

**PROJECT INFORMATION DOCUMENT (PID)**  
**APPRAISAL STAGE**

Report No.: PIDA782

<b>Project Name</b>	Climate Info System & PPCR Coordination (P132116)
<b>Region</b>	MIDDLE EAST AND NORTH AFRICA
<b>Country</b>	Yemen, Republic of
<b>Sector(s)</b>	General information and communications sector (50%), Public administration- Water, sanitation and flood protection (50%)
<b>Lending Instrument</b>	Specific Investment Loan
<b>Project ID</b>	P132116
<b>Borrower(s)</b>	Ministry of Planning and Development Cooperation
<b>Implementing Agency</b>	EPA (Environment Protection Authority)
<b>Environmental Category</b>	B-Partial Assessment
<b>Date PID Prepared/Updated</b>	27-Feb-2013
<b>Estimated Date of Appraisal Completion</b>	29-Mar-2013
<b>Estimated Date of Board Approval</b>	27-Sep-2013
<b>Decision</b>	
<b>Other Decision</b>	

## I. Project Context

### Country Context

The Republic of Yemen, situated on the southern end of the Arabian Peninsula, is one of the poorest countries in the world. Yemen has a population of about 24 million – about 76 percent live in rural areas where poverty incidence is particularly high. The country ranks 154th out of 187 in the 2011 Human Development Index. The country has a GNI per capita of US\$1,070 (2010) compared with an average of US\$2,321 for lower middle-income countries. Yemen is among the ten countries in the world with the highest rates of food insecurity. It ranks third for the highest level of malnutrition in the world and is facing rapid population growth of over 3.5 percent a year. The country lacks clear alternatives to the oil economy with limited institutional capacity and outreach of the State, very limited and rapidly depleting water reserves, poor infrastructure, limited human development, and acute gender inequality issues.

The impact of the recent security, political and economic crisis is significant in all key development domains. Yemen experienced intense and far-reaching country unrest from February 2011 until November 2011. The long lasting conflict and turmoil, and severe shortages of food and fuel, combined with high commodity prices have left many poor unprotected. During this period of crisis,

the economy contracted by 10.5 percent and the number of those living below poverty line is estimated to have increased from 8 to 50 percent of the Yemeni population.

Yemen is particularly reliant on its natural resources outside the extractive industries. Agriculture plays a leading role in Yemen's economy and employs more than half of the labor force. It also accounts for more than 90 percent of all water use. Unlike most of the world, economic dependence on agriculture is growing because of reduced growth in the industrial, manufacturing and service sectors since 2000. Half of agricultural land is rainfed while 40 percent relies on rapidly depleting groundwater resources.

In addition to significant development challenges, Yemen is particularly vulnerable to climate change. Rainfall is erratic and variable, a situation made worse by high evapotranspiration rates. Flash floods and droughts are frequent hazards displacing thousands, causing loss of life and significant damage to assets and livelihoods. The floods of 2008, for example, killed 180 people, displaced 10,000 and caused damage and losses to infrastructure, shelter, and livelihoods at US\$1,638 million equivalent to 6 percent of Yemen's GDP with agriculture accounting for nearly 64% of the total losses. In 2010 heavy rains hit the Capital Sana'a causing 9 deaths, the collapse of many houses in the old city of Sana'a, a UNESCO World Heritage Site, and the disruption of electricity service for several days. A lack of long-term, systematic records of rainfall and temperature severely hampers efforts to quantify long-term changes in climate, assess renewable natural resources such as water, prepare climate projections, and develop adequate policies and programs. In addition, institutional weaknesses undermine the state's ability to adjust to demographic pressures, a problem made more difficult by the poor economic outlook.

## **II. Sectoral and institutional Context**

Yemen is located in arid and semi-arid climate zones. The diverse physical and topographical features of Yemen – mountain chains, plateaus, plains and wadis – lead to variations in climatic conditions resulting in distinct agro-climatic zones. There are two main weather patterns – the northerly flow from the Mediterranean in winter and the southwestern monsoon in summer. The monsoon rainfall is highly variable. Lengthy droughts are common to all regions.

A comprehensive network of rainfall and temperature observations is needed to assess accurately climate impacts on agriculture and water resources. Long-term, systematic records of rainfall and temperature are scarce. The lack of data hampers efforts to quantify long-term changes in climate and to assess renewable natural resources such as water. Nonetheless, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (FAR) projects higher rates of warming over East Africa and the Arabian Peninsula than the global average. Since the 1950s, summer precipitation has declined across the Sahel, extending into the Yemen Highlands. The seasonal distribution of rainfall is also changing.

Agriculture is most vulnerable to flood risk and has incurred the highest level of losses in physical assets. In the 2008 floods losses in agriculture were nearly 64 percent of the total damages. Floods are the most recurrent natural disaster in Yemen causing significant economic damage and loss. Reducing and managing flood and drought risk through more reliable forecasts using better hydro-meteorological data and information to improve decision-making would help build resilience of the agriculture sector to climate change.

Improving weather, climate and water information services and associated actions in Yemen is essential for stable social and economic development. The need to establish and maintain a data base

for climate change is one of the key actions in Yemen's National Adaptation Program of Action (NAPA). Amongst the actions proposed is systematic measurement of water availability, including groundwater occurrence and depth. Upgraded weather, climate and water information will pave the way for early warning systems, disaster reduction strategies to build disaster resilience and reduce vulnerabilities to natural hazards, and improved water resources management on which food and water security depend. Sustainable development of Yemen requires knowledge of climate variability and change, and reliable meteorological and hydrological forecasts and warnings. Monitoring and forecasting of meteorological and hydrological variables would address several of the key risks identified in the NAPA.

- (i) Improved monitoring and prediction of rainfall and temperature would help assess drought frequency, better manage water resources, increase agricultural productivity and minimize climate-sensitive diseases.
- (ii) More accurate and timely forecasts and warnings of extreme hydrometeorological events would reduce threats to lives, livelihoods and property.
- (iii) Climate monitoring, including marine observations, would contribute to understanding the impact of climate change on habitats, biodiversity and the coastal zone.

The support provided by Yemen's Pilot Program for Climate Resilience (PPCR) aims to respond to the NAPA while being based on the comprehensive public consultations which are at the core of the PPCR process by building climatic resilience and adaptation into the water and agricultural sectors, and coastal zones, which are considered to be the three areas most at risk. The PPCR will enable knowledge generation of human and ecological adaptation to climate change in a number of diverse areas of Yemen and provide a framework to integrate this knowledge to regional and national levels. It includes development of permanent mechanisms for stakeholder participation from the local to the national level. Effective adaptation to the consequences of climate variability and change depends on access to timely and reliable meteorological and hydrological information to inform the decision making process. This project strengthens the institutions primarily responsible for monitoring and evaluating the weather, climate and water; increases their capacity to observe and analyze this information; and enables climate-informed decision making by improving the utility and delivery of weather, climate and water information to those most affected by the climate and resulting hydrometeorological hazards.

In an effort to strengthen the institutional capacity related to climate change the Government has established the Inter-Ministerial Committee on Climate Change (IMCCC) which was approved by the Cabinet on November 10, 2009 (Cabinet Decree No. 349). The IMCCC reflects the Government's strategic institutional framework that adaptation initiatives need to be implemented as part of a broader set of actions within Yemen's existing development processes, decision cycles and institutional arrangements. The IMCCC is a Sub-Committee of the Cabinet, and is chaired by the Minister of Planning and International Cooperation and constituted by the Ministers of all line Ministries. The IMCCC has the full support of the Government of National Reconciliation. A thorough stakeholder consultation process guided by the IMCCC identified the key institutions involved in the PPCR for this project, which form the IMCCC Technical Committee. These are the Environment Protection Authority (EPA), Civil Aviation Meteorological Authority / Yemen Meteorological Service (CAMA/YMS) within the Ministry of Transport (MOT), Ministry of Agriculture and Irrigation (MAI) and the National Water Resources Authority (NWRA) within the Ministry of Water and Environment (MWE). These agencies support the project implementation. The EPA is the National Focal Point to the United Nations Framework Convention on Climate Change (UNFCCC). The EPA includes a Climate Change Unit which has taken the lead in the coordination and development of the Initial National Communication to the United Nations Framework Convention on Climate Change

(UNFCCC; 2001) and is presently finalizing the Second National Communication to the UNFCCC. The EPA also took the lead in the development of the NAPA, which was finalized with the endorsement of the document by the Cabinet in June 2009. The EPA is mandated to host the Technical Secretariat to the IMCCC.

There are a range of entities operating fragmented and largely outdated or damaged networks and, with the exception of civil aviation, the benefits to end-users are limited. CAMA/YMS is the national authority for weather and climate forecasts and warnings, providing aviation weather services, public weather services, and weather services to government and to the private sector. Currently, CAMA/YMS competently operates a network of synoptic meteorological stations that underpin its forecasting and warning services. While suitable to meet international aviation requirements, this network neither covers the entire country nor all climate-sensitive sectors. Additional meteorological and hydrological data are collected by Yemen Geological Survey & Mineral Resources Board (YGSMRB), Yemen Seismic & Volcanic Observation Center (YSVOC), National Disaster Management Unit (NDMU) at the Civil Defense Authority, and the Ministry of Public Works and Highways (MoPWH); however, the existing climatological record is based on the CAMA/YMS network of synoptic observations. The principal Government stakeholders for the provision of climate information are MAI and NWRA, as well as governorate stakeholders, such as Tehama Development Authority (TDA). Each operates its own agro-meteorological and hydro-meteorological networks, which were extensively damaged or destroyed during the recent unrest, or simply outdated and need to be refurbished to meet international standards for agro-meteorological and hydro-meteorological monitoring, and integrated into a National Framework for Climate Services (NFCS) creating a more sustainable and integrated “network of networks”. This would allow the development of new products and services for rainfall and climate prediction for agricultural production, as well as the development of forecasts for flood control measures, improved disaster risk management through the Ministry of Interior (MOI) Civil Defense Authority (CDA), and other services which would be supplied by CAMA/YMS in coordination with the participating organizations and other beneficiaries. The Disaster Risk Management Unit (DRMU) in CDA, the Remote Sensing and GIS Center, and the Environmental Emergencies Unit in the MWE, and the EPA are all critical entities that carry responsibilities for data analysis, and climate and weather related disaster outreach to communities. However there is little coordination, cooperation, or sharing of data between and amongst these agencies. For example, in 2010 the Remote Sensing and GIS Center published a comprehensive national Atlas that did not include climate. While there is a sufficiently large number of trained people in CAMA/YMS, NWRA and MAI to provide a basis for a strengthened weather, climate and water services system, their climatic work needs to be technically coordinated following quality standards and assurance on the technical level provided by CAMA/YMS.

Improving weather, climate and water services in Yemen will help build resilience to climate change and reduce vulnerabilities. The project focuses on supporting the collection, processing and delivery of weather, climate and water data and information needed to cope with climate change and resulting weather extremes. It will achieve this by strengthening the key agencies involved in the collection and processing of weather, climate and water data and information. These are CAMA/YMS, MAI and NWRA. The beneficiaries are all individuals and communities, and the organizations and government entities responsible for community support, which can use this information to reduce vulnerability to meteorological and hydrological hazards. The project is particularly sensitive to the specific information needs of women – given their role in the community and livelihood development, they are particularly vulnerable and a primary goal is to ensure that they have adequate information for the protection of life and livelihoods. In summary, three areas need addressing: (i) institutional capacity, including overcoming the factors inhibiting data sharing and coordination; (ii) improving the meteorological and hydrological observing and forecasting systems; (iii) improving

hydrometeorological services delivery to stakeholders including the Government and the public. Success would lead to the development of knowledge systems that could contribute to stable social and economic development and stem recurring economic losses and the loss of human lives from weather- and climate-related disasters.

### III. Project Development Objectives

The project development objective is to improve the quality of hydro-meteorological and climate services provided to end-users

### IV. Project Description

#### Component Name

Component A: Institutional Strengthening and Capacity Building

Component B: Modernization and Expansion of the National Hydrometeorological and Monitoring Networks

Component C: Enhancement of Service Delivery System

Component D: PPCR Program Management and Knowledge Sharing

**Component A. Institutional Strengthening and Capacity Building (PPCR Financing US\$3.40 million including contingencies):** This component aims to improve climate resilience in Yemen through provision of weather, climate and water services that meet stakeholders' needs by creating the conditions that ensure institutional, staffing and financial sustainability of the key providers (CAMA/YMS, MAI and NWRA). This includes revising and updating institutional strategies taking into account new requirements for climate services. It will support revision and adoption of legal frameworks and standard operating procedures, in line with international common practice to share data and information to improve intra-government cooperation to cope with weather, climate and water related hazards. It will build capacity through training providing access to new skills and opportunities within each of the participating organizations. The component will also support the technical design and implementation of the overall modernization program to ensure that the new components can be integrated into the current operational systems.

**Component B. Modernization and Expansion of the National Hydrometeorological and Monitoring Networks (PPCR Financing US\$7.55 million including contingencies):** This component aims to upgrade and expand the observations networks for meteorology, agro-meteorology and hydro-meteorology, ensuring that these networks are interoperable between CAMA/YMS, MAI, NWRA and the development authorities to enable the efficient and timely transmission of information that is essential for management of disaster risks, agriculture and water resources. Collection and timely communication of high-quality data is the foundation of producing reliable weather forecasts and warnings as well as monthly and longer term climate outlooks based on a national climatology. The modernization of the observing networks includes rehabilitating and extending the MAI and NWRA agrometeorological and hydrometeorological networks; extending the CAMA/YMS weather and climate surface and upper air network, and installing Doppler radar for enhanced precipitation measurement, severe weather and flood forecasting. It requires modernizing the communication and ICT system to transmit data efficiently. The component also includes the design and pilot operation of an environmental monitoring system.

**Component C. Enhancement of Service Delivery System (PPCR Financing US\$4.35 million including contingencies):** This component aims to enhance the delivery of weather and climate

services to end-users. It provides for the implementation of a systematic upgrade of the weather, climate and water-related end-to-end services provided to all agencies, communities and individuals. In particular, it will extend the forecasting, analysis and service delivery capabilities of CAMA/YMS to provide guidance to agriculture, water resources and irrigation, DRM, media, civil aviation, health and renewable energy. It will also provide demographic-specific services where differentiated information targeted to specific vulnerable groups and individuals. Information specific to rural women will be developed and highlighted because of their vulnerability in livelihood development. Given the importance of warning systems for flash floods – two pilots will focus on implementing end-to-end early warning systems developed together by CAMA/YMS, MAI, NWRA and CDA, on behalf of the wider disaster risk management community, and in consultation with other DRM efforts. This component will also help CAMA/YMS, MAI and NWRA improve the quality of their services to their various stakeholders. It provides the foundation for a National Framework for Climate Services, which would increase access to high quality climate information, facilitate sharing of knowledge and know-how, and strengthen or establish community-level partnerships between the users and providers to understand and use weather, climate and water information more effectively and ultimately reduce vulnerability to climate change. Information will be delivered in a variety of ways depending on the specific local circumstances ranging from radio and mobile telephone messages that inform users directly to bulletins delivered through community based organizations. All of which are standard procedures for existing weather and climate information.

**Component D: PPCR Program Management and Knowledge Sharing (PPCR Financing US\$3.70 million including contingencies):** This component will carry out the oversight of the PPCR implementation, including synthesizing the main results achieved by the investments under the SPCR to inform relevant decision-making. It will include monitoring and evaluation of gender sensitive approaches to project implementation. Knowledge sharing will be carried out across all of the Yemen PPCR investments to increase public awareness of climate variability and change and its impact on day-to-day activities in Yemen. It would guide the initial development of the climate database management system by establishing procedures to ensure open access to climate information by all users. Public education and outreach activities will be geared towards improving information access and awareness raising of the challenges caused by climate change. Particular attention would be given to communities which need to take preparatory action to mitigate adverse consequences of the climate and hydrometeorological hazards – improving community response to flood warnings, improving management of surface water resources, improving food security, improving health outcomes, improving climate-resilient coastal zone management, and improving rural livelihoods. This component also supports and strengthens the PPCR-PCU to carry out the fiduciary responsibilities and reporting in a timely and effective fashion as required by the legal and binding agreement entered into between the Bank and the Government of Yemen.

## V. Financing *(in USD Million)*

<b>For Loans/Credits/Others</b>	<b>Amount</b>
Borrower	0.00
Strategic Climate Fund Grant	19.00
Total	19.00

## VI. Implementation

*Project Oversight.* Oversight of the project would be entrusted to the Inter-Ministerial Committee on Climate Change (IMCCC), which is chaired by the Minister of Planning and International

Cooperation, and comprised of Ministers of all line-Ministries. The IMCCC is assisted by a Technical Secretariat, the EPA, and by a Technical Committee (TC) comprised of the Project Partners – CAMA/YMS, MAI, and NWRA. These are the institutions responsible for the collection and processing of weather, climate and water related data and information and for its distribution to the public and specific social and economic sectors. CAMA/YMS is the official weather service of Yemen and represents Yemen in the WMO; MAI is responsible for weather, climate and water information for agriculture and farmers; and NWRA is responsible for the management and coordination of Yemen's water resources. Other agencies receive data and information from, and provide data and information to, these primary, mandated entities.

*Project Coordination.* The IMCCC has delegated the responsibility for implementation, coordination and fiduciary management of the Project to the EPA. This aligns with its mandate to coordinate development of general environmental policy, environmental laws and standards, in addition to enhancing environmental awareness, dissemination of environmental information and development of national capacities.

*Project Management.* The PPCR-PCU already established in the EPA would be responsible for overall project management. In line with the assessment carried out and the needs for this project, it would be significantly strengthened by recruiting a PCU Director, a Procurement Manager, an M&E Specialist, a Procurement Assistant, an Accountant, an IT Specialist, a part-time Environmental Advisor, a part-time Social Advisor and a part-time Gender Specialist. The PCU Director would be recruited to manage this project while also overseeing Phase I. The Director would report to the EPA Chairman as the Head of the Technical Secretariat to the IMCCC and as PPCR National Focal Point. To support the Government's efforts to increase female participation in the specialist workforce, the aim would be to recruit women for a minimum of 30% of the above positions. In addition the PPCR-PCU will be supported by a minimum of 2 female specialists seconded by the participating organizations in support of a "Gender Smart Management Framework" outlined below.

*Fiduciary Responsibility of the PPCR-PCU.* The PPCR-PCU will facilitate the implementation of project activities through financial management (FM), procurement of goods and services with the technical assistance of the General Consultant/Integrator and in accordance with IDA regulations and procedures elaborated in the Project Operating Manual (POM). The PCU has acquired some experience in the implementation of Phase I project, and the current staffing will be augmented as described above. The PPCR-PCU will: (i) monitor outcome and output indicators; (ii) support CAMA/YMS, MAI and NWRA in executing the Implementation Plan; (iii) ensure compliance with the signed MOU; (iv) resolve implementation issues; (v) prepare and submit progress reports to the IMCCC and the Bank, including the baseline and values of specific implementation indicators by component; and (vi) submit the quarterly Interim Financial Reports and the annual Audit Reports to the Bank in a timely manner.

*Technical Implementation.* CAMA/YMS will be responsible for the technical implementation of Components A, B, and C, in close coordination with MAI and NWRA and with the assistance of the General Consultant/Integrator. More specifically, CAMA/YMS will be in charge of: (i) preparing the main tasks/TORs for and controlling performance of the General Consultant/Integrator; (ii) preparing, with support of the General Consultant/Integrator and in consultation with MAI and NWRA, detailed technical specifications and bidding documents for equipment procured under components A, B and C of the Project; (iii) jointly with General Consultant/Integrator, providing guidance on installation, operation and maintenance of the equipment; (iv) developing new information formats and products for analyzing weather and climate information; (v) maintaining a publically accessible climate database; and (v) strengthening partnerships with end-users to ensure the uptake of new weather,

climate and water services.

*Data accessibility.* A Memorandum of Understanding (MOU) on cooperation and data exchange between CAMA/YMS, MAI, EPA and NWRA was signed by the Ministers of MAI, MOT and MWE on January 28, 2013 (Annex 8). CAMA/YMS has demonstrated in its current operating model that cost-recovery based on civil aviation use can ensure sustainability. This can also result, however, in limiting access to data because all of the costs of providing and managing the data and information are provided by the customer for their own use. Creating a shared database and information exchange mechanism would be in the best interests of all parties, and of the country in general, since this would maximize access to climate information by everyone. Operating and Maintenance costs for such a system would need to be factored into the long-term operation of the system. As has been demonstrated elsewhere, this does not necessarily limit opportunity to add-value and generate additional revenue from the sale of bespoke services, which do not compromise public safety or limit public access to basic data and information.

*Project Operating Manual.* All eligible activities included in this project will be implemented according to the POM approved by the Government and acceptable to the Bank. The POM is expected to be finalized and approved by the Government and “no-objected” by the Bank prior to negotiations. The POM will describe decision making processes, roles and responsibilities of implementing organizations and PPCR-PCU staff, detailed administrative, procurement, financial management and disbursement aspects of the project, safeguards arrangements, reporting and evaluation procedures. The POM will also include the terms of reference for the additional PCU staff.

*Gender Smart Management Framework.* While respecting the cultural setting, the PPCR- PCU will be staffed by 2 female specialists seconded by the participating entities allowing for hands-on specialist training. TORs of the PPCR-PCU Director will be enhanced by making specific reference to ensuring that a thorough inclusion of female colleagues as well as ensuring targeted training aimed at female colleagues are carried out.

*Project Implementation Support by the World Bank.* The PPCR-PCU will fully participate in the joint project implementation support missions and will regularly communicate with the World Bank on all implementation matters. Due to security concerns, the ability of the Bank to conduct missions in the field remains restricted. Recently, the World Bank signed a contract with a Third Party Monitoring Agent (TPMA) to assist the World Bank in monitoring project implementation in Yemen especially focusing on infrastructure projects. The role of monitoring agent is expected to be expanded and the team will identify the needs of TPMA during the appraisal and request support accordingly if foreseen to be required during project implementation.

## **VII. Safeguard Policies (including public consultation)**

<b>Safeguard Policies Triggered by the Project</b>	<b>Yes</b>	<b>No</b>
Environmental Assessment OP/BP 4.01	<b>X</b>	
Natural Habitats OP/BP 4.04		<b>X</b>
Forests OP/BP 4.36		<b>X</b>
Pest Management OP 4.09		<b>X</b>
Physical Cultural Resources OP/BP 4.11		<b>X</b>
Indigenous Peoples OP/BP 4.10		<b>X</b>



Involuntary Resettlement OP/BP 4.12		<b>X</b>
Safety of Dams OP/BP 4.37		<b>X</b>
Projects on International Waterways OP/BP 7.50		<b>X</b>
Projects in Disputed Areas OP/BP 7.60		<b>X</b>

## **VIII. Contact point**

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