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Project Information Document/ Integrated Safeguards Data Sheet (PID/ISDS)

Concept Stage | Date Prepared/Updated: 08-Sep-2017 | Report No: PIDISDSC23110



BASIC INFORMATION

A. Basic Project Data

Country Western Africa	Project ID P163252	Parent Project ID (if any)	Project Name Economic growth and water security in the Sahel through improved groundwater governance (P163252)
Region AFRICA	Estimated Appraisal Date Jan 15, 2018	Estimated Board Date Mar 30, 2018	Practice Area (Lead) Water
Financing Instrument Investment Project Financing	Borrower(s) Sahara and Sahel Observatory (OSS),CILSS Interstate Committee for Drought Control in the Sahel	Implementing Agency Sahara and Sahel Observatory (OSS),CILSS Interstate Committee for Drought Control in the Sahel	GEF Focal Area International waters

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Proposed Development Objective(s)

The Project Development Objective (PDO) is to improve the knowledge on groundwater potential in the Sahel and to strengthen groundwater governance arrangements at local, national, and regional level.

Financing (in USD Million)

Financing Source	Amount
Global Environment Facility (GEF)	13.58
Total Project Cost	13.58

Environmental Assessment Category B-Partial Assessment	Concept Review Decision Track II-The review did authorize the preparation to continue
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Have the Safeguards oversight and clearance functions been transferred to the Practice Manager? (Will not be disclosed)

No



Other Decision (as needed)

B. Introduction and Context

Country Context

1. **The Sahel is a semi-arid region which extends 5,400 km from the Atlantic Ocean to the Red Sea, spanning across nine countries.** It is home to a rapidly growing population of over 300 million people. Most of the population is poor and relies on rainfed agriculture and agro-pastoralism for its livelihood, in a climate characterized by irregular and unpredictable short rainy seasons and recurrent droughts. This challenging climate for agriculture and livestock husbandry is compounded by significant land and pasture degradation resulting in low productivity and food insecurity. Increasing population density in the Sahel, combined with growing interest from outside investors in largescale commercial agriculture and extractive industries, will put additional pressure on the region's fragile natural resource base, pushing it in some cases beyond its regenerative capacity. As competition for resources intensifies, conflicts over land and water are likely to multiply, which may exacerbate insecurity and emigration.



Figure 1. Maps of the Sahel¹

2. In a climate characterized by irregular and limited rainfall, irrigation can contribute significantly to increase agricultural productivity and reduce fluctuations in agricultural production. However, in a context of rapidly growing water demand fueled by high population growth and limited exploitable water resources, irrigation expansion should be promoted with care in order to avoid the over-exploitation of water resources, notably groundwater. This was recognized in the 'Dakar Declaration on Irrigation' adopted by the six Sahelian countries of Burkina Faso, Mali, Mauritania, Niger, Senegal and Chad in October 2013, under the Comité Permanent Inter-États de Lutte contre la Sécheresse au Sahel (Permanent Interstate Committee for Drought Control in the Sahel, CILSS) leadership. The Dakar declaration calls for a renewed effort to scale up irrigation development and improve irrigation sector performance in the six Sahel countries **without over-exploiting scarce water resources,**

¹ http://www.acegeography.com/uploads/1/8/6/4/18647856/6372964_orig.jpg



considering water demand from priority uses (potable water supply); pre-existent economic activities (i.e. livestock husbandry; flood recession agriculture) and critical ecosystems.

3. **The World Bank Sahel Irrigation Initiative Support Project (SIIP) aims to support the implementation of the Dakar declaration, scaling-up the implementation of the irrigation development agenda in the six signatory countries** through institutional strengthening and selected irrigation land development. The proposed GEF funded projects aims at complementing World Bank support to irrigation development in the Sahel to reduce the risks related to groundwater over-abstraction in the medium and long terms. The proposed project, due to its relatively limited budget, will focus on three of the six SIIP countries (**Chad, Mali, and Niger**). **They were prioritized because, amongst the SIIP's countries, they offer the largest potential for groundwater development** (see paragraph 18). If this project is successful, a second phase could expand the geographic scope of the proposed interventions.

Sectoral and Institutional Context

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4. **Because of its decentralized nature, groundwater can play a unique role in addressing some of the key development challenges in Africa.** Groundwater constitutes a natural buffer against the variability of climate and can be an important ingredient for building climate resilience. As a decentralized and often easy accessible water resource, (shallow) groundwater can provide water security in fragile or conflict-ridden regions where centralized water supply services are lacking. Believed to be widely available and comparatively cheap, groundwater can also be a catalyst for economic opportunity. Increased water security could help reduce some of the drivers for immigration as they are linked to lack of economic opportunity and loss of livelihoods due to climate shocks. As such improved groundwater governance and increased water security also contribute to regional stability. These unique attributes are particularly valuable in the context of African drylands, including the Sahel. In particular, there is potential for agricultural intensification via groundwater irrigation to contribute to upstream and downstream value chain job creation and income improvements. In the Sahel, groundwater plays an especially critical role for the off-season crops.
5. **Notwithstanding these potential benefits, there are significant risks of over-exploiting this strategic resource if groundwater knowledge and governance arrangements are not improved. Uncontrolled groundwater development may threaten water security.** Although several studies seem to agree that the existing regional groundwater potential is not fully utilized, questions remain about how to quantify the potential and how to mobilize the groundwater resource in a sustainable way. There are major deficiencies in our knowledge and understanding of groundwater in the Sahel. It must be noted that existing observations on which potential usage projections are developed are based on regional balances and rarely, on local data budgets, which are themselves based on partial inventories of irrigated water points. Moreover, the transboundary nature of a large share of groundwater resources in Africa complexifies their assessment and management. Considering projected demand growth, the question arises how much groundwater should be set aside to ensure water security for populations and livestock, especially during periods of reduced surface water availability, and which share of the available groundwater resource can safely be mobilized for economic development, including irrigation. Before in a specific location groundwater resources are allocated for irrigation it is important to ensure availability for priority uses like water supply for citizens and livestock during periods of lowest availability, for example a prolonged drought.



6. There are many studies on groundwater in the Sahel region. These studies focus on two major aspects, namely the characterization of large deep aquifers and on rural water supply. **Most regional assessments do not consider 3 major limitations to groundwater use: (i) the spatial and temporal variability of the shallow groundwater resource², including the quantification of the recharge of the water tables (ii) the economic limitations to the use of deeper groundwater, and (iii) quality constraints.** The Sahel region is in the arid and semi-arid zone, characterized by high inter-annual and intra-annual variability of rainfall. The most readily accessible and affordable groundwater resources are those stored in shallow alluvial or hard rock aquifers that are also most vulnerable to climatic variations. Often, data on groundwater availability do not reflect the significant spatial and temporal variability of the renewable groundwater resources. Correlated to the rainfall patterns groundwater recharge sharply decreases from South to North and intra-annual and inter-annual variability of rainfall is very high. As a result shallow groundwater availability varies a lot across the region and in time. Water security plans should consider minimum water availability and not long-term averages. Another aspect often highlighted in regional studies is the large volume of deep groundwater storage present below the subsoil of the Sahel region. Considering the depth of these reserves, the required technology and infrastructures to tap them and the economic cost to lift them greatly limit the usefulness of a large share of this resource for economic uses that do not generate much cash flow, like small-scale irrigation. **The technical and economic constraints in many cases generate a relative scarcity of the resource.** Finally, due to high evaporation rates combined with low recharge rates, groundwater in arid and semi-arid regions may have poor water quality characteristics including high salinity, fluoride or arsenic that limit its use for human and animal consumption or for irrigation purposes.
7. **Most developments of groundwater use in the region focus on expanding irrigation, which is likely to have negative impacts on groundwater quantity and quality and in its turn, reduce water availability for drinking purposes.** Technological changes probably pose the greatest threat to groundwater sustainability. Any increase in the use of motorized pumping (be it diesel, or solar) places additional stress on any aquifer. While the resource could potentially suffice for small garden plots, increased commercialization will require more water (USAID, 2014)³. Even though in most Sahel countries (except Niger) they do not account for most the volumes collected, the groundwater withdrawals for drinking are of vital importance for the communities in the arid zones that depend on them. It is thus critical for the survival of the local populations to safeguard groundwater for drinking purposes
8. **Although overall groundwater resources (deep and shallow) represent a significant strategic water storage, there are already many cases of overexploitation of their renewable part.** At the local level, local populations exploit mostly the shallow groundwater reserves. Shallow groundwater, which often depends on rainfall, is very sensitive to climate variability. For instance, most rural areas in Northern Chad depend on groundwater from shallow hand dug wells and boreholes for mainly domestic, but also agricultural uses in the dry season. Overabstraction negatively impacts the poorest groups because they cannot afford to dig deeper. In water-dependent societies, this particularly impacts the lives of poor women, who needs to walk further to fetch water from other wells. Overexploitation is amplified by the decline in precipitation in recent years and the desertification of the Sahelian zones, which reduce the recharge by the runoff water and modify the balance of

² Shallow being defined here as the undep groundwater reserves, up to a maximum depth of about 15 m below surface, that are accessible through traditional wells and structures

³ Hammond Murray-Rust, D., et Fakhruddin, S.H.M. (2014), Climate Change and Water Resources in West Africa: An Assessment of Groundwater Management, USAID.



the water tables. Overexploitation also has impacts in terms of water quality. It induces accelerated salinization of soils, uplift of saline groundwater (some oases in Chad and Niger), or intrusion of salt margins (the lower valleys of Sine Saloum and the Casamance and Senegal River deltas at Senegal). Finally, by concentrating agricultural activity and generating the anarchic expansion of certain villages, it can also indirectly induce water pollution by nitrates, organic or bacteriological micro-pollutants (in urban and peri-urban areas, oases). The Quaternary sheet of Kanem in Chad and the Ingall Oasis of the North of Niger are two examples of groundwater overexploitation (see Box1).

Box 1. Example of overexploitation of groundwater: the Ingall Oasis in Niger.

In the 1990s, groundwater was at 4-5m and allowed the production of dates. In the early 2000s, the introduction of motor pumps, coupled with the development of onion cultivation, completely destabilized the balance. The number of motor pumps was multiplied by 20 in 4-5 years. This allowed operators to drive up to 3 cycles of onion crops per year. After a couple of years, the combination of these two factors resulted in a 3 to 4 meter drop in the water table, which severely affected date production, as date palms are not able to reach deeper than 4 m to catch water. In its turn, the dropping water table disrupted the main source of income for most farmers.

9. **Besides the need to better quantify and map the usable groundwater resource, it is therefore also necessary to improve governance arrangements at all levels, to reduce the risk of over-abstraction and ensure an adequate allocation of the groundwater resource.** Governance arrangements need to be put in place/ strengthened at the local level, and supported by adequate water resources management (i.e. including planning) at the national level before the resource is over allocated. Finally, many of the deeper aquifers in the Sahel are transboundary, which requires improved cooperation and management mechanisms among countries through regional and basin organizations.

Relationship to CPF

10. The World Bank has had a long-standing commitment to global priorities and region-wide programs and the 2008 Regional Integration Strategy for Africa provides a coherent and strategically focused framework to guide the Bank Group's assistance in support of regional integration and regional programs in the provision of regional public goods. The strategy acknowledges that regional approaches to the management of shared waters can provide improved water security and more sustainable management of these resources than achievable through national action. It further recognizes that effective management is even more urgent given the potentially disruptive impact of climate change on water resources availability and increasing water demand resulting in potential conflicts arising from limited supplies. In addition, the Bank has been increasingly providing support to complex groundwater projects and ESW works. The Bank's strategy for Africa also recognizes that many of African challenges (such as climate change, water resource management and food security) are best addressed through cooperation and integration at the regional level.
11. **The Country Partnership Framework of the 3 individual States all include a strong focus on water and recognition of the role of water, and particularly of its sustainable management and improved governance, in fostering the goals of economic cooperation.** Specifically,



- **Chad's** three focus areas ((i) strengthening management of public resources; (ii) improving returns to agriculture and building, value chains; and, (iii) building human capital and reducing vulnerability) aim to address weak water resources management at all levels, from governance, to productivity, to making sure any further development is sustainable (CPF FY16-20, signed 2015/11/03, report no. 95227).
- Water is also one of the main focuses of **Mali's** CPF and it is addressed in all three pillars (: (i) improve governance; (ii) create economic opportunities; and (iii) build resilience). Specifically, one expected outcome of pillar (ii) is to improve water resources management in the country, whereas pillar (iii) aims amongst others at ensuring the resilience of rural communities to climate variability and change (CPF FY16-20, signed 2015/11/03, report no. 94005).
- The **Niger's** CPF mentions sustainable water and natural resources management as a key focus for both its main themes ((i) promote resilient growth objective and (ii) reduce vulnerability). Niger's CPF also specifically highlights that new opportunities for tapping groundwater for irrigation are materializing in the north and should be exploited – in a way that ensures resilient growth (theme (i)) (CPF FY13-16, signed 2013/03/29, report no. 76232).

12. By focusing on ensuring that groundwater developments are managed in a sustainable way via increasing the knowledge of the availability and exploitability of the resources for various uses (drinking, irrigation, pastoralism), and via designing appropriate governance mechanisms, this project is well aligned with the CPFs of the three target Sahel countries. In addition to the SIIP, the Bank is preparing and implementing climate smart agriculture projects in the sub-region, such as Drylands Development Project (P164052) expected FY18, Niger Climate Smart Agriculture Support Project (P153420) ongoing, and the Ag Climate Resilience & Product Project (P162956) expected FY18 for AFCW3. This GEF project seeks to mitigate, in a coherent manner across the Sahel, the risk of ending up over exploiting groundwater.

13. **Relationship with other regional projects from the World Bank.** The project will be closely coordinated with other World Bank funded regional projects. These include the Sustainable Groundwater Management in SADC Member States project (P127806) the current and pipelined Niger River Basin projects (P093806); the Senegal River Basin Water Resources Management project (P131323); the Volta Basin Water Management Project (in the pipeline); and the Sahel Irrigation Initiative Support Project (SIIP, P154482).

PROPOSED PDO/RESULTS

A. Proposed Development Objective(s)

14. The specific Project Development Objective (PDO) is to improve the knowledge on groundwater potential in the Sahel and to strengthen groundwater governance arrangements at local, national, and regional level. It will therefore contribute to improving water security in the Sahel.



B. Key Results

Key outcome indicators will be refined during project preparation, but the following are proposed:

- Number of aquifers with improved assessments of their exploitable groundwater potential from a quality, quantity, and economic angle.
- Number of local participatory groundwater management plans developed

PROJECT CONTEXT

A. Concept

1. Description

15. **Approach.** Ensuring the sustainability of groundwater related uses requires reliable information on the actual availability of the resource and a proper institutional framework to help avoid overexploitation and manage critical situations. The five pillars of the **Framework for Action (FFA) developed by the Global Groundwater Governance Project** (2011-2016), funded by GEF, were used as a guidance for the development of the components (see ANNEX III). The Framework emphasizes the importance of understanding and adapting governance to the local context and different countries will have different starting points and varied capacity to progress. *What* is done and *when*, has to take into account what already exists. The FFA also emphasizes the need for stakeholders *at all levels* to act. The proposed GEF project proposes to conduct governance diagnostics at local, national and transboundary level to prioritize actions and investment in the face of rising human demand, overall water scarcity, and the anticipated impacts of climate change in the targeted countries.

16. **The proposed GEF project has been designed to complement the Sahel Irrigation Initiative Project (SIIP, P154482), currently in advanced stages of preparation.** The regional SIIP project has an estimated financing envelope of US\$ 200 million and supports the following countries: Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal. The SIIP aims at improving stakeholders' capacity to develop and manage irrigation and increase irrigated area using a regional solutions approach in participating countries across the Sahel. Most of the project will focus on groundwater irrigation development in the Sahel. While not fully blended into a single operation, the technical link between SIIP and the proposed GEF project is strong and synergies during implementation will be drawn as the projects are effective on the ground. The proposed GEF project will complement SIIP's activities by strengthening knowledge and governance of groundwater resources, so to avoid its overexploitation due to excessive development and use. The GEF-funded activities will therefore contribute to the sustainability of the IDA-funded investments. For instance, SIIP pilots will all test solar pumping technologies and VISA irrigation systems. In the selected GEF pilots, this project will add low-cost monitoring equipment and add a component to the SIIP's trainings on new technologies, focused on the sustainable exploitation of the groundwater resources (incl. monitoring).

17. **The proposed project will provide support to 3 of the 6 countries participating in the SIIP, namely Chad, Mali, and Niger, because in these 3 countries expansion of irrigation from groundwater is expected to be the highest,**



and therefore the importance of improving sustainable groundwater management practices is the most urgent.

Mali, Niger and Chad, with less than 1 percent use of renewable groundwater resources according to some sources, are currently exerting very low hydrological pressure on groundwater resources. Today, in Mali and Niger, groundwater use at the national level accounts for 4 and 2 percent respectively of agricultural water uses, and 28 percent in Chad, against between 30 and 45 percent in the other Sahel countries. In addition, **water governance in Chad, Mali, and Niger generally neglects groundwater.** The three countries share a weak knowledge of the groundwater resource, and an extremely limited knowledge of its uses, except in some case of potable water uses. In Mali, UNDP financed a network of 230 groundwater level observation boreholes between 1981 and 1991, but it is outdated. No national groundwater quality monitoring program exists. Similarly, in Chad information on groundwater sources is generally scattered. None of the countries has developed plans for the management of the aquifers – whether deep or shallow, although for instance the Niger Water Charter addresses groundwater. The few available data are at the national level and most transboundary River Basin Organizations do not integrate groundwater in their mandate – if they do, little action to improve groundwater management follows. For instance, the Niger Basin Authority (NBA) has long engaged in surface water management, but only recently it has started working with the German Development Cooperation on an integrated water resources management program, which includes the protection of groundwater sources. Moreover, it is currently implementing a GEF grant on the Lullemeden basin. Similarly, the Lake Chad Basin Commission is executing now two GEF funded projects which are addressing groundwater knowledge and management.

18. The proposed GEF project with an estimated US\$13.58⁴ million has been structured around three main components, complementary to SIIP's project components (SIIP Component A: Modernizing the Institutional Framework, Component B: Financing Irrigation Investment Solutions and Component C: Information and Knowledge Management and Coordination). Each component includes a regional dimension, with a set of activities at local, national or transboundary level in the Sahel, and a global dimension aiming at developing guidance for assessing and governing groundwater in dryland regions in Africa and elsewhere.

- **Component 1: Assessment of groundwater resources at national and transboundary levels (GEF: US\$ 5,500,000).** This component focuses on the data needed to identify usable groundwater. It concerns the improvement of knowledge of groundwater availability in pilot areas and selected aquifers, in order to ensure the sustainability of uses, considering the constraints linked to the temporal and spatial variability of the resource, its cost of development and exploitation (including different green technologies), and its quality. At regional level, this component will provide regional and national policy makers and institutions with the information and knowledge base required to develop groundwater uses in a sustainable way. Specifically, the diagnostics will map groundwater resources, and distinguish between shallow and deep, renewable and non-renewable aquifers, and theoretically available versus economically exploitable groundwater. Moreover, the diagnostic will include estimates of groundwater demand versus water availability/recharge projections considering the high intra-annual and inter-annual variability of hydrological processes under the Sahelian climatic conditions rather than average conditions, as it is common practice. The diagnostic will help uniform the national hydrological databases, add data on quality, record existing uses, and – with the improved governance of component 2 – suggest provisions for data, information, and knowledge. These provisions will include mechanisms, arrangements, and tools for: (a) systematic data acquisition (time-independent data and monitoring); (b) on the basis of acquired data, adequate generation of information and knowledge on groundwater and its context; (c)

⁴ Reflects the rounded GEF Grant amount of US\$ 13,577,982 million



sharing data, information and knowledge (voluntary and legally binding arrangements) (Step 1 of FFA). This component will leverage existing knowledge and include the collection of new data on groundwater resources to eliminate the current bias and support improved planning and management, in order to help make more informed decisions on the sustainable development of groundwater-dependent uses in the selected countries. As part of this component, the project will also develop a methodology for groundwater resource assessments, considering the economic cost of extraction, the variability, and the quality of the resource (global activity).

- **Component 2: Groundwater governance at local, national, and transboundary levels (GEF: US\$ 5,500,000).** This component concerns the improvement of groundwater governance focused on the management of the risks linked to exploiting the resource (Step 2 of FFA) and includes the installation and capacity building of groundwater monitoring equipment. An initial diagnostic will assess the current groundwater governance situation in the areas concerned, in order to provide guidance to the next steps (Step 1 FFA). The diagnostic will lead to the participatory formulation of groundwater management plans (to be included in integrated water resources management plans) and the implementation of actions and reforms (pilot projects) to implement those plans. The project will implement 2-3 pilots per country, at least one of which will be in a transboundary aquifer. Within each country, we will choose the areas more suitable to irrigation developments, in line with the pilot areas selected by SIIP (see Box 2).

Box 2: Preliminary Pilot areas preselected by SIIP in Chad, Mali, and Niger.	
Chad	<u>Eastern region:</u> Ouadra, Wadi Fira, and Sila; <u>Central region:</u> Guera and Salamat; <u>Western region:</u> Hadjet Lamis and Chari Baguirmi; <u>Southern region:</u> Mayo Kebbi East and West, Tandjile, Logone Oriental, and Occidental
Mali	<u>Koulikoro region:</u> cercles Koulikoro and Dioïla; <u>Ségou region:</u> cercles Ségou and Barouéli ; <u>Office du Niger area.</u>
Niger	<u>Four administrative regions:</u> Agadez, Tahoua, Dosso and Tillabéri

These pilots will support SIIP pilots by improving governance of groundwater at different levels and providing measuring equipment. Amongst others, the GEF project will support groundwater management by **creating and/or strengthening local water committees**, with special focus on drinking water, irrigation, and pastoralism. The SIIP foresees to strengthen the local water resources management bodies in the zones where irrigation schemes will be developed through the adoption of a formalized water allocation process following the IWRM approach. The proposed GEF project will add to it, by helping these committees identify area-specific groundwater management issues and groundwater governance goals and priorities, set up systems to address these issues, and provide them with low-cost groundwater monitoring equipment (Step 3 FFA). These committees will therefore develop the groundwater management plans, which will also include provisions for how to strengthen the financial sustainability of the committees and ensure the maintenance of the equipment. A **national framework** needs to support and ensure the sustainability of these committees, via integrated legislation, regulations, and enforcement. Therefore, the project will provide capacity building at the national level in the 3 selected countries, to promote the integration of groundwater monitoring and sustainable use in national water management strategies. Trainings at the national level will include strengthening the capacity of governments to implement, administer, and enforce groundwater legislation and regulations. At the **transboundary** levels, the project will support the co-management of a shared aquifer with the development of a shared plan amongst riparian countries (for instance, the lullemeden aquifer), which includes reaching consensus on required aquifer services and planning objectives and drawing common management strategies, including specific monitoring needs and associated finances (Step 5 FFA). As part of improved transboundary governance, so to ensure a more sustainable collective management of the shared aquifer, the projects will provide shared training on



groundwater monitoring and sustainable exploitation techniques. Several guidelines will be produced within these component (global activities): (i) guidelines for governance diagnostic; (ii) guidelines on FFA implementation for irrigation & pastoralism in drylands; (iii) guidelines for voluntary code of conduct for agricultural groundwater use in dryland conditions. In addition, the component will develop recommendations on the role of regional and river basin agencies in groundwater management (i.e., ECOWAS, SADEMAC, OSS, OMVS, etc).

- **Component 3: Project Coordination and Knowledge Management (GEF: US\$ 2,577,982).** This component focuses on project management, monitoring and evaluation of project activities, extracting and disseminating lessons learned from project implementation, and sharing experiences between Sahel countries and other arid regions of Africa and of the world. This component will also include activities on building awareness/dissemination/capacity building on FFA (global activity). This component will also support the M&E system for the GEF, reporting requirements, and sharing of results and knowledge gained through the project by participation in IW-Learn activities (1% of the GEF grant). Activities will be implemented in collaboration with global partners such as the FAO, UNESCO, IWMI and specific tasks and roles will be defined during project preparation.

19. **Regional and Global dimension:** The project will receive USD 13.58 M of GEF financing, of which USD 10 M will cover the local, national, and the regional dimension and the remaining USD 3.58 M will be devoted to global activities. CILSS, and/or OSS (to be defined during preparation) will support regional and national activities. The proposed project will also engage international partners of the Global Groundwater Governance alliance⁵ and GRIPP⁶ in the design and implementation of the FFA at local level as well as the drawing of lessons and dissemination of results. Implementation of global activities will involve key partners (FAO, IWMI, and others) to ensure that activities are delivered in synergy with ongoing and existing work. FAO is expected to support the development of a voluntary code of conduct and involvement of the agricultural supply chain in promoting good governance, UNESCO will contribute to groundwater knowledge and governance assessments, and IWMI is expected to contribute to the governance challenges and opportunities of solar pumping and in awareness and dissemination. In addition, the SIIP financing will also provide support to complement various activities under components 1, 2 and 3., ensuring synergy with ongoing and existing work. Table 1 below summarizes the potential project's activities at the local/national/regional and global levels.

Table 1: Preliminary Component summary of national, regional and global activities.

	Local, National, regional USD 10 M	Global Activities USD 3.58 M
Components	Potential partners: OSS, CILSS	Potential partners: FAO, UNESCO, IWMI
1- Assessment of groundwater resources at national and transboundary levels	<ul style="list-style-type: none"> • Assessments of shallow & deep, renewable & non-renewable groundwater resources considering variability, cost and quality (in pilot areas and selected aquifers) 	<ul style="list-style-type: none"> • Develop methodologies for groundwater assessments (variability, cost, quality)

⁵ FAO, UNESCO, World Bank and International Association of Hydrogeologists (IAH)

⁶ The Groundwater Solutions Initiative for Policy and Practice (GRIPP) partnership is led by IWMI and aims to advance the agenda of sustainable groundwater management at a global scale



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	<ul style="list-style-type: none"> • Arrangements for data acquisition, compilation, management, processing & sharing 	
2- Groundwater governance at local, national, and transboundary levels	<ul style="list-style-type: none"> • Conduct groundwater governance diagnostics • Install Groundwater monitoring systems • Establish (and train) local water committees • Develop local groundwater management plans • Implement groundwater management plans (in the selected pilots) • Capacity building at national level • Support transboundary management and shared planning and training 	Operationalizing FFA, by: <ul style="list-style-type: none"> • Develop methodology for groundwater governance diagnostics • Develop voluntary code of conduct for agricultural/pastoralist groundwater management • Develop guidelines for groundwater governance and solar pumping • Develop guidelines for the role of river basin organizations in groundwater management
3- Project Coordination and Knowledge Management	<ul style="list-style-type: none"> • Project management • M&E 	<ul style="list-style-type: none"> • Lessons learned & dissemination • Building awareness on FFA

20. Gender inclusion. The project design is gender sensitive and will assess during preparation the implications for women and men of any planned action, including legislation, policies and activities on the ground at all levels. Particularly noting that land rights are linked to water rights and these have implications for access to land and water, access to credit, access to irrigation technology etc. In the Sahel, access to water has major implications as women are generally in charge of fetching water and running small vegetable gardens. Often, the needed water comes from groundwater. Therefore, although over extraction negatively impacts the poorest and most vulnerable groups, because they cannot afford to dig deeper, women are especially affected because they need to fetch it from further away. This project will pay particular attention to the gender dimension, particularly through *Component 2 Groundwater Governance at local, national, and transboundary levels*. For one, the governance diagnostic will also include a section on the gender barriers and based on that, the implementation of the pilots will address any emerging issues. Indeed, gender-sensitive groundwater development and management help secure and protect groundwater access. An institutional approach to groundwater development and management that puts gender at the center stage facilitates the representation and participation of women in aquifer management, so that groundwater priorities of men and women for different activities (such as irrigation versus domestic supply) are both considered in planning. The project design will lay emphasis on the gender dimension through both ensuring equal representativeness in the local water committees and including gender equality issues in the groundwater management plans.



21. **During project preparation and implementation, this WB-GEF project will coordinate closely with other development partners supporting groundwater management in the Sahel to maximize synergies and avoid duplication.** Moreover, the WB-GEF project will coordinate closely with other development partners supporting groundwater management in the Sahel (GIZ/BGR, AfDB/GEF projects, IUCN/UNDP/Volta GEF project) to maximize synergies and avoid duplication. For instance, recently, BMZ/GIZ has funded a project specifically on groundwater in Lake Chad, which aimed at strengthening the capacity of Lake Chad Basin Commission to coordinate the exchange of groundwater data between member states, integrate them in a management system, and elaborate water resources strategies of sustainable character (ended in July 2017). Although this project will likely not cover the Lake Chad Basin, we will coordinate with BMZ/GIZ to exchange lessons learnt. It will also work in close coordination with the GIZ groundwater project with the Niger Basin Authority (NBA), to avoid overlapping and maximize the use of resources. Similarly, the GEF/UNDP-UNEP Niger lullemeden project which is under preparation will support conjunctive management considerations, so the project will coordinate with them too during preparation. The GIZ project will support the collection of all existing documents, data, and maps in the basin; identify areas where groundwater creates conflicts, and provide capacity building at transboundary and local levels. The "Observatoire du Sahara et du Sahel" (OSS⁷) coordinates the management and protection of groundwater in several aquifers in the region. It has recently concluded extensive studies on the lullemeden aquifer. The OSS is also one of the suggested implementing agencies, precisely for its long-term experience in dealing with groundwater management in the region. Finally, GEF is supporting two efforts in the Lake Chad basin, one being implemented by AfDB⁸ and the other by UNDP⁹. These two projects aim respectively at improving knowledge and governance of the basin, including its groundwater sources. GEF is also supporting the World Bank in the Sahel and West Africa Program in Support of the Great Green Wall Initiative and the Food Security IAP program¹⁰, which target amongst others rural development and small holder agriculture, and will provide important lessons learnt for the design of this GEF project.
22. The **regional approach** is preferred to complement and extend the benefits of individual national interventions, as well as reflecting the important transboundary nature of many aquifers in the Sahel region. All three components will benefit from regional technical assistance and cross learning activities. The regional dimension of the project is critical in the implementation of this project, notably by fostering exchange of experience among institutions built or strengthened in participating countries. It will help the policy dialogue on groundwater governance issues among the 3 countries. Actual activities will include: (i) data sharing; (ii) preparation of tools and guidelines; (iii) development of joint groundwater management plans; (iv) provision of training of trainers; (v) facilitation of exchange of experience through study tours and the delivery of cross learning events; (vi) designing and carrying out communication and advocacy campaigns.

⁷ OSS is a Tunis-based international, **intergovernmental organization** established in 1992. It specializes in environmental monitoring and natural resource management, with a focus on land and water. The organization operates in Africa's **Sahel-Sahara region**. Its ongoing Water Program aims of bridging knowledge gaps on the Sahara-Sahel region's transboundary aquifer basins. Directly relevant to the Sahel GW project are its activities related to the **lullemeden and Taoudeni-Tanezrouft aquifer systems (GICRESAIT)** and the **Senegalo-Mauritanian Aquifer System (SASM)**.

⁸ <https://www.thegef.org/project/regional-project-conservation-and-sustainable-development-lake-chad-enhancing-transboundary>

⁹ <https://www.thegef.org/project/improving-lake-chad-management-through-building-climate-change-resilience-and-reducing>

¹⁰ <https://www.thegef.org/project/food-iap-fostering-sustainability-and-resilience-food-security-sub-saharan-africa-integrated>



SAFEGUARDS

A. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The project includes three Sahel countries (Chad, Mali, and Niger) and will provide equipment and trainings to improve the knowledge and governance of groundwater (incl. transboundary aquifers), so to avoid overexploitation and ensure its sustainable management.

The Sahel region is mostly semi-arid land, a number of important ecosystems that are dependent on groundwater and local people for whom the durable access to water resources is a serious concern. The project, during preparation and implementation stages, is not expected to have any negative impacts on either groundwater-dependent ecosystems, forests, natural habitats, safety of dams, physical cultural resources and/or indigenous peoples with its regional approach and its three components: (i) Assessment of groundwater resources at national and transboundary level, (ii) Groundwater governance at local, national, and transboundary level, and (iii) Project management, lessons learned, and experiences sharing.

B. Borrower's Institutional Capacity for Safeguard Policies

Safeguards capacities vary across the selected countries. In Mali, the National Directorate for Sanitation, Control of Pollution and Nuisances (DNACPN) is the national institution in charge of ESIA (validation and monitoring of the implementation of ESMP). The DNACPN has regional structures (DRACPN), which could reinforce its operationality in terms of proximity in the conduct and especially the monitoring of the implementation of the activities on the ground. However, there are few critical analyzes to better assess the actual capacities of this structure for these kinds of projects and programs in the groundwater sectors sector.

In Niger, the country has an environmental ministry. There is a certain disparity between the different actors in terms of environmental and social assessment and management. Some actors, including the BEEEI (the national agency responsible for environmental assessments), whose primary mission is to ensure that environmental and social concerns are taken into account in the implementation of development actions, have a real potential in this field. They can therefore be used as a support for capacity building of other actors as rural communities involved in the project.

In Chad, the Ministry of Agriculture and Environment has a General Directorate for the Environment (DGE), which comprises five technical departments dealing specifically with environmental and natural resources management issues. The CEO has technical staff trained on environmental and natural resources management. However, their capacities will have to be strengthened on the World Bank's environmental safeguards policies.

The modest scale of the potential impacts is such that capacity should not be a serious constraint as long as due consideration is given to safeguards issues

C. Environmental and Social Safeguards Specialists on the Team

Alexandra C. Bezeredi, Social Safeguards Specialist

Emeran Serge M. Menang Evouna, Environmental Safeguards Specialist



D. Policies that might apply

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Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The component 1 of the current project aims at improving knowledge about groundwater availability in order to ensure the sustainability of uses, considering the constraints linked to the temporal and spatial variability of the resource, its cost of development and exploitation, and its quality. Based on that component, the ongoing World bank funded operation is mainly a Technical Assistance(TA). However, the component 2 includes activities that may have potential adverse impact on environment components. For instance, there are the installation of groundwater monitoring equipment in the 2-3 pilots per country. Those sub-projects may induce potential impacts on environment components. The project activities are expected to have positive social results, but there may be some low to moderate social impacts associated with the aquifer management, which will be assessed further. As Integrated Water Management Plans will be prepared, the proper safeguard instrument to develop is a Strategic Environmental and Social Assessment(SESAs). However, only the terms of reference (ToR) for a SESAs will be developed at this stage for each country. After its preparation, each ToR will be reviewed, consulted upon and disclose within each country and at the World Bank’s website prior to Decision meeting. But the SESAs themselves will be carried out as part of the project implementation.
Natural Habitats OP/BP 4.04	No	The project does not involve natural habitats.
Forests OP/BP 4.36	No	The project does not affect or involve forests.
Pest Management OP 4.09	No	The project does not involve pest management
Physical Cultural Resources OP/BP 4.11	Yes	The use of equipment for the groundwater monitoring will involve excavation. Taking into account that factor, the policy on physical cultural resources is triggered because it could induce to vestiges discoveries. However, the triggering of this policy does not entail the preparation of a specific safeguard instrument. A chapter will be included in the ESMF to provide guidance in case physical cultural resources will be discovered.



Indigenous Peoples OP/BP 4.10	No	None of three countries hosts Indigenous people as defined by the World Bank policy.
Involuntary Resettlement OP/BP 4.12	TBD	The project is not expected to require land acquisition leading to physical or economic displacement. This will be confirmed at appraisal.
Safety of Dams OP/BP 4.37	No	The project does not involve or depend on dams. The monitoring equipment that will be implemented in ephemeral stream beds close to rural communities are not expected to affect or cause any damage on dams.
Projects on International Waterways OP/BP 7.50	Yes	The project will pilot groundwater resources' monitoring in at least one transboundary aquifer in the Sahel, which will be chosen during preparation.
Projects in Disputed Areas OP/BP 7.60	No	The project will not be located in a Disputed Area.

E. Safeguard Preparation Plan

Tentative target date for preparing the Appraisal Stage PID/ISDS

Dec 31, 2017

Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing should be specified in the Appraisal Stage PID/ISDS

Terms of Reference (ToR) of a Strategic Environmental and Social Assessment (SESA) are expected to be prepared, reviewed and disclosed in each country during the preparation phase (prior to Decision Meeting) . The SESA themselves will be developed during the project implementation phase and, for each country as part of projects activities.

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Borrower/Client/Recipient

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CILSS Interstate Committee for Drought Control in the Sahel

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