deployment and replication. By tailoring lending and insurance products to groups working along the essential oil value chains, it will create a multiplier effect to encourage others to take out loans and obtain credit to acquire adaptation innovations or insurance products.

Limited access to financing and risk mitigation products by stakeholders working along the value chains: project will develop and provide financial products/mechanism for the most vulnerable to access climate adaptation TPS. These will include development of innovative financing structures, e.g., credit lines to aggregators. Furthermore, the project will set the groundwork to introduce climate-risk insurance products by supporting climate data collection and making Madagascar insurance groups aware of such existing products. Furthermore, at local/national scale, the experience gained by the PMU and the Accelerators 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.

309. 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 Madagascar and potentially across the region.

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[1] https://data.worldbank.org/indicator/AG.SRF.TOTL.K2?locations=MG

[2] https://www.britannica.com/place/Madagascar

[3] https://data.worldbank.org/indicator/AG.SRF.TOTL.K2?locations=MG

[4] WB Databank: https://databank.worldbank.org/reports.aspx?source=2&series=SP.POP.TOTL&country=MDG

[5] WB Databank: https://databank.worldbank.org/reports.aspx?source=2&series=SP.POP.TOTL&country=MDG

[6] WB Databank: https://databank.worldbank.org/reports.aspx?source=2&series=SP.POP.TOTL&country=MDG

[7] Doing Business 2020 Report: https://openknowledge.worldbank.org/bitstream/handle/10986/32436/9781464814402.pdf

[8] Out of 180 countries analyzed, Madagascar is in position 147 (Position #1 is shared by Finland, New Zealand and Denmark, which are perceived as the cleaner countries in terms of corruption perception, i.e., not corrupt). https://www.transparency.org/en/countries/madagascar

[9] Score goes from 0 to 100. Countries with a lower score are perceived as more corrupt and countries with a higher score are perceived as cleaner.

[10] https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=MG

[11] OEC, https://oec.world/en/profile/hs/essential-oils?yearSelector2=tradeYear2

[12] OEC, https://oec.world/en/profile/hs/essential-oils?yearSelector2=tradeYear2

[13] OEC, https://oec.world/en/profile/hs/essential-oils?yearSelector2=tradeYear2

[14] Lemesle S. Essential oils and floral waters from Madagascar, 4th edition 2017

[15] http://www.madagascarconsulate.org.za/madagascar/economy/essential-oils/

[16] https://unctad.org/system/files/official-document/ditcted2017d7_fr.pdf

[17] OEC, https://oec.world/en/profile/hs/essential-oils?yearSelector2=tradeYear2

[18] MSMES in this project refers to start-ups, entrepreneurs, micro, small and medium sized enterprises

[19] Sep 2019 workshop findings on the Advantages of the EO Sector

[20] USAID Translinks: Promoting Transformations by Linking Nature, Wealth and Power

[21] Sep 2019 workshop findings on the Advantages of the EO Sector

[22] INVEST_IN_ESSENTIAL_OIL_MADAGASCAR_en.pdf (edbm.mg)

[23]PIF, March 2022.

[24] https://allafrica.com/stories/202101130267.html

[25] https://www.agri-resources.com/2022/02/07/13279/

[26] https://jacarandas-si.com/en/madagascar-spice-wholesaler/

[27] https://jacarandas-international.com/en/our-sustainable-environmental-and-social-approach/

[28] https://hotspots-explorer.org/

[29] World Bank CCKP: https://climateknowledgeportal.worldbank.org/

[30] https://thinkhazard.org/

[31] August 2022, https://gain.nd.edu/our-work/country-index/rankings/

[32] https://germanwatch.org/sites/germanwatch.org/files/Global%20Climate%20Risk%20Index%202021_1.pdf

[33] https://climateknowledgeportal.worldbank.org/country/madagascar

[34] Estimated from data on Madagascar Mean Temperature between 1951-2020 extracted from the https://climateknowledgeportal.worldbank.org/country/madagascar/trends-variability-historical

[35] Extracted from the https://climateknowledgeportal.worldbank.org/country/madagascar/trends-variability-historical

[36] Madagascar NAP of December 2021

[37] https://climateknowledgeportal.worldbank.org/country/madagascar/trends-variability-historical

[38] Madagascar NAP of December 2021

[39] Madagascar NAP of December 2021

[40]World Bank Climate Change Knowledge Portal | for global climate data and information! CRU TS (Climate Research Unit gridded Time Series is widely used climate dataset.

[41] This is information extracted from the World Bank Group, CCKP https://climateknowledgeportal.worldbank.org/cmip5 and also from the Madagascar NAP 2022

[42] Generated through the World Bank Group, CCKP, https://climateknowledgeportal.worldbank.org/country/madagascar/climate-data-projections-expert

[43] Generated through the World Bank Group, CCKP, https://climateknowledgeportal.worldbank.org/country/madagascar/climate-data-projections-expert

[44] Figure built with information extracted from the World Bank Group, CCKP https://climateknowledgeportal.worldbank.org/cmip5

[45] Analysis of the World Bank Group, CCKP data, https://climateknowledgeportal.worldbank.org/cmip5 and also verified by the Madagascar NAP 2022

[46] Analysis of the World Bank Group, CCKP data, https://climateknowledgeportal.worldbank.org/cmip5

[47] Analysis based on information from CCKP, https://climateknowledgeportal.worldbank.org/cmip5

[48] CPGU, Madagascar Climate Tendencies, 2019

[49] https://reliefweb.int/report/madagascar/climate-risks-food-peace-geographies-madagascar

[50] Figure built with graphs generated from the World Bank Group, CCKP, https://climateknowledgeportal.worldbank.org/cmip5

[51] World Bank Climate Change Knowledge Portal

[52] Madagascar - Vulnerability | Climate Change Knowledge Portal (worldbank.org)

[53] Own analysis of data available in Madagascar Profile: https://www.desinventar.net/DesInventar/profiletab.jsp?countrycode=mdg&continue=y

[54] Own analysis of data available in Madagascar Profile: https://www.desinventar.net/DesInventar/profiletab.jsp?countrycode=mdg&continue=y

[55] Prevention Web accessed Oct 2019 https://www.preventionweb.net/countries/mdg/data/

[56] https://reliefweb.int/report/madagascar/climate-risks-food-peace-geographies-madagascar

[57] Think Hazard - Madagascar - Cyclone

[58] https://thinkhazard.org/en/report/150-madagascar/FL

[59] https://reliefweb.int/report/madagascar/climate-risks-food-peace-geographies-madagascar

[60] https://climateknowledgeportal.worldbank.org and CGPU, Madagascar Climatic Tendances, 2019

[61] CGPU, Madagascar Climatic Tendances, 2019

[62] ibid

[63] CGPU, Madagascar Climatic Tendances, 2019 and Madagascar NAP 2022

[64] National Adaptation Plan of Madagascar | UNFCCC

[65] ibid

[66] World Bank Climate Change Knowledge Portal

[67] National Adaptation Plan of Madagascar | UNFCCC

[68] Harvey, C. et all, (2014), Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar, extracted at: https://royalsocietypublishing.org/doi/10.1098/rstb.2013.0089

[69] Harvey, C. et all, (2014), Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar, extracted at: https://royalsocietypublishing.org/doi/10.1098/rstb.2013.0089

[70] Harvey, C. et all, (2014), Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar, extracted at: https://royalsocietypublishing.org/doi/10.1098/rstb.2013.0089

[71] Based on the findings of Harvey, C. et all, (2014), Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar, extracted at: https://royalsocietypublishing.org/doi/10.1098/rstb.2013.0089

[72] Harvey, C. et all, (2014), Extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar, extracted at: https://royalsocietypublishing.org/doi/10.1098/rstb.2013.0089

[73] https://earthjournalism.net/stories/clove-farmers-in-indonesias-spice-islands-face-increasing-uncertainty-in-a-changing-climate

[74] https://hotspots-explorer.org

[75] SSP2 ? is the socioeconomic scenario, describing wider trends in societal development, such as population growth, income inequality, education, urbanization rate, etc. SSP2 is the "middle of the

road" scenario, with continued economic growth and development, and gradual improvements in inequality and sustainability.

[76] https://hotspots-explorer.org

[77] https://thinkhazard.org/en/report/150-madagascar/FL

[78] Creating Markets in Madagascar: Country Private Sector Diagnostic (ifc.org)

[79] Adapted from PIF

[80] World Bank Madagascar overview https://www.worldbank.org/en/country/madagascar/overview June 2019

[81] Essential Oils Production in Madagascar - Markets, Suppliers and Exporters (selinawamucii.com)

https://oec.world/en/profile/hs/essential-oils?yearSelector2=tradeYear2

[82] Bowman, Megan; Steenmans; Climate Finance Law: Legal Readiness for Climate Finance, extracted at: https://wedocs.unep.org/bitstream/handle/20.500.11822/26378/climate_finance_law.pdf?sequence=1&isAllowed=y

[83] Bowman, Megan; Steenmans; Climate Finance Law: Legal Readiness for Climate Finance, extracted at: https://wedocs.unep.org/bitstream/handle/20.500.11822/26378/climate_finance_law.pdf?sequence=1&isAllowed=y

[84] http://iem-madagascar.com/place-de-la-femme/

[85] Global Commission on Adaptation: https://gca.org/global-commission-on-adaptation/solutions

[86] https://hotspots-explorer.org

[87] https://www.sei.org/featured/how-to-model-energy-and-water-linkages-using-leap-and-weap/

[88] https://thinkhazard.org/es/

[89] https://lightsmithgp.com/wp-content/uploads/2020/09/asap-adaptation-solutions-taxonomy_july-28-2020_final.pdf

[90] Jenkins and Mansur (2011). Bridging the Clean Energy Valleys of Death

[91] https://lightsmithgp.com/craft/

[92] https://climateasap.org/asap-partnership-program/

[93] https://www.conservation.org/docs/default-source/gef-documents/20191125-ci-ldc-accelerator-gef-pif-resubmission.pdf?sfvrsn=be0bc1e_0

[94] https://lightsmithgp.com/wp-content/uploads/2020/09/asap-adaptation-solutions-taxonomy_july-28-2020_final.pdf

[95] Noble, I.R., S. Huq, Y.A. Anokhin, J. Carmin, D. Goudou, F.P. Lansigan, B. Osman-Elasha, and A. Villamizar, 2014: Adaptation needs and options. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada,

[96] https://lightsmithgp.com/wp-content/uploads/2020/09/asap-adaptation-solutions-taxonomy_july-28-2020_final.pdf

[97] https://lightsmithgp.com/wp-content/uploads/2020/09/asap-adaptation-solutions-taxonomy_july-28-2020_final.pdf

[98] Adapted from the Adaptation Solutions Taxonomy https://lightsmithgp.com/wp-content/uploads/2020/09/asap-adaptation-solutions-taxonomy_july-28-2020_final.pdf

[99] University of Pretoria. The entrepreneurship process. URL: https://repository.up.ac.za/bitstream/handle/2263/24173/04chapter4.pdf?sequence=4

[100] University of Pretoria. The entrepreneurship process. URL: https://repository.up.ac.za/bitstream/handle/2263/24173/04chapter4.pdf?sequence=4

[101] Jenkins and Mansur (2011). Bridging the Clean Energy Valleys of Death

[102]https://www.researchgate.net/publication/322998670_How_Do_Accelerators_Select_Startups_Shifting_Decision_Criteria_Across_Stages

[103] Jenkins and Mansur (2011). Bridging the Clean Energy Valleys of Death

[104] Jenkins and Mansur (2011). Bridging the Clean Energy Valleys of Death

[105] IFAD Climate Change Risk Assessments in Value Chain Projects

[106] This calculation was carried out having into account that each household in Madagascar has 4.6 people, sob y reaching to 1 person in the household, the ARCHE Project is also reaching out to the additional 3.6.

[107] This calculation was carried out having into account that each household in Madagascar has 4.6 people, so, by reaching to 1 person in the household, the ARCHE Project will be reaching out to the addition 3.6.

[108] Strengthening M&E of Climate Change Adaptation, GEF STAP and UNEP, May 2017

[109] https://unepmeba.org/

[110] Hallegatte, Ste?phane, Jun Rentschler, and Julie Rozenberg. 2019. *Lifelines: The Resilient Infrastructure Opportunity.* Sustainable Infrastructure Series. Washington, DC: World Bank. doi:10.1596/978-1-4648-1430-3. License: Creative Commons Attribution CC BY 3.0 IGO

[111] GCA, 2019: ?Adapt Now: A Global Call for Leadership on Climate Resilience.? Rotterdam and Washington, DC: Global Commission on Adaptation. https://gca.org/ reports/adapt-now-a-global-call-for-leadership-on-climate-resilience/

[112] The MEbA project was implemented in the period 2012-2020 in two phases. Phase 1 (2012-2017) focused on training 5 MFIs in Colombia and Peru. In its second phase (2018-2020) MEbA provided technical assistance (TA) to nine MFIs in 8 countries including Benin and Senegal in Africa. An initial institutional assessment and green strategy was provided to Vahatra NGO in Madagascar. A leverage ratio of 5:1 was obtained (5 USD of private funds disbursed towards EbA for each 1 USD invested in TA).

[113] https://yapu.solutions/

1b. Project Map and Coordinates

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

1. The project will be initially focused on the regions identified as the most vulnerable ones to climate change impacts and where the EO value chains are located. These are: **Vakinankaratra, Amoron?i Mania, Haute Matsiatra, Vatovavy Fitovinany, Atsimo Atsinanana and Ihorombe.** The **s**elected regions for the ARCHE project and EO plants grown in each can be seen in Figure 18 below. The Capital city and their Geo-coordinates are provided in Table 5.

Table 5: Regions targeted, their capital cities and geo-coordinates

	Target regions	**Capital city**	**Geo-coordinates**
1	Vakinankaratra	Antsirabe	19?52?0?S 47?02?0?E
2	Amoron?i Mania	Ambositra	20?31?0?S 47?15?0?E
3	Haute Matsiatra	Fianarantsoa	21?27?13?S 47?05?09?E
4	Vatovavy Fitovinany	Manakara	22? 09? S, 48? 00? E
5	Atsimo Atsinanana	Farafangana	22?49'20"S 47?49.569'E
6	Ihorombe	Ihosy	22?24?13?S 46?07?33?E

Region	Planted EO plant	Collected EO plants
Vakinankaratra	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger
Amoronimania	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger
Haute Matsiatra	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger
Vatovavy Fitovinany	Clove, Ylang Ylang,	Niaouli, Cinnamon, Helichryse Faradifani, Ginger
Atsimo Atsinanana	Clove;	Niaouli, Cinnamon, Helichryse Faradifani, Ginger
Ihorombe	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, Ginger

Figure 18: Selected regions for the ARCHE project and EO plants grown in each

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:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

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

1. Adaptation to climate change across the EO value chains requires effective collaboration and a participatory approach involving all types of stakeholders for the identification of the climate change risks and vulnerabilities, project interventions, the creation of the necessary synergies to address the issue in an integrated way, and to identify how, when and to what extent the different stakeholders should be involved. The aim of this process is to get the maximum possible output from the project and guarantee the ownership of the resulting products and outputs, 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, as described in the SEP (see Annex K).

<u>During the preparation of the project (PPG)</u>

2. Achieving the project objectives requires coordination and engagement of a wide range of stakeholders across different sectors, including central and local government, the private sector,

development partners, civil society, etc., 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 key parts of engaging with the stakeholders in the project.

3. During PPG phase, people form Madagascar and international stakeholders were engaged for i) the development of the baseline report and the CRVA (Annex P); ii) formulation of the project activities; and iii) the identification of a preliminary set of MSMEs and businesses that could propose pilot projects, as well as accelerators and FSP that are expected to be engaged and provide support during implementation. This was carried out by the international consultants through virtual meetings with different stakeholders and an online questionnaire.

4. The following were the stakeholders directly and indirectly involved in the project definition at PPG stage:

Public sector / Government Institutions

Donors/International Cooperation Agencies

Financial and Banking Sector Institutions

Private Sector (e.g., MSMEs, entrepreneurs)

Civil Society Organisations (CSO) / Non-Governmental Organisations (NGOs)

Research centres and academic/educational institutions

Business Groups and Business Associations

5. The description and analysis of relevant stakeholders are shown in the Baseline Report and SEP (Annex P and K, respectively), as well as in the Annex O ? Evidence of Stakeholder Engagement. 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.

<u>During project implementation</u>

6. The project execution will be undertaken through multiple contractual arrangements between UNIDO, the PEE, national and international organizations, national government entities and private sector operators.

7. This project will establish cooperation through various means with the Government institutions, academia, research institutes, producer/distiller associations/cooperatives, women?s and youth associations, private industrial stakeholders and NGOs, as well as with financial organizations (commercial banks and microfinance institutions) and other insurance agencies.

8. The following table summarises the roles of the different stakeholders that will be involved during project implementation.

Table 6: Stakeholders? roles envisaged during project implementation

Stakeholder	Current role in the country	Envisaged role in the ARCHE Project
United Nations Industrial Development Organisation (UNIDO)	**UNIDO** is a UN specialised agency that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability. It has a Field Office in Antananarivo, Madagascar and have conducted several projects and programmes in the country.	Project Implementation Agency Oversees project execution to ensure good governance alignment with standards and GEF requirements. Reports and is accountable to GEF Council. Responsible for project cycle management, project management and evaluation and reporting on project?s impact achievement.

Ministry of Environment and Sustainable Development (MEDD- *Minist?re de l?Environnement et du D?veloppement Durable*), through the National Coordination Bureau for Climate Change and REDD+ (**BNCC-REDD+**).	The **MEDD** is responsible for the design, coordination, implementation and monitoring-evaluation of the State policy on the Environment and Sustainable Development. The MEDD?s responsibilities are to: Develop and/or update political, strategic and legal instruments to improve environmental and forest governance. e, integrating environmental diplomacy, in coordination with the Ministry of Foreign Affairs. Represent the Government nationally and internationally on all matters relating to the environment, sustainable development and climate change. Ensure, in a coordinated manner, that the environmental dimension is taken into consideration in development policies at the level of all sectors and decentralized communities. Develop strategies for the sustainability of the Protected Areas Management for the preservation and enhancement of biodiversity for the benefit of ecotourism and their sustainable use, as well as to increase the surface area of Marine Protected Areas. Implement the national strategy for reforestation and restoration of urban and forest landscapes. Promote rural and urban sustainable development programs and projects. The **BNCCREDD+** consists of two main departments: the National REDD+ Coordination Office (REDD+ Madagascar) and the **National Coordination Bureau for Climate Change and REDD+ (BNCC-REDD+).** The BNCC-REDD+ mission is to coordinate all actions relating to the fight against climate change, including: (1) promoting, in Madagascar, a resilient economy, adapted to climate change, (2) promoting sustainable development with low carbon emissions and other greenhouse gases that cause climate change and (3) develop sustainable financing mechanisms to fight climate change. The BNCCREDD+ is also responsible for developing the National Adaptation Plan. Source: https://www.environnement.mg/organigramme https://www.environnement.mg/archives/organisation/bureau-national-de-coordination-des-changements-climatiques https://www.environnement.mg/archives/organisation/bnc-redd	The **BNCC-REDD+** is nominated as the Project Executing Entity (PEE) responsible for the overall project execution. It will contract other Project Executing Partners (PEPs) to support the execution of different project activities. The **MEDD** will chair the PSC. The **MEDD** will co-chair (with the GEHEM) the Sustainable EO Coordination Platform. The **MEDD/BNCC-REDD+** will be supporting the: *Development of the tool to assess climate change risk and vulnerability in Madagascar we well as support the identification of the EO sustainable production zones, by being part of the group of stakeholders involved in its development Output 1.1.1.* *Development of the Sustainable Essential Oil Development strategy.* *Provide advice on the policy recommendation/standards to be developed* As the **PMU, the BNCC-REDD+ will also be responsible for:** *Conduction of the mapping of the EO stakeholders, under Output 1.1.1;* *Providing guidance to the needs assessment on the regulatory/policy recommendation as well as on the selection of the two instruments to be developed under Output 1.1.2.* *Support the delivery of the three (3) training courses under Output 1.2.1.* *Selection of the*

National Office for the Environment (ONE, *Office National pour l?Environnement),* MED D	ONE is responsible for ensuring that public and private investments follow local environmental legislation (e.g., projects conduct Environmental Impact Assessments when necessary), do not pollute the environment, and have the corresponding environmental certificates to operate. The ONE also monitors the implementation of Environmental Management Plans, and manages the environmental information system, among other tasks. In broad terms, ONE?s role include: i) Prevent environmental risks in public and private investments and fight against pollution; ii) Manage the environmental information system for monitoring and evaluating the state of the environment; iii) Environmental labelling and certification. As regulatory body, it ensures the implementation of the MECIE[1] decree in its capacity as both delegated contracting authority and one-stop shop. Furthermore, in collaboration with the sectoral ministries concerned, the Office proposes limit values and at the same time draws up standards and environmental guidelines. ONE is called upon to watch over the prevention of environmental risks, on the one hand by coordinating the monitoring of Environmental Management Plans (EMP), and on the other by proposing sanctions or appropriate measures. ONE is responsible for promoting Strategic Environmental Assessment (SEA), while providing advice and expertise to entities in need. The Office manages the environmental information system, monitoring and assessment of the state of the environment to support environmental assessment and for better decision-making at all levels. Source: https://www.pnae.mg/apropos.html	Member of the PSC. Member of the Sustainable EO Coordination Platform (Output 1.1.1) Support for the development of the Sustainable Essential Oil Development Strategy (Output 1.1.1) Provision of awareness and training on climate change adaptation (EbA and innovation focus) as part of Output 1.2.1. Participate in the communication and outreach activities from all different project components.

Association of Essential Oils Exporters, Extracts and Oleoresins from Madagascar ? Economic Interest Group (GEHEM-GIE, *Groupement des Exportateurs d'Huiles essentielles, Extraits et ol?or?sines de Madagascar - Groupement d'Int?r?t Economique*)	The GEHEM-GIE was established in 2019 as a union of essential oils exporters. The GEHEM-GIE represents the economic interests of all its members, now reaching around 60 companies. Their activities are oriented to make the essential oils sector the pillar of the green economy for the development of Madagascar. The GEHEM intervenes in the following areas: Facilitation of administrative procedures and Public Private Partnership (to ease dialogue with Ministries and obtain documents to operate) Access to new information (so all members have access to the same information) Search for new markets (for the members to expand operations internationally) Reforestation (commitment of members to reforest 100,000 seedlings of essential oil trees per year) Source: https://gehemgie.com/nos-activites/	Identified as potential Project Executing Partner. Co-Chair the PSC and the Sustainable EO Coordination Platform. The **GEHEM-GIE** will be responsible for: *Participating in the development of the tool to assess climate change risk and vulnerability in Madagascar we well as support the identification of the EO sustainable production zones, by being part of the group of stakeholders involved in its development Output 1.1.1.* *Development of the Sustainable Essential Oil Development strategy under Output 1.1.1.* *Provide advice on the policy recommendation/standards to be developed under Output 1.1.1.* *Carry out the needs assessment on the regulatory/policy recommendation as well as on the selection of the two instruments to be developed under Output 1.1.2.* *Participate in the communication and outreach activities from all different project components.* *Selection of 3 of the 4 pilots and dissemination of the results and experiences from the 4 pilot projects under Output 2.1.3* *Management of research centres and laboratories focused on resilient farming practices in the EO value chains* *Popularization of technologies among MSMEs across the EO sector*

Ministry of Industrialisation, Trade and Consumption (MICC - *Minist?re de l'industrialisation, du commerce et de la consommation*) Through its two directorates: Directorate for Industrialisation (*Direction de l'industrialisation*) Directorate of Trade and Commercialisation (*Direction du commerce et de la consommation*)	The MICC, among other activities is responsible for developing the considerable industrial potential of the country based on original and authentic products (Industrialisation). The MICC, through the Directorate of Trade and Commercialisation, is in charge of the implementation of State policy, in terms of export promotion, management of competition, monitoring of supply for the benefit of the national economy, as well as competitiveness and integration of Madagascar into the world economy. The MICC has created alongside the Ministry of Agriculture, in 2021, the **National Vanilla Council (*Conseil National de la Vanille, CNV*)** whose main aim is to fix the organisational modalities of the vanilla sector and derivatives (products) in all the national territory. The decree also provides for the regulation of the sector through the recognition of the role and missions of the council. The CNV was created to represent the sector?s interests as a platform to foster dialogue among the sector?s public and private actors, ensure its sustainable development, contribute with policy and regulatory framework development, promote quality, environmental and social procedures application, promote adoption of innovative approaches, in terms of traceability, technologies, structuring and financial inclusion, act as liaison between the state and national / international vanilla sector?s partners, and communicate and disseminate information about the sector. Source : https://micc.gov.mg/organigramme/ https://micc.gov.mg/wp-content/uploads/2020/10/BROCHURE-VF_compressed.pdf	Member of the PSC and of the Sustainable EO Coordination Platform. Support in establishing the Adaptation Accelerator and in identifying MSMEs within PC2 Advocacy for the sustainable EO development strategy and in developing EO standards under PC1 Participate in the communication and outreach activities from all different project components.

Ministry of Agriculture and Livestock (MINAE - *Minist?re de l'Agriculture et de l'Elevage*) through its General Directorate of Agriculture (DGA - *La Direction G?n?rale de l?Agriculture*)	Decree n? 2021-890 sets the MINAE organigram as well as its role and functions. One key task of the MINAE is to contribute to the implementation of the Plan Emergence Madagascar (PEM), by targeting accelerated economic growth in the rural world through a transformational vision of the agricultural and livestock sectors. This includes 24 programmes and projects, amongst which the ones relevant in association with the present ARCHE project are: **SFDA:** Fonds de D?veloppement Agricole (Agriculture Development Fund) https://www.fda.mg/accueil **AD2M II:** Projet d?appui au d?veloppement du Menabe et du Melaky, phase II (Menabe and Melaky development support project, phase II) https://www.ad2m.mg/. Among other sources, it received ASAP funding and the FDA. **PROSPERER :** Programme de Soutien aux P?les de Micro-Entreprises Rurales et aux Economies R?gionales (Support Program for Rural Micro-Enterprise Clusters and Regional Economies) https://www.minae.gov.mg/prosperer/ **FORMAPROD** : https://formaprod-madagascar.mg/fr/objectifs **PrAda:** Projet Adaptation des cha?nes de valeur agricoles au changement climatique (Agricultural value chains adaptation to climate change). Financed by BMZ and executed by GIZ. Run between March 2017 and February 2020. https://www.minae.gov.mg/wp-content/uploads/pdf/Factsheet%20PrAda%20170519_giz.pdf **PLAE:** Programme de lutte Anti?rosive (Erosion Control Programme) http://plae.mg/structure/ Financed by KFW **CGARD :** Centre d?Application G?o-informatique pour le D?veloppement Rural (Geoinformatics Application Center for Rural Development). Supported by Indian Government. **DEFIS - Programme de d?veloppement des fili?res agricoles inclusives :** financed by IFAD, will operate between 2017 and 2024 in 8 regions in southern and centre-eastern Madagascar. Eight value chains ? rice, maize, cassava, groundnut, coffee, onion, small ruminants and honey ? have been selected, three in each region, and sorghum and millet (value chains of special interest) https://www.ifad.org/en/web/operations/-/project/2000001492 MINAE claims that since most AMP (aside from products derived from trees) grow or are produced in buffer or agricultural lands, the EO sector falls under their mandate. Tax rates applicable to this and other parts of the EO value chains steps are established by the Ministry of Economy and Finances. Source: https://www.minae.gov.mg/page-d-exemple/organnigramme/	Member of the PSC Support the identification of the EO Regional Hubs. Support the development of the tool to assess climate change risk and vulnerability in Madagascar we well as lead the identification of the EO sustainable production zones, by being part of the group of stakeholders involved in its development under Output 1.1.1 Development of the Sustainable Essential Oil Development Strategy under Output 1.1.1 Provide advice on the policy recommendation/standards to be developed under Output 1.1.1 Look into the possibility of expanding the FDA and FIR funds to cover all actors in the EO value chain under Output 2.2.1. Popularization of the agricultural practice of adaptation to climate change through the dissemination of information and documentation on the project Financing of irrigation / watering infrastructure Support the implementation of EbA-related policies, including the ones that will be referenced in the Sustainable Essential Oil Development Strategy. Support in the identification of community organizations and association to deploy the exhibitions/roadshows on adaptation TPS for the EO value chain under PC3. Participate in the communication and outreach activities from

Ministry of Economy and Finance (MEF - *Minist?re de l'Economie et des Finances*)	Decree N?2019-093 established its roles and functions as well as the organigram. Among the many MEF activities and responsibilities, it can be found the supervision, planification, coordination and evaluation of development programmes in the medium and long terms, at all levels, and coordination of development aid and international cooperation. The MEF has an International Cooperation Support Bureau, in charge of coordinating and managing the relationship between the MEF and the technical and financial partners (i.e., from the EU). Source : http://www.mef.gov.mg/page_personnalisee/index/menu/8 https://www.facebook.com/BACE.Madagascar	Member of the PSC Facilitation of the reduction in the interest rate on bank credit / MFI Implementation of incentive taxation for sustainable microenterprises and the import of materials or equipment for the manufacturing of sustainable technologies Represented in Sustainable EO Coordination Platform Participate in the communication and outreach activities from all different project components
Ministry of Water, Hygiene and Sanitation (MEAH *Mini st?re de l'Eau, de l'Assainissement et de l'Hygi?ne*) General Directorate of Water (DGE)	The MEAH, among other tasks, is in charge of the development and application of the water code. Source: https://www.facebook.com/meahmadagascar https://meah.gov.mg/	Represented in Sustainable EO Coordination Platform Facilitation of access to equipment and practices to ensure sustainable water management in EO production/distillation Participate in the communication and outreach activities from all different project components

Ministry of Transport and Meteorology (MTM - *Minist?re des Transports et de la M?t?orologie de Madagascar*) General Directorate of Meteorology (DGM)	The General Directorate of Meteorology provides the national weather forecast in different forms (weekly, general, seasonal, etc.). It also provides air quality information, weather vigilance info and alerts according to the risk of occurrence of hydrometeorological events dangerous for the population and livelihoods (flood/flooding, heavy rain, strong winds, strong swell), as well as specific tracking of tropical cyclones and alerts. *Meteo Madagascar* also offers maps (statistics, predictions and forecasts) that can be used to analyse climatic conditions that impact, e.g., agricultural activities. with particular focus on agriculture, it offers two products: *Agrometeo Bulletin* (climate information for agriculture that complements the crop calendars. This document allows a detailed monitoring of the current growing season, such as the state of the crops, the satisfaction of water needs, drought, etc. Issued monthly) and Crop Calendars (they are according to the climatic outlook of the hot and humid season and focus on rainfed crops. It provides info on peanut, **ginger**, bean, maize and rice, for each region of the country). There is also a weather app available to install in mobile phones. Source: https://www.meteomadagascar.mg/	Participate in the identification and development to tools assess climate vulnerability and support the identification of appropriate adaptation TPS for the EO value chains under Output 1.1.1 Participate in the communication and outreach activities from all different project components
Regional Environment and Sustainable Development Directorates (DREDD, *Directions R?gionales de l?Environnement et du D?veloppement Durable)*	The MEDD has decentralised services throughout the different regions of the country through its DREDDs. There are currently 19 different DREDDs. With regards to the EO value chains, they are in charge of controlling of the exploitation of endemic and/or introduced essential oil trees and wild plants. It is also in charge of fixing / collecting the EO operating fee.	Part of the PSC Participation on the Sustainable EO Coordination Platform as a member. Participate in the dissemination of information, communication and outreach activities of the ARCHE project

Ministry of Population, Social Protection and Women?s Empowerment (MPPSPF)	The MPPSPF is responsible for the implementation of the National Strategy for Social Protection (SNPS), this last one with the aim to reduce extreme poverty, promote investments of human capital and household livelihoods and contribute to household? progressive empowerment over the long term.	Member of the PSC. Participate in the Sustainable EO Coordination Platform. Ensuring gender and youth considerations are analysed an integrated into the policy/regulatory recommendations and /or standards developed under Output 1.1.1. Ensure gender and youth considerations are mainstreamed and tracked on the ARCHE project. Participate in the communication and outreach activities from all different project components, fostering women and youth participation
PFAN (Private Financing Advisory Network)	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. 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 (CTI) in 2006, PFAN is hosted jointly by the United Nations Industrial Development Organization (UNIDO) and the Renewable Energy and Energy Efficiency Partnership (REEEP). Source: https://pfan.net/	Support for Component 2 relative to providing training and mentoring for MSMEs Support with connections to investment groups and regional investor convenings.

Agriculture Development Fund (FDA - *Fonds de d?veloppement agricole***)**	Since its creation, the FDA has been committed to sustainable agricultural development in Madagascar by supporting the achievement of the food self-sufficiency and the modernization of the agricultural sector goal set in the PEM, and supporting the development polices of MINAE and MPEB. The FDA provides financing in the terms of: direct services to farms for technical, economic and management support, applied research, access to markets; access to production factors (materials, inputs, equipment and infrastructure); strengthening POs, structuring and promoting value chains; agricultural training and the installation of young farmers; strengthening producer support systems. Access to FDA financing is for individual producers, producers? associations or groups (formal), agricultural cooperatives. There is also a list of types of services eligible for FDA funding, as well as a set of access conditions. The FDA has identified a set of priority sectors by region for the 2021-2023 period. For some regions they include export crops such as cocoa, vanilla, and cloves. Source: https://www.fda.mg/accueil	Member of the PSC Look into the possibility of expanding the FDA and FIR funds to cover all actors in the EO value chain under Output 2.2.1. Participate in the communication and outreach activities from all different project components.
FIHARIANA	FIHARIANA is an initiative by His Excellency President Andry Rajoelina, and it is a national program of the State whose main objective is to give both ?technical? and ?financial? support to Malagasy wishing to start a business. They can now go into entrepreneurship and borrow between 200,000 Ariary to 200 million Ariary from the Program to finance their project. The applicants must follow a selection process and training after applying. They can do it online on at the kiosks located in different parts of the country. As of July 2022, FIHARIANA is offering three products: Akoho nak?, focused on poultry farming; Soatantely, focused on honey production and beekeeping; Miarina 2, focused on these sectors: agriculture & livestock, industry, services and tourism. The BNI and BOA banks, which are the main partners in implementing this project, will grant loans repayable at subsidized rates to young entrepreneurs (4 to 9%). Source : https ://fihariana.com/en/about/	Part of the PSC upon invitation. Involved in the definition and provision of financial products to the EO value chain as part of Output 2.2.1. Within that, look into the release of guaranteed funds from banks for the provision of special rate credit for microenterprises for young people and women.

EDBM ? Economic Development Board of Madagascar	It is the Official Investment Promotion Agency in Madagascar. It has set itself the objectives of strengthening the competitiveness of the Malagasy private sector, increasing Foreign Direct Investment (FDI), developing and recommending incentives related to private investment in Madagascar and supporting investors in their implementation and expansion efforts by providing them with dedicated services by specialized Advisors (Sector Portfolio Managers) and through its One-Stop Shop. It is a government agency created by the Presidency of the Republic to boost economic growth and create jobs through the implementation and development of projects maximizing the benefits of Madagascar and which are carried out by both foreigners and nationals. It offers support for those who look for business opportunities in sectors with high growth potential and in which Madagascar has comparative advantages: agribusiness, light export industry such as Textile/Clothing, infrastructure/PPP, mining, ICT and tourism. It operates as a one-stop-shop for the creation of a company, acquiring business permits, authorisations, etc. Source: Official Investment Promotion Agency in Madagascar (edbm.mg)	Part of the PSC upon invitation. Provide comments during the development of the Sustainable Essential Oil Development Strategy under Output 1.1.1 Provide support on how to encourage investments in the EO value chain and connection with potential investors. Support those investors from abroad who would like to invest in local projects of the EO value chains to expand to Madagascar. Represented in Sustainable EO Coordination Platform Participate in the communication and outreach activities from all different project components
International Development Agencies and Banks	There are several international development agencies and multilateral organisations that have executed or are executing projects with which synergies could be explored. This includes: *World Bank (WB)* *African Development Bank (AfDB)* *United Nations Development Programme (UNDP)* *French Development Agency (AFD)* *GIZ (German Agency for International Cooperation) and the German Federal Ministry for Economic Cooperation and Development (BMZ).* *Green Climate Fund (GCF)* *African Enterprise Challenge Fund (AECF)* *Climate Technology Centre and Network (CTCN)*	International Development Agencies operating the Madagascar on Adaptation or/on the EO sector will be invited to be part of the Sustainable EO Coordination Platform. GIZ will be involved in the definition and provision of financial products to the EO value chain as part of Output 2.2.1. creating synergies with projects that they have on-going with the FDA.

Insurance agencies *ARO* *HAVANA* *Allianz* *SANLAM* *Comit? des Entreprises d?Assurances ? Madagascar (CEAM)*	**ARO Assurances R?assurances Omnibranches** has dominated the insurance market since 1975 and it is mainly owned by the State. https://www.atlas-mag.net/en/article/assurances-reassurances-omnibranches-aro https://assurancesaro.mg/home **Ny Havana Assurance et R?assurance** is operative since 1968 by Government initiative, who owns 47% of the capital. It has several branches all over the island. https://www.nyhavana.mg/ **Allianz Madagascar** is present in the country since 2006 https://www.allianz.mg/ **SANLAM Assurance** (formerly SAHAM). The acquisition of 30% of SAHAM Finances' capital by Sanlam Group occurred in 2015 and 100% of it in 2018. SAHAM Insurance becomes SANLAM in Madagascar and 11 other countries in 2021. Headquarters are located in Morocco. https://mg.sanlam.com/entreprises Those are the four most important insurance companies of Madagascar[2]. There is also the *Comit? des Entreprises d?Assurances ? Madagascar (CEAM)*, the Committee of Insurance Companies of Madagascar.	Involve in PC2 activities, to potentiate the creation of insurance products as an adaptation TPS to be provided to the EO value chain.

Private sector - knowledge partners Climate-KIC	EIT Climate-KIC is a Knowledge and Innovation Community (KIC), working to accelerate the transition to a zero-carbon, climate-resilient society. Supported by the European Institute of Innovation and Technology, EIT Climate-KIC identifies and supports innovation that helps society mitigate and adapt to climate change believing that a decarbonized, sustainable economy is not only necessary to prevent catastrophic climate change but presents a wealth of opportunities for business and society.	It intends to support the implementation of several activities: Activity 1.1.1.3. Identification and development to tools assess climate vulnerability and support the identification of appropriate adaptation TPS for the EO value chains, including mapping of EO sustainable production zones Activity 1.2.1.1. Needs assessment to identify the needs in terms of training on climate change and climate change adaptation TPS, Activity 1.2.1.2. Development of the curricula and training materials for the several target groups Activity 1.2.1.3. Delivery of three (3) capacity building/training courses to the Sustainable EO Coordination Platform to train them in promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain (with a 50% of women and 30% of youth participation) Activity 2.1.1.1. Design the EO Adaptation Accelerator Programmes ? Pre-Accelerator and Accelerator Activity 2.1.1.2. Select at least four (4) incubators/accelerators (from existing incubators/accelerators, research institutions and/or universities) and train them to run the EO Adaptation Accelerator programmes (including main training and yearly refresher)

International Centre for Research Applied to Development (CIRAD - *Centre International de Recherche Appliqu?e au D?veloppement)*	Conducts research to enhance the exceptional Madagascan biodiversity, manage environmental services and promote an agroecological approach for sustainable agriculture, especially for family farms in the Highlands. These activities are carried out in partnership with the main research institutions, universities and development stakeholders (University of Antananarivo, FOFIFA). Contributes to various observatories in the service of development and public policies (land, value chains, world agriculture, etc.) and collaborates in regional networks for product quality, health safety and security, emerging animal diseases and territorial development in the Indian Ocean. Source: Madagascar / CIRAD in Madagascar - CIRAD in Madagascar	Member of the Sustainable EO Coordination Platform Part of the PSC upon invitation Potential institution to become a EO Regional Hub under PC3, and potential executing partner of the activities of the EO Regional Hubs. Potential Pilot Project Proponent and potential co-financing of tests and popularization of agricultural adaptation practices Participate on training to MSMEs on adaptation technologies/practices, with focus on EbA

FOFIFA/CENRADERU **National Center for Applied Research in Rural Development** ***(****Foibem-pirenena momba ny Fikarohana ampiharina amin?ny Fampandrosoana ny eny Ambanivohitra / Centre National de Recherche Appliqu?e au D?veloppement Rural*) **DRFGRN -** D?partement de Recherches Foresti?res et de la Gestion des Ressources Naturelles (Department of Forest Research and Natural Resource Management)	The FOFIFA conducts research on several topics and carries out the production of seeds. Thematic research can include, for example, agricultural production, animal production and fish farming, forestry and natural resource management, agro-food conservation and processing, socio-economics & Agro-economics. The forestry and natural resource management research is the key goal of the DRFGRN, and essential oils are part of their research topics (native species, collection and prospecting of seeds, ecological study of a particular species (in progress for wild pepper or Tsiperifery), extraction technology and chemistry of essential oils; among other. They also provide support for diagnosis of productivity problems associated to erosion and finding solutions (techniques), and training. Source: https://www.fofifa.mg/?page_id=250	Member of the Sustainable EO Coordination Platform Part of the PSC upon invitation Potential institution to become a EO Regional Hub under PC3, and potential executing partner of the activities of the EO Regional Hubs. Involved in the development of the tool assess climate vulnerability and support the identification of appropriate adaptation TPS for the EO value chains as part of the Output 1.1.1 Development and popularization of research on the agricultural practice of adaptation to climate change Establishment of a regional research centre on the essential oil sector Participate in communication and outreach activities of the different project components of the ARCHE project.

National Centre for Industrial and Technological Research (CNRIT - *Centre National de Recherche Industrielle et Technologique*)	The CNRIT is a public institution of scientific, technical and economic nature, endowed with civil personality and administrative and financial management autonomy. It is under the technical supervision of the Ministry of Higher Education and Scientific Research and under the financial supervision of the Ministry of Economy and Finance. It has 3 key missions: 1) Participate in the development and implementation of the national technological research policy (research for innovation and valorisation of raw materials and local resources), 2) Absorb and adapt foreign technologies, promote and apply research results for sustainable development, 3) Strengthen regional capacities and skills through the mastery of clean technologies; manage and protect the environment (industrial, physical and social, etc.). Source: Reception (cnrit.edu.mg)	Member of the Sustainable EO Coordination Platform Part of the PSC upon invitation Potential institution to implement the two EO Regional Hub under PC3, and potential executing partner of the activities of the EO Regional Hubs. Training to MSMEs on adaptation technologies/practices, with focus on EbA and innovation Participate in communication and outreach activities of the different project components of the ARCHE project.

Other research centres and educational institutions of interest: *Centre National de Recherches sur l'Environnement (CNRE) ?* National Research Centre for the Environment *Centre d'Information et de Documentation Scientifique et Technique (CIDST)* - Scientific and Technical Information and Documentation Centre ISTE *Institut des Sciences et Technique de l?Environnement* - Institute of Environmental Science and Technology ISST *Institut Sup?rieur des Sciences et Technologies* - Higher Institute of Science and Technology INSCAE - *Institut National en Sciences comptables et Administration d?Entreprise* ISCAM: *Institut Sup?rieur de la Communication, des Affaires et du Management* AUF : *L?Agence Universitaire de la Francophonie* ESCM business school	**CNRE** : Among its missions, there is to contribute to the implementation of the Malagasy Conservation Strategy for sustainable development. The activities of the CNRE are organized into research programs grouped in the fields of: Ecology, Agronomy, Chemistry, Pollution, Biochemistry, Economics and Environmental Law, Health, Nutrition Marine Sciences, Hydrology and GIS. The Department that deals with ?Terrestrial Ecosystems? takes care of analysing and controlling the microbiological and chemical quality of products, which include essential oils. http://cnre.recherches.gov.mg/ **CIDST :** The mission of the CIDST is to 1) Contribute to the development and implementation of the national research policy on information, communication and the dissemination of knowledge; 2) Support development actors through better circulation of information in general and the dissemination of scientific and technical information relating to the results of national and international research; 3) Provide scientific expertise in the authentication and security of information; 4) Provide training cycles for better information management and capacity building for professionals. It has 4 (four) regional branches (Mahajanga, Toliara, Fianarantsoa, Toamasina). The CIDST manages a bibliographic database with 59,000 scientific and technical documents, and a commercial database with 230 agricultural products, as well as a patents database. The CIDST issues 4 different journals, 2 of them being in biological sciences and technological sciences. The ?Madadoc? (http://madadoc.irenala.edu.mg/) is the site that gives access to all the documentation on rural development and the environment in Madagascar. There are 4 (four) titles that directly or indirectly address the essential oils topic. http://cidst.recherches.gov.mg/spip.php?article1 ISTE: is the institution of technical sciences and the environment which is also a department found within the University of Fianaransoa in Madagascar ISST: is the higher institution of Science and Technology (ISST) at the University of Fianaransoa which is dedicated to higher professional studies that meet the economic needs of the region, which cover oenology, the water sector and agri-food. Source of information on these two institutions can be found here: http://www.mesupres.gov.mg/?Serie-d-inaugurations-a-l INSCAE: *Institut National en Sciences comptables et Administration d?Entreprise* (National Institute of Accounting Sciences and Business Administration). It is a private university that specializes in the fields of Administration and Accounting. The institute is part of the higher schools of Antananarivo. Source of information: INSCAE ? (studyadvisor.mg) ISCAM : *Institut Sup?rieur de la Communication, des Affaires et du Management* (Business School). Source : https ://iscam.mg/ AUF ? L?Agence Universitaire de la Francophonie. A global association of French-speaking higher education	Participate in communication and outreach activities of the different project components of the ARCHE project. Participate in the development of the train the trainers courses under PC1.

Accelerators, and Entrepreneurship networks	There are several national accelerators who contribute to fostering entrepreneurship and encourage private sector development. They are detailed in the Baseline Report (Annex P) and include private companies, NGOs, Government programmes, Cooperatives. They provide a diverse set of services from incubation of companies to advanced acceleration as well as training and education, networking and co-working spaces. Most of them are located in Antananarivo. During the PPG a group of potential accelerators was identified to support the acceleration process: MIARAKAP SOLIDIS There is a list of other potential accelerators provided in the Baseline Report (Annex P) and included in the SEP (Annex K) that should be invited to apply to become the accelerator to run the EO Adaptation Accelerator.	Running the EO Adaptation Accelerator programmes from Y2 to Y4, and the related activities under PC2. Report in it to the PMU. Identify potential MSMEs within the EO Adaptation Accelerator that can become Pilot Projects under Output 2.1.2. Communication and outreach activities.

MSMEs, Entrepreneurs, associations, federations and groupings of the EO value chain actors and other relevant for the project	There are several MSMEs and individual entrepreneurs who were identified both at PIF and PPG stages. The list includes individual companies (informal) as well as formal companies, cooperatives and associations. The list also includes distillers, which usually come in the form of associations or cooperatives, farmers (rural communities of different regions) or other groups which are formed to advocate for the economic interests of the EO value chain actors (e.g., distillers, growers). Contact details and names are provided in Annex K (SEP). Some examples of these groupings and associations are: *SAHALANA Madagascar ? idenitified as one of the companies to implement a pilot project within the selected ARCHE project region.* *Habite ? Fianarantsoa* *F?d?ration EMA : f?d?ration des groupements de planteurs* *CHESE - ?Cluster Huiles Essentielles Sud Est ?* *La Confederation FEKRITAMA-Confederation des agricultures Malagasy (Madagascar farmers confederation)* *SEVAM Madagascar (Syndicat des exportateurs de vanille de Madagascar) - https://www.linkedin.com/company/sevam-madagascar/about/* *Association Inside Madagascar - it implements sustainable development projects in the SAVA region, mainly for the benefit of small vanilla farmers and their communities. It aims to reconcile simultaneously the economic growth of rural populations, social equity and the preservation of the environment. https://insidemadagascar.org/* *FCCIM F?d?ration des Chambres de Commerce et d'Industrie de Madagascar in Antananarivo - http://www.fccim.mg/sitefccim/* *FOM (Fikambanan'ny Orinasa Malagasy) ? Association of Malagasy Businesses - https://www.facebook.com/fommada/* *PCAF HE - Platform for Consultation and Support for the Essential Oil Sector in Haute Matsiatra* Yapu Solutions - YAPU provides premium Digital Tools for Financial Service Providers https://www.yapu.solutions/	Participating the Sustainable EO Coordination Platform when invited. Popularization of agricultural technologies and practices for adaptation to climate change via training and awareness-building.

Financial Service Providers / local banks / potential investors and funds *BNI Madagascar* *Baobab Bank* *Vola Mahasoa, S.A.* *CRAFT*	The following list includes potential financial services providers and investors or funds: Baobab Bank - https://baobabgroup.com/mg/ VOLA MAHASOA (microfinance) - https://www.volamahasoa.mg/vola-mahasoa-choix-langue-3.html CRAFT - Climate Resilience and Adaptation Finance and Technology Transfer Facility	BNI Madagascar and Vola Mahasoa will be be engaged in the activities under PC2, especially the ones related with the providion of financial products. More particularly in the activities as suppliers of financial products or services for MSMEs/entrepreneurs to develop their projects and adaptation TPS as well as for those vulnerable segments of the population to acquire the TPS and increase their climate resiliency. In addition, they could participate in the design of innovative financial products and be part of the financial mechanisms to be designed for the project.

Madagascar Bureau of Standards (BNM, *Bure au de Normes de Madagascar*)	The BNM is endowed with legal personality and enjoying administrative and financial autonomy. It is the National Standardization Body, responsible for the implementation of the National Standardization Strategy, as defined by the Government. It operates under the technical supervision of the MICC, and under the budgetary supervision of the MEF. Its main activities include: i) Normalisation/Standardisation; ii) Quality Assurance / Certification; iii) Homologation; iv) Capacity building/Training. The mission of the BNM is to: ? Develop Malagasy national standards; ? Coordinate standardization work in Madagascar; ? Promote the application of standards; ? Manage all normative documentation; ? Disseminate any normative information; ? Promote approaches to quality assurance of products, goods and services. ? Provide training to economic actors; ? Represent Madagascar before regional and international standardization bodies; ? Carry out the national certification of products according to a Malagasy ?NMG? national standard; ? Manage the ?NMG? national mark of conformity; ? Contribute to the management of collective marks of conformity; ? Manage affiliated laboratories. Source : Bureau des Normes de Madagascar ? Bureau des Normes de Madagascar (bnm.mg)	Participate in the Sustainable EO Coordination Platform. Member of the PSC Participate in the development of the Sustainable EO Development Strategy as well as in the identification of needed standards for the sector. Communications and outreach activities.

NGOs / CSOs working in gender, youth and vulnerable groups empowerment and entrepreneurship: *ODEFI* - Op?rateur de D?veloppement et de Formation Int?gr?e *EFOI Madagascar* *Groupement des Femmes Entrepreneurs de Madagascar (GFEM)* *Conseil National des Fems de Madagascar (CNFM)* **Other NGO/CSOs relevant for the project:** *Conservation International* *A4ED ? Action for Entrepreneurship and Development* *Missio Austria (Pontifical Mission Societies in Austria)* *ALEFA Menabe* *FANAINGA Madagascar* *Nitidae*	The following is a brief list of those associations or organisations which are relevant for empowering women, youth and vulnerable groups working in the EO value chains: ODEFI: It is an NGO that intervenes in Community Health, Environment, Training. Source: ODEFI Op?rateur de D?veloppement et de Formation Int?gr?e - Home | Facebook EFOI Madagascar: is a professional association that brings together 450 women entrepreneurs of all nationalities. Currently extends over 15 branches namely Antananarivo, Antsirabe, Ambositra, Ihosy, Fianarantsoa, Toliara, Taolagnaro, Toamasina, Mahajanga, Antsiranana, Nosy-Be, Antalaha, Sambava, Maevatanana and Farafangana. It partners with several development agencies and local entrepreneurship and business support programmes. https://www.linkedin.com/in/efoi-madagascar-b13178108/?originalSubdomain=mg Groupement des Femmes Entrepreneurs de Madagascar (GFEM) ? Aims to promote women's entrepreneurship, create business opportunities and strengthen the capacities. Source : GFEM | Groupement des Entreprises de Madagascar (gem-madagascar.com) Conseil National des Fems de Madagascar (CNFM) - https://www.facebook.com/CNFMadagascar/?_rdc=1&_rdr Conservation International - https://www.conservation.org/ A4ED - https://www.facebook.com/ONG-A4ED-Madagascar-102096005730393/ Missio Austria - https://www.missio.at/ ALEFA Menabe - Alliance des Leaders et des Elites Form?s pour l?Avenir du Menabe - https://www.alefamenabe.org/ FANAINGA Madagascar - https://fanainga.mg/ Nitidae ?Landscapes and value chain? - Nitid??s mission is to design, develop and lead projects that preserve the environment while contributing to the local economy. https://www.nitidae.org/en	Part of the PSC upon invitation. Communications and outreach activities. Reaching out to those vulnerable segments of the population currently working in the EO value chains to raise awareness and engagement in the project activities.

[1] This is Decree N?99-954 that relates to the compatibility of investments with the environment.

[2] https://www.madagascar-services.com/blog/fr/post/2021/11/11/les-principaux-assureurs-a-madagascar

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 assesment.

1. The following paragraphs summarise the Gender Analysis Report included as Annex I to this Project. 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.

2. 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.

3. According to the World Bank Data, 80% of women work in the agricultural sector. Yet,, women do not normally share direct benefits of additional income from their labour. In fact, the literature on women?s role in the agricultural sector reports that in the rural areas, the role and responsibilities for men and women are gendered, and the agricultural tasks that are assigned to women are often less valued and less paid.[1]

4. 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. Women, often ignored, are also mostly engaged in cultivating the flowers that are the raw material of the EO value chains and a labour-intensive task. 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. This slows their work pace[2]. In undertaking productive roles, men rarely support women. In undertaking productive roles, men rarely support women.

5. Climate change, with consistently higher temperatures, cyclones, 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[3]. Without technical and financial supports, small producers and women become the most vulnerable. **They are also less competitive with the larger producers/distillation companies and will become increasingly less resilient when climate shocks impact their essential oil plant production.**

6. 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.

7. Women from Madagascar 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 2020 was 0.528 which puts the country in the low human development category positioning it at 164 out of 189 countries and territories[4]. **Also, due to the lack of data from Human Development Report (2020), the national Gender Inequality Index (GII) could not be retrieved** [5]

8. 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. At the subnational and household echelons, women?s participation in decision-making is also limited. According to USAID[6], in some parts of Madagascar (that do not include the areas targeted by the project) women and men are not allowed to attend meetings where the other gender is also present. These sociocultural barriers, result in women?s low participation in decision-making communities.

9. While policies and laws in Madagascar specifically address gender equality, gender disparity remains a serious challenge. Efforts include laws, policies, regulations, and institutional practices that have been put in place in enacting the gender and social-inclusion normative in Madagascar. These are included in all echelons of governance; international, national, and local. As a member of the United Nations, the GOM has ratified international treaties related to gender and social inclusion. These include the Convention on the Rights of Persons with Disabilities; the Optional on the Elimination of Discrimination Against Women (CEDAW) -ratified in 1989; The Beijing Declaration and the southern African Development Community Protocol on Gender and Development; etc.[7] However, despite these efforts, there are currently no policy or strategy initiated that can promote gender equality in the

country. For instance, there are strategies like ?the National Action Plan for Gender and Development 2004-2008 which is now outdated.[8] At the level of the MINAE no policies are being implemented to reduce difficulties faced by women. Evidence from UN Women shows; work still needs to be done in Madagascar to achieve gender equality. Another issue identified is that there is currently no coordination mechanism between the institutions, especially government ministries, when involving issues related to gender disparity and gender integration.[9] Moreover, **Statistics from December 2020 show that only 37.7% of indicators needed to monitor the SDGs from a gender perspective were available, with gaps in key areas, such as: violence against women and women in local governments**[10]. However, a new policy on equality between women and men is being drafted under the Ministry of Population, Social Protection, and Women?s Empowerment[11].

10. 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[12] (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.

11 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, attention will be paid to 1) 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; 2) gender dimensions will be considered in all decision-making processes (e.g. efforts to achieve gender balance/representation in such processes), including Project Steering Committee (PSC) meetings; 3) sex-disaggregated data will be collected; 4) Consultations will be held with stakeholders promoting gender equality and women?s empowerment, such as gender experts and organizations, CSOs and NGOs, e.g. for outreach purposes.

12. Annex I Gender Analysis Report provides an in-depth analysis on gender equality in Madagascar. It does so by firstly providing a baseline of all the relevant stats in reference to gender equality between girls and boys or men and women, i.e., years of education, access of assets, literacy, etc. The annex also covers the relevant regulations, policies, and programmes set in place when concerning gender mainstreaming, and it covers all echelons of governance. From international, national, to local. However, it also covers non-governmental organisations and their efforts in accelerating gender mainstreaming in the country, for instance there does exists a civil-society organisation (CSOs) which has worked toward gender equality and social inclusion. However, due to the lack of institutional coordination, and concrete national policy, the organisation is faced with challenges related to insufficient funding and limited female leadership.

13. The annex has used the UNIDO Gender Mainstreaming Tool and Data Collection tools from the gender analysis conducted by CARE.[13] Both methodologies make use of questions such as ?What is the context; Who does what? Who has what? Who decides; and Who benefits? These questions have helped to conduct a thorough analysis of the gender analysis in Madagascar. The analysis on gender in Madagascar has found that the country has implemented an institutional framework for gender equality and progress has been made. For instance, there are now female parliamentarians designated to defend women?s rights and encourage more women to be represented in Parliament However, social/cultural norms, customs, and traditions stand as a barrier to any further progress being made when it comes to gender mainstreaming Especially when concerning the role of women in the agricultural sector, they are disadvantages in access and capacity to use productive resources, assets, income, public services, and technologies.

14. As general rule for the ARCHE project, a target of 50% women participation in applicable activities will be sought. In addition, a 30% youth participation target will be adopted and sought throughout the project implementation.

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[1] https://banyanglobal.com/wp-content/uploads/2020/08/USAID-Madagascar-Gender-Analysis-for-the-2020-2025-CDCS.pdf

[2] FAO of UN N 2018-National gender profile of agriculture and rural livelihoods-https://www.fao.org/3/I9554EN/i9554en.pdf

[3] https://careevaluations.org/wp-content/uploads/Gender-analysis-ASPIRE-Madagascar_FINAL-ENG.pdf

[4] Global Gender Gap Report, 2021: http://www3.weforum.org/docs/WEF_GGGR_2021.pdf

[5] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://hdr.undp.org/sites/default/files/Country-Profiles/MDG.pdf

[6] https://banyanglobal.com/wp-content/uploads/2020/08/USAID-Madagascar-Gender-Analysis-for-the-2020-2025-CDCS.pdf

[7] https://banyanglobal.com/wp-content/uploads/2020/08/USAID-Madagascar-Gender-Analysis-for-the-2020-2025-CDCS.pdf

[8] https://banyanglobal.com/wp-content/uploads/2020/08/USAID-Madagascar-Gender-Analysis-for-the-2020-2025-CDCS.pdf

[9] https://banyanglobal.com/wp-content/uploads/2020/08/USAID-Madagascar-Gender-Analysis-for-the-2020-2025-CDCS.pdf

[10] https://banyanglobal.com/wp-content/uploads/2020/08/USAID-Madagascar-Gender-Analysis-for-the-2020-2025-CDCS.pdf

[11] https://banyanglobal.com/wp-content/uploads/2020/08/USAID-Madagascar-Gender-Analysis-for-the-2020-2025-CDCS.pdf

[12] https://www.thegef.org/sites/default/files/documents/UNIDO_Gender_Mainstreaming_Analysis_Tool.pdf

[13]https://careevaluations.org/wp-content/uploads/Gender-analysis-ASPIRE-Madagascar_FINAL-ENG.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; Yes

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.

1. The project will expand the catalytic grant investments brought by the LDCF, AAP and PIC projects to establish an enabling environment for the private sector to act as agents for market transformation in the field of adaptation innovation. Via the creation and support to the Sustainable EO Coordination Platform, the project will establish partnerships with local banks, microfinance institutes and Madagascar funds to pool financial resources to support adaptation innovation. The goal will be to tailor financial products to MSMEs that focus on environmental sustainability, climate resilience and adaptation-oriented TPS that need patient and non-dilutive capital to grow and expand their businesses. Financial support by various private sector parties will be provided at different stages of the innovation cycle. For instance, seed capital can be provided by PIC, AAP, FDA and the CTCN, which provides up to USD 250k per sub project, which may involve one or more MSMEs and must be validated by the national designated authority. Later on, financial support with regional partners such as ASAP and PFAN can support MSMEs/entrepreneurs to have viable business models and their products commercially ready.

2. The project will work with the existing MSMEs support services to build their capacities on adaptation innovation, develop better management capacities and bankable business models. The MSMEs will be selected through public calls for the EO Adaptation Accelerator Programmes.

3. At the local level, the private sector will also be engaged. Under PC3, the project will work with microfinance institutions such as VOLA MAHASOA to create unique products for rural populations working in the EO value chains, as well as work in the development of credit lines for the EO sector in collaboration with the FDA and FIR (national agricultural development funds). Private financial channels will be used to reduce risks associated with innovation. Collateral requirements can be made more flexible. Due to having revenues bound by cultivation cycles, the project will reinforce the capacities of existing financial services to have more flexible loan products for stakeholders along the value chain that can be given on the condition that their productivity is enhanced or becomes more efficient applying adaptation innovation. Tools developed in previous projects will be adapted and made accessible to MFIs, so they may improve their risk and information management using ICTs.

4. Similarly, the project?s support for EO-focused insurance projects and working with private insurance agencies will support the resilience of small-scale growers and producers to climate change impacts. In this regard, any innovations that facilitate climate and weather data collection will be available to insurance and re-insurance groups as a first step to establishing weather-index based insurance products.

5. 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):

Table 7: Risks and Mitigation Actions (P = Probability and I = Impact)

Risk	Risk Level	Mitigation Action

Development risk	P= 2 I=2	PC1 includes the establishment of a Sustainable EO Coordination Platform, which will be co-chaired between MEDD/GEHEM and other members: Public and private sector organizations, accelerators, MSMEs, FSPs, CSOs, NGOs. This platform will ensure coordination of the different actors acting across adaptation and the EO value chain, establishing cooperation opportunity and enjoying synergies. Also by involving both public and private sector stakeholders as well as representatives of vulnerable groups across the EO value chains the project will ensure coordination with existing activities/programmes and projects as well as make sure that needs across the value chain are addressed, specially of the most vulnerable ones. Throughout the project implementation, support will be provided by PMU and UNIDO to ensure effective coordination between the key project stakeholders. The roles and responsibilities that each party will play should be stated and recorded in an inception Meeting Report
Management risk	P=2 I=2	Proper coordination will be ensured through the establishment of the PMU, the Sustainable EO Coordination Platform and the Project Steering Committee (PSC). 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 ARCHE Platform 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.
Political risk	P= 2 I=2	PC1 includes streamlining the importance of adaptation innovation into the Sustainable EO Production Strategy and coordinating with relevant actors across sectors. This includes reinforcing sector capacities in understanding the cost-benefits of adaptation so that they will prioritize adaptation initiatives. Also, support for the private sector Adaptation MSMEs including financial products, will enable continued and sustained support for innovation that business forces will drive. The MSMEs and FSPs will be trained to identify outlying risks such as pandemics so that they can be prepared with appropriate mitigation measures. The PMU, MSMEs, FSPs and relevant stakeholders will also be trained to identify outlying risks such as pandemics so that they can be prepared with appropriate adaptation measures. 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 EO, agricultural, and water sectors and in the financial sector. This will minimize potential challenges at operational levels.
Institutional risk Limited absorptive capacity by the national counterparts	P=2 I=2	The project will provide capacity building, and awareness raising / information dissemination 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.

Market Risk Lack of interest by entrepreneurs and other stakeholders to participate in the project, especially women/young entrepreneurs or women/young led MSMEs	P=1 I=3	Outreach and communications activities will be a key component of the project in the lead-up to the opening of the application processes under the different activities of the project, specially the ones that aim to and throughout the project attract entrepreneurs, potential sponsors and partners, and mentors and judges. On the other hand, bearing in mind that the project will be addressing one key barrier to entrepreneurship, which is access provision of financial products and services, it is expected that there will be enough interest in participating. Women / youth engagement activities and measures to encourage their participation will be continuously implemented to ensure a high percentage of women / youth involvement. The EO Adaptation Accelerator 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 within the EO value chains. 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 PC2, financial products and services will be made available to both adaptation MSME (supply) and adaptation demand (EO value chain actors looking to adopt/implement adaptation TPS) to support both sides of the market.
Financial risk including Risk that insufficient financing from commercial and other FSPs will be mobilized Risk of unfavourable terms & conditions of commercial financing for MSMEs (high interest rates, collateral requirements etc.) Repayment risk of MSMEs Risk that access to finance for target customers remains limited resulting in low ability to scale up adaptation technologies and ideas	P=2 I=3	The project seeks to strengthen the provision of appropriate funding instruments and mechanisms to enable the deployment of adaptation technologies and services. Training and capacity building programmes for existing national agricultural financing and insurance mechanisms (FIR, FDA, MFIs) will focus on risk assessment of climate adaptation technologies and on MSMEs active in this sector. The project will provide specific technical assistance with designing financial products & services adapted to the needs of MSMEs including training to existing national agricultural financing and insurance mechanisms on risk assessment and structuring and on adequate risk mitigation measures. The project will provide extensive business development support to MSMEs, including business plan development, financial forecast, risk assessment, market analysis to reduce repayment risk. The project will include dedicated activities to assist existing national agricultural financing and insurance mechanisms with developing and adopting financial products & services adapted to the needs of vulnerable populations, including digital finance solutions.

Environment risk	P=2 I=4	In PC1, the project puts a strong emphasis on strengthening sustainable land and forest management. Only by having a strong policy and strategy foundation to use the natural resources sustainably will an adaptation TPS be able to scale up. In PC3, target EO value chain stakeholders will be trained on improved, sustainable production and management practices. PC3 activities not only aim to reach to the most vulnerable across the EO value chains but also to make services available to them to maintain and sustain the use of the adaptation TPS that they acquire through the engagement of extension service suppliers through the EO Regional Hubs. This also reduces the environmental impact of technology malfunction ? which may have negative impacts the way that they start using the natural resources ? as well as reduces waste, by ensuring the equipment is repair instead of become waste that is not managed appropriately. 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. Also, the select pilot project will contemplate the identification of environmental and social impacts and will be asked to be screened against the criteria set up in the ESMP of the project.
Climate risk	P=2 I=4	PC2 will provide the government tools to conduct Climate Risk Vulnerability Analyses. During the PPG phase a CVRA will be conducted in order to specifically identify climate risks and vulnerabilities in the target regions. This CRVA will inter alia be based on data from The World Bank Climate Change Knowledge Portal, ThinkHazard!, Resourcewatch by the WRI, as well as data from relevant IPCC reports. The adaptation innovations will be chosen based on the highest vulnerability priority regions and the most appropriate interventions for the local context. Vulnerabilities will be quantified in order to guide the strategies and roll-out plans for adaptation innovations. Focusing on these regions with targeted adaptation innovations that emphasize an ecosystem-based approach will build resilience climate shocks. This project will also strengthen adaptation and resilience measures by enabling the most vulnerable to access adaptation innovations via tailored lending and insurance products developed and make available through the implementation of activities in PC2. Innovations will enable the most vulnerable to fully exploit their value chains sustainably. With an asset base and risk mitigation measures, the vulnerable populations, particularly women and youth, will have higher asset bases and become more resilient during climate shocks. The implementation of EbA solutions will diversify income and ensure that essential ecosystem services to sustain the livelihoods of small-scale producers are maintained.

Delay risk	P=2 I=2	Execution of activities to be implemented under this project will be carried out with the support of international experts/companies with demonstrated and successful past experience, as well as in close collaboration with PIC, ASAP and AAP. Only proven and high-impact adaptation technologies will be piloted under PC2. Capacity building and enabling activities will pay special attention to further defining the existing baseline in order to develop effective tailored and well-targeted training programmes and curricula. The status of the pilots will be regularly reviewed, and any necessary corrective steps will be promptly taken.
Social and Gender Risk	P=2 I=3	To mitigate this risk, the project will pursue thorough and gender-responsive communication showing the benefits of gender equality for both women and men and ensure stakeholder involvement at all levels, with special regard to involving both women and men and CSOs and NGOs promoting GEEW, and gender experts. This shall mitigate social and gender-related risks, promote gender equality, create a culture of mutual acceptance and understanding, and maximize the project's potential contribution to improving gender equality in the EO value chain. A category for female-led teams will be introduced as part of the accelerator programme. Furthermore, the project seeks to nominate female entrepreneur ambassadors. This is expected to build awareness and participation of female entrepreneurs in the project. To attract qualified female and young candidates to the project, an adequate and gender/youth-responsive communication strategy will be carried out by reaching out to women?s/young groups and associations while also making trainings and workshops accessible for women/youth, e.g., by providing safe transport, offering childcare, lifting restriction to resources and assets, and offering training at suitable times for women when children are in school and day-care, etc. If necessary and in the scope of the project, additional bridging courses for women will be considered, developed, and implemented to empower women and youth. Furthermore, the 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.

COVID-19 risk analysis

Risk	**Risk level**	**Risk mitigation measure**

Operational Risk ? On-going global restrictions due to global evolution of the pandemic remain	Medium/High	If travel or group gatherings and meetings are not possible due to restrictions for people traveling from/to Madagascar, or commuting around the country, virtual / on-line meetings will be conducted to the extent possible.
Technical expertise is not readily available due to the pandemic	Low	Necessary efforts will be made to identify alternative technical experts in case it is required (e.g., having a list of alternative experts). Planning will be flexible enough to reschedule activities onsite 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. The PMU will also be continuously monitoring the national restrictions and rules in order to foresee and plan ahead of potential changes in measures.
Some project supporters, co-financiers or beneficiaries may not be able to continue with project execution/ implementation	Low	The situation will be closely monitored by the PMU and the PEE in order to find alternate supporters or co-financiers, or to readjust the list of beneficiaries if needed.
Price increases for procurement o f goods/services	Medium	The project team will undertake efforts needed to find alternative providers and make sure that competitive pricing is obtained

COVID-19 opportunity analysis

Opportunity	**Opportunity level**	**Opportunity optimization measure**
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 levels and shared with entrepreneurs as part of the market intelligence information. 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.

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.

Figure 19 illustrates the overall implementation arrangement to be applied in this project.

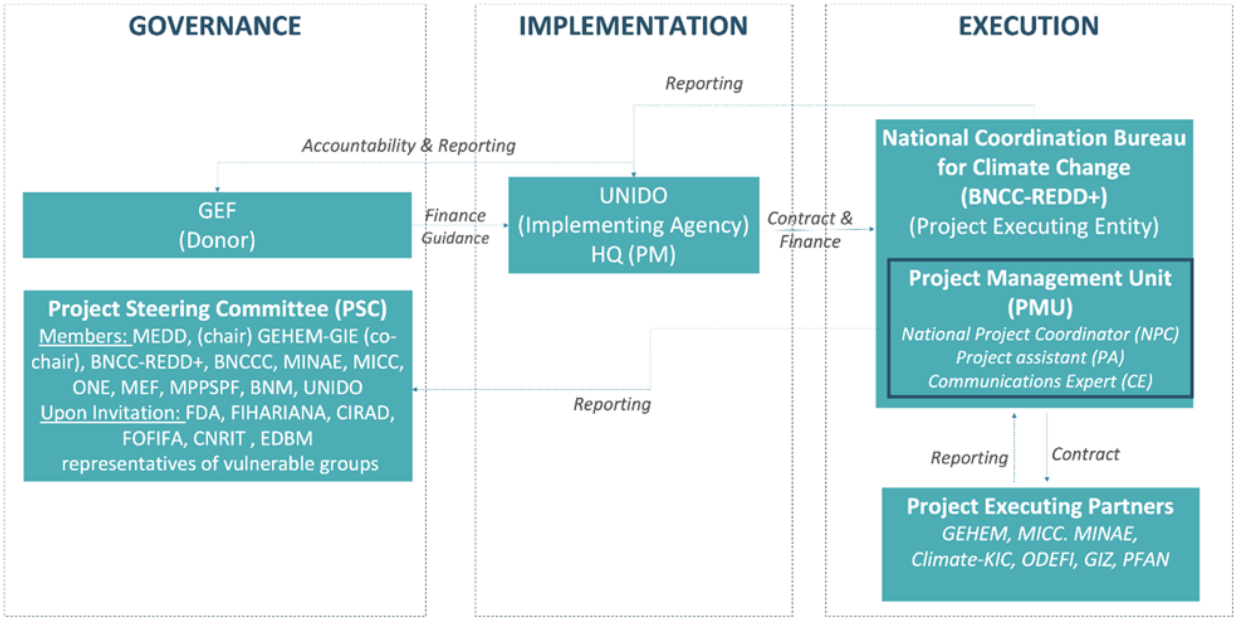

Figure 19: Implementation arrangement schEmatic

1. The ARCHE 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.

2. The Project Executing Entity (PEE) for this project will be BNCC-REDD+BNCC-REDD+. UNIDO will be issuing an implementing partner agreement to BNCC-REDD+ for the overall project execution. The PEE will be responsible for the overall project execution and for the execution of PC1, PC2, PC3 and

part of PC4, including the management and disbursement of the funds associated with these project components. BNCC-REDD+

3. BNCC-REDD+ mission is to coordinate all actions relating to the fight against climate change, including: (1) promoting, in Madagascar, a resilient economy, adapted to climate change, (2) promoting sustainable development with low carbon emissions and other greenhouse gases that cause climate change and (3) develop sustainable financing mechanisms to fight climate change.

4. The BNCC-REDD+ is the structure in charge of piloting and coordinating all activities related to the REDD concept at the level of the Ministry of Environment and Sustainable Development (MEDD) as well as the REDD+ process in general in Madagascar.

5. As the guarantor of the coherence of activities carried out at the national level, it is required to consider forest policy in terms of sustainable management of forest resources and to ensure the linkage of the REDD process with the political and strategic decision-making process of the main technical sectors concerned.

6. In this way, the BNCC-REDD+ will be able to ensure that technical activities and studies comply with recognized standards.

7. To ensure this function and the related attributions, the National REDD+ Coordination Office is structured in several cells, functional bodies that guarantee the proper functioning of coordination and supervision of activities. These bodies also serve as interlocutors between the BNCC-REDD+ and partners, the public and other stakeholders.

8. The BNCC-REDD+ 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., Climate-KIC, PFAN, GEHEM, ODEFI, CNRIT, PIC, SAHANALA, MIARAHAP) 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.

9. The PMU will be created and will sit at the BNCC-REDD+. The PMU will include a National Project Coordinator (NPC), Project Assistant (PA), and Communications Expert (CE); and they will be responsible for the day-to-day management of the project activities under PC1, PC2, PC3 and PC4, including implementation of the M&E plan and follow-up with PEPs. The PMU 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 M&E of project activities, as to be specified in the project workplan.

10. A Project Steering Committee (PSC) will be formed at project start and will be the core of the Sustainable EO Coordination 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 MEDD and co-shared by the GEHEM. 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 BNCC-REDD+ and UNIDO) have been identified as potential members of the PSC, namely:

*Chair: MEDD - **Ministry of Environment and Sustainable Development** (Chair)*

Co-chair: GEHEM-GIE - Association of Essential Oils Exporters, Extracts and Oleoresins from Madagascar ? Economic Interest Group

MEF - Minist?re de l'Economie et des Finances

MINAE - Minist?re de l'Agriculture et de l'Elevage

MICC - Minist?re de l'industrialisation, du commerce et de la consommation

ONE - Office National pour l?Environnement)

MPPSPF - Ministry of Population, Social Protection and Women?s Empowerment

BNM - Madagascar Bureau of Standards

11. The following organizations are envisaged to participate in the PSC meetings upon invitation:

FDA - Agriculture Development Fund

FIHARIANA

CIRAD - International Centre for Research Applied to Development

FOFIFA - National Center for Applied Research in Rural Development

CNRIT - National Centre for Industrial and Technological Research

EDBM - Economic Development Board of Madagascar

Representatives of vulnerable groups (to be identified at project start)

Coordination with other GEF-financed projects and initiatives

12. This project will be conducted in coordination with ongoing GEF projects in Madagascar, as well as other projects and initiatives identified above in the Baseline Scenario (see Table 4) as to build upon lessons learned, increase synergies, and avoid duplication of efforts.

13. There are a number of planned activities and GEF-financed projects in Madagascar that present potential for synergies and collaboration with the ARCHE 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 the following table.

Table 8: Coordination with GEF Project

Project title	Time- frame	Financiers	Coordination Mechanisms
Adaptation MSME Accelerator Project (ASAP)	2019- 2023 (Extended)	GEF, the Lightsmith Group and Conservation International Ventures	? Use of ASAP?s taxonomy and toolkit to identify, recruit and support adaptation MSMEs for Madagascar Adaptation Accelerators to be placed in existing accelerators ? Regional and global marketing support for EO focused MSMEs identified such as through publicizing with company profiles ? Sending Madagascar EO value chain adaptation MSMEs to Regional Adaptation MSME Networks ? 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
CTCN[1]	2014- 2023	GEF and AfDB	? 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 ? Working together to improve market access for the EO value chains.
CRAFT	2017- 2021	GEF via Cl	? 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 ? CRAFT fund could be a potential funding resource for the selected MSMEs in Madagascar
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	2021-2026	GEF via UNIDO	The project aims to enhance adaptation to climate change by establishing the business case, building capacities, and enabling increased investment in Nature Based Infrastructure. For that, the Project will: ? Support technologies and solutions that support biologically diverse forests, mangroves, wetlands, grasslands and agricultural lands to provide valuable ecosystem services and adaptation ? Ensuring that adaptation focused MSMEs support topics such as carbon sequestration, nutrient removal, water storage, harvesting
Adaptation Accelerator Program: Building Climate Resilience through Enterprise Acceleration (AAP)	2021-2023	GEF with CI	This project aims to put in place and adaptation accelerator to both Liberia and Madagascar. The activities for Madagascar still need to kick-start. The ARCHE project will seek to build synergies with AAP for Madagascar, especially in relation to the implementation of PC2.
Upscaling Ecosystem-based Adaptation for Madagascar?s Coastal Zones	Concept approved in May 2022	GEF via UNEP	This project aims to enhance the resilience of local communities, livelihoods and ecosystems in four coastal regions of Madagascar to the adverse impacts of climate change, and it will be implemented by the MEDD. The ARCHE project will seek to build synergies with this project through the MEDD.

Transfer of assets

14. 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

15. ?The Government of the Republic of Madagascar 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 19 March 1991 and entered into force on 14 April 1992.?

[1] https://www.thegef.org/projects-operations/projects/10680

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assesments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

1. The ARCHE 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/microfinance institutions in the development and offering of financial products for both MSMEs and the vulnerable population within the EO value chain to acquire innovative adaptation TPS. Those TPS will be identified and provided through the implementation of this project at the same time that it will build resilience of the EO value-chains and support climate change adaptation in Madagascar.

2. The ARCHE Project leverages on Madagascar?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 D?veloppement 2019-2023, the National Climate Change Adaptation Plan (2021), the Revised National Climate Change Policy (2021), the Third National Communication to the UNFCCC (2017), the NDC (2016), the Politique G?n?rale de l?Etat, and the Politique Nationale de lutte contre le Changement Climatique (2010), the Plan d?Actions National de Lutte contre le Changement Climatique. These are all the main (and most recent) plans guiding the country?s climate change adaptation efforts. Table 9 summarises the alignment of the project with the most relevant national strategies and plans.

TABLE 9: CONSISTENCY OF THE PROJECT WITH NATIONAL STRATEGIES AND PLANS

National Document (strategy or plan)	Consistency of the project with national document (strategy or plan)
National Climate Change Adaptation Plan - *Plan National d?Adaptation au Changement Climatique (PNA)* *Madagascar**[1]***	The PNA supports the vision established for the country in the PEM and is organised around three strategic axes: Strategic axis 1: Strengthen the governance and integration of adaptation; Strategic axis 2: Implement a program of priority sectoral actions; Strategic axis 3: Financing adaptation to climate change. The PNA focuses on the agriculture-livestock & fisheries sector, Water Resources, Public Health, Biodiversity and Forestry, Coastal Zones, Infrastructure, Management/Reduction of risks and climatic disasters, while considering in a transversal way the strengthening of human, financial, technical and technological and institutional capacities, as well as taking gender into account. A dozen strategic programmes have been identified in the PNA, several of which focus on diversity and forest conservation, increasing resilience and adaptation of the agricultural sector and infrastructure, management of protected areas and natural resources, acceleration of REDD+ mechanisms, etc. The National Adaptation Plan has been developed with a 10-year planning perspective, with the possibility of revision after 5 years, depending on the evolution of the context and the results of the mid-term evaluation The ARCHE project adheres to the PNA?s core Strategic Axes 1 and 3: 1) Strengthening governance and integration of adaptation and 3) Financing adaptation to climate change. Within PC3, the project will adhere to the NAPs by promoting by-products and developing income-generating sectors for improved profitability of farms. It will also adhere to strengthening the socio-economic resilience of rural populations through the development of value chains by reinforcing the resilience to climate change of income-generating activities in the essential oil sectors (vanilla, cloves, etc.).; Finally, the project will promote sustainable management of ecosystems, in line with identified priorities of the PNA.
Revised National Climate Change Policy - Politique nationale de lutte contre les changements climatiques re?vise?e (PNLCCR)	A revised version of the previous National Climate Change Policy of 2010, which addresses the objective of the country in its efforts to contribute to sustainable development through the reduction of climate risks, benefiting from greenhouse gas mitigation and strengthening adaptation actions, was developed in 2021. Its objectives are divided into 4 strategies. First strategy is to enhance mitigation contributions, through multi-sectoral socio-economic and environmental benefits shares, and supported by initiatives, research, and innovative technologies. Second strategy, is to build adaptive capacity, increase resilience of socio-economic and ecological systems, and reduce vulnerability, to contribute to sustainable and equitable development and ensure access to vital resources. Third strategy, to mobilize adequate means of implementation consistent with the objectives of reducing climate risks and vulnerabilities, resilient economic growth, and national mitigation contributions that respect environmental integrity and are consistent with the sustainable development foundation. Fourth strategy is to develop and promote autonomy and collaboration to ensure strengthened and sustainable action. The PNLCCR will be implemented through the following strategic axes: The ARCHE project is addressing its first strategic target to ?Strengthen adaptation to climate change, considering Madagascar?s realistic needs.?.

Third National Communication to the United Nations Framework Convention on Climate Change[2]	The Third National Communication to the UNFCCC (2017) is focused mainly on GHG inventory, mitigation measures, vulnerability study, adaptation, and other information such as research, integration of climate change into different policies and national strategic documents and awareness raising. With particular emphasis to the EO sector, the Third National Communication to the UNFCCC highlight the need for devising an adaptation strategy for the forest/biodiversity sector, where actions may include the establishment of natural resource management plants in areas where high-value non-timber products, such as the EO, are produced. The project is aligned with the of technology transfer. As stated in the Third National Communication to the UNFCCC the transfer of environmentally sound technologies is essential to reduce vulnerability to climate change, and the ARCHE Project will do that for the EO value chains.
Madagascar Nationally Determined Contribution (NDC) - *Contribution Pre?vue De?termine?e au niveau National de la Re?publique de Madagascar*	The NDC (2016) aims at increasing carbon sinks by 32% through a reforestation programme with indigenous species covering 270,000 ha. Main mitigation actions include large scale reforestation for sustainable timber production and conservation of indigenous species, reduced timber extraction, and large-scale adoption of agroforestry. This highlights the need to develop alternative revenue streams through non-timber forest products, such as oils and other products for commercial purposes, and to enhance local knowledge and sustainable management of Madagascar?s unique biodiversity. In priority adaptation actions for the 2020-2030 period, the NDC notes the need for widespread application of integrated models for resilient agriculture, implementation of ecosystem- based adaptation, and restoration of natural habitats. The adaptation costs for the 2015-2030 period are estimated at 42.1 billion. The project is aligned with NDC (2016), which includes both mitigation and adaptation actions/measures to be rolled out in the EO value chains and will contribute to address the value chains vulnerabilities using a range of instruments, including financial and technological support. The ARCHE Project will support a diversified reforestation programme to act as carbon sinks as well as large scale implementation of ecosystem-based adaptation, conservation agriculture and climate-smart agriculture.
National Strategy to Combat Climate Change in Agriculture-Livestock- Fishery sectors - *Strate?gie Nationale face au Changement Climatique pour les secteurs agriculture, e?levage et pe?che* (SNCC/AEP)	The National Strategy to Face Climate Change in Agriculture-Livestock-Fishery sectors for the 2012-2025 period is articulated around 5 axes: (i) agriculture adapts to climate change; (ii) mitigation actions generate socio-economic benefits for these sector; (iii) agriculture integrates climate change concerns into all its actions; (iv) agriculture has sustainable financial mechanisms for its adaptation and mitigation actions; and (v) agriculture promotes applied research and technical innovations and uses research results into effective decision-making and development tools to face climate change. The ARCHE Project is fully aligned with this strategy and will contribute to its implementation through the promotion of adaptation into the EO value chains of the country.

National Action Plan for Adaptation (NAPA) under LDCF/UNFCCC[3]	Madagascar National Adaptation Programme of Action (NAPA) was first submitted in December 2006 to UNFCCC. The NAPA identifies technology transition, particularly within the agriculture sector, as central to improving productivity and providing inputs to agro-processing and the manufacturing sector. Both would lead to increased contributions to foreign exchange earnings and resilience to emerging challenges. The NAPA highlights the need for adaptation measures for the sustainable management of natural resources, including integrating appropriate adaptation technologies supported through national institutional capacity building, providing training for farmers and businesses in the agriculture industry and required policy reformations. The ARCHE Project design and objectives are fully aligned with all the strategic goals, objectives of the NAPA and would contribute to their achievement.
Paris Agreement?s	The ARCHE Project furthermore helps to address the Paris Agreement?s Global Goal on Adaptation by (i) facilitating the establishment of Madagascar?s fist Adaptation Accelerator for MSMEs that will mobilize public and private finance for adaptation in developing countries, (ii) supporting the development of adaptation and climate resilience focused MSMEs, and (iii) providing technical assistance for market entry and capacity building for climate adaptation and resilience solutions in developing countries.

3. The ARCHE Project is also aligned with the UNIDO Country Programme (CP) and will build on baseline co-financing contributions that support the following UNIDO CP components: 1) Agro-Industry and agribusiness development, including value chain development & entrepreneurship in promising sectors, 2) Renewable energy development, energy efficiency, environmental protection, 3) Support to agro-processing Zone and industrial parks development and 4) Institutional strengthening and governance support for competitivity, innovation & investment promotion

4. Insofar as the ARCHE Project will result in the implementation of the EO Adaptation Accelerator programmes focused on adaptation and climate resilience, this project is consistent with and promotes the goals of the UNFCCC and the UNCBD and particularly the pursuit of adaptation and resilience to climate change in developing countries. In addition, the ARCHE Project is consistent with and supports the Sustainable Development Goals (Goal 3 ? Good Health and Well-Being, Goal 6 ? Clean Water and Sanitation, Goal 7 ? Affordable and Clean Energy, Goal 9 ? Industry, Innovation, and Infrastructure, Goal 11 ? Sustainable Cities and Communities, Goal 13 ? Climate Action, and Goal 17 ? Partnerships for the Goals).

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[1] https://unfccc.int/sites/default/fil es/resource/PNA- Madagascar.pdf

[2] https://unfccc.int/non-annex-I- NCs

[3] https://unfccc.int/resource/docs/napa/mdg01f.pdf

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.

1. The ARCHE Project aims to build ongoing international and national efforts to promote adaptation to climate change risks and vulnerabilities in the EO value chains of Madagascar through the engagement of the private sectors, namely entrepreneurs/MSMEs and financial service providers. Knowledge management and sharing have been incorporated through the project activities in PC1, PC2, PC3 and PC4. The focus on learning takes on added significance in the context of the MSME?s ecosystem in climate adaptation innovation in Madagascar, 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:

2. Within PC1, it is expected that the platform created ? the Sustainable EO Coordination Platform and the ARCHE Online Platform ? will not only be operational to share knowledge and information during the project but also after it.

3. The Sustainable EO Coordination Platform will bring together a intersectoral group of stakeholders to discuss adaptation to climate change and guide the project implementation. This will allow intersectoral discussion of the different needs in terms of adaptation as well as on the different possible contributions to address adaptation in the EO value chains, being the discussion and resultant guidance, a knowledge product. This platform will be ?transformed? into the CHNEO, the platform expected to be created once the draft EO decree is approved and adopted.

4. The ARCHE Online Platform will be one of the main tools that will be used for dissemination of knowledge by the project. It will be hosted by the BNCC-REDD+/PMU during the 4 years of the project, and, since it will be established as part of the BNCC-REDD+ website, it will be maintained by the BNCC-REDD+ after the end of the project.

5. 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 the EO sector, on the EO Adaptation Accelerator, financial products and services available, etc. The curricula and training materials developed will be integrated in university, vocational institutions and accelerators programmes, envisaged to be maintained after the project finishes.

6. PC3 and PC4 will establish a Monitoring, Evaluation and Learning (MEL) system to be managed by the BNCC-REDD+, GEHEM and the Sustainable EO Coordination Platform. The focus on learning takes on added significance in the context that the ecosystem of MSMEs in climate adaptation innovation in Madagascar, and in particular adaptation MSMEs with TPS to be supplied to the EO value chains, is very much limited. Learning in fact underpins adaptation and innovation; thus, designing for adaptation requires designing for learning[2]. The PMU will be responsible for developing a monitoring and evaluation framework and the continuous outreach and sharing of gained knowledge, lessons learned and best practices. The BNCC-REDD+, GEHEM and the Sustainable EO Coordination Platform will also be

responsible for developing an online marketplace to highlight adaptation solutions offered in Madagascar. The project will coordinate with AAP and ASAP, who are simultaneously developing a curriculum, taxonomy, adaptation technology database and measurement metrics on best adaptation technologies/practices. The project will build update the PROSPERER M&E system and link with the existing FDA monitoring/evaluation system. The existing M&E system will be enhanced and focused on adaptation, with clear indicators for impacts on innovation and ecosystem conservation (including MEbA[3] indicators). Within this system, a gender-disaggregated and age-disaggregated knowledge base will be developed to share best practices and lessons learned and a support information exchange with policymakers at global forums and regional events (such as those convened by ASAP) on climate adaptation relevant information and results. 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 develop benchmarks for innovations and develop case studies on climate change adaptation in EO value chains. In order to ensure the sustainability of this project after the project completion, the M&E Expert to be housed within the PMU will conduct more frequent evaluations to iteratively improve the impact of the EO Adaptation Accelerator and the home-grown ideas that graduate from the Accelerator. Different communication channels to disseminate lessons learned and success stories will include training manuals, good practice guides, datasheets, 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. It will also raise public awareness of the importance of innovation and deployment of adaptation-oriented technologies in priority essential oil value chains. All publications developed under this project will comply with the ARCHE Project communication strategy, and thus with GEF and UNIDO communication policies.

7. Under PC4, national capacity will be built on the implementation of the M&E system, including to other staff of the BNCC-REDD+, MEDD, GEHEM and other PEPs involved in the implementation of project activities. In addition, the ARCHE 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 Madagascar and abroad so that successes can be repeated.

8. All knowledge management activities will be gender mainstreamed. This includes integration of gender dimensions into publications, for instance, presenting gender-disaggregated data, gender-energy nexus theory, gender-sensitive language in publications, photos showing both women and men, and avoid presenting stereotypes, as well as assuring that women, men and the youth have access to and benefit from the knowledge created.

9. Table 10 provides a general overview of the of the main deliverables relevant for knowledge management.

Table 10: 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 ARCHE Communication Strategy (Output 3.1.3)	By the 6th month of project implementation/execution with regular updates each year
Materials produced during the implementation of the ARCHE Project: including policy briefs, impact reports, brochures, webinars and other types of promotional materials distributed through briefing sessions, press releases, social media presence, advertising, the exhibitions/roadshows deployed in selected NGOS/CSOs and associations, etc.	From the 6th month of project implementation/execution and according to the timeline as to be specified in the ARCHE Project knowledge management, communication, and advocacy strategy
The ARCHE Online Platform created and operationalized	By the 6th month of project implementation/execution
Meetings of the Sustainable EO Coordination 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/

[3] https://unepmeba.org/

9. Monitoring and Evaluation

Describe the budgeted M and E plan

1. 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.

2. 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.

3. 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.

4. 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.

5. There will be an external mid-term review (MTR) 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 PC4).

6. 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.

7. 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.

8. An overview of indicative costs of M&E activities is provided in Table 11 below.

Table 11: 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	28,000	15,000	25,000	PEE
Periodic progress reports	Every 6 months		10,875	20,875	PEE

Project Implementation Review (PIR) reports	Every fiscal year the project is under implementation, to be submitted to GEF by 15 September each year.		30,000	15,000	PEE to provide feedback and UNIDO to finalize and submit the GEF
Mid-term review	At 3 years after implementation start date	47,715	56,500	54,000	External evaluator, submission to UNIDO
Terminal Evaluation	Start 3 months prior to estimated project end date	60,000	56,500	54,000	External evaluator, submission to UNIDO
Total		**137,715**	**168,875**	**168,875**	

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)?

1. The proposed ARCHE Project is built on fostering the engagement of the private sector to deliver TPS and techniques for the Madagascar EO value chains to foster its adaptation to climate change risks and vulnerabilities. The project is expected to:

Create the legal and regulatory environment to increase the sustainability resilience to climate change of the EO value chains, and engage the private sector in its implementation;

Result in more innovative adaptation start-ups and MSMEs being identified and supported, acting as a catalyst for entrepreneurship development and adaptation investment in Madagascar, including the implementation of pilot project to demonstrate the application of adaptation TPS.

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 along the EO value chains can access finance to acquire the TPS necessary to adapt their activities to climate change risks, especially for in the targeted provinces by the project.

2. The ARCHE Project will create 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.

3. The proposed ARCHE 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.

4. In addition, the increased use of adaptation innovation TPS supported by the ARCHE Project will also result in GHG emission reductions (as part of the GEBs). The ARCHE Project will highlight the need for a stronger support at the national level for adaptation innovations and 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.

As per UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), this project has been categorized as "Category B". Category B projects are likely to have less adverse impacts on human populations or environmentally important areas than those of Category A. An Environmental and Social Management Plan (ESMP) has been developed during the project inception stage. Additionally, the project sites will be chosen and activities planned in accordance with the requirements of the UNIDO?s ESSPP."

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
E&S_Screening_Template_UNIDO ID 190280_Madagascar_LDCF	**Project PIF ESS**	

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).

Project Strategy	KPIs/Indicator	Baseline	Target	Means of Verification	Assumptions
Objective: Building adaptation and resilience to climate change in the essential oil sector in Madagascar	# beneficiaries reached by the project (sex- and age-disaggregated)	None	Number: at least 34,000 beneficiaries Women participation target: 50%	Project M&E System Project Annual Reports ARCHE Online Platform and other Project?s communication materials developed	There is continuous support for and participation by industry and other EO actors to make production sustainable National government continue to support innovation ecosystems and adaptation entrepreneurs Financial and human resources can be channelled towards promoting adaptation innovation Promising adaptation MSMEs, including women and youth, have sufficient access to relevant EO markets
	USD investment leveraged for adaptation technologies (with indication of % invested in women-led and youth-led businesses)	None	At least US$ 3 million raised in co-finance supporting deployments of adaptation technologies		
	# enterprises with economic gains (sales, savings) supported by the project (sex-disaggregated)	None	Number: At least 21 enterprises with economic gains supported by the project At least 50% women-led enterprises		
	# enterprises with an increase in exports, supported by the project	None	Number: At least 1 enterprise with an increase in exports, supported by the project		
	# MSMEs with increased inclusion in value chains (with indication of % of women- and youth-led MSMEs)	None	Number: At least 50% of the supported MSMEs with increased inclusion in value chains At least 50% women-led MSMEs At least 30% youth led MSMEs		
PC1: Institutional capacity building and mainstreaming climate resilience into Essential Oils value chain					
Outcome 1.1: New strategy provides direction to develop climate resilient EO value chains					

Output 1.1.1: New Essential Oils (EO) Strategy developed integrating climate change adaptation and resilience	New EO strategy developed and proposed for adoption (Yes/No)	None	New EO strategy developed and proposed for adoption: Yes	EO strategy proposal document ARCHE Online Platform and other Project?s communication materials developed Stakeholders mapping process results (reports) Project M&E System records Package of training materials available Relevant reports developed after workshop(s) take place Project Annual Reports	National government continue to support EO sector and is committed to develop the strategy Sustainable EO Coordination Platform is formed Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists
	# of stakeholders (organisations) mapped that advocate for gender equality and/or inclusion of the youth in the EO value chain	None	Number of stakeholders (organisations) mapped: at least 3 organisations mapped		
	New EO strategy includes gender-related perspectives or actions (Yes/No)	None	New EO strategy includes gender-related perspectives or actions: Yes		
	Training materials developed consider gender-related concerns around climate change impacts (Yes/No)	None	Training materials developed consider gender-related concerns around climate change impacts: Yes/No		
	# of workshops conducted for validation of New EO strategy	None	Number of workshops: 1		
	# of attendees to the workshops (sex- and age disaggregated)	None	Number of attendees: 50 Women inclusion target: 50% Youth inclusion target: 30%		
Output 1.1.2: At least two (2) recommendations on regulatory instruments and measures to promote the uptake of innovative adaptation technologies and services into the essential oil value chains developed	Needs assessment report on regulatory instruments and policy gaps conducted (Y/N)	None	Needs assessment conducted: Yes	Recommendations report and/or Needs Assessment report developed Project Annual Reports Relevant reports developed after workshop(s) take place Project M&E System records ARCHE Online Platform	National government continue to support EO sector and is committed to develop the strategy Sustainable EO Coordination Platform is formed Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists
	Needs assessment report on regulatory instruments and policy gaps identifies specific needs for women and the youth (Y/N)	None	Women?s and youth?s needs clearly identified in the needs assessment: Yes		
	# of recommendations proposed	None	Number: at least 2 recommendations proposed		

	Recommendations proposed include gender-related and youth-related perspectives (Yes/No)	None	Recommendations proposed include gender-related and youth-related perspectives: Yes		
	# of workshops conducted for validation of the recommendations proposed	None	Number: 1		
	# of attendees to the workshops (sex- and age-disaggregated)	None	Number of attendees: 50 Women participation target: 50% Youth participation target: 30%		
Outcome 1.2: MEDD/BNCC-REDD+ and GEHEM have capacity to support integration of adaptation and resilience into the essential oils value chain					
Output 1.2.1: Members of the Sustainable EO Platform trained in promoting the adoption of gender-responsive climate-resilient technologies and services along the EO value chain	Needs assessment on climate change adaptation training needs conducted (Yes/No)	None	Needs assessment conducted: Yes	Needs assessment report Package of training materials available Project Annual Reports Relevant reports developed after workshop(s) take place Project M&E System records ARCHE Online Platform	National government continue to support EO sector and is committed to develop the strategy Sustainable EO Coordination Platform is formed Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists
	Training materials developed include gender and youth inclusion perspectives (Yes/No)	None	Training materials include gender and youth perspectives: Yes		
	# training courses delivered	None	Number of training courses: at least 3		
	# attendees to the training courses (sex and age disaggregated)	None	Number of attendees: at least 15 per course (total 45 people) Women participation target: 50% Youth participation target: 30%		
PC2: Innovative adaptation technologies and services promoted and deployed along the EO value chain					
Outcome 2.1: Proven innovative adaptation technologies and services are promoted and piloted along the essential oils value chain					

Output 2.1.1. At least 21 MSMEs/entrepreneurs with proven and high-impact innovative climate change adaptation-oriented technologies and solutions for the essential oil value chain receive acceleration services (training, coaching, mentoring and business growth support)	# Programmes designed under the Pre-Accelerator	None	Number: 2 programmes (train-the-trainers for accelerators, and the general programme for MSMEs)	Package of training materials available Project Annual Reports Relevant reports developed after workshop(s) or outreach activities are conducted Project M&E System records ARCHE Online Platform Relevant reports developed by those conducting the acceleration process (the selected accelerators)	Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists Interest from EO MSMEs/entrepreneurs exist in participating in the acceleration process
	# of Accelerators selected to run the EO Accelerator programmes	None	Number: 4 accelerators selected (one per region)		
	# of gender responsive outreach activities	None	Number: at least 1 outreach activity executed per region with gender perspectives		
	# of calls for applications for the Pre-Accelerator programme stage	None	Number: 3 calls for Pre-Acceleration, one per year from the 2nd to the 4th		
	# of applicants applying to the Pre-Accelerator Programme (sex and age disaggregated)	None	Number: at least 45 applications (with 50% women-led and 30% youth-led applications)		
	# of calls for applications for the entire EO Accelerator programme stages	None	Number: 1 call for applications per year and per Programme stage: ? 1 call for Acceleration ? 1 call for Advanced Acceleration ? 1 call for Post-Acceleration		

	# of programmes conducted for the entire EO Accelerator programmes stages	None	Number: 3 complete programmes in total (one per year), each comprising three stages, namely: ? 3 Accelerators ? 3 Advanced Accelerators ? 3 Post-Accelerators		
	# of MSMEs/entrepreneurs trained in the Pre-Acceleration programme (sex-disaggregated and age disaggregated by business leader)	None	Number: train at least 45 MSMEs/entrepreneurs in total (15 MSME/entrepreneurs per year), with 50% women-led and 30% youth-led MSMEs/entrepreneurs		
	# MSMEs/entrepreneurs accelerated (sex-disaggregated and age disaggregated by business leader) throughout the Acceleration, Advanced Acceleration and Post-Acceleration stages	None	Number: at least 21 MSMEs/entrepreneurs in total throughout the three stages (with 50%women-led MSMEs/entrepreneurs accelerated and 30% youth-led MSMEs/entrepreneurs accelerated)		
Output 2.1.2: Four (4) pilot projects implemented to deploy innovative adaptation technologies and solutions	# call for pilot project proposals	None	Number: at least 1 call for pilot project proposals	Project Annual Reports Relevant reports developed on the pilot project deployed Project M&E System records ARCHE Online Platform	Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists Interest from EO MSMEs/entrepreneurs exist in participating in the acceleration
	# companies selected to deploy pilot projects (with % women-led and youth-led companies)	None	Number: at least 4 pilot projects selected and implemented Women participation target is 50% Youth participation target is 30%		

	USD investment leveraged for adaptation technologies deployed through the pilot projects (with % going to women-led projects)	None	Target: 500,000 USD leveraged		process
Output 2.1.3 Results and experiences from the four (4) pilot projects documented and widely disseminated	# of dissemination materials created for the pilot projects	None	Number: at least 3 different types of dissemination materials created for each pilot project (example: newsletter, video, exhibit, printed brochure, news on online project webpage, etc.)	Package of training materials available Project Annual Reports Project M&E System records ARCHE Online Platform Relevant reports developed on the pilot project deployed	Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists Interest from EO MSMEs/entrepreneurs exist in participating in the acceleration process
	Gender perspectives included in the dissemination materials of the pilot projects (Yes/No)	None	Gender perspectives included in the dissemination materials of the pilot projects: Yes/No		
Outcome 2.2: Innovative financing to support deployment of adaptation technologies and services along essential oil value chains piloted					
Output 2.2.1: Model innovative financing mechanisms (FIR, FDA, MFIs) to provide dedicated (gender-responsive) catalytic financing designed and piloted in collaboration with actors in the financing ecosystem	# of innovative financing mechanisms and products designed and piloted adapted to vulnerable groups	None	Number: at least 1 innovative financing mechanism designed and piloted, with a focus on at least 1 vulnerable group identified (women, the youth, other)	Project Annual Reports Project M&E System records ARCHE Online Platform	National government continue to support EO sector Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists Demand for financing products exists from EO MSMEs/entrepreneurs and vulnerable groups Interest from FSPs and MFIs exists in providing new financing products
	# of FSPs and MFIs involved in the design of innovative financial products	None	Number: at least 2 FSPs or MFIs involved in the design of the financial products		
PC3: Knowledge sharing and learning					
Outcome 3.1: Lessons from the project documented and widely disseminated					

Output 3.1.1: Distribution and support channels established, strengthened, and showcased to ensure that EO growers, distillers associations and cooperatives, including women and youth, of the identified vulnerable regions, access adaptation technologies and diversified livelihoods	# Regional EO Adaptation Hubs identified and established	None	Number: at least 2 regional Adaptation Hubs identified and established	Project Annual Reports Project M&E System records ARCHE Online Platform Communications Strategy document Relevant reports developed after workshop(s) or outreach activities are conducted Package of training materials developed	National government continue to support EO sector Continuous support from business partners, NGOs and other relevant actors in the EO value chain exists Sustainable EO Coordination Platform is formed Interest from EO MSMEs/entrepreneurs exists in growing their businesses and making them more climate-resilient
	# Beneficiaries reached by the Regional Hubs through their collaborating organisations / institutions (sex- and age-disaggregated)	None	Number: 34,000 beneficiaries Women participation target: 50% Youth participation target:30%		
	# of awareness raising and information sharing events conducted by each regional hub	None	Number: 1 per year, per hub, from Y2 to Y4 of project implementation period. Total: 6 events.		
	# of people reached by awareness raising and information sharing events (sex-disaggregated and age-disaggregated)	None	Number: 13,800 EO stakeholders (directly to 3,000 and indirectly to 10,800 considering household members multiplication factor of 4.6) Women participation target: 50% Youth participation target: 30%		
	# event summaries or proceedings submitted to the PMU	None	Number: 1 per year, per hub, from Y2 to Y4 of project implementation period. Total: 6 summaries (one per event).		
	# technical training events conducted	None	Number: at least 6 training events of 1 day each conducted alongside the awareness sharing events.		

	# repair networks created by the regional hubs with disaggregation of repair service providers per region (sex- and age-disaggregated by business owner/leader)	None	Number: at least 1 network with 1 repair service provider per region included in the network Women participation target: 50% Youth participation target: 30%		
	# of exhibitions and roadshows conducted per vulnerable region	None	Number: at least 1 exhibition or roadshow conducted per region		
	# of organisations identified by the PMU that can contribute to conducting the exhibitions or roadshows, per vulnerable region	None	Number: at least 1 organisation identified per region		
	# of people reached by the exhibitions or roadshows (sex- and age-disaggregated)	None	Number: 20,200 EO stakeholders (directly to 4,392 stakeholders, and indirectly to 15,808 stakeholders considering household members multiplication factor of 4.6) Women participation target: 50% Youth participation target: 30%		
	Information dissemination materials developed for the exhibitions/roadshows (Yes/No)	None	Target: information dissemination materials developed for the exhibitions/roadshows: Yes, such as leaflets, brochures in French and Malagasy or other local language		

Output 3.1.2: Online platform to showcase adaptation technologies, their benefits and suppliers established and managed by the PMU ? *ARCHE Online Platform*	# of online platforms (the ARCHE Online Platform) operating (with a specific gender/youth focused tab)	None	Number: 1 online platform / website or group of webpages operating, with a specific gender/youth focused tab	ARCHE Online Platform Project Annual Reports	Sustainable EO Coordination Platform is formed National government continue to support EO sector
Output 3.1.3 Lessons learnt documented and widely disseminated: Development or the ARCHE communication strategy and disseminate materials and lessons learnt	ARCHE Communication Strategy developed with indication on how to address gender perspectives in project communications (Yes/No)	None	ARCHE Communication Strategy developed: Yes, with indication on how to address gender perspectives in project communications	ARCHE Communications Strategy document Project Annual Reports	Sustainable EO Coordination Platform is formed National government continue to support EO sector
	# of Annual Reports developed by the PMU	None	Number: 4 reports (one per year)		
PC4: Monitoring and Evaluation					
Outcome 4.1: Monitoring of results and evaluation					
Output 4.1.1 Project effectively monitored	# of M&E systems developed for the ARCHE Project, including gender perspectives tracking	None	Number: 1 M&E system developed during Y1 for implementation, including gender perspectives tracking	M&E System Project Annual Reports Package of training materials developed Training reports	PMU established Commitment from project partners in collaborating with M&E activities
	# of trainings on the M&E system delivered to enhance national capacity, including gender perspectives	None	Number: at least 1 training delivered to the BNCC-REDD+, MEDD, GEHEM and other partners involved in the implementation of the ARCHE Project activities, including gender perspectives		
Output 4.1.2: Mid-term review and independent terminal evaluation conducted	# mid-term reviews conducted	None	Number. 1 mid-term review conducted	MTR Report	
	# Independent terminal evaluations conducted	None	Number: 1 independent terminal evaluation conducted	TE Report	

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).

n/a

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:			
Project Preparation Activities Implemented	***GETF/LDCF/SCCF Amount ($)***		
	Budgeted Amount	***Amount Spent Todate***	***Amount Committed***
Finalization of project document	20,000	20,000	-
Preparation of environmental and social management plan	5,000	5,000	-
Gender Assessment	5,000	5,000	-
Stakeholder Engagement activities during PPG	8,000	8,000	-
Micro-Assessment of Executing Entities	12,000	8,474	-
Other (to be spent on eligible expenditures, in line with GEF Guidelines)	-	-	3,526
Total	50,000	46,474	3,526

ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.

The project will be initially focused on the regions identified as the most vulnerable ones to climate change impacts and where the EO value chains are located, namely: **Vakinankaratra, Amoron?i Mania, Haute Matsiatra, Vatovavy Fitovinany, Atsimo Atsinanana and Ihorombe** as shown below in the map.

Region	Planted EO plant	Collected EO plants
Vakinankaratra	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, G
Amoronimania	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, G
Haute Matsiatra	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, G
Vatovavy Fitovinany	Clove, Ylang Ylang,	Niaouli, Cinnamon, Helichryse Faradifani, Ginger
Atsimo Atsinanana	Clove;	Niaouli, Cinnamon, Helichryse Faradifani, Ginger
Ihorombe	Geranium (bourbon type), Vetiver	Helichryse Faradifani, Female Helichryse, Male Helichryse, G

The Capital city for each region and their Geo-coordinates are provided below:

	Target regions	**Capital city**	**Geo-coordinates**
1	Vakinankaratra	Antsirabe	19?52?0?S 47?02?0?E
2	Amoron?i Mania	Ambositra	20?31?0?S 47?15?0?E
3	Haute Matsiatra	Fianarantsoa	21?27?13?S 47?05?09?E
4	Vatovavy Fitovinany	Manakara	22? 09? S, 48? 00? E
5	Atsimo Atsinanana	Farafangana	22?49'20"S 47?49.569'E
6	Ihorombe	Ihosy	22?24?13?S 46?07?33?E

ANNEX E: Project Budget Table

Please attach a project budget table.

Categories by Year	Total Project Components (USD)				Sub-total (USD)	M&E (USD)	PMC (USD)
	PC1	PC2	PC3	PC4			
Year 1							
International Consultant	-	-	-	-		-	-
Local Consultant	-	-	35 000	7 000	**42 000**	7 000	30 600
Consultancy Services - Company	117 000	195 000	100 000	-	**412 000**	-	15 879
Training / Workshops / Meeting	5 150	-	-	2 500	**7 650**	2 500	
Travel	-	-	-	-	**-**	-	6 092
Office Supplies	-	-	-	-	**-**	-	3 000
Total Year 1	122 150	195 000	135 000	9 500	**461 650**	9 500	55 571
Year 2							
International Consultant	-	40 000	-	45 715	**85 715**	45 715	-
Local Consultant	-	-	35 000	7 000	**42 000**	7 000	30 600
Consultancy Services - Company	20 000	184 007	8 700	-	**212 707**	-	-
Training / Workshops / Meeting	16 400	8 000	32 467	500	**57 367**	500	-
Travel	-	-	-	-	**-**	-	6 092
Office Supplies	-	-	-	-	**-**	-	3 000
Total Year 2	36 400	232 007	76 167	53 215	**397 789**	53 215	39 692
Year 3							
International Consultant	-	40 000	-	-	**40 000**	-	-
Local Consultant	-	-	35 000	7 000	**42 000**	7 000	30 600
Consultancy Services - Company	15 000	254 007	8 700	-	**277 707**	-	-
Training / Workshops / Meeting	3 900	8 000	32 467	500	**44 867**	500	-
Travel	-	-	-	-	**-**	-	6 092
Office Supplies	-	-	-	-	**-**	-	3 000
Total Year 3	18 900	302 007	76 167	7 500	**404 574**	7 500	39 692
Year 4							
International Consultant	-	40 000	-	60 000	**100 000**	60 000	-
Local Consultant	-	-	35 000	7 000	**42 000**	7 000	30 600
Consultancy Services - Company	-	114 007	8 700	-	**122 707**		-
Training / Workshops / Meeting	2 150	8 000	32 467	500	**43 117**	500	-
Travel	-	-	-	-	**-**		6 092
Office Supplies	-	-	-	-	**-**		3 000
Total Year 4	2 150	162 007	76 167	67 500	**307 824**	67 500	39 692
Total Years 1 - 4	**179 600**	**891 021**	**363 500**	**137 715**	**1 571 836**	**137 715**	**174 648**

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 Agencys 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).