### BASIC INFORMATION

#### A. Basic Project Data

<table>
<thead>
<tr>
<th>Country</th>
<th>Project ID</th>
<th>Parent Project ID (if any)</th>
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<tr>
<td>Sudan</td>
<td>P177091</td>
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<td>Sudan Irrigated Agriculture Revitalization Project (P177091)</td>
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<td>Republic of Sudan</td>
<td>Ministry of Agriculture, Ministry of Irrigation and Water Resources</td>
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#### Proposed Development Objective(s)

to improve irrigation and drainage services and to improve agricultural support services in and around selected irrigation areas in Sudan.

### PROJECT FINANCING DATA (US$, Millions)

<table>
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| Environmental and Social Risk Classification | Concept Review Decision |
B. Introduction and Context

Country Context

1. **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 km$^2$, making it Africa’s third largest country after Algeria and Democratic Republic of Congo. 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 US$590 in 2019, resulting in downward revision of World Bank’s income classification from ‘lower-middle income’ to ‘low income’.

2. **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.

3. **Sudan’s fragile political economy, compounded by high inflation, large trade and fiscal deficits, high unemployment and poverty, worsening food security, long history of conflict and violence, long-standing tension between the center and the periphery and the outbreak of the COVID-19 pandemic, is posing a considerable risk to Sudan’s stability.** After losing 75% of its national revenues following the loss of oil exports due to the secession of South Sudan, Sudan is contending with a new reality that agriculture sector is key to job creation, improved incomes, poverty reduction, food security and boosting exports. 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.

4. **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.** However, the path for GoS during this transition is precarious with substantial challenges and high expectations from those who led the revolution. 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. The new reform-oriented Transitional Government creates a unique window of opportunity in Sudan to spur economic growth, rebuilding, resilience, and job creation, especially for youth and women. The General Framework for the Program of Transitional Government sets out 10 priorities for the Government. One of these priorities is focused on ‘addressing the economic crises and establishing the bases of sustainable development’ and includes, amongst others, ‘developing and
promoting productive sectors (agriculture, livestock, industry). 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.

5. The Government of Sudan (GoS) has taken notable steps towards resolving long-standing internal conflicts, unwinding economic distortions, renewing the social contract, and re-engaging with the international community. 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. In March 26, 2021, the Republic of Sudan cleared its arrears to the International Development Association (IDA), enabling its full re-engagement with the World Bank Group (WBG) after nearly three decades. This has paved the way for the country to access US$2 billion in IDA grants for poverty reduction and sustainable economic recovery. By clearing its arrears, Sudan has also completed a key step for receiving comprehensive external debt relief under the Heavily Indebted Poor Country (HIPC) Initiative.

Sectoral and Institutional Context

6. Sudan’s agriculture contributes around 30 percent to the GDP, provides livelihood to approximately two-thirds of the population, employs about 60 percent of the labor force and supplies raw material needed by the agro-based industries and generates demand for industrial consumer goods. Aside from its potential to promote overall economic growth, agriculture occupies a crucial space in the economy for reducing poverty. Rural areas are more impoverished than urban areas: 58 percent of rural households are poor, versus 27 percent of urban households. For more than 60 percent of households in the poorest quintile, agriculture—frequently livestock production—is the main source of livelihood. While women have high participation in the agriculture sector, they face wide disparities in economic opportunities. This sector supplies most of the country’s staple food crops such as sorghum and millet. Nevertheless, increasing amounts of wheat are being imported due to shortages in domestic supply. Despite abundance of resources, the sector has not lived up to its potential, causing serious food insecurity. Agricultural productivity is well below regional and global averages. Agricultural production systems have steadily become less productive on an increasingly depleted natural resource base. Cereal yields in Sudan are lower now than they were in the 1960s; at 472 kilograms per hectare in 2012, they stood among the lowest in the world. With few exceptions, during the oil boom Sudan’s traditional agricultural exports lost global market share, and the growing internal demand for food was met largely through imports. In other countries, agriculture has been the foundation for building thriving upstream (input and service supply) and downstream (agro-processing) industries; these linkages have for the most part failed to develop in Sudan. Agricultural value chains in Sudan are underdeveloped, disorganized with limited or no value addition. The consequences of this decline in agricultural productivity are evident: (i) Sudan sits at the bottom end of the global food security index (93rd out of 113 countries); (ii) despite a comparative advantage such as gum Arabic, sesame seeds and livestock, Sudan is not able to compete in the regional and global markets; and (ii) it is the seventh most vulnerable country to climate shocks.

7. Changes in climate pose challenges to Sudan’s ongoing efforts to combat poverty, reduce food insecurity and sustainably manage natural resources. Sudan is among the most vulnerable countries in the world to climate variability and change. Increased frequency of droughts and high rainfall variability over the past few decades have already put stress on the region’s rainfed agriculture and pastoralist systems, the dominant livelihoods in rural areas. Food shortages accumulating from consecutive years of drought have created recurring food emergencies and famine across the country, which placed disproportionately higher burden on women and girls to find means to feed their families. In North Darfur, reduction of rainfall, in combination with increased water demand and land use change, has contributed to desertification of millions of hectares and depletion of water sources over the past
few decades. Climate projections in Sudan include increases in temperature, increased unpredictability of seasonal rains, increased incidence of drought, rising sea levels and higher storm surges. Impacts of climate change on Sudan’s agricultural sector include reduced pasture and water for livestock, loss of arable land, reduced crop yields, and increased rural to urban migration. Conflict over water resources is also expected to increase if climate change impacts are not properly managed.  

8. **Agricultural policy instruments have been biased toward subsidies, taxes, and direct government intervention to control markets, rather than the provision of public goods and services (such as agricultural research, extension advice, and improved transport), which could have had great impacts on productivity, competitiveness and value addition.** Like many countries, Sudan has a long history of taxing agriculture. In particular, Sudan has taxed export products in which it has a strong comparative advantage (sesame, gum Arabic, cotton, and livestock) while subsidizing the consumption and production of foods in which the country has no plausible comparative advantage (especially—but not only—wheat, which competes for limited irrigated land near the Nile, where farmers also grow more traditional crops, including sorghum). The government remains heavily involved in importing agricultural inputs (seed and fertilizer in particular), under a regulatory system that is somewhat opaque, places the private sector at a great competitive disadvantage, and raises input costs. Wheat imports have placed a heavy burden on Sudan’s foreign exchange resources and worsened its negative trade balance. The policies that affect agriculture have not only been inconsistent but poorly coordinated. Weak policy coordination is partly a function of Sudan’s system of government, in which federal, state, and local agencies often share responsibility for similar functions, but in many cases coordinate that responsibility ineffectively. Weak institutions add to the high cost of doing business by worsening what is already an onerous regulatory compliance burden and exacerbate the unfavorable business climate for agriculture and discourage potential investors.

9. **The Government of Sudan’s Agricultural Investment Plan (SUDNAIP) indicates that the agriculture sector suffers from structural problems such as low productivity and high marketing costs that reduce competitiveness and result in lower prices for farmers.** This situation results from volatile and poor economic and sectoral policies as well as by weak institutional capacities. Also, the prevailing distortions in land rights have led to misuse of the land resource and have further exacerbated the low productivity syndrome. To transform agriculture into an engine of growth, the SUDNAIP recommends: (i) increasing production and productivity through modernization of the agriculture systems; (ii) enhancing production by support services and establishing knowledge and information network; (iii) developing marketing infrastructure to increase competitiveness and increase value-addition through agro-industrialization and value chain development; (iv) protecting and conserving natural resources with a priority of addressing the agriculture land issue as a key factor in the natural resource management; (v) mainstreaming food and nutrition security and safety; (vi) creating an enabling policy and a legal environment for sustained agriculture growth; and (vii) reforming the institutions and increasing capacities of staff and producers in the agricultural sector.

10. **Development of irrigated agriculture is a key contributor to the reduction of food insecurity, creation of employment opportunities and economic development.** Despite its potential, irrigation has seen serious decline in production and productivity over the last decade, which are associated with multiple factors including: i) degraded control structures and pumps, ii) sedimented canals; and iii) inadequate operations and maintenance (O&M), including lack of sustainable financing to modernize schemes.

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11. Historically, investments in irrigation development have prioritized revenue-rich and relatively easy to develop schemes that primarily utilize water resources available from the Nile and its tributaries. Unbalanced socio-economic development, including irrigation, in different parts of the Sudan is also one of the major challenges that merit attention. This has concentrated large scale irrigation developments in a limited area of central Sudan and thus created large socio-economic disparities between different parts of the country, which has resulted in considerable social and economic inequity for large segments of the population. Support and rehabilitation of small-scale schemes in conflict states and for low income marginalized areas present a unique opportunity for restoring the social and economic fabric of these communities. To address these social inequalities, it is also important to support farmers who are marginalized from irrigation schemes and benefit less from social services while still obliged to improve productivity on their own.

12. Among the irrigation schemes that need urgent attention are the 380 Medium Size Pump Irrigation Schemes (MSPIS) that account for 600,000 hectares of cultivable land and sustain over 130,000 farmers across the country. These diesel operated MSPISs were constructed in the 1940s and 50s and range in size between 100-20,000 hectares. These are public small holder irrigation schemes, which are managed by farmers associations or state governments. They are geographically dispersed across four states, irrigated from the Blue, White or Main Nile River system. Despite their significant livelihood potential, the MSPISs have been largely neglected and only around 39 percent of their area is under cultivation at present. Areas still under cultivation have succeeded due to presence of strong scheme-level association that manage joint resources and effectively utilized collected fees for O&M. Further successful schemes based on individual efforts were also able to access credit to procure inputs and spare parts. Geographic proximity to market has also helped some schemes stay afloat. Several factors contributed to the low utilization of the potential cropped areas of these schemes including: (i) deterioration of the pumps due to lack of spare parts and inadequate maintenance of the irrigation network and associated water control structures; (ii) lack of investments in establishing and strengthening farmers’ associations to effectively operate the schemes; (iii) lack of investments in modernizing and adopting new cost-effective technologies; (iv) cashflow and security issues that result in unreliable supply of fuel for pumping; and (v) inability of the state governments managing some of these schemes to generate adequate revenue from the collection of water charges to cover the O&M costs.

13. In the states where MSPISs exist, they represent a key pillar for economic and social support, and the primary source for food security and employment opportunities. The number of farmers employed within these schemes are twice as much as Gezira scheme (110,000 households) and produce a wide variety of staple foods and cash crops. These schemes also support value chains for key products such as high value fruits and vegetables, oil seeds and wheat. In addition to their economic and social importance, these schemes provide a symbiotic relationship and contribute to pastoralist and livestock sustenance. In the dry season, migratory herds and pastoralists utilize the remaining harvest as fodder and can easily access water. Since the average size of MSPIS is smaller than gravity-fed irrigation schemes, investment in MSPIS has an impact over a larger area with a smaller investment and a shorter implementation period.

14. In addition, spate irrigation represents another critical form of irrigation in Sudan. It is mostly practiced seasonally in non-Nile streams and rivers and primarily relies of flood waters. This form of irrigated agriculture is a unique form of optimizing seasonal water to increase agricultural productivity in such schemes. Around 400,000 hectares of land in various parts of Eastern and Western Sudan are cultivatable for spate irrigation schemes. These schemes also represent a critical lifeline for mitigating against climate variability. Irrigation infrastructure and storage allows farmers to strategically save and optimally utilize seasonal waters. Like the MSPISs these schemes are delipidated and suffer from a series of technical, institutional, financial and legal issues. Invasion of invasive plant species without adequate O&M has also complicated irrigation and reduced irrigable land significantly. The large-scale spate irrigation systems include Tokar (Red Sea State), Gash (Kassala), Abu Habil (North Kordofan), Wadi ElKu (North Darfur). The oversight and operation of Tokar and Gash were transferred from state level management to federal under the care of the Ministry of Irrigation.
and Water Resources (MoIWR), while the remaining schemes are under the provision of state level Ministries or Agriculture.

15. The Ministry of Irrigation and Water Resources (MoIWR) has embarked on an ambitious reform agenda to address policy, institutional and technical challenges in the water sector. The reform agenda in place includes: (i) restructuring of MoIWR’s directorates, including establishment of a centralized capacity building directorate and assessment of state-owned enterprises; (ii) review of existing policies, strategies and applicable laws associated with irrigation, water resources management and water supply with tangible recommendations for revisions and updating; and (iii) preparation of the National Water Sector Strategy (NWSS) and associated sub-sector strategies for irrigation, water supply and water resources management. The NWSS is comprised of three sections outlining the challenges and opportunities in the three sub-sectors (irrigation, water supply and water resources). The NWSS outlines a series of short, medium and long-term interventions to be implemented in a 10-year period to address identified gaps, meet national targets as well as support the country in meeting the Sustainable Development Goals (SDGs). The NWSS sets out tangible targets for irrigation rehabilitation and expansion and underpins the scope and objectives set out in this proposed project.

16. As part of the NWSS, the MoIWR has internalized lessons learned and adopted a comprehensive strategy that integrates rehabilitation of the infrastructure, institutional capacity building and appropriate strategies for an orderly transfer of responsibilities of O&M to farmers’ organizations. To put the strategy into practice, the MoIWR established a number of working groups to collect data and develop a phased implementation approach. These working groups were able to: (i) collect preliminary data from each of the MSPIS and created an inventory with the following information: total area, actual annually crop area, number of farmers, types, number and condition of the pumps, status of the irrigation canals and associated water control structures; (ii) review existing institutional, management and production systems for each scheme; (iii) assess the rehabilitation works required; (iv) assess institutional and governance aspects to formulate lessons learned and orient capacity building interventions; and (v) estimate costs of rehabilitation works. The MoIWR has also carried out detailed assessment of spate irrigation schemes Tokar and Gash and has put in place a targeted plan to rejuvenate scheme to increase areas under irrigation. Additionally, a joint MoIWR and Ministry of Agriculture task force prepared pre-feasibility studies on Gezira scheme in 2016. The assessment and series of consultative workshops have come out with a series of recommendations for rehabilitation.

17. A phased and long-term engagement plan is required to lay the foundations and strategically finance agriculture revitalization in Sudan. After decades of neglect and complex structural challenges, the agriculture sector in Sudan requires support to implement its ambitious plans while learning from weaknesses of previous large-scale agriculture transformation roadmaps and interventions. Assessment of previous endeavors to launch large scale agriculture “revolution” and revitalization highlight challenges in the application of polices and regulations, ineffective institutional and coordination structures, inefficient and limited financing and limited access to innovative technologies and international good practices as well as ineffective matching of sector capacities with needs. Revitalization of the agriculture sector will require a phased approach to target the structural challenges facing the sector, while simultaneously building sufficient capacity to plan, implement and monitor proposed interventions.

18. The proposed operation aims to capitalize on irrigation infrastructure rehabilitation and strengthen production systems to address food insecurity and value addition and provide employment opportunities especially for youth and women. This new operation seeks to support the GoS in revitalizing agriculture as a key contributor to its GDP and livelihood interventions. The rehabilitation efforts will be accompanied by carefully tailored institutional strengthening, targeted improvement in agricultural productivity, water use efficiency, farmer knowledge and skills with due consideration to the role of women in agriculture, climate resilience and adoption, agriculture supply chain, advisory and extension services, commercialization and competitiveness; targeted institutional reforms and capacity building
including climate resilience and adoption; and opportunities to leverage private sector participation. This operation proposes a three-pronged approach: (i) immediate revitalization of irrigated agriculture to demonstrate “quick wins” and kickstart agricultural production; (ii) build capacity for planning and implementation of a vibrant agriculture sector through catalytic investments to embark on service oriented and farmer-centric institutional systems; and (iii) lay foundational measures for longer-term sector engagement and agricultural productivity. Selection and implementation of proposed rehabilitation works will be distributed geographically in an effort to maximize opportunities for community empowerment, value addition, creation of employment opportunities and strengthening service delivery at local levels. Further, the proposed operation will aim to enhance knowledge and technology transfer through the implementation of strategic pilots that will orient the revitalization of the country’s large-scale schemes.

C. Proposed Development Objective(s)

to improve irrigation and drainage services and to improve agricultural support services in and around selected irrigation areas in Sudan.

Key Results
Potential PDO level indicators could include:

- Number of farmers provided with gender-sensitive training for irrigation planning at state and scheme levels;
- Area with Improved irrigation and drainage services (hectares).
- Number of farmers benefitting from improved irrigation and agricultural services under the project (of which female)
- Increase in fee collection rate in the selected irrigation schemes
- Main crops’ production increased in selected irrigated areas

D. Concept Description

19. **To address challenges of acute food insecurity, optimize existing infrastructure and to provide additional economic and employment opportunities, the NWSS proposes a staged approach to rehabilitate some of the existing irrigation schemes and pilot interventions that can be effectively scaled up.** The proposed physical rehabilitation of strategically selected schemes will be carried out in phases based on prioritization criterion outlined in the Component 2 description below. The rehabilitation will be accompanied by: (i) interventions to address institutional and operational challenges; (ii) enhance agricultural services to ensure sustainability of rehabilitated infrastructure; (iii) put in place mechanisms to improve equity, water use efficiency and productivity; and (iv) promote technology and knowledge transfer; and (v) create opportunities and leverage private sector participation. Provision of irrigated services will be better integrated with water resources management, productive use of water, agriculture, climate resilience and governance. These interventions will be coordinated with other line ministries such as Ministry of Agriculture, and Ministry of Finance and Economic Planning. These integrated approaches are aimed at ensuring investments in irrigation infrastructure are sustainable and resilient. The project aims to deliver quick and visible interventions through the following components:

20. **Component 1: Pathways for Building Robust Irrigated Agriculture Institutions ($30 million).** This component aims to address key institutional, policy, regulatory and technical bottlenecks that hamper effective coordination, planning and implementation of the irrigated agriculture sub-sector that will support both MoIWR and MoA. Based on assessments and lessons learned from previous rehabilitation and modernization interventions financed by GoS, institutional aspects of irrigated agriculture are the key common factors that contribute to lack of sustainability. A strong institutional context and robust planning incorporating climate change considerations are also critical for increasing the resilience of the
agricultural sector and farmers. The project aims to directly tackle some of these underlying structural challenges in order to revitalize irrigated agriculture in selected areas. This component will also provide valuable lessons learned and “proof of concept” to enable wide scale applications of tools and approaches to enhance the irrigated agriculture sub-sector’s enabling environment. This component is comprised of 3 key areas of interventions: (i) Strengthening Sector Planning; (ii) Institutional Strengthening and Capacity Building; and (iii) Project management.

21. **Sub-component 1.1. Strengthening Sector Planning and Oversight ($7 million).** This subcomponent will support: (i) establishment of mechanism to review and implement strategic frameworks for the irrigation sub-sector; (ii) prepare investment pipeline; (iii) develop a robust knowledge base and management information system to capture information on characteristics and functionality of schemes; (iv) carry out public expenditure review and provide roadmap to optimize sector financial planning; (v) develop framework for regulatory oversight for irrigation schemes; vi) review and reform select agricultural policies and regulations to improve farmers’ access to agricultural inputs and to attract private sector investments such as farmer organizations/cooperatives act, quality seed, fertilizer and pesticides, agricultural mechanization and technology and (vi) develop a framework for performance-based and participatory development of irrigated infrastructure at scheme level.

22. **Sub-component 1.2: Institutional Capacity Strengthening and Capacity building ($10 million).** The subcomponent will support institutional and policy reforms for improved governance, management, and coordination amongst the participating institutions for better performing irrigation schemes and agricultural advisory and extension services. This subcomponent will finance: (i) enhancement of implementation and coordination with other sectors (agriculture, and social development, etc.); (ii) carry out functional review of sector stakeholders and needs assessment to provide guidance on roles and responsibilities to streamline implementation as well as any legislative review processes; (iii) gender-sensitive training for irrigation planning at federal, state and scheme levels; (iv) develop and implement targeted training for core functions of water users associations; (v) engage relevant research institutions in research and development and piloting use of innovative technologies and approaches; and (vi) pilot field-level leadership approaches in selected irrigation schemes to address institutional and management issues at local levels.

23. **Sub-component 1.3: Project Management and Coordination ($13 million).** This sub-component will support implementation of this project through: (i) capacity building, financing of additional implementation support and technical experts; (i) operational costs for project management; (ii) awareness raising, communication and outreach, including citizens engagement; (iii) procurement and contract management to improve implementation of proposed infrastructure; (iv) application of environmental and social safeguards instruments and compliance; (v) state level operational support; (vi) knowledge management and experience sharing. This component will also finance procurement of equipment and goods required by federal, state and scheme-level implementing agencies to effectively manage and implement the proposed activities.

24. **Component 2: Revitalization of Irrigated Agriculture (US $230 million)-** This component aims to finance catalytic infrastructure investments in a comprehensive and participatory manner. The component will carry out selective rehabilitation to revitalize critical irrigation services and to overcome bottlenecks in systems and on-farm. Improving the performance of irrigation systems is a powerful climate change adaptation strategy for Sudan’s agricultural sector – threatened by increased in temperature, rainfall variability, and drought frequency. It also aims to introduce elements of modernization through greening irrigation initiatives (e.g. energy efficiency, renewable energy sources, etc). It also aims to improve irrigated water productivity through investments in monitoring gauges, automatic weather stations and use of ICT at scheme level. The project is divided into three subcomponents that focus on different typologies of irrigation schemes for agriculture with the aim of providing quick tangible results and lesson learned that can be scaled up in future interventions. The three sub-components are:
25. **Sub-component 2.1: Rehabilitation and Modernization of Medium Size Pump Irrigation Schemes (US $120 million)** - This subcomponent will finance the physical rehabilitation of medium-size pump irrigation schemes including: (i) repair of intake pumps and water control structures; (ii) rehabilitation and desiltation of irrigation canals; (iii) land leveling and on-farm physical works; and (iv) provision of water supply for communities and livestock. It will also include scoping and financing of alternative energy sources to enhance energy efficiency. The 380 schemes will be rehabilitated in stages. Stage 1 will include the rehabilitation of 100,000 hectares. To prioritize stage 1 interventions, the selection of schemes will be based on a pre-determined criterion that consists of the following factors: (i) level of complexity of required rehabilitation; (ii) number of beneficiaries and potential economic and social impacts prioritizing marginalized communities; (iii) number of hectares of land that can be brought back under cultivation; (iv) an irrigation scheme that additional assessments may consider crop production in schemes and accordingly define an allocation formula per hectare of land based on the canal sizes and type of crops cultivated. This component will be complemented by activities in component 3 that will include a range of agricultural extension capacity building and support. In parallel to modernization and rehabilitation works, the project will support value chain development and include a range of agriculture market service linkages to improve productivity of schemes. This component will also finance technical studies in medium size pump irrigation schemes.

26. **Sub-component 2.2: Rehabilitation and Modernization of Spate Irrigation Schemes (US $60 million):** This component will focus on rehabilitation and modernization of spate irrigation schemes in eastern and central Sudan, namely Tokar (Red Sea), Gash (Kassala), and Habil (North Kordofan). It will finance: (i) rehabilitation of irrigation infrastructure (main and secondary canals and dikes); (ii) replace and modernize water control structures; (iii) rehabilitate on-farm water management structures. This component will also finance parallel activities to support livelihood measures such as livestock production and management of invasive plant species in a sustainable manner. This component will also finance strategic studies to enhance water productivity and efficiency of spate irrigation systems.

27. **Sub-component 2.3: Improving Water Management for large Scale irrigation (US $50 million)** - This subcomponent will focus on rehabilitation and pilot modernization of an existing gravity-fed large-scale, small-holder irrigation scheme – geographically interventions will be implemented in a major branch of the Gezira Scheme. It will finance piloting of strategic interventions that can provide tangible guidance for modernization of this scheme. Based on the 2016 assessment carried out by MoIWR and a panel of international experts and through extensive consultations with a wide range of stakeholders, a set of recommendations were proposed. This subcomponent will select a pilot area based on a pre-defined criterion to implement a set of integrated interventions to address identified challenges: (i) physical rehabilitation; (ii) agronomic; (iii) institutional; (iv) financial; and (v) human resources. This subcomponent will provide seed funding, implementation of additional assessments, studies, and piloting of technology adoption (including mechanization and improvement of value chains) and approaches for optimal private sector participation that will orient the strategies for large scale irrigation.

28. **Component 3: Strengthening Agricultural Services ($40 million).** This component includes two subcomponents, which will focus on improving agricultural knowledge and practices, on-farm water management and, farm mechanization, value addition and strengthening agriculture market service linkages. As for Component 3, these on-farm water management practices are critical to support farmers adapt to a changing climate. This component includes:

29. **Sub-component 3.1 Enhancing farmer capacity in good agricultural practices ($15 million).** This sub-component will primarily focus interventions in areas in and around the selected irrigation schemes and will work towards helping farmers engage in farming, expand their production area, adopt new technologies and implement and build an asset base for improved livelihoods. It would include, inter alia: (i) the formation and strengthening of farmer groups; (ii) enhancing
farmer knowledge, skills base and adaptive capacity for improved, climate smart production; (iii) strengthening advisory and extension services for timely support to farmer/producer; (iv) promoting water use conservation and efficiency; (iv) streamlining inputs supply chain, quality seed, improved and stress-tolerant crop varieties (high yielding varieties, nutrient dense crops, heat, drought and pest and disease resistant varieties, flood water management, conservation agriculture and integrated soil fertility management (minimum tillage, crop rotations, crop residue management, soil fertility management practices), farm equipment and O&M services to the farmer/producer by supporting local businesses/dealerships and entrepreneurship especially women and youth; (v) piloting and implementing Farmer-Led Irrigation Development initiative to create linkages between small holder farmers and providers of goods and services; and (vi) providing capacity building to strengthen and sustain participating schemes’ or state government’s capacity to plan, implement and manage irrigation (this includes planning, technical, financial as well as stakeholder engagement with farmers and communities). In recognition to the significant role women play in agriculture, the project will accord special attention to their issues and concerns in agriculture, gender-based violence and work towards their empowerment.

30. Given the lack of extension and advisory services at the local level, the project will build the capacity of agriculture/extension staff and support community-based extension systems to deliver relevant knowledge and skills to farmers for improved agricultural production and climate resilience

**Sub-component 3.2: Improving Support Services for Agricultural value chains ($25 million)**

31. This sub-component aims to improve the adoption of modern farm technologies, mechanization, and the use of renewable energy for farm power. The project will provide the much-needed financial support (evouchers, matching grants) to target farmer organizations and farmers (with particular efforts to support women’s groups) for investments to increase agricultural productivity, agroecosystem resilience and value addition under changing climatic conditions. The project will support local microenterprises and youth in the production and maintenance of farming tools and equipment to address lack of after-sale services, spare parts and skilled technicians. The project will offer skills enhancement training and kits to interested youth on production, operation and maintenance, and repair of old and newly introduced equipment and tools that would require replacement of parts. This will also provide opportunities for self-employment and jobs in agricultural inputs, services, agro-logistics, as well as off-farm opportunities to project beneficiaries.

32. Furthermore, this sub-component aims to lay the foundation for development of select agricultural value chains. The project will support interventions to reduce post-harvest losses between farmgate to whole sale by addressing critical bottlenecks such as post-harvest management, sorting, storage, value addition, processing, logistics, digital and innovative technology, access to market information and improved linkages between producers, aggregators, processors and buyers.

33. The following areas, namely i) climate co-benefits, ii) gender, iii) job creation, and iv) maximizing finance for development will be core aspects of the project and will be integrated across all project components.

- **Gender:** A gender assessment will be carried out to integrate it into the design of the project and improve gender outcomes. All sub-components of the projects will be screened using a gender lens to maximize gender impact from the project interventions.

- **Climate resilience:** The project will build public and private sector capacity to improve resilience of the agricultural systems while minimizing Greenhouse Gases (GHG) footprint. The resilient rural infrastructure will improve farmer resilience to droughts, erratic rainfall, flooding while ensuring green and clean energy deployment in infrastructure operations and carbon sequestration through catchment area treatment. Market and enterprise development will help support climate smart agriculture and support enterprises that could
contribute to building resilience and reducing emissions. An enabling environment component will support the development of policies and regulations that contribute towards adaptation and mitigation. Consideration of climate resilience will be introduced in all studies that will be financed by the project.

- **Job creation**: Rural job creation will be delivered through multiple pathways including creating a multiplier effect of productivity improvement across agricultural value chains; and supporting enabling environment for greater private sector development, and thereby greater job creation.

- **Maximizing finance in development**: SIARP will review binding policy, institutional and regulatory constraints to understand strategic bottlenecks embedding scale up of private sector participation in the agriculture sector and will aim to carry out initial assessments and lay foundation for future interventions to increase private sector participation in this sector.

### Legal Operational Policies

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<th>Projects on International Waterways OP 7.50</th>
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<th>Projects in Disputed Areas OP 7.60</th>
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### Summary of Screening of Environmental and Social Risks and Impacts

34. The project’s environmental risk is rated substantial at this stage. The potential environmental risks and impacts are linked with modernization of irrigation Schemes (Component 2, US$ 230 million, 75.8% of the project budget) which will finance rehabilitation and modernization of medium size pump irrigation schemes, rehabilitation and modernization of spate irrigation schemes, and improving water management for large-scale irrigation. The potential risks and impacts are also associated with improving institutional capacity and productivity (Component 3, US$ 40 million), including a series of on-farm interventions. Accordingly, the main potential risks and impacts include pollution (soil, water and air pollution); inefficient use of natural resources including energy, water and raw materials as well as other resources; degradation of irrigated land (comprising salinization, alkalization/acidification, and/or water logging); impacts on downstream users (due to potential reduction in flow regime) and on aquatic flora & fauna; disturbance of existing ecosystems (aquatic/wetlands and land), including extraction of local construction materials for rehabilitation of irrigation infrastructure; and siltation from the Nile River and surface runoff from non-irrigated land. Water-borne and water-related diseases, including malaria whose vectors proliferate in the irrigation waters, are also potential risks and impacts to farmers and vulnerable communities within and around project sites.

35. The risks may also include occupational and community health and safety issues, including potential risk of COVID-19 infection, injury or death associated during rehabilitation, construction, extraction of local construction materials, drowning in canal & night storage reservoir. Though the project is not intended to finance agrochemicals, including fertilizers and pesticides, beneficiary farmers may utilize such materials based on their capacity and financial resources to procure such items. Use of Agrochemicals, in turn, may adversely affect the health of farmers and surrounding communities if technical support is not given timely and monitored accordingly. Also, the residues of agrochemicals could
pollute the local environment, including soil and water resources. Therefore, capacity building for farmers is required on best practice in integrated pest management.

36. The limited familiarity of the implementing entities with, and experience in, the Bank’s ESF and ESSs, and the government’s weak institutional structure related to environmental and social risk management requires capacity building support. Thus, the institutional capacity building and training along with budget for ESSs and related aspects of implementation will be further assessed during the preparation; and the ToRs to be prepared for capacity building to integrate the principles and objectives of relevant ESSs to ensure that outputs are consistent with the WB ESF and GoS requirements. Overall, prior to appraisal, the project will prepare, consult upon and disclose the ESF instruments (Environmental and Social Management Framework (ESMF), Stakeholder Engagement Plan (SEP), Labor Management Procedures (LMP) and Environmental and Social Commitment Plan (ESCP)) that highlight proportionate mitigation measures to address the potential E&S risks and impacts. Also, site-specific ESSs instruments (e.g. ESIsAs/ESMPs) for subprojects will be prepared, implemented and monitored during the project implementation as per the ESMF and other relevant ESF instruments. Also, based on the client’s site specific ESSs, the client will require civil works contractor(s) to prepare Construction-ESMP(s) satisfactory to the GoS and the WB and enforce their implementations accordingly during rehabilitation of irrigation infrastructure.

37. The social benefits of the project manifest through increasing agriculture production in targeted areas and contributing to moving people out of food insecurity, creating livelihood opportunities, developing water security for pastoralists, livestock, and institutional capacity building for water user associations and farmer groups. The type and nature of the project as well as the sensitivity of the social environment will determine magnitude of the social risks. The specific locations of the subprojects are not determined yet. The proposed project aims to rehabilitate and modernize irrigation schemes within existing command area. The project intends to strengthen capacity of implementing institutions and farmer associations, local service providers and suppliers; respective states to increase the number of trained & skilled experts; support symbiotic use of resources by availing livestock water supply, fodder services and support a series of community prioritized interventions to amplify impact and improve rural livelihoods of communities and farmers. The project will be working in some states that are conflict prone with varying intensity. Sudan’s fragility is anchored on the economic shocks, disproportionately affecting poor and vulnerable groups. The project activities will be tailored to contribute for broader social cohesion through coordinated planning and implementation of the project with the FCV team by considering the diverse sources of conflict, fragility and adopt conflict sensitive approach. The growing civic space and activism signals for enhanced space for structured stakeholder engagement and feedback mechanism, including for project beneficiary communities for rehabilitation, operation & maintenance of schemes. A Stakeholder Engagement Plan (SEP) will identify stakeholders including beneficiaries, outline method & frequency of engagement with responsible entity during project preparation & implementation. The SEP will outline a sketch of the project GRM.

38. Sudan is a diverse country home for people with varied cultural, linguistic & livelihoods background. The project will undertake a social assessment (SA) for people meeting the requirements of ESS7 including pastoral & agro-pastoral groups. The preparation of the SA shall account mobility patterns, access to and use of natural resource rights. The issues of vulnerable groups, IDPs, refugees will be covered in the ESMF. The social risks of the project include, i) exclusion of vulnerable farming/pastoral HHs, women and ethnic minorities; ii) conflict over access to & use of resources between farmers & pastoralists; iii) income inequality among households; iv) increase in insecurity of beneficiaries due to in migration, competing for project benefit; (v) possibility of land acquisition including access restriction due to irrigation canal & water reservoir/storage expansion, & vi) adverse effects from labor influx. The social risks emanate from FCV context with varying intensity. Violence (political, ethnic, civil unrest) & GBV/SEA/SH are two forms of concern exacerbating the potential social risks. Based on the online GBV/SEA screening tool the risk is moderate. The GBV risk could be substantial aggravated by conflict and fragility, plus the influx of labor. The project will prepare a GBV action plan.
commensurate to the risk. The scope of project land take is assessed low to be managed through a defined voluntary land donation procedure satisfactory to the Bank for limited land take. The actual scenario of land take will be assessed during project preparation. The social aspects of the project potential impacts & risk mitigation measures will be included in an ESMF including a baseline of vulnerable groups. A Stakeholder Engagement Plan (SEP), Social Assessment (SA), GBV Action Plan, & Labor Management Procedure (LMP) will be prepared. The Implementing Agencies (IAs) are expected to obtain clearance from the Bank & disclose ESF instruments prior to appraisal. The social risk is assessed substantial. Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) Risk Rating Moderate The project SEA/SH Risk is assessed using the online platform and classified as moderate. The SEA/SH Risk Rating will be assessed and updated during project preparation and implementation.

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