



PRE-CONCEPT FOR A REGIONAL PROJECT/PROGRAMME

PART I: PROJECT/PROGRAMME INFORMATION

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|------------------------------------|---|
| Title of Project/Programme: | ENhancing Adaptive Capacity of Andean Communities through Climate Services (ENACACS) |
| Countries: | Chile, Colombia, Peru |
| Thematic Focal Area ¹ : | Disaster risk reduction and early warning systems |
| Type of Implementing Entity: | MIE |
| Implementing Entity: | World Meteorological Organization (WMO) |
| Executing Entities: | National Meteorological and Hydrological Services of Colombia (IDEAM), Chile (DMC) and Peru (SENAMHI), and the WMO regional Climate Centre for Western South America (CIIFEN) |
| Amount of Financing Requested: | 7,398,000 (in U.S. Dollars Equivalent) |

Project / Programme Background and Context:

The Andean region has considerable water resources but unevenly distributed over time and location due to strong seasonal to interannual precipitation variability and local weather. Countries in the region are under the influence of the ENSO phenomenon and the InterTropical Convergence Zone (ITCZ), which is strongly modulated by the sea surface temperatures in the tropical Pacific. The status of El Niño or La Niña exerts strong control over the spatial-temporal distribution of precipitation, cloud cover, availability of solar and wind resources, as well as food production and agricultural waste (biomass), with significant socio-economic consequences. The Colombian electric system, for example, depends heavily on the availability of water. The 2015-2016 El Niño reduced the Colombian hydroelectric resource to 43% of its historic values for the period of September 2015 to March 2016. The deficit led to higher operational costs and larger CO₂ emissions than in typical years. In Peru, seventy-two percent (72%) of national emergencies are related to drought, heavy rain, floods, frost, and hail. According to the National Convention of Peruvian Agriculture (Conveagro) the floods in April 2017 caused losses of near US\$ 645 million in the agriculture and livestock sectors. These natural disasters are becoming more frequent in the context of climate change. Central regions in Chile are regularly affected by severe drought -on occasions the water shortage has exceeded 50%- but, since 2010, this area has experienced an uninterrupted sequence of dry years (30 to 70% rainfall deficit) that have coincided with the warmest decade on record. The precipitation deficit diminished the Andean snowpack and resulted in amplified declines (up to 90%) of river flow, reservoir volumes and groundwater levels. Climate change is accelerating the progressive retreat of the tropical glaciers in the Andes that host more than 95% of the world's tropical glaciers and that provide water for drinking, small farms, hydroelectric power generation and transnational mining operations. In the past 30 years the glaciers have lost more than 30% of their ice and snow which will lead to severe water shortages in the future.

Colombia, Peru and Chile have requested support to implement the Global Framework for Climate Services (GFCS) and develop climate services for reducing the vulnerability of key societal and economic sectors and building resilience to climate change. This project proposal responds to these requests and provides support by WMO and regional partners to these countries. The present project will assess the impacts of climate variability and change on water, which in turn will provide information for subsequent assessments of climate impacts in other sectors and systems, in particular, food security and food production, hydropower generation and competitive uses of water (e.g. by cities, towns and for irrigation), and ecosystem and biodiversity preservation. Regional similarities and shared climate impacts and vulnerabilities make regional cooperation essential for addressing the dynamics of climate variability and change at both national and local scales. The proposed actions to strengthen climate information for national adaptation involve a coordinated regional climate information-producing and -sharing architecture able to deliver operational climate monitoring and prediction products in support of local communities decision making to mitigate the climate influence over the interconnections related to water use and availability. The proposed approach addresses risk reduction through the provision of tailored climate products that will support improved water, food and energy resources management as part of overall ongoing climate adaptation, mitigation and sustainable development efforts.

¹ Thematic areas are: Food security; Disaster risk reduction and early warning systems; Transboundary water management; Innovation in adaptation finance.

Project / Programme Objectives:

The overall objective of the project is to reduce vulnerability and strengthen resilience of Andean communities in Peru, Colombia and Chile to climate variability and change by increasing the ability of the countries to better manage water for more efficient cropping, irrigation and power generation, including improved adaptation to weather and climate extremes. The identified action areas are:

- Colombia: Upper Magdalena River Basin (Departments of Tolima, Huila and Cundinamarca)
- Peru: catchments affected by El Niño events including the Tumbes and Piura rivers in the north, and Rimac and Huallaga rivers,
- Chile: central region of the country (Valparaiso to Maule regions) where important catchments like Aconcagua, Tinquirica and Maule are located.

The sub-objectives of the project, which are in line with the project components below and the Adaptation Fund outcomes, are:

- Increased resilience of the Andean communities through better climate risk management and improved access to and use of weather and climate information. Enhanced adaptation strategies and planning to ensure food and energy security during periods of water scarcity as result of climate variability and change
- Strengthened technical capacity of the National Meteorological and Hydrological Services (NMHSs) of Colombia, Peru and Chile to generate and disseminate tailored hydroclimate information and services to anticipate and respond to weather and climate hazards
- Sustained provision and use of regional climate information, and end-to-end climate services through a demand-driven approach and stakeholder capacity development
- Improved participation and communication of local communities and diverse stakeholder populations.

Project / Programme Components and Financing:

| Project/Programme Components | Expected Outputs | Expected Activities | Amount (US\$) |
|--|--|--|---------------|
| 1. Identification of stakeholders, climate information requirements, and communication channels for service delivery | <ul style="list-style-type: none"> - Detailed map of water, energy and disaster risk demand climate impacts, and stakeholder's needs - Sustained delivery of weather and climate-related advisories to support decision making and early warnings for water authorities, agriculture and energy producers - Established or strengthened multi-stakeholder platforms to support co-design and co-production of tailored climate services | <ul style="list-style-type: none"> - Assessments of climate impacts, climate information needs and water demand for sectors and communities (national) - Improving capacity for production of and access to high precision, timely, relevant climate advisory services as required by users (national) - Establishment of National Frameworks for Climate Services and hold regular National Climate Forums (national) | 1.200.000 |
| 2. Improved regional-national operational climate monitoring and forecast system for improved adaptation and decision-making | <ul style="list-style-type: none"> - Updated national data management systems and archives, and integrated regional hydrological and meteorological database. - Improved climate predictions and projections by establishing an optimized cascading system involving the regionalization of the global forecast products. | <ul style="list-style-type: none"> - Data rescue, homogenization of dataset in digital form (national) - Gridded regional datasets and data exchange (regional) - Generation of regional Long-Range Forecast (LRF) from Global LRF products and verification (regional) - Information and validation of climate change projections (regional) - Consensus statements through the Regional Climate Outlook Forum (RCOF) (regional) | 1.750.000 |
| 3. End-to-end service through customization of climate information, communication and user feedback system | <ul style="list-style-type: none"> - Suit of climate information products co-designed and co-developed - Enhanced access and use of climate advisory and information products tailored according country/community needs - Partnerships with telecommunication companies for SMS-based two-way communication | <ul style="list-style-type: none"> - Co-design and co-development of climate advisory products (national) - Training activities for NMHSs, sectoral ministries, schools, rural communities, women and youth (regional and national) - Establishing mechanisms for broad dissemination involving private ITC institutions, local radios and television (national) - Collection of best practices and lesson-learned sharing (national and regional) | 1.450.000 |
| 4. Capacity building (development and improvement) | <ul style="list-style-type: none"> - Regional Climate Services Toolkit (CST) - National Climate Information System Helpdesk (CISH) - Improved capacity of NMHSs to generating high quality and high relevant climate products - Improved capacity of RCC to access and regionally optimized climate data and forecasts from the WMO Global Producing Centers - Improved capacity of cities and | <ul style="list-style-type: none"> - Develop the regional CST (regional) - Establish the National (CISH) (national) - Training workshops for climate services information systems (regional and national) - Training workshops on the use of climate products to the main agricultural and energy associations including training of trainers for smallholder farmers and micro-hydropower operators (national) - Mobilization of resources to sustain capacity building efforts (regional and national) - Regional and National Climate Forums (regional) | 1.200.000 |

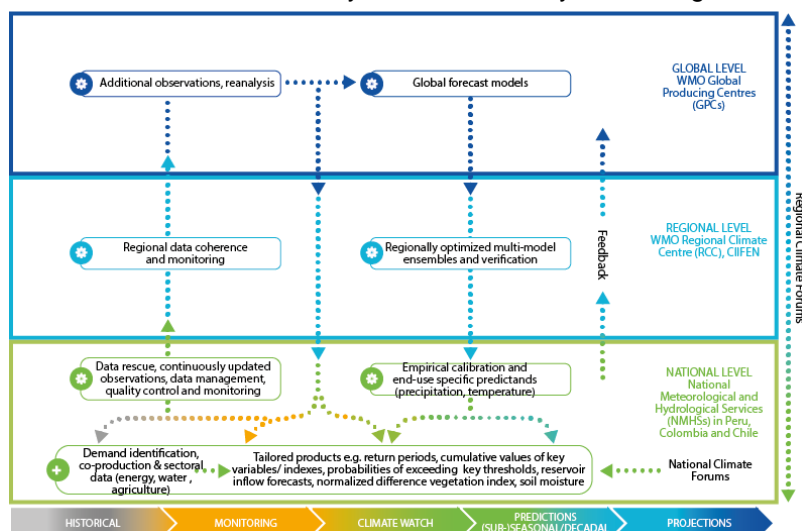
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| | communities to mainstream climate information in risk management | and national) | |
| 5. Quality Assurance and documentation of socio-economic benefits | - Documentation of methodology, description of products and best practices - Specific indicators for feedback analysis and improvement of service delivery - Adaptation Plans based on socio-economic benefits measured by impacts on the use of climate and weather information | - Development of guidelines on the production and use climate services (regional and national) - Collection and evaluation of project impacts on the use of weather and climate information for disaster risk management, agriculture, energy and water management through regular surveys (national) - Socio-economic benefits assessment based on impacts of the use of climate and weather information by sectors (national) | 600.000 |
| 6. Project Management (9.5%) | | | 650.000 |
| 7. Total Project/Programme Cost | | | 6.850.000 |
| 8. Project Cycle Management Fee (Implementing Entity-WMO) 8% | | | 548.000 |
| Amount of Financing Requested | | | 7.398.000 |

Project Duration: Three years and six months (2019 to mid-2022)

PART II: PROJECT / PROGRAMME JUSTIFICATION

Project Components: the regional scale of the project

Colombia, Chile and Peru, and other Andean countries, share regional climate characteristics. As described in the Project Background and Context and according to latest IPCC assessment report, changes in stream flow and water availability have been observed due to the retreat of the Andean glaciers. A regional approach allows for common needs and measures to be identified, supported by an operational system for climate services involving regional and global climate centers as well as National Meteorological and Hydrological Services (NMHSs). The forecast system worldwide is based on operational global and regional numerical weather prediction models fed by data and observations exchanged internationally by NMHSs and regional and global centers. Outputs from these models are analyzed and further downscaled to national scales by NMHSs, and tailored for supporting specific decisions in climate sensitive sectors (see figure). Examples include information on variability of inflow for reservoir operations, soil moisture for selection of crops and water availability for irrigation. Countries in Western South America are supported in this regard by a WMO Regional Climate Center (RCC), the International Research Center on El Niño (CIIFEN), based in Ecuador. CIIFEN, has the goal to strengthen NMHSs capacities to provide better climate services to users in various sectors of the region, especially in food security, water resources, energy, and climate risks. Its mandate is based on GFCS. The activities of CIIFEN and RCC-WSA are regional and scalable at national level through the NMHSs. Some regional activities are aimed to strengthening mechanisms for the operational exchange of meteorological data, the consolidation of regional databases, and analysis of vulnerability to climate change in transboundary basins that optimize resources and creates synergies of national efforts. The RCC plays a pivotal role in supporting NMHSs to better meet the needs of their countries and to achieve the relevant operational connections required to for an optimal climate information system, including the deployment of a Climate Services Toolkit (CST), which facilitates access by NMHSs to relevant climate data and products from CIIFEN and WMO global centers and to tools with which NMHSs can create value-added data and products. The CST deployment will be accompanied by hands-on support from CIIFEN and third-party NMHSs with advanced climate services capabilities. The resulting strengthened operational system will support climate services delivery in selected local communities affected by climate variability and change. The resulting service provision value chain will set



an example for the larger region that could be later scaled up to cover the other countries in the region supported by CIIFEN: Bolivia, Ecuador, and Venezuela. The regional climate outlook forum is a regional integration mechanism involving six NMHSs of western South America on a monthly and uninterrupted basis since 2003 to provide regionally integrated climate forecasts. This integration mechanism will be used to strengthen south-south cooperation where countries contribute with experts to enhance the capacities of their peers in other NMHSs. The RCC-WSA members are the directors of the NMHSs who signed the following regional strategic actions:

1. Strengthening capacities for climate data management.
2. Capacity building for seasonal prediction.
3. Strengthening of climate services to priority sectors.
4. Positioning and visibility of NMHSs as permanent and official entities in the respective countries
5. Resource mobilization and technical cooperation for the operation of the RCC

This project aligns with this regional strategy

Promotion of new and innovative solutions

Expected innovative deliverables through this project include (further information will be included at the concept note stage):

- Improved use and access to weather and water data, remote sensing and model outputs, for use by both intensive and extensive agriculture sectors, from those highly organized to small-scale agro-associations.
- A wide portfolio of services to the energy sector, namely databases, forecasts and scenarios for medium and long term climatic variables, assessment, compliance with international standards of the hydro-meteorological networks, instrumentation calibration, training, research;
- Optimization of decision-making on water use based on resource monitoring, expected climate scenarios and impact-oriented forecasts. This will be particularly important to solve potential conflicts in water use between agriculture, energy and environment using multipurpose infrastructures, taking into account flood protection.

NMHSs are increasingly coordinating with other national and local authorities, private institutions and NGOs to deliver weather/climate advisories and warnings for extreme events. Climate information co-production will constitute core activities among them. CIIFEN, as the Regional Climate Center for the Western South America (RCC-WSAS), will lead the implementation of the regional aspects of the project and provide support to the NMHSs. CIIFEN will share products, methods, technologies and knowledge as necessary to put the regional component of the operational system in place, and support the countries to develop the necessary capacities for their continued operation and delivery of associated services.

Cost Effectiveness

The project will build on the existing global and national climate services information system coordinated by the WMO and national authorities involved in the project. That system will produce and deliver authoritative climate information products through existing operational mechanisms, technical standards, communication and authentication. Duplication of effort and maximum efficiency of intervention will be avoided by strengthening CIIFEN. The impact and cost-effectiveness will be reflected in enhanced on-going collection, updating and processing of data at the regional level, in delivering of reanalysis and forecast model outputs to countries, in providing technical assistance in model downscaling outputs and developing tailored products for country-level decision support systems.

Consistency with national or subnational strategies

The Project will be consistent with national sustainable development strategies, among them:

- Colombia: National Development Plan 2010-2014 (Prosperidad para todos), National Climate Change Adaptation Plan, Green Growth envelope strategy and Law 1715 of 2014, which encourages the diversification of energy supply with other non-conventional renewable sources (wind, biomass, among others), and Nationally Determined Contribution (NDC) to the Paris Agreement
- Peru: National Strategy to Fight Desertification, National Plan on Disaster management (PLANAGERD), National Strategy on Water Resources, National Adaptation Plan for Agricultural Sector 2012-2021, and NDC (developed by a Multisectoral Working Group formed by thirteen Ministries and the National Center of Strategic Planning)
- Chile: Climate Change National Action Plan 2017-2022, Climate Change Adaptation Plan Agriculture Sectoral Plan, Energy Agenda, and NDC

Learning and Knowledge management

A learning and knowledge management component to capture and disseminate lessons learned will be provided by CIIFEN and the Regional Climate Outlook Forums which is a platform for regular interactions between climate specialists and user agencies in a regional/national context. The climate services information system will comprise a set of tools, including an online web interface and sharing platform to facilitate access and networking. Lessons learnt from knowledge management in other projects in the region like CLIMANDES (<https://public.wmo.int/en/projects/climandes>) phase I and II, and PRASDES (<http://www.prasdes-ciifen.org/>), will facilitate the dissemination of best practices.

Consultative Process

This proposal was developed by national institutions, CIIFEN and WMO following a series of national consultations in Colombia, Chile and Peru. CIIFEN has wide experience to engage different audiences which include authorities, local stakeholders, and small communities. The following regional activities emerged after consultations: Regional Climate Information to strengthen risk management in the agriculture sector (2007-

2009). https://www.researchgate.net/publication/255754566_Technical_Guide_IADB_Final ; Regional information to support public policies on climate change and biodiversity in the Andean countries (2011-2013). <http://geportal.ciifen.org/es/> ; Regional Andean Programme to enhance weather, climate water services and development-PRASDES (2013-2016). <http://prasdes-ciifen.org/>
Colombia, Peru and Chile have conducted national consultations on Climate Services requirements with target stakeholders as documented here below:

Colombia: The Climate Services for Resilient Development (CSR) Partnership already conducted a stakeholders meeting in Bogota in 2015, the output white paper on “Options for Climate Services Investments in Colombia “ was published in early 2016.

The official launch of the National Framework of Climate Services held in 1-3 November 2017 provided the basis for the development of a National Plan for implementing Climate Services. Prior to that event, meetings with sectors representatives of agriculture, energy, disaster risk reduction and water took place in September-October 2017 (see report: http://www.wmo.int/pages/prog/wcp/meetings/presentations/Bogota3010-0311-2017/Report_SeasonalForecast_Bogota_2017_final.pdf)

Peru: Regional Forums on Climate Perspectives in Peru (2014-2016):

<http://www.senamhi.gob.pe/?p=prensa&n=492> <http://www.senamhi.gob.pe/?p=prensa&n=16>

<http://www.senamhi.gob.pe/?p=prensa&n=59> <http://www.senamhi.gob.pe/?p=prensa&n=194>

Workshops to identify needs and demands for climate services (2016):

<http://www.senamhi.gob.pe/climandes/index.php/noticias/detalle/senamhi-desarrolla-taller-de-necesidades-y-demandas-de-servicios-climaticos-para-autoridades>

<http://www.senamhi.gob.pe/climandes/index.php/noticias/detalle/conociendo-las-necesidades-de-los-agricultores-en-cusco>

Workshop: Mapping of actors of the agricultural sector for climate services (2017)

<http://www.senamhi.gob.pe/climandes/index.php/noticias/detalle/cusco-senamhi-present-mapeo-de-actores-del-sector-agropecuario-para-los-servicios-climaticos>

Dialogue roundtables on potential socio-economic benefits of climate services (2017):

<http://www.senamhi.gob.pe/climandes/index.php/noticias/detalle/senamhi-instala-mesa-de-dilogo-sobre-beneficios-socioeconomicos-potenciales-de-los-servicios-climaticos>

Chile: Several workshops were organized by DMC during July 2017 with the aim to meet users and learn about their climate information demand. The participant entities were: Dirección Meteorológica de Chile (DMC), Subdepartamento de Información, Monitoreo y Prevención (IMP), Ministerio de Agricultura (MINAGRI), Dirección General de Aguas (DGA), Ministerio de Energía (MEN), de la Unidad de Gestión de Riesgos y Emergencias Energéticas and Ministerio de Medio Ambiente (MMA). The reports of the meetings can be found at <http://164.77.222.61/climatologia/>

Sustainability of the project

The participating NMHSs are standing entities within their national governments. The project sustainability will be guaranteed by DMC, IDEAM and SENAMHI in their roles of government agencies supported by public funding with officially mandated duties. In Peru, policies for adaptation to climate change in agriculture are spearheaded by the Ministry of Agriculture and Irrigation (MINAGRI) in coordination with the Ministry of Environment (MINAM) and with the support of the Regional Governments (GOREs). The National Service of Meteorology and Hydrology of Peru (SENAMHI) provides climate and environmental data. Similar arrangements are in place in Colombia and Chile.

Economic, social and environmental benefits

Investments in risk reduction and preventive adaptation measures based on authoritative climate information spanning the historical recurrence and the future new trends should result in economic benefits for local communities and the whole nation given the potential avoided costs associated with lack of preparedness. The experience of Project CLIMANDES I and II in Peru on the estimation of the socioeconomic benefits (SEB) of climate services adapted to users in pilot areas of the Andes, will be shared with the Project. The exhaustive description of social and environmental benefits will be provided in the final proposal, after due assessments and consultations are carried out with the respective authorities.

Compliance with Adaptation Fund Environmental and Societal Policy

The project will be compliant with the Environmental and Social Policy (ESP) of the Adaptation Fund and will avoid negative impacts relating to the environmental and societal principles identified by the Fund. With the information available at this stage the project is expected to fall into low risk category C. Information required to further assess this classification will be provided at the concept stage.

Overlap with other funding sources and engagement with NIEs

The project will not duplicate efforts of other initiatives or funding sources. Instead the project will synergies with on-going and planned initiatives, and will seek engagement with the NIEs in Chile (AGCI) and Peru (PROFONAPE), regional/national institutions, and MIE (like FAO) in the region. There are no regional projects that bring these countries together to address common climate related phenomenon, and apply similar approaches.

PART III: IMPLEMENTATION ARRANGEMENTS

CIIFEN will support WMO and National Institutions for the project implementation. NMHSs will play a major role in developing partnerships for the project implementation by taking the lead on national consultations and climate information co-production. CIIFEN is expected to lead the project implementation at the regional “common” level as well as to provide support to IDEAM, SENAMHI and DMC given their long experience in project implementation with regional institutions like the Inter-American Development Bank, World Bank, Latin America Development Bank, European Commission etc...

The identified country level project partners are:

- Colombia: National Hydrometeorological Institute IDEAM, Ministry of Agriculture and Rural Development (MADR), Agriculture and Livestock Institute (ICA), Agriculture and Livestock Research Institute (CORPOICA), , Rural Agricultural Planning Unit (UPRA), Tropical Agriculture Research Centre (CIAT), Energy National Operation Centre (CNO), Energy Market Experts (XM), Mine and Energy Planning Unit (UPME), Irrigation Management National Unit (UNGRD) and several private agricultural associations FEDEARROZ, FENALCE
- Chile: National Meteorological Service (DMC), Water General Directorate (DGA), Ministry of Agriculture (MINAGRI), Ministry of Environment (MMA) and Information, Monitoring and Prevention Unit at Ministry of Energy (MEN),
- Peru: National Hydrometeorological Service (SENAMHI), Ministry of Environment (MINAM), National Centre for Estimation, Prevention and Risk Disaster Reduction (CENEPRED), Regional Directorate for Agriculture (DRA) of Piura Regional Government, Ministry of Agriculture and Irrigation (MINAGRI), Ministry of Energy and Mining (MINEM) with Electricity General Directorate.

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government² *Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project/programme. Add more lines as necessary. The endorsement letters should be attached as annexes to the project/programme proposal.*

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| <i>Gladys Santis. Adaptation Officer, Ministry of Environment, Government of Chile</i> | <i>Date: 27th December, 2017</i> |
| <i>Mabel Morales Saravia, General Director of Climate Change, Desertification and Water Resources, Ministry of Environment, Government of Peru</i> | <i>Date: 8th, January, 2018</i> |
| <i>Angélica Maria Mayolo Obregon Head of the Office of International Affairs Ministry of Environment and Sustainable Development, Government of Colombia</i> | <i>Date: 11th January, 2018</i> |

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

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| <p>I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (Colombia: National Development Plan 2010-2014 (Prosperidad para todos), National Climate Change Adaptation Plan, Green Growth envelope strategy and Law 1715 of 2014 encourages the diversification of energy supply with other non-conventional renewable sources (wind, biomass, among others) and Nationally Determined Contribution (NDC), Peru: National Strategy to Fight Desertification, National Plan on Disaster management (PLANAGERD), National Strategy on Water Resources, National Adaptation Plan for Agricultural Sector 2012-2021 and Nationally Determined Contribution (NDC) and Chile: Climate Change National Action Plan 2017-2022, Climate Change Adaptation Plan Agriculture Sectoral Plan, Energy Agenda and Nationally Determined Contribution (NDC)) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p> |
| <p><i>Mary Power, Director Development and Regional Activities Department World Meteorological Organization Signature</i></p> <p><i>(Already provided in the previously submitted pre-concept note)</i></p> <p>Implementing Entity Coordinator</p> |

Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

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| Date: 15 th January, 2018 | Tel. and email: +41 22 730 8003 mpower@wmo.int |
| Project Contact Person: Jean-Paul Gaudechoux and Jose Camacho | |
| Tel. And Email: +41 79 514 4261; +41 730 22 8357, jpgaudechoux@wmo.int ; jcamacho@wmo.int | |