Project Information Document/ Identification/Concept Stage (PID)

Concept Stage | Date Prepared/Updated: 26-Mar-2021 | Report No: PIDC238814

BASIC INFORMATION

A. Basic Project Data

Project ID	Parent Project ID (if any)	Environmental and Social Risk Classification	Project Name
P175911		Substantial	Sudan Flood Resilience and Water Resources Management Project
Region	**Country**	**Date PID Prepared**	**Estimated Date of Approval**
AFRICA EAST	Sudan	26-Mar-2021	
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	Ministry of Finance and Economic Planning	Ministry of Irrigation and Water Resources	

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	3.00
Total Financing	3.00
Financing Gap	0.00

DETAILS

Non-World Bank Group Financing

Trust Funds	3.00
Cooperation in International Waters in Africa	3.00

B. Introduction and Context

Country Context

Sudan is located within the arid and semi-arid part of Sub-Saharan Africa with rich endowment of water resources from the Nile river. Sudan has a Sahelian belt with the desert in the far north, fertile land in the Nile valleys and across the rest of the country for farming and livestock herding. The country has a population of 43 million and occupies 1.89 million km2, making it Africa's third largest country after Algeria and Democratic Republic of Congo (DRC). Sudan has a federal system of governance consisting of the central government, 18 states and 78 localities (Mahalias). Its GNI per capita made continuous growth over two

decades and reached US$1,690 in 2015, but tumbled down to $590 in 2019, resulting in downward revision of World Bank's income classification from 'lower-middle income' to 'low income'.

Sudan faces formidable economic, social, and political challenges, while the COVID-19 pandemic as well as influx of refugees have exacerbated an already complex situation. Sudan has a fragile economy and social contract owing to a history of violent conflict, long-standing tension between the center and the periphery, and internationally-isolated governance. The country has been beset by internal conflicts for most of its independent history that has weakened its growth vibrancy. US designation of Sudan as a state sponsor of terrorism followed by comprehensive economic, trade and financial sanctions from 1994 to 2020 led to virtual isolation of Sudan from most of the international economy. Large public sector deficits have been monetized, driving inflation to over 269 percent as of December 2020. With the COVID-19 emergency and lockdown, the contraction of GDP in 2020 exceeded 10 percent. Also, the country's precarious situation is further complicated by the recent influx of Ethiopian and Eritrean refugees entering eastern Sudan, which is overwhelming the humanitarian response capacity on the ground.

Decades of exclusionary governance, economic mismanagement and political turmoil have placed Sudan among the lowest performing nations in terms of economic and social outcomes. Social indicators have worsened, with Sudan ranked 139 out of 157 in the Human Capital Index (HCI) and 167 out of 189 countries based on the Human Development Index (HDI) in 2018. Trade has steadily declined, and remittances are limited due to restrictions and linkages with international financial sector. Basic commodities such as bread and fuels are in chronic shortage with soaring price. Access to basic services such as electricity and water is intermittent even in major urban centers. Decades of neglect of key productive sectors such as agriculture have contributed to economic decline and social strife, resulting in an estimated 9.6 million people in acute food insecurity and over half of the population under the national poverty line. In addition, the unemployment rate still remains above 40 percent especially among youth.

The 2019 revolution led to the establishment of a transitional government, which presents a unique opportunity for the country to address the decades of political, social and economic turmoil. In the last year, the transitional government of Sudan (GoS) has moved to address internal conflicts, economic distortions and began earnest re-engagement with the international community. During this transition period, GoS is aiming to strengthen and re-establish institutions that have been eroded over the past few decades in order to adequately guide the country's economic, social and political recovery. The path for GoS during this transition is precarious with substantial challenges and high expectations from those who led the revolution. The onset of the ongoing COVID-19 pandemic has added yet another layer of complexity for GoS to address the country's fragile transition process. Despite the mammoth challenges facing GoS and modest progress during its first year in office, the transitional government still retains popular support. The removal of Sudan from the United States' List of State Sponsors of Terrorism in December 2020 ended 27 years of economic sanctions and is expected to open up avenues to integrate Sudan to the international economies and financial systems.

Sectoral and Institutional Context

Climate change has exacerbated the country's social and economic challenges with increasing occurrence of floods and droughts due to growing inter-annual variability of precipitation in the Nile basin. Despite Sudan's arid and semi-arid climate, Sudan is prone to flood disasters with an average of 200,000 people affected every year. According to the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA), Sudan has suffered from major flooding almost every year over the last two decades. In recent years, Sudan has been systematically impacted by floods, affecting 99,000 people in 2017; 222,300 people in 2018; and 426,300 people in 2019 across all 18 states. In addition to loss of lives and assets, the damage to crops and arable land intensified risks of long-term food insecurity in many parts of the country. The occurrence of floods is closely correlated with outbreaks of water-borne diseases such as typhoid fever, cholera and leptospirosis, with a peak in 2017 with more than 30,000 reported cases. Displacement and conflict have contributed to exponential growth of informal settlements in unsafe areas and in peripheries of major urban centers, resulting in homes and assets prone to damage by floods.

During the recent flood in 2020 the Nile reached its highest water level in 100 years and inflicted devastating damage to Sudan. The seasonal rains resulted in a drastic rise in Nile water levels up to 17.4m, causing a flood event that impacted 17 out of 18 states across the country. According to data from the Government's Humanitarian Aid Commission (HAC) and the Emergency Operations Center (EOC), the floods have killed 120 people and injured another 46. In total 830,000 people were affected, and more than 166,000 houses, 34 schools and 2,671 health facilities were destroyed. An estimated 125,000 refugees and internally displaced people were affected, particularly in eastern Sudan, White Nile, Darfur and Khartoum states. North Darfur state was the most severely impacted due to heavy rains and floods of seasonal wadis that affected nearly 125,000 people. The impact in Khartoum state was also high with more than 102,000 people affected. Based on satellite-detected surface waters over the states of Khartoum, Al-Jazirah and White Nile, about 500 km2 of land appears to be flooded. The Bank in collaboration with United Nations Development Program is supporting the GoS in the post-disaster needs assessment (PDNA) process since November 2020, and the final report is planned to be released in March 2021.

In addition to direct inundation from rivers and wadis (seasonal streams), risk of failure of small dams and water harvesting structures, locally referred to as "haffir", is another threat of mass devastation. Small dams in the context of Sudan are defined as those below 10 meter in height or those between 10 to 15 meters in height with less than 10 million m3 storage capacity. Water harvesting structures (haffirs) refer to manmade ground reservoirs to store water from seasonal runoff for drinking, irrigation, and animal husbandry during the dry season. The reservoir capacity of haffirs ranges from 0.1 million m3 to 0.01 million m3. In July 2020, the collapse of Bout Dam, classified as a small dam, in the Blue Nile state caused flooding in the downstream town with a population of 100, 000, where six people were killed, and more than 1,200 houses were destroyed. There are at least 77 small dams in Sudan, and many of which have more than 10,000 inhabitants in its downstream areas that are exposed to the risk of dam failure. Likewise, there are at least 1,500 haffirs across Sudan, and the number is continuing to increase. Although dam safety of large dams is better addressed by the

federal government, operation and maintenance of small dams and haffirs, administered by the local government or local communities, are often neglected, increasing the risk of failure over time.

Major floods in the Nile river system are riverine flood, while non-Nilotic system suffers from flash floods. While almost three quarters of the country area is included in the Nile basin, the area that has access to perennial flow of the Nile river system is estimated to be 15 percent of country. More than 50 percent of the country's population lives along this narrow strip of land along the Nile and its tributaries. The rest of area is called non-Nilotic system, where remaining 50 percent population live and rely on seasonal streams (wadi) and groundwater for their water resources. Flood disasters in Sudan are classified into two different types: (i) riverine floods, which occur when the Nile River system receives exceptional amount of precipitation, often in its upstream area, and over-flows its normal peak boundaries; and (ii) flash floods, which occur as localized exceptional heavy torrential rainfall and run-off observed mainly in non-Nilotic system.

The flood early warning system (FEWS) of the Nile river system suffers severe degradation as a result of years of under investment, while FEWS of non-Nilotic system is virtually nonexistent. Flood forecasting activities are carried out by relevant directorates within the Ministry of Irrigation and Water Resources (MoIWR) as well as the Sudanese Meteorological Agency (SMA), which is subscribed to the MoIWR. The FEWS in the Nile river system is operated by the Nile Waters Directorate of MoIWR, while the early warning in non-Nilotic systems such as wadis is the responsibility of the Groundwater and Wadis Directorate (GWWD) of MoIWR. Most monitoring gauges in the Nile River system are left degraded with limited provision for maintenance, affecting the quality of the overall flood forecast system. As of 2019, only 25 hydrometric stations in the Nile River system are functional, whereas more than 50 stations are not operational. Currently no FEWS exists to support flood forecasting and early warning interventions for vulnerable wadis in the non-Nilotic system. Critical challenges that hinder effective flood early warning specifically and water resources management more broadly include: (i) limited database and knowledge about the hydrological data; (ii) weak institutional coordination to adequately plan and manage flood and water resources; (iii) limited human resources; and (iv) lack of investments in technology to adequately forecast and monitor. Years of economic sanction and isolation have limited the government's capacity to rehabilitate and modernize monitoring infrastructure, while lack of operational budget have worsened the deterioration of that which exists.

There are many gaps in the policy framework, and weak institutional and operational capacities for disaster risk management (DRM), including flood. Since there are no comprehensive laws that govern DRM, the Government of Sudan (GoS) is currently reforming the institutional and policy arrangements in that area, with which this project is meant to be aligned once the reform is completed. Legal affairs related to DRM are scattered within 25 sectorial laws, which resulted in a complicated overlap of mandates and responsibilities of the concerned institutions. The Civil Defense Act 2005 established the National Council for Civil Defense (NCCD), which is comprised of various government institutions including civil defense, MoIWR, the Ministry of Social Development's (MoSD) Humanitarian Affairs Commission (HAC) as well as pertinent line ministries. Despite the existence of the NCCD, the government's interventions were largely focus on reactive emergency efforts rather than proactive mitigation measures to reduce risks and damages. Following the onset of the 2020 floods, the transitional GoS established a High Flood Committee, chaired by the MoSD that is responsible for HAC. The Emergency Operations Center (EOC) was established as an operational arm of this Committee. The

EOC is coordinating with all relevant stakeholders to address aspects of response and is leading the efforts to prepare a PDNA. The GoS, with the initiative of EOC, is now discussing to set up optimal arrangements for DRM interventions in Sudan. The activities of this project are designed carefully to align with this framework.

While flooding in Sudan has devastating consequences on lives and livelihoods, the strategic capture of flood waters through appropriate maintenance of small dams and haffirs can positively impact the country's water security. Water harvesting in the form of small dams and haffirs, play a significant role in enabling water security for multiple users (farmers, pastoralists, communities, etc.), particularly for communities residing in the non-Nilotic system. Although hundreds of haffirs were constructed under the 'Zero Thirst Program' implemented by MoIWR between 2016–2020, there is little or no oversight and inadequate management of these structures, which puts downstream communities at risk of structural breaches and the loss of their only source of water during the dry season. While Sudan is predicted to suffer from more frequent drought caused by climate change, effective management of these structures has the potential to enhance resilience against drought, improve livelihoods, reduce conflict, and promote economic development.

The proposed project builds on regional progress initiated by the Nile Basin Initiative (NBI) in flood forecasting and dam safety. Flood management and dam safety are among the main focus areas of the NBI under the Cooperation in International Waters in Africa (CIWA)-funded Nile Cooperation for Results (NCORE) Project. The Eastern Nile Technical Regional Office (ENTRO) has played active roles on both fronts. Regional flood forecast and early warning system was developed covering sub-basins such as Lake Tana, Blue Nile, Tekeze-Setit-Atbara, and Baro-Akobo-Sobat, but these systems are calibrated at sub-basin level, where the accuracy for vulnerable flood hotspots in Sudan is relatively low. This forecasting system does not cover all the tributaries of the Nile and non-Nilotic systems. On dam safety, ENTRO implemented analytical works and capacity building for national governments including Sudan, but this work primarily focused on the safety of large dams. Sudan has been active in participation and coordination with ENTRO's activities on both fronts through contribution to regional analytical works, dispatch of young professional to ENTRO secretariat and participation in technical workshops. A new phase of Bank support for the NBI, Nile Cooperation for Climate Resilience (NCCR), is scheduled to start implementation in 2021. Under NCCR project, NBI envisions to: i) enhance the reliability of the FFEWS, ii) develop regional network for the safety of large dams and iii) develop a flash flood early warning system for the entire Nile basin, among others. The proposed project will be designed and implemented in full alignment with the NCCR project.

This proposed project aims to enhance the Government of Sudan's capacities and improve targeted communities' resilience to floods and dam failures. The grant will primarily focus on: (i) enhancement of tools and methodologies for flood forecasting and early warning systems; (ii) strengthening technical capacity for O&M of small dams, water harvesting structures (haffirs) and flood management infrastructures; (iii) pilot community level monitoring and management to contribute to livelihood sustainability; and (iv) institutional capacity building and project managements. This project will also build on the results of NCORE and strengthen the safety of small dams in close coordination with ENTRO.

Relationship to CPF

Sudan's Country Engagement Note was approved by the World Bank Board of Directors on October 7, 2020. The CEN embraces a high risk, high reward approach to helping Sudan to stabilize its economy and accelerate progress towards arrears clearance and HIPC Initiative debt relief. The CEN has two focus areas – (i) re-engagement; and (ii) contributing to a renewed social contract - and a cross-cutting theme of promoting inclusion and citizen engagement**.** This project is closely aligned with the CEN's Focus Area 2: "**Contributing to a renewed social contract**" and it will contribute to objective 2.3: Strengthening Service Delivery and Resilience, as well as the cross-cutting theme of Promoting Citizen Engagement and Social Inclusion.

C. Project Development Objective(s)

Proposed Development Objective(s)

The proposed project development objective is to strengthen the capacity for flood forecasting and early warning and improve the operation and maintenance of small water harvesting and flood management structures.

Key Results

- Flood early warning system enhanced and expanded to vulnerable wadis with improved operational and dissemination mechanisms;
- Inventory of small dams, haffirs and flood management structures established;
- Technical guidelines for the safety of small dams and other water management structures developed;
- Multipurpose water structures (including haffirs) rehabilitated and capacitated with participatory community management structures in place;
- Roadmap for hydro-meteorological network expansion and rollout plan of technical guidelines for small dams and other water management structures developed and prioritized by the MoIWR.

D. Preliminary Description

Activities/Components

The proposed project will support activities organized into three components: (1) enhancing forecasting and early warning; (2) improving dam safety and flood management structures; and (3) institutional capacity building and project management.

Component 1: Enhancing forecasting and Early Warning (USD 1.40 million)

This component aims to enhance the reliability of Flood Early Warning Systems (FEWS) for selected flood prone areas to ensure sufficient lead time for preparation and evacuation of people and to mitigate the loss of life and damage to assets, livestock, and others, caused by flood disasters. The FEWS framework will include enhancements in hydro-meteorological monitoring system, flood risk mapping and strengthening dissemination of flood forecasts. The proposed project will strengthen the capacity for flood early warning in selected pilot area with the intention to replicate the established model to other parts of the country in the future. In addition

to the enhancement of accuracy of FEWS, the project will also improve the dissemination mechanism of early warning alerts. This component intends to strengthen GoS efforts to shift towards proactive flood risk management. The project will finance the following activities: (i) strengthening of hydro-meteorological monitoring network; (ii) rehabilitation and expansion of FEWS in selected areas; and (iii) development of community-based hydro-meteorological monitoring mechanism.

The strengthening of hydro-meteorological monitoring network will include assessment of existing rainfall and river flow gauges in selected flood prone areas. Based on the gaps identified through this assessment, a roadmap for hydro-meteorological network expansion as well as technical guideline for management and maintenance of hydro-meteorological monitoring will be developed. The project will also support the rollout of the roadmap and the guideline as a pilot. The target flood prone areas will be narrowed down through the appraisal. At the concept stage, four seasonal streams (wadis) in western Sudan (Kaja, Azum, Nyala and Elku) are identified as potential areas.

The rehabilitation and establishment of FEWS will also start with diagnostic and stocktaking of existing FEWS. A standard suite of FEWS will be proposed based on the diagnostic. The standard suite will cover not only the technical aspects such as monitoring data processing and modeling but also the institutional aspects such as the mandate of respective stakeholders and effective alert dissemination channels. The established suite will be implemented in the selected flood-prone areas as a pilot, and the lessons learned through the pilot will be used to improve the design of standard FEWS suite.

The community-based monitoring system is expected to supplement the hydro-meteorological data collected by the official agencies, i.e. MoIWR and SMA. The activity will engage with civil society such as women's groups and schools. A set of capacity building and awareness program will be conducted in selected pilot sites and the link between the local government and the civil society will be strengthened.

The technical assistance and pilot implementation consultancies will be complemented by capacity building of the Nile Water Directorate, the GWWD, the SMA and related stakeholders on operation and maintenance of FEWS, including the use of earth observation data for flood forecasting. This activity will also be aligned with the institutional and policy reforms which the GoS is currently implementing in the DRM sector.

Component 2: Improving the Maintenance of Small-scale Water Storage Structures (USD 0.90million)
This component will support the Water Harvesting Directorate of MoIWR in their endeavor to reduce the failure risk of small dams and water harvesting structures (haffirs) and asset management procedures for other flood management structures, such as retarding basins and river embankments. Special attention will be paid to the management of haffirs as an entry point for the MoIWR and local government to enhance the asset management procedures for other larger-scale infrastructures. Activities under this component aim to address community level adaptive capacities to mitigate the risk of floods and effectively harness flood waters in haffirs for productive livelihood activities. This component will finance: (i) baseline survey and update the inventory of small dams and haffirs that will include the key dimensions and development of failure risk index; (ii) development of guidelines, standard operating procedure (SOP), and emergency operation plan (EOP) for haffirs, small dams and flood management structures; (iii) minor rehabilitation of damaged haffirs; and (iv)

Piloting of community-based management structures to ensure sustainability. The target site of pilot small scale rehabilitation and establishment of community-based management structures will be determined on the basis of small dam inventory prepared through the project. Community-based management system will ensure active participation of women in decision-making and management of water services. Building on the lessons learned through the piloting, the manuals and guidelines will be rolled out to broader areas, and related training will be conducted in collaboration with pertinent stakeholders such as the Civil Defense.

Component 3: Institutional Capacity Building and Project Management (USD 0.70 million)

This component includes various technical assistance activities, designed to: (i) support preparation and supervision of all structural and non-structural investments planned under the project, including the rehabilitation of Nile FEWS, development of pilot FEWS (Component 1), and pilot rehabilitation of haffirs (Component 2); (ii) strengthen GoS's capacity to prioritize and plan future investments related to flood management and water resources management; (iii) develop and implement capacity building activities including training, procurement of workstations and related goods, etc.; and (iv) project management support including technical assistance and incremental operating costs on project management, technical, fiduciary, monitoring and evaluation, communications and safeguards expertise.

Environmental and Social Standards Relevance

E. Relevant Standards

ESS Standards		Relevance
ESS 1	Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10	Stakeholder Engagement and Information Disclosure	Relevant
ESS 2	Labor and Working Conditions	Relevant
ESS 3	Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4	Community Health and Safety	Relevant
ESS 5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
ESS 6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS 7	Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
ESS 8	Cultural Heritage	Relevant
ESS 9	Financial Intermediaries	Not Currently Relevant

Legal Operational Policies

Safeguard Policies	Triggered	Explanation (Optional)
Projects on International Waterways OP	Yes	The impact of project intervention to the flow

7.50		regime, or abstract water from the system, will be examined after selection of target sites.
Projects in Disputed Areas OP 7.60	No	

Summary of Screening of Environmental and Social Risks and Impacts

The project will be implemented at national level with activities undertaken for enhancing the reliability of Flood Early Warning Systems (FEWS), mostly deals with system strengthening (rehabilitation and new installation of hydromet monitoring stations), peripheral equipment, data processing system, and early warning dissemination system, technical capacity and institutional setup both in the Nilotic and non-Nilotic areas for preparedness and evacuation of people and to mitigate the loss of life and the damage to assets, livestock, and others, caused by flood disasters. These activities of the project may involve in very less environmental and social risks and impacts. i.e., impacts like installation noise, unsafe working conditions related with electrical hazards will be small scale in nature, and these impacts are expected to be highly localized and limited to construction/installation phase. The project will have an overall positive impact on people in Sudan as the project will involve provision of flood management infrastructures which will benefit the people in broader areas by retaining flood inflows and reducing the flood hazard in the downstream areas. It will specifically benefit the people in flood-prone areas both in the Nile and non-Nilotic systems. People in the downstream area of small dams will also benefit from reduced risk of floods caused by dam failure. However, the project may potentially have negative social impacts which include:(i) land acquisition, (ii) inadequate community consultation (iii) Sexual exploitation and Abuse gender-based violence, (iv) operational concerns due to remoteness and security, including monitoring and supervising as well as grievance redress; and (v) weak implementation capacity with limited prior experience . The implementing agency (borrower) of this project will be Ministry of Irrigation and Water Resources (MoIWR) which is responsible for conservation of the national water infrastructures and ensuring sustainable utilization of water resources for irrigation, domestic use, and power generation. MoIWR has long engaged in flood monitoring and early warning of the Nile river system, as well as construction and operation and maintenance of water infrastructures such as dams. MoIWR is currently implementing several projects with various bilateral and multilateral development partners. This project will represent the sector?s first engagement in implementing a World Bank- financed operation with the WB Environmental and Social Framework (ESF), where there is limited familiarity on projects preparation under the ESF and management thereof. The implementing agency (MoIWR) will need to closely coordinate with each of these key entities to ensure that all activities pertaining to management of environmental and social (E&S) risks are integrated. Such activities include, but are not limited to, development of a Stakeholder Engagement Plan (SEP) and an Environmental and Social Commitment Plan (ESCP), Environment and Social management Framework (ESMF), including assessment of cumulative risks and impacts. Social Assessment (SA) including GBV/SH action plan, Dam safety management framework (DSMF) including Dam Safety Management Plan and Dam Safety Emergency Action Plan as well as implementation arrangement of these plans in coordination with the different involved parties. All the instruments (SEP, ESCP, ESMF, SA & DSMF) will be prepared prior to appraisal. These instruments will be prepared in line with the requirements of new WB environment and social standards. The ESMF covers procedures to be implemented throughout the implementation timeline of the project including screening checklists and required E&S site specific management plans and In preparation of ESMF (and DSMF), assessment of cumulative risks will be done, depending on potential

project locations (even if not confirmed during project preparation). Thus, such impacts would be reflected while preparing the small dam inventory. The Dam Safety Management Framework will make transparent all factors considered, thus reassuring the community and other stakeholders that risks to people, property, and the environment are being properly addressed. The framework will address all considerations of how to achieve the necessary balance between benefits to society and adequate protection for individuals and their environment.

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Borrower/Client/Recipient

Borrower :	Ministry of Finance and Economic Planning

Implementing Agencies

Implementing Agency :	Ministry of Irrigation and Water Resources		
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