Concept Note

CLIMATE CHANGE: THE NEW EVOLUTIONARY CHALLENGE FOR THE GALAPAGOS

Ecuador | CAF

20 December 2019

GREEN CLIMATE FUND

Concept Note

Project/Program Title:	CLIMATE CHANGE: THE NEW EVOLUTIONARY CHALLENGE FOR THE GALAPAGOS
Country(ies):	ECUADOR
National Designated Authority(ies) (NDA):	MINISTRY OF ENVIRONMENT OF ECUADOR
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GREEN CLIMATE FUND

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PROJECT / PROGRAMME CONCEPT NOTE Template V.2.2

A. Project/Program Summary (max. 1 page)			
A.1. Project or Program	☐ Project ☒ Program	**A.2. Public or private sector**	☒ Public sector ☐ Private sector
A.3. Is the CN submitted in response to an RFP?	Yes ☐ No ☒ If yes, specify the RFP: ______________	**A.4. Confidentiality**	☐ Confidential ☒ Not confidential
A.5. Indicate the result areas for the project/Program	Mitigation: Reduced emissions from: ☒ Energy access and power generation ☐ Low emission transport ☐ Buildings, cities and industries and appliances ☒ Forestry and land use Adaptation: Increased resilience of: ☒ Most vulnerable people and communities ☒ Health and well-being, and food and water security ☐ Infrastructure and built environment ☒ Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO2eq over lifespan)	1.204.387 TonCO_2eq	**A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)**	250,000 people; (Ecuador population plus visitors)
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD 123,768,058	**A.9. Indicative GCF funding requested**	Amount: USD 65,480,750
A.10. Mark the type of financial instrument requested for the GCF funding	☒ Grant ☐ Reimbursable grant ☐ Guarantees ☐ Equity ☐ Subordinated loan ☒ Senior Loan ☐ Other: specify____________________		
A.11. Estimated duration of project/ Program:	a) disbursement period: 10 years b) repayment period, if applicable: 20 years	**A.12. Estimated project/ Program lifespan**	20 years
A.13. Is funding from the Project Preparation Facility requested?	Yes ☐ No ☒ Other support received ☒ If so, by who: CAF, WWF, FAO	**A.14. ESS category**	☒ A or I-1 ☐ B or I-2 ☐ C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes ☒ No ☐	**A.16. Has the CN been shared with the NDA?**	Yes ☒ No
A.17. AMA signed (if submitted by AE)	Yes ☒ No ☐ If no, specify the status of AMA negotiations and expected date of signing:	**A.18. Is the CN included in the Entity Work Program?**	Yes ☒ No ☐
A.19. Project/Program rationale, objectives and approach of Program/project (max 100 words)	The Program shall catalyze the paradigm shift towards nature-based ecotourism in the Galapagos by adopting climate change actions. The approach combines a multisectoral and crosscutting climate action program which includes GHG emission reduction and adaptation measures. It promotes the energy matrix change of the ecotourism value chain at the Galapagos archipelago; building resilience food system and in High-Ecological Value areas, critical for sustaining nature-based ecotourism; water resources management for climate resilient food production and ecosystem services; and building sustainability mechanisms for climate resilience and low emissions ecotourism development within key institutions, tourism industry and local population.		

B. Project/Program Information (max. 8 pages)

B.1. Context and baseline (max. 2 pages)

Nature-based tourism is the major economic engine of the Galapagos, generating annual revenues of USD 450,000,000, which represents close to 20% of Ecuador´s tourism Gross Domestic Product (GDP) (Ministerio del Ambiente, 2015), and almost 80% of the economy in the Galapagos (Pizzitutti et al., 2017). Marine-related tourism jobs alone, account for 37% of the working population (Lynham et al., 2015). In 2018, 275,817 tourists entered the Galapagos, featuring an 8% average annual growth rate over the past 50 years (Conservation International & Mentefactura, 2014). Tourism in the Galapagos can be separated into boat-based (48% accommodation growth/ 75% occupation rate) and land-based tourists (324% accommodation growth/ 20% occupation rate) (Ministerio de Turismo, 2016). The first type spends the main part of their tourism experience on-board, while the land-based tourists rely almost completely on local products, services and labor. The Galapagos archipelago is located in the Pacific Ocean along the equator line, about 972 km from the continental Ecuadorian shoreline (Dirección del Parque Nacional Galápagos, 2014). The confluence of warm and cold-water currents combined with a volcanic origin and its tropical latitude location has given rise to the unique ecosystems and biodiversity that we know today (Fordhamn and Brook, 2010). Due to its unique environment, the impacts of climate change will be different here than anywhere else in the world (Galapagos Report 2009 – 2010). The conservation of the Galapagos archipelago is a priority public policy focus for the Ecuadorian Government. The approval in 1998 of the Special Law for the Galapagos, which imposes strict limits on residence and employment of non-local residents, restrictions on economic activities such as land purchase and investments by non-local residents, and restraints on importation of vehicles, as well as the construction of new hotels. This special administrative regime regulates land use: (i) 96.7% (773,258 ha.) of the total land surface area is designated as National Park; (ii) and the remaining 3.3% (26,282 has) is destined to urban (4%) and rural areas (96%), hosting a population of 29,658 people (iii) Galapagos has the world's seventh largest marine protected area, created in 1998, with a total surface of 138,000 km^2 (Dirección del Parque Nacional Galápagos, 2014). **The Galapagos climate** is a product of the interaction of oceanic currents surrounding the islands and the winds from the southeast (Trueman & d'Ozouville 2010). The influence of currents and winds is governed annually by the north-south migration of the Intertropical Convergence Zone (ITCZ[1]), a warm band of deep convection. The recurrence of the ITCZ gives rise to the two seasons in Galapagos: a warm and rainy season (January to May) and a cool and dry season (June to December) (Hamann, 1979; Itow, 2003). Additionally, there is a Pacific-wide phenomenon, which also determines the Galapagos climate: El Niño Southern Oscillation (ENSO). The warm phase of ENSO is called *El Niño* and the cold phase as *La Niña*. *El Niño* events are characterized by high sea surface temperature, a lack of west-to-east thermal gradient across the surface of the Pacific coupled with a weakening of the easterly trade winds (Snell & Rea, 1999). *El Niño* effects in the Galapagos include high air temperatures, torrential rainfall and a longer than usual warm season, whereas *La Niña* events are abnormal colder conditions and drought (Sachs & Ladd, 2010). ENSO events have been occurring in the Galapagos for thousands of years, however it has been suggested that these events have increased in intensity and frequency in more recent years (Rustic et al 2015; Thompson et al., 2017). **Climate projections scenarios**, based on Santa Cruz island climate records, suggests there will be a progressive increase in the annual maximum and minimum air temperatures (1.8-5 and 3-5ºC respectively) throughout the 21st century (Development Bank of Latin America, 2019). Precipitation is also expected to increase between 90 and 140% by the end of the 21st century with a daily mean variation increase of around 2.5-4.5 mm in the rainy season and a mean reduction up to 3 mm per day in the dry season (Development Bank of Latin America, 2019). Currently there is no discernible trend of a significant shift in sea surface temperature (SST) of the Galapagos islands. However, the equatorial Pacific has warmed 0.4º-0.8º over the last 40 years (Pachauri, 2007) and greater increases are expected in this region due to greenhouse warming (Rustic et al 2015). It is known that periods of high rainfall are in agreement with sustained high SST. This also holds true for years of extreme *El Niño* events with sustained high SST and increased rainfall (Trueman & d'Ozouville, 2010; Martin et al., 2017). Thus, higher ocean temperatures will have negative effects in the Galapagos because wet seasons could be more extreme and longer lasting, leading to stronger El Niño events. Further, inland Galapagos climatic conditions are changing, leading to prolonged and intense rainfall events. With predicted higher temperatures, changes in mist distribution on upper zones of the islands would affect ecosystem water balance and hence water availability for human consumption and agriculture production. Currently, water inputs from mist formation represents up to 26% of the total water budget on Cristobal and Santa Cruz islands (Pryet et. al., 2012). **The Galapagos archipelago, like many tropical islands, is a system highly sensitive to human impacts** (Fordham & Brook 2010) and climate dynamics (Grant & Grant 2006). The intrinsic sensitivity of the Galapagos has increased in recent decades due to the **combined**

[1] Appendix 6 includes a list of acronyms.

effect of climate change, business as usual tourism development, and unsustainable agricultural and fisheries practices. Climate change and tourism are related in a circular manner (Patterson et al, 2006). Tourism contributes to anthropogenic global climate change through the emission of greenhouse gases (GHG) related to accommodation, activities and transport (Moreno & Amelung 2009). At the same time, by disrupting ecosystem processes and emblematic species, climate change could have a profound impact on the tourism industry. Marine ecosystems will be affected mainly by the rising of sea surface temperature and acidification. Further, a warmer ocean would change the primary productivity affecting all the trophic chain. Less available food coupled with the pressure of overfishing, which is already affecting some parts of this territory (Ruiz et al., 2016) would make this ecosystem less resilient to variable weather conditions. Climate change will also affect terrestrial ecosystems by triggering more intense and frequent rainfall, causing a massive increase in herbaceous plants and vines from the arid zones. Wetter conditions, apart from increasing vegetation biomass will also increase erosion and formation of watercourses (Tye and Aldas, 1999). The combined effects of persistent humid conditions and the increase in temperatures might affect the expansion of invasive non-native species, which would be catastrophic for arid-zone ecosystems and agricultural areas (Development Bank of Latin America, 2019). At the same time, wetter conditions will also increase the abundance of pathogens and disease vectors, harming both animals and plants. In this context, **climate change vulnerability of the tourism system** in the Galapagos presents four major challenges: (i) Increased dependency on the continent to supply tourism with goods and services (energy, water, food); (ii) Degradation of key biodiversity features that positioned the Galapagos as a world-renowned premium nature-based tourism destination. (iii) Market shift from high-end nature-based destination towards unsustainable tourism; (iv) Decreased competitivity across the value chain, due to increase in operation costs and the degradation of the destination attractiveness. As the **Galapagos' major economic engine, tourism** --in all its forms-- is the main driving factor behind increasing demands for natural resources and population growth (IUCN & UNESCO, 2006), leading to an unsustainable development model, fundamentally incompatible with long-term conservation interests. Economic growth is actively encouraged by government subsidized fuel, electricity and transportation of people and goods from the continent (CDF, GNP, and Governing Council of Galapagos, 2010). Tourism has grown at almost the same rate as electric power demand in Galapagos, with an annual average growth rate of 7.7%. This additional demand is mostly driven by tourism, representing almost half of the total electric consumption, thus suggesting a direct driver for associated emissions (Ministerio de Energía Eléctrica y Renovable, 2017b). **The electric power generation system** of the Galapagos has four isolated grids for each of the inhabited islands: Santa Cruz, Isabela, San Cristobal and Floreana, where thermoelectric plants are still the main source of power generation. During 2016, according to the National Energy Balance, the energy sector in the Galapagos consumed a total of 3,401,766 gallons of diesel (Ministerio de Energía Eléctrica y Renovable, 2017a). This amount, in addition to consumption associated with ship transport to the islands, represented emissions worth 35,415-ton CO_2eq/year. In this context, in 2007 the Ministry of Electricity and Non-Renewable Natural Resources through the initiative "Zero Fossil Fuels in Galapagos Islands," introduced the first renewable energy power plants. Additionally, the renovation of the thermoelectric plants conducted in previous years, allowed a reduction of diesel consumption by 1.1 million gallons in 2016 (Ministerio de Energía Eléctrica y Renovable, 2017a). The 2016-2025 Ecuador Electricity Masterplan (PMEE) included the Plan for Generation Expansion in the Galapagos Isolated System (PEGSAG), which seeks to shift the current energy generation composition of the islands (85% diesel, 11% wind, 4% solar) towards 60% renewables penetration (Ministerio de Energía Eléctrica y Renovable, 2017b). Because of the expected disruption in inland climate conditions (e.g. increased weather variability) and the alteration of the water cycle (e.g. uncertainty of water availability), **the food system in Galapagos** is likely to be seriously affected, which will be reflected in a reduction of the food supply for the resident and visitor population. In 2014, 25.000 tons of food were consumed in the Galapagos, of which 76% was imported and 24% was locally produced (Sampedro *et al.,* 2018). According to population growth projections, food imports for 2030 will reach 31,825 tons, aggravating dependency on food imports from mainland Ecuador, deepening the food sector vulnerability (Ministerio de Agricultura y Ganadería, 2018a) and increasing GHG emissions from the related transport services. The agricultural area extends over 2.4% of the island's territory (19,010 ha.), distributed in 755 farming units, of which 63% are family farms (units of less than 5 ha.) and 30% are managed by women (Ministerio de Agricultura y Ganadería, 2018a). As a result of the above-mentioned climate stressors, decreased production yields are expected, thus increasing the food insecurity and vulnerability of rural livelihood. During 2016, a severe drought generated losses for the agricultural sector by more than USD 15 million (Ministerio de Agricultura y Ganadería, 2018a), with the largest loss related to livestock production and the agricultural production of cassava, corn, plantain, tomatoes, cantaloupes, and oranges. All of these products are part of the basic food basket (BFB), accounting for the nutritional balance of the resident population and tourist's consumption. Climate vulnerability of farming units is increased due to major structural barriers, including inefficient crop and livestock production, in addition to inadequate management practices, considering the particular fragility of local conditions (e.g. water scarcity, reduced soil fertility). Farmers have very low capacities to implement adaptation measures or to restore ecosystems at their farms or at the landscape scale. The inefficient use of and limited access to water for agricultural production constitute a major limitation in the agricultural sector. Water access and distribution are costly and inefficient, relying on fossil fuels and generating soil salinity with serious consequences for production and ecosystems health.

B.2. Project/Program description (max. 3 pages)

The Galapagos archipelago is among the world's twenty most irreplaceable ecosystems. Its special and unique features make it a world-class tourism destination (Pizzitutti et al., 2017). The degree to which it is exposed and its limited adaptation capacity have categorized the Galapagos archipelago as one of the most vulnerable to climate change (Di Carlo et al, 2010). Consequently, an ambitious paradigm shift towards low-emissions and climate-resilient tourism development is urgently needed, marking a new evolutionary challenge for the Galapagos**. The general objective of this Program is to implement a multisectoral and crosscutting climate action program to catalyze nature-based ecotourism in the Galapagos archipelago.** The Program envisions a comprehensive approach, combining climate change mitigation and ecosystem-based adaptation measures, targeting the tourism value chain as the main driver for GHG emissions in the islands, while also a highly vulnerable destination. The Program aims to provide concrete solutions to increase resilience, reducing Galapagos' current dependency on mainland Ecuador, as well as to mainstream climate change considerations in public policy and management instruments. The Program complements other related governmental efforts, led by the Governing Council of the Galapagos, including: the Galapagos 2030 Program (currently under discussion) dealing with the adoption of the Sustainable Development Goals, the Sustainable Construction Living Lab to develop standards and regulations for resilient construction, and other interventions related to sustainable transport, shipping and logistics facilities. The Program will target vital services across the tourism value chain such as energy, food, water and functional ecosystems, which support nature-based ecotourism. From an integral perspective, the Program will **reduce carbon intensity and mitigate tourism related GHG emissions associated with energy generation and efficient consumption** by hotels, restaurants and operators. Smaller scale mitigation opportunities will also be pursued through sustainable land use practices, as well as by encouraging local food production, thus reducing GHG emissions associated with food imports from continental Ecuador. Additionally, the Program will **build adaptation capacity in the tourism system** by accelerating the adoption of sustainable production and consumption practices through credit lines and ecotourism certification schemes. The Program will **strengthen the islands' food system,** resulting in increased availability of local food to supply visitor and resident populations, while simultaneously addressing the provision of fundamental **ecosystem services for the tourism industry, such as water as well as healthy ecosystems and emblematic species to sustain nature-based activities**. The sustainability of these proposed adaptation and mitigation measures demands adaptive capacity in local institutions and the ecotourism system to improve decision making, and mobilize additional resources for funding and promoting long-term social commitment. The Program envisions the following six outcomes: **Outcome 1: Renewable energy generation installed for less carbon intensive ecotourism development.** The tourism sector in the Galapagos is responsible for almost half of the islands total energy consumption, emitting annually 17,708 TonCO_2, (Ministerio de Energía Eléctrica y Renovable, 2017a). Within the Zero Emissions Galapagos Policy Framework, this outcome seeks to reduce GHG emission by implementing renewable energy generation systems, which are included in the PEGSAG. The proposed portfolio of energy generation projects will cover up to 50% of energy needs with renewable energy sources and reduce 34,805 TonCO_2/year emissions of GHG by 2026 (or six years of implementation)[2].

System[3]	Peak Load [MW]	Thermal Power installed [MW]	Wind power installed [MW]	Solar Power installed [MW]	Energy Storage [MWh]	Diesel 2018 [Gal.]	GHG emissions 2018 [4] [TonCO_2/yea]	Share Renewable Energy[5]	Mitigation GHG emissions[6] [TonCO_2/year]
Santa Cruz-Baltra	7.26	13.9 (11 units)	2.25 (3 units)	1.567	4 LA* 0.268 LI	2.09 million	21.200	54%	23.033
San Cristobal	4.54	8.4 (8 units)	2.5 (3 units)	-	-	1 million	10.100	60%	9.806
Isabela	1.06	1.62 (5 units)	-	0.922	0.258 LI	0.395 million	4.020	52%	1.710
Floreana	0.082	0.283 (4 units)	-	0.021	0.19 LA	0.028 million	285	60%	256

* LA: Lead acid battery; LI: Lithium-ion battery

Outcome 2: Efficient energy consumption measures implemented by the ecotourism system. The Program will support key stakeholders across the ecotourism value chain to adopt energy efficiency best practices and opportunities for improving competitivity, trough the following two outputs: (i) Adoption of distributed energy generation scheme

[2] Estimate based on renewable projects listed at PEGSAG MERNNR, 2018.
[3] Energy Balance 2018, ELECGALAPAGOS
[4] IPCC 2006 Energy Generation Factors
[5] New Renewable projects PEGSAG MERNNR 2018
[6] GHG Reduction from 2026

among the ecotourism system. The Program will accelerate the distributed energy generation scheme among the touristic sector, engaging hotels with technology suppliers and credit facilities. Distributed energy generation in the tourism/commercial sector will help to increase efficiency in electricity transmission, optimizing its use and flattening the demand curve. This energy will help to reduce peak noon demand thus decreasing the needed thermal generation; this will further strengthen tourism sector involvement in mitigation actions targeting hotels with the highest energy consumption in three isolated systems. Floreana Island was not considered because its tourist sector doesn't have a significant impact on the electricity demand. (ii) Implementing energy efficiency measures across the ecotourism value chain in line with the National Energy Efficiency Plan 2016-2035. The first phase reduced 420 TonCO_2 GHG emissions/year; The Plan envisions a second phase of demand-oriented strategies, such as implementing sustainable construction standards, replacement program for equipment with higher energy consumption, and implementing ISO 50001 Standard in public institutions, and the tourism and commercial sector. In this second phase, all projects will reduce 160,488 TonCO_2 over 20 years. Technical assistance will be provided to strengthen ecotourism engagement with the electric mobility plan, led by the Consejo de Gobierno del Régimen Especial de Galápagos (CGREG). **Outcome 3: Building resilience in the Galapagos food system**. This outcome seeks to increase climate resilience in the food production sector and rural livelihoods in the Galapagos, as well as to improve water management and increase resilience of flows of ecosystem services in agricultural landscapes. This outcome promotes agro-ecosystem resilience, by incorporating sustainable land management practices outside the protected area as a means to promote climate resilient food production for resident and visitor populations. To accomplish this, three interrelated outputs are considered: (i) *Implementing climate resilient practices in agricultural landscapes (crops and livestock) to increase productivity, and adaptation and mitigation capacity*. This includes the use of drought resistant crop varieties, implementation of hydroponic systems, greenhouse production, and fodder banks for animal feed during droughts, among other practices. The Program will facilitate participatory and integral planning by farmers, technical assistance for the application of agricultural resilient measures, and the provision of materials and equipment. These activities will be implemented on minimally 60% of the agricultural land in the islands, covering at least 5,000 hectares; (ii) Strengthening fisheries integration to the ecotourism value chain, which consist on improving the use, processing and access of fisheries for tourist and increase local consumption of sea food that impact on food security of Galapagos inhabitants; (iii) *Enabling environment to scale-up climate resilient food supply chains and food environments for local and visitor populations*. Activities will focus on the development of financial solutions, such as agricultural insurance that considers climate change scenarios for agricultural producers. It also includes the development of market solutions to increase the availability of and physical access to locally produced food for the resident and fluctuating visiting population. **Outcome 4: Water resources management for climate resilient food production and ecosystem services.** The intervention is focused on improving water management to resilience of agroecosystems. This includes ecosystem restoration measures, water management, and protecting and increasing forest coverage, within farms and associated areas. It considers the following outputs: (i) *Increasing resilience of ecosystem services at the agricultural landscapes scale*, to promote different strategies for ecosystem recovery. These strategies include soil management (soil moisture retention, increased organic carbon), integrated management of crops and soil fertility, and restoration at farm scale, considering agroforestry and silvopastoral systems to foster landscape connectivity between agricultural zones and protected areas (output 5.3), and the recovery of environmental services in at least 2000 has.; (ii) *Improving water collection, use and management practices for climate resilient food production*, which include the establishment of rainwater collection, water harvesting, treatment, storage and efficient irrigation systems at farm scale. These measures combined with restoration activities (also ecosystem restoration in output 5.3) will contribute to the recovery of environmental services, especially water regulation, benefiting food production and providing water for the population in general. **Outcome 5: Adopting ecosystem-based adaptation measures in High-Ecological Value areas, critical for sustaining nature-based tourism.** The augmented frequency and intensity of climatic anomalies in the Galapagos islands can exceed the potential of organismal adaptation and the resilience capacity of ecosystems. Marine ecosystems will be primarily affected by increased SST coupled with increased acidification, which in turn will lead to habitat degradation and changes in primary productivity. Furthermore, a shift in the productivity of marine ecosystems will directly affect terrestrial communities. Increased rainfall product of increased SST will affect both low- and highland ecosystems altering plant growth, community structure, promoting erosion and providing better conditions for invasive species. In this context, this outcome seeks to increase the resilience of the Galapagos ecosystems in the face of climate change, through the implementation of adaptation strategies in marine and terrestrial High-Ecological Value Areas (HEVAs). HEVAs constitute selected landscapes of primary importance due to: (1) intrinsic biotic characteristics (e.g. high endemism); (2) high exposure to climate change impacts coupled with human-induced impacts (e.g. habitat loss, invasive species propagation), and; (3) key nature-based tourism attractions. This outcome has three interrelated outputs: (i) Implementation of ecosystem-based adaptation measures in selected HEVAs, including reduction of water pollution, control of overfishing, reduction of tourism impacts (e.g. anchorage sites, visitation routes), strengthening of invasive species eradication programs, coupled with restoration strategies, among others; (ii) This output targets

HEVAs in mountain forest landscapes which are vital for water provision in the inhabited island, through the implementation of measures that increase horizontal precipitation interception by recovering mountain forest vegetation; (iii) The third output focuses on strengthening at least two long-term applied research and monitoring programs that will document climate change impacts on HEVAs, and asses the effects of adaptation measures in increasing ecosystem resilience. These monitoring programs will be linked to the Information System proposed in outcome 6, to guarantee their articulation with decision-making processes and informing public policy. **Outcome 6: The response capacity of key institutions, the tourism industry and local population of Galapagos, is strengthened to ensure the sustainability of climate change mitigation and adaptation measures.** This outcome aims to improve the response capacity of Galapagos' institutions, to understand and integrate key climate change information in decision-making, and adopt mitigation and adaptation practices. This outcome will be addressed by five interrelated outputs: (i) Implementing an Ecotourism Certification Schemes in order to engage with best practices (e.g. local food consumption, water and energy efficiency) and international standards for sustainable consumption and production patterns across the tourism value chain. (ii) Developing the tools and mechanisms to ensure the long-term financial sustainability of key project interventions. A financial sustainability plan will be implemented, considering a wide array of public, private and cooperation funding sources, to design financial mechanisms such as credit lines, impact investments, corporate social responsibility schemes, visitor fees, green bonds, etc., in line with the recently approved Environmental Organic Code. The plan includes the feasibility to constitute the Galapagos Climate Change Fund as the financial vehicle to channel all these additional investments, either through the already established Environmental Sustainable Investment Fund or the National Environmental Management Fund. (iii) Inform policy and decision making through the establishment an information system aligned with national policy instruments and official institutions in charge of climate change data, aimed at reducing the uncertainty and information gaps related to climate change impacts and forecast scenarios. Both public and private organizations possess invaluable information, they manage and continuously collect loads of data on a daily basis. Data sharing and aggregation among Galapagos institutions is still a limited practice which requires fostering collaboration through virtuous partnerships that promotes inter-institutional cooperation and gives added value to the information generated. The Program will foster a platform to generate, share and integrate relevant climate change information to support policy formulation, as well as design and assess adaptation measures. Similarly, the Program will seek to strengthen key technological, infrastructure and human capacities as a means to generate and analyze information to assess climate change impacts, guide adaptation measures and implement an early warning system. (iv) Mainstreaming climate change across local planning, management tools and decision-making processes. This will promote long-term institutional commitment to ensuring the sustainability of climate change mitigation and adaptation efforts in the Galapagos. A critical activity to achieve this goal will be the assessment and update of several key governance tools such as the "Galapagos Special Regime Land Use Plan" and "Galapagos Protected Areas Management Plan", "Invasive Species Management Plan", "Fisheries Calendar", "Farm's implementation plan for climate–resilient practices." (v) Promoting long-term social commitment by developing communication, education and participation processes. **Alignment with the national policies and pertinence of the Accredited Entity.** The proposed Program contributes to the implementation of the National Climate Change Strategy 2012 - 2025 (ENCC), which mandates: "To sustainably preserve and manage natural heritage and its land and marine ecosystems, to contribute with response capacity in the face of climate change impacts". All six outcomes are also aligned with Ecuador´s National Determined Contribution (NDC) 2019: (i) 40% emission reduction in the energy sector; (ii) 100.000 hectares for restoration target within the forestry and protected areas sector; (iii) reducing vulnerability and promoting technology transfer under the agriculture and land use sector. The first outcome is aligned with the PMEE, the PEGSAG; the second outcome is aligned with the "Eco-sustainable Farming Plan for Galapagos," promoting resilient, profitable agriculture that fits the natural characteristics of the islands; also aligned with the second outcome are the "Galapagos Special Regime Land Use Plan" and the "2019-2029 Invasive Species Management Plan for Galapagos". Regarding the third outcome, the Galapagos Protected Areas Management Plan (including the zoning system of Galapagos protected areas), focuses on the conservation of the islands' ecosystems. The third outcome is aligned with the Fisheries Calendar defined by the Dirección del Parque Nacional Galápagos (DPNG). Finally, the municipal land use plans (Isabela, San Cristobal, and Santa Cruz) regulate land use outside the protected areas (including agricultural lands, as well as some of the high-ecological value areas). For the proposed program, Development Bank of Latin America (CAF) will act as accredited entity, leading the first outcome through a Special Purpose Vehicle (SPV). The Food and Agriculture Organization of the United Nations (FAO), will be the executing entity of the 3rd and 4th Outcomes, in collaboration with World Wildlife Fund Inc. (WWF) for fishing and water activities. FAO will coordinate the activities with the Ministerio de Agricultura y Ganadería (MAG), as well as other governmental agencies related to agriculture in the Galapagos, such as the Instituto Nacional de Investigaciones Agropecuarias (INIAP). The WWF will be the implementing entity for the fifth outcome, in close collaboration with the DPNG and the CGREG as lead local institutions. The sixth outcome will be jointly executed through CAF, WWF and FAO, as it integrates adaptation and mitigation measures and adds value to the overall intervention. With regards to

Program risks and mitigation measures, environmental impact assessment and specific management plans will ensure full compliance with Galapagos National Park regulations and state of the art practices for low impact implementation.

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

Potential impact: The Program will benefit 250,000 people. It will directly benefit the entire population of Galapagos, approximately 30,000 people, 48,2% males and 51,8% females[7] (0,017% of Ecuador´s population). But it will also provide benefits to 220,000 people representing the annual visitors entering Galapagos. The entire population of Ecuador (17 Million People) will benefit indirectly, considering Galapagos is Ecuador´s most important biodiversity hotspot and renown tourism destination.

GCF Result Area	Indicator	Expected Value
Energy generation and access	Reduction of tons of CO_2eq by diversifying the electricity generation matrix and promoting efficient use.	859.148 T CO_2eq[8]
Forest and land use	Expected tons of CO_2eq to be captured due to restoration and protection activities.	345.239 T CO_2eq in a 20-year period[9]
Health, food and water security	Number of people with reduced vulnerability	3.181 farmers (50% of people involved in agricultural activities, 49% women) and fishers (100% of fishers, 30% women)
Ecosystems and ecosystem services	Density (Num individuals/km^2) of key marine and terrestrial species has increased.	To be defined in full proposal
	Water regulation capacity (cm^3/second) has increased in restoration areas.	To be defined in full proposal
	Landing volumes (tons) are according to fish calendar regulations and best practices.	To be defined in full proposal
	Nature-based tourism (number of visitors/visiting site/time) is maintained.	To be defined in full proposal

During detailed funding proposal preparation, these indicators of impact will be developed in detail. The attached logical framework details the indicators per outcome, output and budget.

Paradigm shift: The Program will catalyze the paradigm shift from business as usual tourism development towards climate resilient and low emissions nature-based ecotourism in Galapagos. Ecotourism has been widely recognized as the only sustainable model for tourism development in the islands (CDF, GNP, and Governing Council of Galapagos, 2010,). Visitors have access to limited public use sites, strictly regulated by the world-renowned Galapagos National Park (Pizzitutti et al., 2017), complemented by policies intended to control and limit tourism development (UNESCO, 2006). However, until this Program, climate change has not been addressed from the tourism destination perspective in Galapagos. Therefore, resilient and low emission ecotourism development is highly innovative, as it marks an alternative pathway for the future of tourism operations in this UNESCO World Heritage Site. It is still possible to represent the Galapagos brand in the world tourism market as an uncontaminated wildlife sanctuary (Pizzitutti et al., 2017). The Program anticipates market trends related to carbon-conscious travelers, and shows leadership in positioning Galapagos brand as a climate resilient ecotourism destination. The Program will shift the paradigm away from carbon intensive tourism development and unsustainable consumption and production patterns. It will also shift the traditional biodiversity conservation paradigm, mainstreaming climate change tools and capacities to increase ecosystem resilience.

The Program is highly innovative since it develops a crosscutting vision from a climate change perspective, through tangible adaptation and mitigation measures in an isolated territory such as the Galapagos islands, in the context of the ecotourism system as a transversal axis of the economy and development of the archipelago. The Program proposes the adoption of low emissions technologies for power generation, food production and biodiversity conservation in the islands, taking into account World Tourism Organization´s (UNWTO) commitment to improve the tourism sector's engagement towards biodiversity and climate change impacts, as well as how to adequately prepare destinations for the expected shifts in weather patterns. The need has never been greater for integrating sustainable tourism practices with other best practice guidelines developed for thematic areas such as biodiversity, climate

[7] Galapagos Special Regime Land Use Plan 2015- 2020".
[8] Estimation based on the Galapagos Electrification Masterplan, for a 20-year implementation period.
[9] Measured with the Ex-Ante Carbon-balance Tool (EX-ACT) http://www.fao.org/tc/exact/ex-act-home/en/, projected to 20 years

resilience, coastal zone management, sustainable land management, and rural development. Integrated approaches will increase efficiency, reduce overlap and result in a more cohesive sector response to prevailing impact issues in Galapagos islands. Research on value- and supply chain management approaches at destinations will also strengthen inter-linkages between tourism and other sectors (e.g. agriculture, fisheries) providing opportunities for multiplier effects and minimizing leakage. It promotes deep changes of the production and consumption patterns, which in the short term will noticeably improve the carbon footprint of Galapagos by making it less dependent upon the mainland. Likewise, the Program will build local capacity, facilitating favorable conditions and enabling institutional elements for climate change adaptation and mitigation. It will do so through innovative financing models involving the creation of a SPV, which is a trust fund under the Securities Market Law of Ecuador, to meet the Ecuadorian authorities' regulations and conditions to approve the construction of renewable energy plants in Galapagos and to ensure legal guarantees to funding institutions and stakeholders. Additionally, the Program will design and facilitate access to credit products, through private and public development banks such as Corporación Financiera Nacional and BanEcuador, aimed to change the energy matrix, renovate technology and adopt climate change adaptation practices.

This Program offers a strategic opportunity in terms of potential for replication and regional scale-up of their experiences in mitigation and adaptation to climate change. To such end, an exclusive outcome is proposed for the generation of information, knowledge and capacities applied to planning, decision-making and education processes. The Program, through outcome 4 (i.e. information system), will strengthen and assist local institutional capacities to adopt the information system and sustain it in the long-term. In this context, the Program seeks to catalyze the information related to climate change impacts and its relationship with human livelihoods in the archipelago, as well as potential detrimental effects over the tourism, agriculture and the artisanal fisheries industries. All this, in order to inform land-use planning decisions and instruments related with the sustainable development of the Galapagos archipelago. Similarly, the Program will create learning opportunities for other key stakeholders in mainland Ecuador, and in countries of the region relevant to the information system, as a way of having a decentralized information system that integrates key stakeholders in a knowledge hub that informs and assists policy decisions. Building on these existing social and institutional assets, the Program proposes to establish capacities and practices that enable Galapagos' public institutions to adapt and incorporate the climate variable into their operation. This entails a change of mindset within institutions, as well as the staging of conditions and the environment that favor change.

The Galapagos protected areas serve as worldwide role models for biodiversity conservation. For many Latin American and Caribbean countries, its management systems in the Galapagos serve as a benchmark for other archipelagos, oceanic ecosystems, and other priority conservation areas. Galapagos holds a leading position in terms of innovation as regards its regulatory and institutional framework, visitors' management, participatory management of resources, control and surveillance systems, and invasive species eradication and control. Galapagos plays a key role in the capacity building and institutional strengthening of Ecuador's National System of Protected Areas, actively engaged in the exchange of knowledge, which sustains south-south cooperation relations with a series of countries and international initiatives. These conditions suggest that a successful program in Galapagos is likely to inspire a long-term paradigm shift not only in continental Ecuador but also across protected areas of the region**.**

Sustainable Development: Changing the Galapagos energy matrix will generate annual savings worth USD 5 million[10] for the Government of Ecuador (GoE), due to the avoided consumption of diesel. The tourist sector will benefit from reduced GHG emissions further strengthening its ecotourism branding, as they will move towards largely adopting energy efficient and distributed generation schemes. The Program is estimated to create more than 450 jobs (270 men, 180 women), of which roughly 53% will be in the agricultural sector, 33% will be related to ecosystem adaptation, 7% in the energy sector and 7% in managing and administering the Program[11]. Among the social benefits, there is the increase in climate-resilient agriculture production, local consumption of healthy products and diversification of farming products, with a positive effect in the population's diet and health. The boost to the agricultural sector also points at greater resilience on account of the diversification of households' economies and lesser vulnerability associated with dependence on the mainland for food supply. Greater appreciation for local farming products will be particularly beneficial for women, who presently represent 25% of all producers of the province (Ministerio de Agricultura, 2018b). Increased income for women will improve girls' education. A demand for women in the workplace and their participation in the Program's decision-making will be promoted. Better conditions will be created for women producers.

Needs of the recipient: One thousand kilometers from mainland, the oceanic Galapagos archipelago is one of the most vulnerable places to climate change (Di Carlo et al, 2010). Changes are anticipated for almost all of life's aspects

10 According to data provided by the MEyRNNR and Petroecuador in year 2018.

11 Estimation based on the average number of workers per farming units provided by staff of the MAG; conversion factor of people employed to kw/hour installed with renewable energy; estimation of number of experts and consultants who will participate during Program implementation.

of its 30,000 residents, in addition to the 220,000 tourists entering the islands every year. Change the Galapagos' energy matrix has been expected for the last 10 years, as it provides the basis for low emissions tourism development. From the 2008 Galapagos Zero Emissions initiative to present-day PEGSAG, initiatives have not been entirely effective due to the current lack of economic resources. With a dollarized economy, a fiscal deficit of 3% of the GDP and a country risk of more than 693 points,[12] it becomes progressively harder and more costly to access adequate and competitive financing options. In the absence of financial resources, the national government has prioritized the participation of private stakeholders to implement specific projects of public investment. Within the domestic market, the conditions to finance those types of projects are not attractive enough to promote participation of private stakeholders. This is where the Program resources come into play and permit a technological leap through concessional funding. Ecuador has made huge efforts to improve both the living conditions and the protection of the environment in the Galapagos Islands, which has demanded significant investment for the country. However, a technological leap of this scale requires financial sources, with advantageous conditions and non-refundable resources in order to gain the desired impacts in the tourism, agriculture, fisheries, conservation and energy sectors.

Country ownership: The Program is aligned and consistent with the Republic's Constitution, guaranteeing nature's rights and recognizing special regimes for planning and development. The National Climate Change Strategy of Ecuador[13], intends to reduce the expansion of invasive species populations in Galapagos and other sensitive ecosystems from continental Ecuador. The Program is in line with the "Galapagos Zero Emissions", which intends to gradually reduce the use of fossil fuels in vehicles, vessels and thermoelectric energy generation, as well as to progressively replace conventional vehicles with electric vehicles in the Galapagos archipelago, initiative for the decarburization of the tourism sector. The Program falls within the NDC 2019 presented by Ecuador this past March 2019, in which the energy sector is vital in emissions reduction and development of adaptation measures in strategic environmental areas in Ecuador. Additionally, the Program is aligned with the Environmental Organic Code[14], sanctioned in 2018, and includes climate change measures in local planning strategies. The proposed Program was developed in close consultation with national and local authorities representing all stakeholders involved in the different outcomes, allowing appropriation and alignment to contribute to relevant state policies by strengthening capacities and competencies of key national and local institutions. Given the Program's characteristics, the investment volume, and the expected impact, the Program has the characteristics necessary to become an emblematic initiative of the government, ratifying Ecuador's commitment to the conservation of Galapagos. As a result, the commitment and endorsement of Ecuador's highest authorities are expected.

Efficiency and effectiveness: The estimated cost in TonCO$_2$eq amounts to USD 126 for 20 years implementation[15]. The Program is not only expected to have an impact on green energy generation, but also to achieve a significant shift towards energy efficiency in the tourist sector, which is targeted because of its multiplier effect as Galapagos' major economic engine. The Government has clear institutional arrangements that guarantee the execution and operation of renewable energy projects with private sector participation. The special purpose vehicle is an efficient alternative to implement Outcome 1, as it honors Ecuadorian regulations, promotes transparency and efficiency. Experienced partners such as FAO and WWF, with capacities and systems in place to ensure quality and punctual delivery, will implement outcomes 3, 4 and 5. Due to the nature of climate change phenomenon, with progressive, long-term and differentiated impacts on ecosystems and productive activities, Outcome 6 will contribute towards ensuring cost effective mitigation and adaptation initiatives, backed by Galapagos planning and regulatory instruments, based on local scientific information.

B.4. Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)

The process of developing this concept note has involved a broad participation and sense of ownership by the stakeholders and institutions related to the Program's objectives. Under the leadership of the Ministerio de Ambiente del Ecuador (MAE) as Designated National Authority, the design of the different outcomes, products and indicators has been coordinated with the DPNG, the CGREG, the MAG, the MEyRNNR, the Ministerio de Turismo and the Gobiernos Autónomos Descentralizados (GADM) of Santa Cruz, Isabela, and San Cristóbal. This coordination has allowed the Program to reflect institutional priorities and become an instrument that supports and complements the implementation of public policies in Galapagos. The Accredited Agency, CAF endorses its own resources to lead the Funding Proposal in close coordination with FAO and WWF, as well as with DPNG, MAE, MAG, MEyRNNR, CGREG and Ministerio de Turismo. The engagement from the tourism, agricultural and fisheries sectors is fundamental, at the individual and

[12] Ecuador's Central Bank as of September 3, 2019.
[13] National Climate Change Strategy of Ecuador; http://extwprlegs1.fao.org/docs/pdf/ecu140074.pdf
[14] Código Orgánico Ambiental. http://www.ambiente.gob.ec/wp-content/uploads/downloads/2018/01/CODIGO_ORGANICO_AMBIENTE.pdf
[15] Estimate based on total project costs divided into the total amount of TonCO2eq during the overall implementation period.

associative scale. In the academic and research field, the Charles Darwin Foundation, the Universidad San Francisco de Quito (USFQ), the Instituto Oceanográfico Nacional de la Armada (INOCAR) and the INIAP participated. All the institutions mentioned have confirmed their interest in remaining involved during the following stages of Program design and implementation.

C. Indicative Financing/Cost Information (max. 3 pages)

C.1. Financing by outcomes (max ½ page)

Component	Indicative cost (USD)	GCF financing		Co-financing		
		Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
Component 1: Energy Matrix Change in the Ecotourism Value Chain at Galapagos' Archipielago.	88,587,308	31,000,000[16]	Senior Loan	24,720,447[17]	Equity	Private sector
		300,000	Grant	32,566,861[18]	Senior Loan	CAF
				TBD[19]	Private investment	Tourist sector
Component 2: Building resilience in the Galapagos food system.	8,400,000	8,400,000[20]	Grant	TBD[21]	Private investment	Agricultural producers
Component 3: Building High-Ecological Value areas resilient to climate change.	10,000,000	10,000,000[22]	Grant			
Component 4: Sustainability mechanisms for climate resilience and low emissions ecotourism development.	10,600,000	10,600,000[23]	Grant			
Indicative Outcome Costs	117,587,308	60,300,000				
Program Management Cost 5%	3,015,000	3,015,000[24]	Grant			
Indicative total cost (USD)	120,602,308	63,315,000				
Implementation FEE Cost 5%	3,165,750	3,165,750[25]				
Indicative Total Cost of the Program (USD)	**123, 768,058**	**66,480,750**				

A Programme Management Unit (PMU) will be established within the Executing Entities (FAO and WWF) in order to guarantee all components and activities are carried out according to the Programme design. This PMU will articulate monitoring and evaluation activities covered by CAF, as Accredited Entity, to ensure that all expected results are achieved on time and within budget. The prefeasibility assessment concludes that Outcome 1 presents a reasonable financial feasibility. Green Climate Fund (GCF) funding plays a central role in shifting energy production and consumption patterns in Galapagos. Under current conditions, without GCF´s conditionality, such a goal would only be partially achieved. To implement Outcome 1 a financial structure is anticipated through a SPV to provide assurance to the lending and implementing organizations (GCF, CAF), the private sector investors, and the Government of Ecuador.

[16] GCF financing through senior loan (49% of the total investment for the Energy Matrix Change).
[17] Loan matching private contribution (28% of the total investment for the Energy Matrix Change).
[18] CAF contribution through credit (23% of the total investment for the Energy Matrix Change).
[19] Amount estimated in prefeasibility study to implement distributed generation in 20% of hotels
[20] Budget estimated based on prefeasibility study, breakdown per output presented in logical framework
[21] According to Viteri 2017, agricultural producers of Galapagos are estimated to invest 2.5 million every year in control of invasive species.
[22] Budget estimated based on prefeasibility study, breakdown per output presented in logical framework.
[23] Budget estimated based on prefeasibility study, breakdown per output presented in logical framework.
[24] Percentage based on GFC operational guidelines.
[25] Percentage based on GFC operational guidelines.

This SPV will be responsible for administering, supervising, building and operating the implementation of electricity generation systems with renewable energy, in the 4 systems of the islands, in line with the PEGSAG.

Capital structure for Outcome 1 is composed of private loans and equity. The investment cost for Outcome 1 is $88,58 million, of which $24,7 million will come from private equity, $32,8 million from a CAF senior loan and the remaining balance from the GCF through a senior loan. The GCF loan will be channeled via CAF. The investment of the public sector is contributed by a no-cost leasing of the land. Private investors will contribute capital in the form of assets, which will also serve as a loan guarantee to the GCF; this capital and equity (loans and assets) will be managed through the SPV. The government will pay the private energy supplier a fixed price Kwh/USD, resulting from a technical and financial analysis of each individual project.

C.2. Justification of GCF funding request (max. 1 page)

The long-term conservation of the Galapagos archipelago is a high priority for Ecuador', as it is the country's natural region with the highest international profile, and contributes about 20% of the country's tourist GDP to the Ecuadorian economy (MAE, 2014). The Galapagos features exceptional conditions, setting it up to become a center of climate knowledge and innovation in oceanic ecosystems of high global conservation priority. Under the current circumstances, without the GCF financing it would be impossible to catalyze any change, coordinated among the different entities involved, to the extent necessary to adequately address these challenges.

The GoE has set a public finances goal to reach a fiscal deficit of 0% in 2021[26]. According to the Ministry of Finance has determined that in 2018 deficit closed at 3%[27] in relation to GDP, so it maintains a policy of austerity throughout the public sector, prioritizing spending in sectors such as education, health and housing. Likewise, the economic reform that will be implemented starting in 2019, will substantially curtail the budgets of all the public sector institutions until achieving fiscal balance. For this reason, other alternatives are being sought for investments in other sectors.

Based on the above, and due to a legal model that favors the creation of this type of public-private partnerships (PPP), these PPPs are now possible for the energy sector, and the GoE supports these partnerships. Therefore, the GoE needs to ensure the existence of private bidders, for whom the main incentive is access to soft loans, which could not be offered by commercial banks due to liquidity and national interest rates. The GCF's concessional funding would allow private stakeholders to implement projects that are feasible from a financial point of view. In exchange, the GoE is committed to buying the energy that these projects generate, at the price agreed upon via signed contracts, and which must necessarily be lower than the costs of energy generated by the country's current thermoelectric plants. This purchase is guaranteed as already indicated in the Charter of the Public Electricity Utility.

For outcome 3, these outputs have little possibility of being financed by the agricultural private sector mainly because the actions anticipated under this outcome are of a public investment nature and would not have a direct financial return. The agricultural sector does not currently have adequate profitability to maintain its activity in the islands (Toledo, 2017). Therefore, implementing measures at both the production unit and the enabling environment scales, to allow the gradual transformation of this sector - currently vulnerable to environmental and economic shocks-- towards a state of climate resilience, will strengthen and attract the investment of agricultural producers. This will provide economic security to families whose income depends on this sector.

For outcomes 3 to 6, the proposed actions are additional and complementary to the work already carried out by public and non-public institutions in support of local stakeholders and the conservation of the islands. Under current fiscal adjustment conditions, without GCF´s funding, such goals would be unfeasible. The Program proposes a paradigm shift in all related institutions, and significant technological leaps that currently cannot be financed by the Ecuadorian state or domestic resources.

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)

The Program contributes to the islands' sustainability in three dimensions: environmental, social and economic. It aims to catalyze a shift towards sustainable production and consumption patterns, addressing the tourism sector as a vehicle for accelerating mitigation and adaptation practices. The Program will allow the islands to be less vulnerable to climate change, which in turn will guarantee that these ecosystems continue to produce services that are the cornerstone of the economic sustenance of the islands, that is: tourism and fishing. This Program is designed to address existing root causes and barriers, in particular, the following key elements of the exit strategy:

[26] Ecuadorian Observatory for fiscal policy, 2019

[27] Ecuadorian fiscal budget account #421: https://www.finanzas.gob.ec/wp-content/uploads/downloads/2018/11/13-CN_Por-Entidad_Gastos.pdf

- Alignment with national and local policies and priorities. The design and implementation consider adequate institutional and stakeholder participation, leading to strong ownership as a key pre-condition for long-term institutional sustainability.
- Focus on strengthening existing, rather than creating new parallel structures. The Program will establish strong partnerships and institutional coordination mechanisms to ensure effective governance, coordination and management, and thus supporting sustainability.
- Increased climate knowledge and awareness will provide a foundation for informed decision-making, leading to mainstreaming climate change in key policies, strategies, plans and budgets. The Program will adopt a broad multi-stakeholder approach and bring on board different ministries, agencies, universities, NGOs, private sector stakeholders, communities and others. Capacity development activities, awareness raising and a dedicated knowledge management outcome, will enhance their capacity and facilitate the sustainability of results. Institutional strengthening with relevant government authorities will enhance the effective collaboration within the government and civil society
- New equipment, technologies and tools for observations, monitoring, modelling and prediction will be integrated into the DPNG, the CGREG, the MAG, the Ministry of Energy and Non-Renewable Natural Resources, and the Ministry of Tourism. Staff will have the necessary baseline capacity and will be further strengthened as institutions are committed to providing proper operations and maintenance.
- The payment of credit granted to the private generators will be guaranteed by the SPV, which is financed by the monthly income generated through bill-payment by energy users in the Galapagos. Once the project is completed, investments in electricity generation will be maintained by the ongoing dynamic of the energy market in Ecuador. Considering that the energy costs will be lower than the current ones, and that the private generators will have recovered their investments within 20 years of implementation, allowances can be made for the modernization of necessary technology to ensure the supply of renewable energy to the islands.
- Regarding the climate resilient food production outcome, the actions seek to generate impacts both at the production unit scale and in the productive environment surrounding the sector. This will allow the structural changes that the agricultural sector requires, ensuring sustainability over time. The Program will overcome the barriers that have caused a crisis in the sector and dependence on mainland Ecuador. Upon completion of Program with the GCF, the barriers will have been overcome and the farming sector will be able to generate sufficient profitability for the farmers, as well as reduce the threats and vulnerability to the islands and the impact of climate change in the sector.
- Financial sustainability to maintain key adaptation practices will be achieved through a diversified portfolio of funding sources and financial mechanisms, which would be explored and fully developed through a financial sustainability strategy that includes an economic assessment of climate change impact on ecosystems. These mechanisms could include a new local climate fund, green financial mechanisms, and economic tools, among others. Integration with national budgets and improved allocation of governmental investments is also likely to contribute to sustainability considering the Program will allow financial savings for the State equivalent to USD 100 million, thanks to the reduction in electricity generation costs[28].
- Sustainability and replicability of the Program will be enabled through key partnerships with academic and research institutions, and the alignment with existing platforms, such as the Eastern Pacific Tropical Seascape, REDPARQUES (Latin-American technical cooperation network for protected areas and wildlife), among others. These partnerships will provide a regional audience to capitalize knowledge generated by the Program.
- Mid and long-term sustainability will also be achieved through the communication, education and participation activities (Output 6.5), centered around developing the necessary knowledge, values, attitudes, and capacities to make informed decisions and responsible actions to maintain environmental integrity, to ensure economic viability, and to support a just society for the current and future generations.
- Almost 60% of local residents depend, directly or indirectly, on tourism. This accounts for nearly 80% of the local economy (Pizzitutti et al., 2017). Targeting a transformational change across the ecotourism value chain is very likely to achieve a clear multiplier effect within the local population of Galapagos, offering the potential to scale up an ecotourism model for other key destinations in mainland Ecuador.

D. Supporting documents submitted (OPTIONAL)

☒ Map indicating the location of the Program

☒ Diagram of the theory of change

Matrix of values and calculations

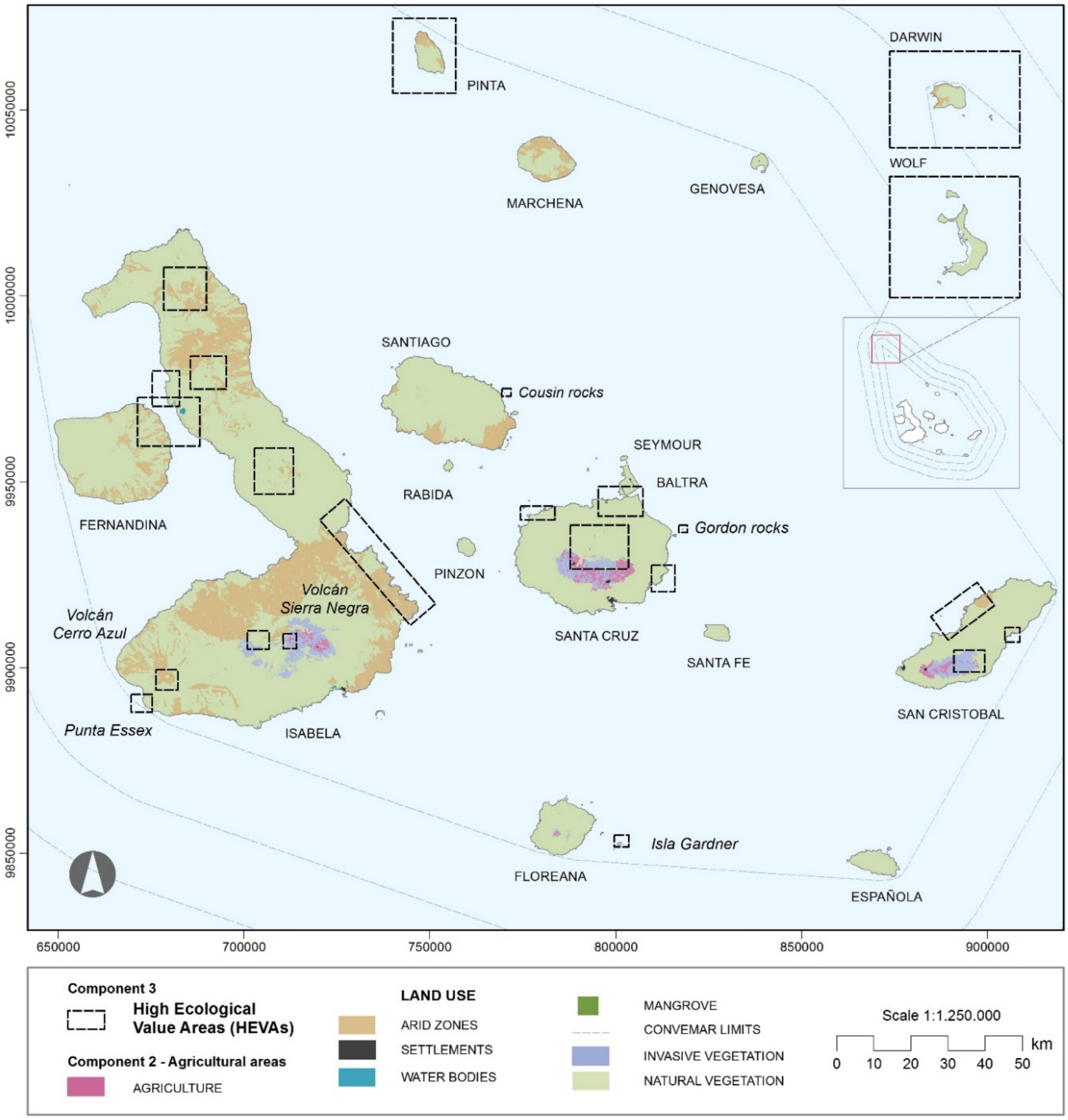
☒ Economic and financial model with key assumptions and potential stressed scenarios

[28] According to data provided by the MEyRNNR and Petroecuador in year 2018

☒	Pre-feasibility study
☐	Evaluation report of previous project
☐	Results of environmental and social risk screening

Self-awareness check boxes
Are you aware that the full Funding Proposal and Annexes will require these documents? Yes ☒ No ☐ • Feasibility Study • Environmental and social impact assessment or environmental and social management framework • Stakeholder consultations at national and project level implementation including with indigenous people if relevant • Gender assessment and action plan • Operations and maintenance plan, if relevant • Loan or grant operation manual as appropriate • Co-financing commitment letters
Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes ☒ No ☐

Appendix 1
Priority areas for Program Intervention



In Component 2, selected areas correspond to agricultural lands (UPAs) in inhabited islands. In Component 3, selected areas correspond to High-Ecological Value Areas (HEVAs). HEVAs are defined based on their intrinsic biotic importance (Singularity), Exposure/Sensitivity to climate change impacts and provision of ecosystem services (i.e. all selected areas are key for nature tourism on the Islands). Final intervention areas will be selected during project full-proposal formulation phase.

Appendix 2
Theory of Change

<table>
<tr><td rowspan="6">High Level Contribution</td><td>Paradigm Shift</td><td colspan="6">Shift from business as usual tourism model to an ecotourism model, by adopting climate change actions in the Galapagos archipelago.</td></tr>
<tr><td rowspan="5">Key GCF Results</td><td colspan="6">Fund level impacts for mitigation:</td></tr>
<tr><td colspan="6">1. Reduced emissions through the increase of renewable energy generation, access and energy efficiency;</td></tr>
<tr><td colspan="6">2. CO_2 removal due to implementation of improved land management practices in selected farming units.</td></tr>
<tr><td colspan="6">Fund level impacts for adaptation:</td></tr>
<tr><td colspan="6">1. Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions;
2. Increased resilience of health and well-being, and food and water security;
3. Improved resilience of ecosystems and secure provision of ecosystem services;</td></tr>
<tr><td rowspan="3">Program</td><td>Program Objective</td><td colspan="6">Implement a multisectoral and crosscutting climate action program to catalyze nature-based ecotourism in Galapagos archipelago.</td></tr>
<tr><td>Component</td><td colspan="2">Energy Matrix Change in the Ecotourism Value Chain at Galapagos archipelago.</td><td colspan="2">Building resilience in the Galapagos food system.</td><td>Building ecosystem resilience to climate change.</td><td>Sustainability mechanisms for climate resilience and low emissions ecotourism development.</td></tr>
<tr><td>Expected Program Outcomes</td><td>1. Renewable energy generation installed in the Galapagos archipelago.</td><td>2. Efficient energy consumption measures implemented by the ecotourism value chain.</td><td>3. Climate resilient food production and improved rural livelihoods in Galapagos.</td><td>4. Water resources management for climate resilient food production and ecosystem services.</td><td>5. Adopt ecosystem-based adaptation measures in High-Ecological Value areas, critical for sustaining nature-based tourism.</td><td>6. The response capacity of key institutions, the tourism industry and local population from Galapagos, is strengthened to ensure the sustainability of climate change mitigation and adaptation measures.</td></tr>
</table>

	Outputs	1.1. Implementing renewable energy generation systems in the four inhabited islands in accordance with the Generation Expansion Plan of the Galapagos Isolated System 2025 (PEGSAG).	2.1. Developing technical and financial tools to promote distributed energy generation in the ecotourism value chain. 2.2. Implementing energy efficiency measures across the ecotourism value chain.	3.1. Implementing climate resilient practices in agricultural landscapes (crops and livestock) to increase productivity, and adaptation and mitigation capacity. 3.2. Strengthening artisanal fisheries integration into the ecotourism value chain. 3.3. Enabling environment to scale-up climate resilient food supply chains and food environments for local population and visitors.	4.1. Increasing ecosystem services resiliency to climate change at agricultural landscapes scale. 4.2 Improving water collection and management practices for climate resilient food production.	5.1. Implementing ecosystem-based adaptation measures in sea and land High-Ecological Value landscapes. 5.2. Increasing water provision in inhabited islands by promoting restoration practices in key mountain forest landscapes. 5.3 Strengthening at least two long-term applied research and monitoring programs to understand climate change impacts on ecosystems and assess the effects of adaptation measures.	6.1. Implementing an Ecotourism Certification Scheme to adopt best practices and international standards for sustainable consumption and production patterns across the tourism value chain. 6.2. Developing the tools and mechanisms to ensure the long-term financial sustainability of key Program interventions. 6.3. Establishing a decentralized information system, aimed at reducing the uncertainty related to climate change impacts and forecast scenarios, including an early warning system. 6.4 Mainstreaming climate change into regulatory frameworks and planning instruments, to foster long-term adoption of climate change mitigation and adaptation measures, with emphasis on energy, agriculture, water consumption patterns and ecosystems. 6.5. Promoting long-term social commitment through communication, education and participation strategies.

Barriers, Impacts, Risk and Assumptions	***Barriers to achieve outcomes***	High fossil fuel-based technology dependence of the tourism value chain. Consumption and production patterns of the tourism value chain, which triggers CO_2 emissions. Limited financing to allow adoption of new technologies through public or private partners.	Farmers limited access to mitigation and adaptation options in Galapagos. Limited articulation of artisanal fisheries to the Galapagos food system and ecotourism value chain. Weak institutional and technical capacity to address climate change in Galapagos' food production. Competition with food imported from the mainland due to lower prices.	Limited capacity of the Galapagos National Park and Marine Reserve to address climate change impacts on ecosystems, through appropriate technological and science-based solutions. Limited knowledge of climate change impacts on terrestrial and marine ecosystems, to guide adaptation measures.	Lack of regulatory frameworks to address ecosystem degradation and biodiversity loss. Climate-change related information is fragmented, insolated and partially available. Decision-making processes partially integrate available information and ongoing research in climate change. Limited awareness on the part of the Galapagos population towards climate change impacts and adaptation needs. Lack of financial instruments to scale-up the adoption of climate-resilient practices. Reluctance on the part of beneficiaries to adopt ecotourism practices and technologies. Reluctance on the part of key institutions that provide relevant climate change information for Galapagos, to engage in a decentralized information system.
	Barriers to achieve the program	Beneficiaries are reluctant to adopt ecotourism practices and technologies. Unsynchronized timing between GCF's disbursement and Ministry of Energy tender process.			
	Implications on the Galapagos Tourism industry	Increased dependency on the continent to supply tourism with goods and services (energy, water, food) (C1/C2 /C3/C4) Degradation of ecotourism attractions affecting its positioning as nature-based tourism destination (C1/C3/C4) Shift from nature-based towards unsustainable tourism (C1/C4) Decreased competitivity for the tourism sector (C1/C2/C3/C4) Increase in operation costs (C1/C2/C3/C4)			

	Climate Change Impacts in the Galapagos system	Fragile ecosystem degradation due to habitat loss, invasive species propagation, native species extinction and alteration of ecosystem dynamics. Alteration of the water cycle and uncertainty of water availability for local food production and human consumption and tourism needs. Decreased production yields and food supply for local population and visitors. Reduction of fishing landings of locally consumed seafood in the artisanal fishing sector. Threats to the sustainability of major nature-based tourism attractions and features.		
	Stressors caused by Business as Usual Behaviors	Unsustainable production and consumption patterns from the tourism system (energy, food). Dependency on continental Ecuador to supply goods and services for the tourism system. Land use change patterns developed to accommodate tourism demands.		
	Climate Change Stressors	Increased precipitation variability. Increased average annual maximum and minimum air temperatures. Warmer sea-surface temperature and acidification Alteration of cloud-based deposition patterns.		
	Risks the program can cause during implementation	Hight risk of environmental impacts to Protected Areas during implementation of the Program. Low risk that both women and men may not have equal opportunities to participate in the Program if there is no identification of the gender role differences at the Archipelago.	***Assumptions***	Commitment and endorsement of Ecuador's highest authority are expected (Ministry of Environment, Ministry of Energy, Ministry of Agriculture, Ministry of Tourism, Government Council of Special Regime of Galapagos). The interest of all institutions participating in the design of the Concept Note is maintained in the next stages of Program design and implementation. The Program is executed by different entities, which need to articulate with CGREG, MAE, MAG, MinTur and MEER. Diverse sectors --agriculture, hotels, transport, restaurants, energy generators, and artisanal fishery-- are willing to participate and adopt adaptation measures.

Appendix 3
Logical Framework

General Objective:

Specific Objectives:
- Reduce greenhouse gas emissions by diversifying and optimizing the islands' energy matrix.
- Implement an integrated model of resilient agriculture and livestock production in the islands.
- Implement ecosystem-based climate change adaptation measures in High-Ecological Value areas of Galapagos.
- Development of human and institutional capacities, information management and monitoring systems for decision-making.

Climate compatible Galapagos				
Components	**Outcome**	**Outputs**	**GCF Budget**	**Output indicators**
Component 1:			**$ 31,300,000**	
Renewable Energy and Efficient Consumption development by the Galapagos Ecotourism System	1. Renewable energy generation installed in the Galapagos archipelago.	1.1 Implementing renewable energy generation systems in the four inhabited islands in line with the Generation Expansion Plan of the Galapagos Isolated System 2025 (PEGSAG).	$ 31,000,000	By the fifth year, a reduction of 34,800 $TonCO_2eq$/year, or 696,140 $ToCO_2eq$ in a 20-year period, are expected due to diversification of electricity generation.
		1.2. Developing technical and financial tools to promote distributed generation by the ecotourism system.	$150,000	At least 20% of the commercial hotel sector installs photovoltaic self-generation system; reducing 3,800 $TonCO_2$ / year.
	2. Efficient energy consumption measures implemented by the ecotourism value chain.	2.2. Implementing energy efficiency measures across the ecotourism value chain.	$ 150,000	In a 20-year period, a reduction of 160,888 $TonCO_2eq$ due to the increase in the efficiency in the ecotourism value chain.
Component 2:			**$ 8,400,000**	
	3. Climate resilient food production and improved rural livelihoods in Galapagos.	3.1. Implementing climate resilient practices in agricultural landscapes	$ 4,000,000	5000 ha of agricultural landscapes (60% of agricultural land use in

Climate compatible Galapagos				
Components	**Outcome**	**Outputs**	**GCF Budget**	**Output indicators**
		(crops and livestock) to increase productivity and adaptation and mitigation capacity.		Galapagos[29]), with increased resilience to climate change
				2181 direct beneficiaries (50% of people involved in agricultural activities, 49% women) with improved access to technologies and services to implement adaptation and mitigation measures at their farms.
		3.2. Improving fishing practices to enhance adaptation capacity in artisanal fisheries.	$ 500.000	1000 direct beneficiaries (100% of fishers and their family members, 30% women) with improved access to value chain services.
Building resilience in the Galapagos food system		3.3. Enabling environment to scale-up climate resilient food supply chains and food environments for local population and visitors	$ 900,000	At least 5 policies and instruments (insurance, local fairs) are strengthened for climate–responsive agriculture and fisheries.
	4. Water resources management for climate resilient food production and ecosystem services.	4.1. Increasing resilience of ecosystem services at agricultural landscapes scale.	$ 1,500,000	2000 ha of land with improved forest management and restoration measures to maintain ecosystem services[30] 17.262 Tn CO2eq/year or 345.239 T CO2eq in a 20-year period tons of carbon dioxide to be sequestered due to carbon capture in soil and biomass[31]
		4.2 Improving water collection and management practices for climate resilient food production.	$ 1,500,000	100 ha. of agricultural land with improved water management

[29] To be implemented in agricultural land such as grass/pasture areas, permanent and transitory crops, silvopastures.
[30] Covering 1.500 ha of evergreen forest and shrublands with improved management and 500 ha of pastures with restoration/afforestation activities.
[31] Carbon benefits are Measured with the Ex-Ante Carbon-balance Tool (EX-ACT) http://www.fao.org/tc/exact/ex-act-home/en/, projected to 20 years

Climate compatible Galapagos				
Components	**Outcome**	**Outputs**	**GCF Budget**	**Output indicators**
Component 3:			**$ 10,000,000**	
Building ecosystem resilience to climate change	5. Galapagos increases its resilience capacity by adopting ecosystem-based adaptation measures in High-Ecological Value areas, critical for sustaining nature-based tourism.	5.1. Implementing ecosystem-based adaptation measures in sea and land High Ecological Value landscapes.	$ 7,100,000	By the end of the fifth year at least 10 marine and terrestrial High-Ecological Value Areas, equivalent to 2000 km2, have increased their resilience to climate change.
				By the end of the fifth year, at least two prioritized invasive species* (those that proliferate in climate change scenarios) are under control in High Ecological Value areas.
				By the end of the fifth year, 60% of artisanal fisheries boats adopt ecosystem-based adaptation management practices and comply with fishing regulation criteria.
				By the end of the fifth year, at least 50% of tourism activities inside the HEVAs have adopted ecosystem-based adaptation measures.
		5.2 Increasing water provision in inhabited islands by promoting restoration practices in key mountain forest ecosystems.	$900,000	By the end of the fifth year, at least three critical locations (equivalent to at least 4 km2) in inhabited islands, within mountain forest landscapes, are under successful restoration schemes.
		5.3. Strengthening at least two long-term applied research and monitoring programs to understand climate change impacts on ecosystems and assess the effects of adaptation measures.	$ 2,000,000	By the end of the fifth year, at least two land and marine research and monitoring programs are carried out, providing evidence of effects of climate change impacts and adaptation measures on High-Ecological Value areas.
Component 4:			**$ 10,600,000**	

Climate compatible Galapagos				
Components	**Outcome**	**Outputs**	**GCF Budget**	**Output indicators**
Sustainability mechanisms for climate resilience and low emissions ecotourism development	6. The response capacity of key institutions, the tourism industry and local population of Galapagos, is strengthened to ensure the sustainability of climate change mitigation and adaptation measures.	6.1. Implementing an Ecotourism Certification Scheme to adopt best practices and international standards for sustainable consumption and production patterns across the tourism value chain.	1,500,000	
		6.2. Developing the tools and mechanisms to ensure the long-term financial sustainability of key Program interventions.	$ 600,000	By the end of the second year, the DPNG has a financial sustainability strategy in place, which includes an economic assessment of climate change impact on ecosystems.
				By the end of the second year, with the support of local authorities, the project promotes the creation of credit lines, incentives, agricultural insurance, or other financial solutions that allow the beneficiaries to finance eco-efficient farming activities and climate change adaptive measures.
				By the end of the third year at least three financial mechanisms will be fully implemented.
		6.3. Establishing a decentralized information system, aimed at reducing the uncertainty related to climate change impacts and forecast scenarios, including an early warning system.	$ 3,000,000	By the end of the first year, an institutional climate change information and monitoring network, which integrates key stakeholders, is in place.
				By the end of the second year, key technological, infrastructure and human capacities are in place, to generate and analyze information to assess climate change impacts and guide adaptation measures.
				By the end of the third year, a decentralized information system that

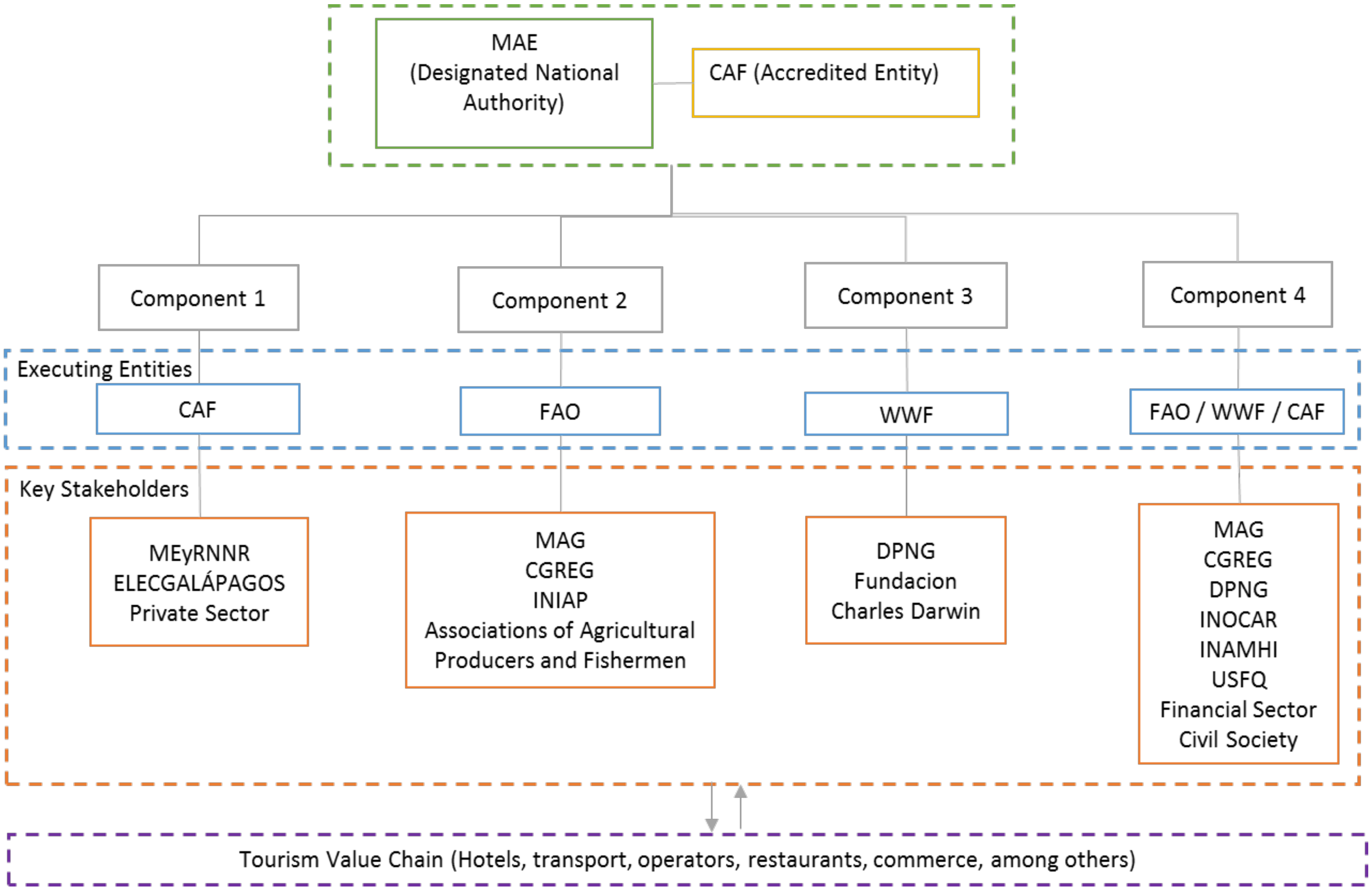
Climate compatible Galapagos				
Components	**Outcome**	**Outputs**	**GCF Budget**	**Output indicators**
				delivers climate and land use change information, sensitive indicators and scenarios, is in place.
		6.4 Mainstreaming climate change into regulatory frameworks and planning instruments, to foster long-term adoption of climate change mitigation and adaptation measures, with emphasis on energy, agriculture, water consumption patterns and ecosystems.	$ 3,500,000	By the second year, the targeted key local institutions have the human, technological and infrastructure capacity to address the needs inherent to climate change and management of climate risks. By the end of the third year the following policy and planning tools have been developed or updated with climate change considerations and measures: (i) Agro-tourism plan for farms; (ii) Implementation plan for climate resilient practices for farms; (iii) Galapagos Protected Areas Management Plan (Marine Reserve and National Park) considering climate change and land use change scenarios; (iii) At least two fisheries management plans with climate change considerations and articulated to the Galapagos Protected Areas Management Plan and the Galapagos Special Regime Lan Use Plan; (iii) The Galapagos Special Regime Land Use Plan articulated to the Protected Areas Management Plan By the end of the third year, at least 10 relevant institutions will have strengthened their human and infrastructure capacities for evidence-based decision-making to adapt and mitigate climate change.

Climate compatible Galapagos				
Components	**Outcome**	**Outputs**	**GCF Budget**	**Output indicators**
		6.5. Promoting long-term social commitment through communication, education and participation strategies.	2,000,000	By the end of the fifth year, key segments of Galapagos population are aware and understand climate change impacts; and are willing to adopt climate change adaptation and mitigation practices.

Appendix 4
List of Acronyms

APP	Application
BFB	Basic Food Basket
CAF	Development Bank of Latin America (by its Spanish acronym)
CGREG	Consejo de Gobierno de Régimen Especia de Galápagos - Governing Council of Galapagos Special Regime (by its Spanish acronym)
DPNG	Dirección del Parque Nacional Galápagos -Galapagos National Park Directorate (by its Spanish acronym)
ENCC	National Climate Change Strategy (by its Spanish acronym)
ENSO	El Niño-Southern Oscillation
FAO	Food and Agriculture Organization of the United Nations
FCD	Charles Darwin Foundation (by its Spanish acronym)
FEIG	Fondo de Especies Invasoras de Galápagos - Fund for the Control of Invasive Species of Galapagos (by its Spanish acronym)
GADM	Gobierno Autónomo Descentralizado Municipal - Municipal Decentralized Autonomous Governments (by its Spanish acronym)
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GMR	Galapagos Marine Reserve
GoE	Government of Ecuador
HEVA	High-Ecological Value Areas
INIAP	Instituto Nacional de Investigaciones Agropecuarias - National Agricultural Research Institute (by its Spanish acronym)
INOCAR	Instituto Oceanográfico de la Armada - Oceanographic Institute of the Navy (by its Spanish acronym)
IPCC	Inter-governmental Panel on Climate Change
ITCZ	Intertropical Convergence Zone
MAE	Ministerio del Ambiente de Ecuador - Ministry of Environment of Ecuador (by its Spanish acronym)
MAG	Ministerio de Agricultura y Ganadería - Ministry of Agriculture and Livestock Production (by its Spanish acronym)
MEBA	Microfinance for Ecosystem-based Adaptation
MEyRNNR	Ministerio de Energía y Recursos Naturales no Renovables - Ministry of Energy and Non-Renewable Natural Resources (by its Spanish acronym)
PEGSAG	Generation Expansion Plan in Galapagos Isolated System (by its Spanish acronym)
PGE	Presupuesto General del Estado - State General Budget (by its Spanish acronym)
PMEE	Electricity Masterplan of Ecuador (by its Spanish acronym)
PMU	Programme Management Unit
PNG	Parque Nacional Galápagos - Galapagos National Park (by its Spanish acronym)
PPP	Power Purchase Partnerships
SPV	Special Purpose Vehicle
SST	Sea Surface Temperature
UNFCC	United Nations Framework Convention on Climate Change
UNTWO	World Tourism Organization
UPA	Unidades de Producción Agropecuaria - Farming Units (by its Spanish acronym)
USAID	US Agency for International Development
USD	US Dollar
WWF	World Wildlife Fund

Appendix 5
Stakeholder Mapping



Appendix 6
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