



## WAIPRO

“Improving food security in West Africa through revitalizing irrigation systems performance and productivity and promotion of agricultural water and small-scale irrigation”

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## Project Document

**Applicant:** Comité Inter-Etats de Lutte contre la Sécheresse au Sahel (CILSS)  
And International Water Management Institute (IWMI)

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**Project duration:** Phase 1: 12 months (2009/2010)  
Phase 2: 12 months (2010/2011)

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## Summary

This project aims to improve the performance and productivity of selected irrigation schemes through identifying and implementing targeted interventions in two West African countries, namely Burkina Faso and Niger. The interventions will be implemented through a consortium of relevant institutions involving National Agricultural Research and Extension Systems, irrigation management institutions, and NGOs with expertise capable of revitalizing existing irrigation systems under the leadership and support of the Comité Inter-Etats de Lutte contre la Sécheresse au Sahel and the International Water Management Institute.

Plans will be developed and implemented in Burkina Faso and Niger, with the intention that the lessons learned are up-scaled and out-scaled both within the project countries and throughout the West Africa region. It will help these countries to tackle the growing food insecurity and poverty crises by systematically identifying impediments to irrigated agricultural productivity and efficiency of irrigated crops (mainly rice).

The project consists of three interconnected strands of activities. These are:

**Activity 1:** Diagnostic activities involving scoping study, participatory analysis of constraints and opportunities of existing irrigation systems.

**Activity 2:** Based on the insights obtained from **Activity 1**, develop intervention plans, and implement the same in pilot irrigation systems in Burkina Faso and Niger.

**Activity 3:** Capacity building, synthesis, dissemination and communication of the lessons learned and the experiences gained from the pilot implementation.

**Activity 4:** Promotion of agricultural water and small-scale irrigation in the Sahel

More intervention areas will be defined following participatory diagnosis of constraints and opportunities but the following **priority interventions** are already identified through engagement with partners:

- Improving water conveyance and distribution systems and in-field water management
- Strengthening Water Users Associations
- Enhancing linkages with support services

It will incorporate a strong element of ensuring solutions are environmentally and economically sustainable. The project to succeed will be built through a strong lead of the Comité Inter-Etats de Lutte contre la Sécheresse au Sahel (CILSS), supported by the International Water Management Institute (IWMI) in collaboration with CORAF stakeholders: Institut National de Recherche Agricole du Niger (INRAN), and the Institut de l'Environnement et de Recherches Agricoles (INERA) in Burkina Faso. Implementation of this project will be done by the Direction du Développement de l'Irrigation (DDI) in Burkina Faso and the Direction du Génie Rural (DGR) and the Office National des Aménagements Hydro-Agricoles (ONAHA) in Niger. Dissemination will be carried out by the Association Régionale pour l'Irrigation et le Drainage (ARID) and the Réseau des Organisations Paysannes et des Producteurs Agricoles de l'Afrique de l'Ouest (ROPPA) through their national focal points and ECOWAS. IWMI will consult with the Africa Rice Center (WARDA) and IFDC regarding the use of best agronomic practices. Farmers will be full

partners in the process. Given the gender imbalance of African smallholders, attention will be given to partnering with women farmers. The project's vision is to: enhance the capacity utilization of existing irrigation systems, increase irrigated crop yields, increase farmers' income, reduce farmers' vulnerability to droughts, reduce consumers' vulnerability to current food price hike, and enhance national governments foreign exchange reserve through boosting domestic rice production and sustain water management. Thus, the project contributes to the Initiative to End Hunger in Africa (IEHA), specifically programmatic areas related to agricultural sector productivity and agricultural sector enabling environment.

## **1. Background and justification**

West Africa is home to some 254 million people. The economies of the countries are characterized by low per capita income and high population growth rate of 2.6%, which is above average for Africa. In most of the countries, more than 70% of the population is living below the poverty line, especially in the Sahel, and is predominantly engaged in subsistence farming with few immediate options for employment outside of agriculture. Persistent droughts and crop failures are frequently recorded, especially in the Sahelian and Sudano-Sahelian zones. The recent increases in food and fuel prices have exacerbated the already grim socio-economic situations.

Common features of the West African countries are: (1) agriculture is mainly rainfed and they have not taken full advantage of their irrigation potential; (2) alleviation of pervasive poverty and ensuring sustainable food security are key government development goals; (3) their economies remain vulnerable to global commodity price changes; and (4) the production volume of rice, one of the most important staple cereal crops, cannot match the ever increasing demand, forcing many of the countries to rely on imports to bridge the consumption-production gap (see figure 1).

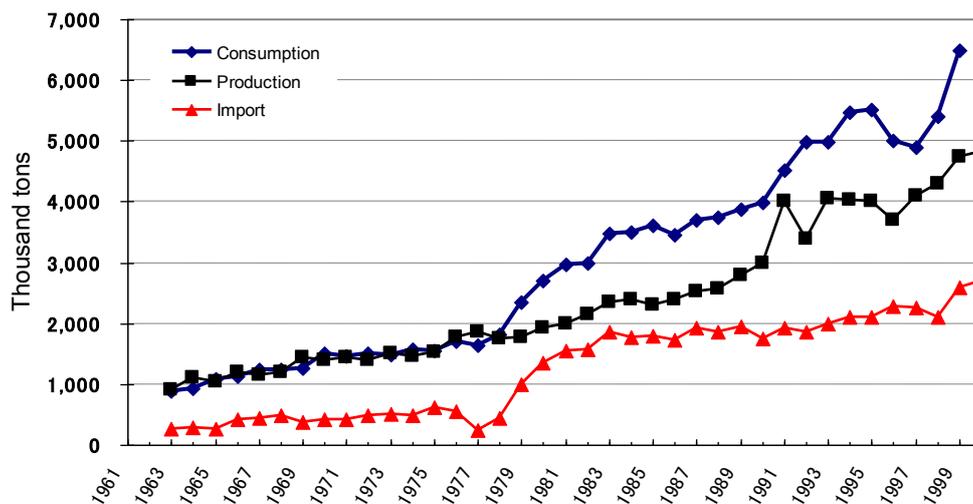


Figure 1. Rice consumption, production and import trends in West Africa (WARDA, 2000).

### 1.1. The state of irrigation development in West Africa

In West Africa, rice is the main irrigated crop and its production has more than doubled from 3.69 million to 7.45 million tons between 1984 and 2000. However, the productivity of existing irrigation systems is by far below the acceptable performance standards for many reasons: they suffer from serious capacity underutilization; crop yields are extremely low; risk and uncertainty high; and water conveyance and water use efficiencies are among the lowest in the world. Examples of failed irrigation systems in West Africa are numerous. For instance in Nigeria, by 1990, 162 dams had been constructed with a total storage capacity sufficient to irrigate 725 000 ha. By 2004, only about 20 percent of the area planned for public sector irrigation had been developed and only 32 percent of the developed area was being irrigated. In Ghana, the actual irrigated area is only 61% of the equipped area. Hence, there appears to be a relatively high potential for enhancing food security and poverty reduction through **revitalizing irrigation systems' performance and productivity.**

At present, many countries in West Africa have rapidly growing populations with increasing food requirements that exceed the food production capacity of low-input rain-fed farming. To keep pace with the growing food demands and the high climatic variability of most West African farming systems, irrigation remains an indispensable constituent of the overall strategy for increasing food production.

### 1.2. Trends in rice production and consumption in West Africa

Rice is the most important agro-food import, representing around 20% of agricultural imports within the sub-region throughout the last thirty years. With an amount close to one billion US Dollars in the recent years, rice imports weigh heavily on Western African countries' currency reserve. Initially triggered by the food crisis of early seventies, the rapid growth of rice imports responded to an increasing demand induced by a change in West African consumers' behavior. Since 1973, regional demand has grown at an annual rate of 6.0%, driven by a combination of population growth (2.9% growth rate) and substitution away from the region's traditional coarse grains. During the 1970's, the number of rice fields increased,

however the rice yield in the region was as low as 1.64 t/ha, which is roughly 73% of that produced throughout Africa on average (2.25 t/ha). The deficit between rice production and consumption is increasing annually by 0.11 million tons in West Africa. Rice production will need to be increased further to meet this growing demand.

In addition to the inefficiencies of existing irrigation systems, food security and poverty reduction impacts of the domestic rice sector are compromised by inefficiencies in support services including markets, processing facilities (including lack of appropriate post-harvest handling technologies), the extension system, and financing. The relative severities of these constraints vary from country to country and among irrigation schemes, necessitating a more thorough diagnosis of these challenges before considering any major short-cut solutions.

The main premise of this project is that irrigation interventions are most effective when the producers are facilitated to extract more value out of production or move-up the value chain. The central question is how can we improve performance and the productivity of existing irrigation systems so that a country's food security situation is improved?

## **2. Goal**

The overall goal of this project is to identify and implement feasible interventions that can revitalize the performance and productivity of irrigation systems.

## **3. Project objectives**

The specific objectives of the project are:

- 1 To improve the performance and productivity of existing irrigation schemes through appropriate technological, managerial, and institutional innovations.
- 2 To increase irrigated crops (mainly rice) production and farmers' income and provide countries with harmonized policies, tools and references to better manage water resources

## **4. Activities and methodology**

The project consists of three main complementary activities, which involve several sub-activities or tasks.

**Activity 1 (A1):** Participatory analysis of constraints and opportunities of existing irrigation schemes and development of intervention plans

**Activity 2 (A2):** Implementation of interventions for increasing overall system productivity and performance in selected irrigation systems

**Activity 3 (A3):** Capacity building, synthesis and knowledge sharing

**Activity 4 (A4):** Promotion of agricultural water and small-scale irrigation in the Sahel

## **Coordination and management of project**

As the lead institution of the project, CILSS will provide overall project governance and coordination, including acting as secretariat for the Country Steering Committees of the Project. In that capacity, CILSS will take part in the Project Steering Committee meetings, and provide, jointly with IWMI, for the project monitoring in the countries and final evaluation of the project.

The proposed project will be implemented in the Sahel Region targeting two West African countries, i.e. Burkina Faso and Niger.

### **Activity 1 (A1): Participatory analysis of constraints and opportunities of existing irrigation schemes and development of intervention plans in three West African countries (IWMI in collaboration with NARES)**

#### **A1.1. Participatory rapid diagnosis and action planning for irrigated agricultural systems**

Constraints limiting the optimal contribution of irrigation schemes to food security and rural poverty reduction in the study countries will be identified. These constraints will be conveniently classified into groups (i.e., biophysical constraints, institutional constraints, and design and management related constraints) to facilitate the conceptualization of the necessary interventions for improving irrigation performance. In diagnosing the constraints and opportunities of the irrigation systems, we will follow “Participatory Rapid Diagnosis and Action Planning for Irrigated Agricultural Systems (PRDA)”, which is a methodological manual developed by IWMI based on the experiences of irrigation modernization projects carried out in many sub-Saharan African countries (Van der Schans and Lemperiere, 2006). PRDA is a method for analyzing and improving the performance of an irrigation scheme together with farmers. PRDA makes a diagnosis of the main constraints of the irrigation scheme, which generates an action plan for improvement.

#### **A1.2. Performance benchmarking**

Diagnostic activity (A1.1) will be complemented by performance benchmarking analyses, which involves identification and application of irrigation system specific best practices with the goal of improving the competitiveness, performance and efficiency of irrigation systems. It implies comparison, either internally with previous performance and desired future targets, or externally against similar irrigation systems. The benchmark irrigation schemes could be selected from within the project countries, from other countries within West Africa or even from other comparable developing countries. Benchmarking is a continuous process that involves: internal assessment of irrigation systems, comparing irrigation systems with the best practices of more successful similar systems, determining performance gaps between current practices and best practices, and selecting and tailoring the best practices to fit the irrigation system and implementing them. The benefits of benchmarking performance are more productive and efficient use of land, water, labor, finance, and agricultural inputs, leading to more productive and sustainable irrigated agriculture and improved livelihoods and well-being of the rural population.

Following the guidelines specifically developed for this purpose (Molden et al., 1998; FAO 2001), the benchmarking process will be implemented in six steps: identification and planning, data collection, analysis, integration, action, and monitoring and evaluation. For each of the countries, a National Focal Unit (NFU) will be identified to access the database and a webpage holding information about selected irrigation schemes across the developing world including few schemes from sub-Saharan Africa (See <http://oibsv2.iwmi.org/>). CILSS and ECOWAS in partnership with IWMI and NFU will handle this webpage, maintain and update the database with fresh data from the irrigation schemes even after the completion of the project. This will enable the irrigation scheme managers to periodically monitor the performance level of their schemes either over time relative to their past performance or relative to comparable best schemes in the country or elsewhere.

### **A1.3 Analysis of the productivity and profitability of irrigated rice and vegetables**

The productivity and the profitability of irrigated agricultural enterprises are partly influenced by the level of irrigation system performance. To gauge the influence of farm and field level variables, a sample of irrigated rice and/or vegetables farms/fields will be randomly drawn to gather the requisite data for enabling productivity and profitability analyses. A multivariate analysis will be used to determine yield influencing factors and their quantitative significance.

In each of the project countries, a consortium involving relevant research, extension, development, policy institutions, and NGOs will be established to implement identified interventions. The International Water Management Institute (IWMI) together with CILSS will facilitate the creation of the consortium and oversee the overall functioning of the consortium. The consortium will work hand-in-hand with irrigation farmers and irrigation system managers to identify solutions for significant production and management constraints of irrigation schemes. The choice of intervention areas will be guided by criteria such as: potential impacts, conformity with the level of resources, and the project time frame. At a minimum, we will include the interventions described further in section A2 and A3 below.

### **Activity 2 (A2) Implementation of interventions for increasing productivity and performance in selected irrigation schemes (Implementing agencies: DDI, DGR and IWMI)**

Following the diagnostic activities (A1), a complete picture of the constraints and opportunities within irrigation systems will emerge. Based on the knowledge gained from those activities, integrated interventions will be developed and implemented in sample irrigation schemes in Burkina Faso, and Niger (Table 1). For Niger in particular, the project intends to contribute to Niger's Rural Development Strategy, which targets food security through more efficient management of water resources. Niger Rural Strategy document has three strategic priorities:

1. Facilitating access of rural populations to economic opportunities so as to establish favorable conditions for sustainable economic growth in rural areas
2. Preventing risks, improving food security and managing natural resources sustainably in order to increase security and living conditions for the population, and
3. Reinforce capacities in public institutions and rural organizations in order to improve rural sector management

The current project is well in line with these priorities.

Table 1. Selected irrigation schemes in Burkina Faso, and Niger.

Country	Irrigation scheme	Developed area (ha)	Area in use (ha)	Number of farmers
Burkina Faso	Périmètre irrigue rizicole de Karfguela	350	350	730
	Périmètre irrigue rizicole de Mogtedo	110	110	378
Niger	Dayberi (Tillabéri)	350	309	660
	Chetimari (Diffa)	55	55	212
	Djirataoua (Maradi)	500	530	2120
	Galmi (Tahoua)	250	250	845
Total		1615	1604	3219

In each of these schemes, the project will work at the farm and scheme levels. At field level, we plan to carry out a set of interventions leading to improved water application and reduced water losses (e.g. bunding, leveling, etc), and improved agronomic practices (plowing, seeds, fertilizer application, planting dates, etc). The exact content of these interventions will be further clarified following the implementation of the diagnostic activities (Activity 1).

### **A2.1 Improving water conveyance and distribution systems and in-field water management (Implementing agencies: DDI, DGR)**

The study irrigation schemes face several challenges and constraints. Some of these constraints are unique to an irrigation scheme, while most of the observed constraints are common to all. Critical constraints that are most common are low water availability and inequitable water distribution, which are the result of several interrelated factors as detailed in Box 1.

#### **Box 1: Irrigation systems constraints**

<ul style="list-style-type: none"> <li>• Sub-standard construction (low levels of expertise, deficient planning and implementation, lack of participation by beneficiaries in design and construction, poorly adapted construction equipment)</li> <li>• Water overflow and inundation of farms</li> <li>• Canal deterioration (heavy seepage from canals)</li> <li>• Lack of water control structures, such as sluices or water gates</li> <li>• Lack of water measurement instruments</li> <li>• Reservoir and canal siltation</li> <li>• Protection dyke breakage</li> <li>• Unleveled plots and fields</li> <li>• Lack of sufficient finance for regular maintenance work</li> <li>• Poor operation and maintenance</li> <li>• Poor drainage caused siltation</li> <li>• Reservoir catchment management and reduced capacity of reservoir (farming within catchment area due to limited irrigated land, grazing activity by animals, sand winning in and around the reservoir, siltation of the reservoir)</li> <li>• Low reservoir recharge (desertification of catchment area)</li> <li>• Broken-down irrigation facilities</li> </ul>
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- Animal grazing (increased herd size)
- Deteriorated irrigation facilities, ageing pumps
- Lack of replacement plan for equipment (e.g., pumps)
- Lack of allowance for pump depreciation in setting water user fees
- Structures damaged by animals
- Broken spillway
- Poor weir design at intake
- Poor water delivery (broken main canal, laterals, culvert; damages by farm machineries)
- Natural hazards (floods, choked drains, silted canals)

Identifying all of the solutions to the constraints enumerated in Box 1 may be unrealistic given the project duration and the financial resources available to this project. Therefore, the project will focus on maintenance and repair, which can be accomplished by mobilizing communities and using their available resources, as well as leveraging available financial resources for this project.

This project, through its diagnostic activities (**Activity 1**) will: identify irrigation seepage hotspots; assess the performance of hydraulic structures; identify realizable irrigation water savings and develop farming systems with reduced deep drainage losses and improved irrigation scheduling. We will link irrigation system managers with leading actors in irrigation modernization (e.g., institutions and consultants) that are capable of providing low-cost solutions.

One of the pervasive problems in irrigation systems is the reduction in reservoir capacity due to human and livestock activities in reservoir catchments. This project will endeavor to limit cultivation practices in catchment areas of reservoirs by expanding irrigated land through improving the capacity utilization of the developed or equipped irrigation areas. Irrigation areas must be increased to accommodate more farmers.

### **A2.2 Strengthening Water Users Associations (WUA) (IWMI, NARES and implementing agencies: DDI, DGR)**

There are different farmer based organizations instituted to facilitate the management of water infrastructure either on their own or in partnership with the government according to some set rules defining the responsibility of each party. Often this partnership is not smooth resulting in poor maintenance and operation of the irrigation systems due to inadequate funds for maintenance. The effectiveness of the WUAs is often sub-optimal due to a myriad of reasons (See Box 2).

#### **Box 2: Constraints facing WUAs**

- Lack of experience in irrigated agriculture
- Inability of farmers to adhere to cropping calendar
- Competition among users for limited water and land (competition between herders and farmers; between farmers and fishing folks; between head and tail enders)
- Poor maintenance management
- Poor financial management
- Lack of transparent water allocation rule
- Non-compliance to the agreed water allocation rule
- Weak compliance to rules and regulations governing the cooperatives, low social cohesion
- Superimposition of formal laws and rules on traditional rules
- Unrealistic water system user fees

- Non-existence of hydraulic extension service
- Poor definition of roles
- Inefficient water management (poor choice of equipment and lack of organization of water users on tertiary structures)
- Incompetence of management committees and village associations (illiteracy, lack of training, poor social cohesion, lack of incentives)
- Unpaid water system user fees
- Poor irrigation service cost recovery, lack of sanction for non-payment
- Lack of transparency in use of fees, utilization of fees for other purposes ,
- Low crop yield
- Low price received for the produce

A system of equitable water distribution could be developed by training the outlet committees and WUAs, and by having regular communication between them, the other farmers and the staff of the irrigation and agriculture departments. Proper functioning of the outlet committees and the water user associations would create the community awareness needed for overall improvements in agricultural production. An appropriate irrigation schedule corresponding to the cropping pattern will be proposed. Operation and maintenance of the system by the beneficiaries could be developed following the establishment of appropriate water charges and the training of farmers and extension agents.

The project will:

- Review the rules and bylaws of WUAs and suggest potential improvements including application of effective sanctions against the defaulters of irrigation service cost fees.
- Set-up the method for irrigation service charge estimation (preparation of account book, bills, receipts for improvement of irrigation service cost recovery).
- Facilitate the resolution of conflicts among irrigators, fishing folks and herders.
- Improve productivity of irrigated farming through **Activities A2.1, A2.2, and A2.3**, so that the farmers can have the ability to pay irrigation service charge.

### **A2.3 Enhancing linkages with support services (NARES in collaboration with WARDA and IFDC)**

In almost all of the sample irrigation systems (even though the severity may vary), weakness of the support services such as research and extension liaison, credit facilities, and input and output marketing is well documented. The consequences of these weaknesses are: (1) suboptimal utilization (low demand for) of yield boosting inputs such as improved seeds, fertilizers, farm machineries and crop protection chemicals. These inputs are in the first place not readily available, and if available, are usually perceived too costly by farmers.

The project will partner with the NARES in collaboration with WARDA and IFDC to enhance the availability and utilization of these inputs. The specific steps will involve:

- Improving research-extension farmer linkage so that the farmers have access to improved seeds and fertilizer technologies and good agronomic practices.
- Introducing innovative ways of affordable seed multiplication and quality control mechanisms.
- Improving input credit facility based on international or regional experience.

### **A2.3.1 Participatory on-farm fertilizer trials to refine recommendations**

Present nutrient management recommendations for irrigated crops are typically uniform for large regions and are often outdated, based on experimental results from non-representative locations, and not season specific. Moreover, the recommendations are made based on technical optimum or the physical productivity alone while it is known that farmers base their fertilizer rate decisions on input and output price relations. Since the fertilizer inputs are becoming more and more expensive, farmers often endeavor to economize on its utilization. Substantial efficiency increases can be achieved with site- and season-specific nutrient management approaches. Experimental and simulation studies in West Africa have shown that field-specific fertilizer management and an economically optimal target yield resulted in substantial average yield increases over the existing uniform recommendation. Non-season-specific recommendations accounted for 12% of net benefit loss, whereas lower spatial precision contributed 7% to the net benefit loss (Haefele and Wopereis, 2005). Thus, this project will initiate fertilizer experiments to refine the existing fertilizer recommendations. The adoption of the refined fertilizer recommendation is expected to increase production and farmers income. These experiments will be implemented by INERA in Burkina Faso and INRAN in Niger. IFDC will assist in the definition of the treatments and the design of the trials.

### **A2.3.2 Participatory variety adaptation-cum-demonstration trials**

Access to improved seeds has always been a problem in Africa, despite the significance of the technology in improving productivity farm income and food security. Improved varieties are often available at the agricultural experiment stations but there is institutional deficiency in multiplying and distributing these technologies. Thus, in cooperation with relevant National Agricultural Research and Extension Systems of Burkina Faso and Niger, the best available varieties of irrigated crops will be demonstrated to the farmers through implementing trials. Field days will be arranged to expose farmers to these varieties. The varieties preferred by farmers would be made available through connecting them with seed producers and dealers.

## **Activity 3 (A3) Capacity building, synthesis, and knowledge sharing (IWMI, NARES and ARID)**

### **A3.1 Targeted training**

**Farmer training:** In each scheme, about 50 farmers will be selected for training in contemporaneous in-field water management technologies or practices and improved agronomic practices (including efficient soil nutrient management, crop protection practices, appropriate timing of operations, variety selection). State-of-the art technologies for water management and soil nutrient management will be acquired and demonstrated on selected farmers' fields (about five from each of the sample schemes).

The trained farmers and those benefiting from technology demonstrations are expected to share the knowledge acquired with their peers. This will be done through facilitating farmer field days, establishing farmer learning groups, seminars, workshops, forums, observational study tours.

**Training to private sector organizations or individuals:** The project provides targeted training for entrepreneurs and firms connected to irrigated-agricultural production through output marketing, input supply and processing. It helps build the capacity of private sector organizations to create supportive environment for the marketing and trade of irrigated agricultural products. For instance, one particular concern is the interference of tractor plowing operations with on-farm water control structures such as bunds. Special training would be arranged for tractor owners and/operators to ease this problem.

### **A3.2 Synthesis, dissemination and communication**

The lessons learned from the diagnostic activities and the experiences gained from implementation of interventions would have wider relevance beyond the project member countries including the rest West Africa and even sub-Saharan Africa. Therefore, these lessons and experiences will be distilled and disseminated through various forums and media.

Throughout the project, the project partners will distill a set of key knowledge products that will support the re-vitalization of existing irrigation system. These products will be disseminated through regular project progress reports to USAID, project workshops, websites, country policy dialogues, and outreach sessions at key national, regional and international events. The project will also build on several innovative research dissemination techniques currently in use in other CGIAR projects, and collated and assessed through the IWMI-led CGIAR Knowledge Sharing Research project.

As the lead institute on the project, CILSS in cooperation with IWMI will be responsible for ensuring that the outputs of the project are made publicly accessible by the project partners according to best practices with regard to the documentation, harmonization, management and archiving of information. For IWMI's part, this will involve building on its existing web-based spatial and non-spatial data storehouses (e.g., the IWMI Data Storehouse Pathway and Integrated Database Information System) as well as working with partners (such as ECOWAS, CILSS), to ensure the research products (and supporting datasets) are easily accessible and widely available to the broader community of researchers, policy-makers, implementers and investors in West Africa Region.

Project partners will organize three country policy dialogues (one for each of the project countries) to inform policy makers of the project results and recommendations. The project will endeavor to organize the dialogues to coincide with other key policy-level workshops in order to reach the greatest number of country partners. Moreover, throughout the project activities, the project team will actively engage international NGOs and local NGOs in West Africa.

### **A3.3 Workshops and brainstorming sessions**

**Project inception workshop:** A project inception workshop will be held in the second month of the project. The objectives of the inception workshop are to (1) finalize detailed work plans for each activity; (2) finalize partnership agreements; and (3) initiate project monitoring and evaluation. The workshop will be attended by all partners and key stakeholders.

**Mid-term workshop:** The objectives of the mid-term workshop will be to (1) share preliminary results of the project with stakeholders; (2) identify ways to disseminate and

replicate implementation in other Western African countries; and (3) monitor progress and to make any changes to the implementation plan if necessary.

**Synthesis workshop:** The synthesis workshop is intended to pull together the key findings of all project activities in order to develop a strategy for revitalizing irrigated agricultural systems in West Africa. The main outcome of the synthesis workshop will be irrigation modernization strategy for dissemination to policy makers, NGOs, and water users.

#### **A4. Promotion of agricultural water and of small-scale irrigation**

The agricultural units referred to in Activity A2 fit into an overall national production structure and regional strategies for agricultural water development. The aim, through Activity A 4.2, is to diagnose irrigation policies and programs in the three project countries to ensure that they are consistent with the ECOWAS ECOWAP and the UEMOA Agricultural Policy, and to bring out results that can contribute directly to increased performance of these production units in these three countries first and then be extended to other countries.

##### **A4.1 To assist in aligning the national strategies for investments in water control with the regional policies (such as ECOWAP, PAU, West Africa Water Policy), at the CILSS country level.**

The aim is to make an inventory and analysis of existing policies and strategies for water control investments and to help align them with the ECOWAP and PAU sub-regional policies

##### **A4.2 To review the PRADPIS Programme in order to incorporate the small-scale irrigation priority programs of Sahelian countries**

The aim is to review and update the document by incorporating new irrigation priorities of the countries;

##### **A4.3 To identify, analyze and disseminate best practices as regards water control for small-scale irrigation in the three project countries**

It consists of sharing the experience of these three countries with the other CILSS countries

## **5. Outputs**

- Information/Database:
  - A synthesis report addressing the situation of irrigation schemes
  - A database of irrigation system characteristics
  - A document detailing the interventions needs of the selected irrigation schemes
- Interventions for enhancing the performance and productivity of existing rice irrigation systems identified:
  - Irrigation scheme level interventions (improving water delivery service)
  - Interventions at field level
- Capacity enhanced:
  - Targeted training for farmers
  - Training for irrigation system managers

- Improved maintenance and operation of irrigation systems leading to improved water availability
- Strengthened water users' associations leading to equitable distribution of water, improved irrigation service charge recovery and reduced conflicts
- An analysis document of the national water control strategies and partnership framework for the financing of small-scale irrigation is produced
- A document on the analysis and investment policies and their consistency is produced and placed at the disposal of the states
- A guideline paper on priority investments in small-scale irrigation is prepared and circulated to the states
- The PRADPIS Program document is revised and includes small-scale priority programs of the Sahel countries
- Best practices as regards water control in the three countries are capitalized and disseminated

## **6. Expected project impacts**

The prime beneficiaries of the project are irrigation farmers in Burkina Faso and Niger. The project's vision for success is that within two to five years since the start of the project findings will be used to guide national irrigation modernization strategies and investments. This will lead on the longer run to:

- The livelihoods of the rural poor in the three project countries will be improved and their capacities to cope with drought will be enhanced.
- Government's limited foreign reserves will be freed-up as a result of reduced demand for imports due to enhanced domestic production capacity.

Measurable intermediary steps towards achieving the project's vision of success will be:

- Steady progress towards full utilization of the potential of existing irrigation schemes
- 30 to 50% increase in crop yield
- 20-35% increase in farm income
- Improved capacities of irrigators and institutions to support irrigation development and modernization process.
- Facilitation of investments in small-scale irrigation in the Sahel
- Improvement of agricultural practices in the Sahel
- Improvement of investment policies and strategies in agricultural water in the countries

### **Environmental impacts:**

The project activities are judged to have no negative effect on the natural or physical environments. In fact, some of the activities such as rehabilitation of reservoir catchment positively contribute to the environmental health. It therefore, fits Regulation 216's categorically excluded activities. The environmental compliance summary table is shown in Table 2.

Table 2. Environmental compliance summary table

No	Activities	Site information		Quantity and scale		Screening results				
		Number of irrigation schemes	Location	Area (ha)	Number of farmers	Exempt	Categorical exclusion	IEE required	IEE required & high risk	Regulation 216 citation
1	Analysis of constraints and opportunities	6	Burkina Faso and Niger	1615	3219		X			216.2(c)(2)
2	Irrigation performance benchmarking	6	Burkina Faso and Niger	1615	-		X			216.2(c)(2)
3	Analysis of productivity and profitability of irrigated rice and vegetables	6	Burkina Faso and Niger		720		X			216.2(c)(2)
4	Improving water conveyance and distribution	6	Burkina Faso and Niger				X			216.2(c)(2)
5	Improving on-farm water management	6	Burkina Faso and Niger				X			216.2(c)(2)
6	Strengthening water users' associations and/or cooperatives	6	Burkina Faso and Niger		3219		X			216.2(c)(2)
7	Rehabilitation of reservoir catchment	6	Burkina Faso and Niger	Two reservoirs			X			216.2(c)(2)
8	On-farm fertilizer trails	6	Burkina Faso and Niger	50 sites in each of the schemes			X			216.2(c)(2)
9	Crop variety adaptation-cum-demonstration trails	6	Burkina Faso and Niger	On 50 sites in each schemes			X			216.2(c)(2)
10	Training for farmers, private sector organizations/individuals and irrigation system managers	6	Burkina Faso and Niger				X			216.2(c)(2)
11	Workshops	6	Burkina Faso and Niger				X			216.2(c)(2)

## 7. Project management, Roles and Responsibilities of Collaborating Partners

### 7.1 Partners

The project will be lead by CILSS with strong support from IWMI.

Leading scientists - Comité Inter-Etats de Lutte contre la Sécheresse au Sahel (CILSS)

Dr. Dramane Coulibaly: Coordinator, PRA/SA-LCD-POP-DEV ([dramane.coulibaly@cilss.bf](mailto:dramane.coulibaly@cilss.bf))

Clement Ouedraogo: Coordinator, PRA/ME ([clement.ouedraogo@cilss.bf](mailto:clement.ouedraogo@cilss.bf))

Dr. Mahalmoudou Hamadoun: Expert NRM ([Mahalmoudou.hamadoun@cilss.bf](mailto:Mahalmoudou.hamadoun@cilss.bf))

Abdou ALI: Expert/Water management ([A.ali@agrhyet.ne](mailto:A.ali@agrhyet.ne))

Dr. Keffing Sissoko: Expert ([Keffing.sissoko@cilss.bf](mailto:Keffing.sissoko@cilss.bf))

Leading scientists - International Water Management Institute (IWMI)

Dr. Charlotte de Fraiture (Irrigation engineer; [c.fraiture@cgiar.org](mailto:c.fraiture@cgiar.org))

Dr. Regassa Namara (Economist; [r.namara@cgiar.org](mailto:r.namara@cgiar.org))

Dr. Boubaccar Barry (Agricultural Engineer; [b.barry@cgiar.org](mailto:b.barry@cgiar.org))

Dr. Mark Giordano (Institution specialist; [mark.giordano@cgiar.org](mailto:mark.giordano@cgiar.org))

Mr. Herve Levite (Irrigation engineer; [herve.levite@fao.org](mailto:herve.levite@fao.org))

Partners:

Implementing partners:

- CILSS (Comité Inter-Etats de Lutte contre la Sécheresse au Sahel)
- International Water Management Institute (IWMI)
- Institut de l'Environnement et de Recherches Agricoles (INERA), Burkina Faso
- Institut National de la Recherche Agronomique du Niger (INRAN), Niger
- Direction du Développement de l'Irrigation (DDI), Burkina Faso
- Direction du Génie Rural (DGR), Niger
- Office National des Aménagements Hydro-Agricoles (ONAHA), Niger

Collaborating partners:

- Africa Rice Center (WARDA)
- International Fertilizer Development Corporation (IFDC)
- Association Régionale pour l'Irrigation et le Drainage (ARID)
- Réseau des Organisations Paysannes et des Producteurs Agricoles de l'Afrique de l'Ouest (ROPPA)
- ECOWAS-Water Resources Coordination Unit (Dr. Luis Silva)

### 7.2 Project Management and implementation plan

CILSS in cooperation with IWMI will establish a conducive platform for the efficient management of the project. In each of the two countries, a Project Steering Committee (PSC) will be established, with IWMI as secretary, and a representative of all project partners as members. USAID country offices will also be represented in the PSC. The project leader in consultation with PSC and USAID will set up project monitoring and evaluation mechanisms. Reporting formats will be designed and quarterly reports will be prepared by the partners.

This will be consolidated by the Project Leader into overall biannual/annual reports, documenting progress, lessons learned, and issues needing to be addressed as well as providing a full financial accounting.

The functional relationship among the lead institutions, implementing institutions and collaborating institutions is depicted in figure 2 below. CILSS will contract IWMI for the over all implementation of the project activities and directly channels project funds to IWMI. IWMI will sub-contract NARES (namely INERA, DDI, INRAN, DGR and ONAHA) for implementation of some of the activities. IWMI will also facilitates the link between NARES and collaborating institutions, namely ROPPA, IFDC, ARID, WARDA/ WASA and ECOWAS. The specific roles and responsibilities of these institutions are further elaborated in section 7.3 below.

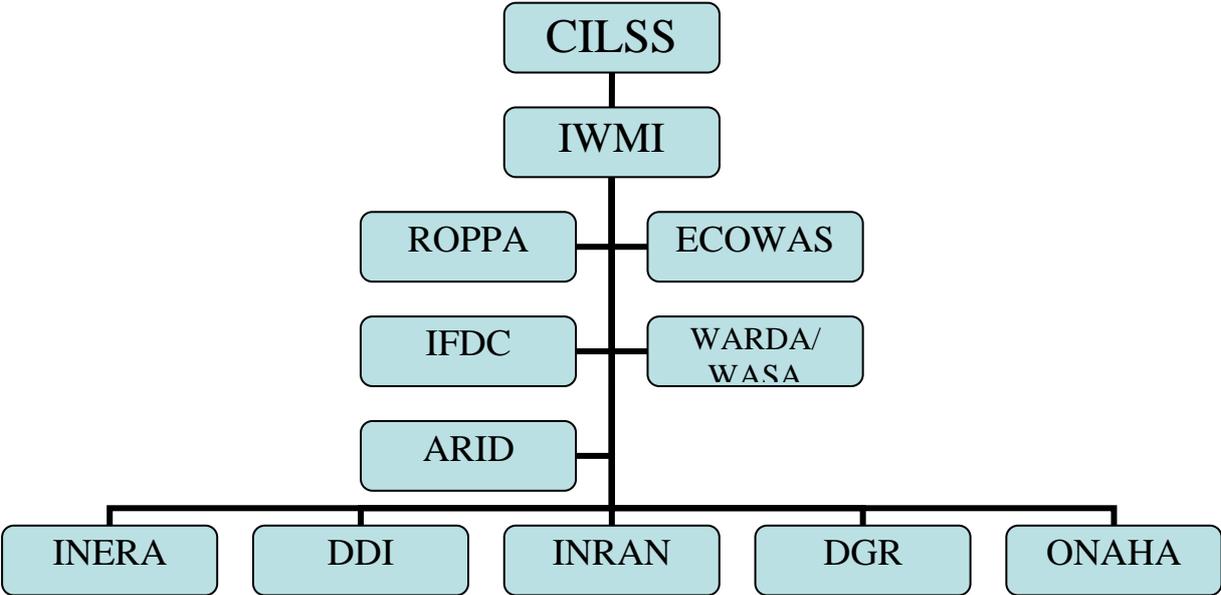


Figure 2. Scematic presentation of leading, coordinating, implementing and collaborating institutions

**7.3 Roles and responsibilities**

The project will be implemented by a multidisciplinary team of professionals and researchers including agricultural engineers and social scientists. Personnel from IWMI, INERA, DDI, DGR, INRAN, and ONAHA, will mainly be involved.

The specific roles and responsibilities of CILSS are:

- Overall project governance and coordination,.
- Financial management and production of all agreed reports.
- Institutional support to the project through office space and logistical support.
- Dissemination of project results through workshops, newsletters, and website.
- Lead activity 4

The specific roles and responsibilities of IWMI will be :

- Lead Activity 1 and Activity 3.

- Facilitate the implementation of Activity 2.2 with NARES and implementing agencies (DDI, DGR)
- Facilitate the implementation of Activity A2.3.1 in Burkina Faso, and Niger. IWMI will also solicit the support of IFDC
- Facilitate the implementation of Activity A2.3.2 in Burkina Faso and Niger. IWMI will also partner with WARDA on variety improvement issues.
- Manage the irrigation scheme database generated under the project, jointly with project partners
- Publish project reports in collaboration with stakeholders.
- Link the project to relevant global and regional initiatives for the purpose of knowledge sharing

Specific roles and responsibilities of ONAHA, INRAN and DGR in Niger are as follows:

- Assign appropriate personnel to contribute to the project
- Lead Activity 2.1 (Improving water conveyance and distribution systems, and in-field water management), Activity 2.2 (Strengthening Water Users' Associations), Activity 2.3.1 (Participatory on-farm fertilizer trials to refine recommendations), and Activity 2.3.2 (Participatory variety adaptation-cum-demonstration trials).
- Provide necessary and relevant information to the project.
- Publish project reports in collaboration with the other stakeholders.

Specific roles and responsibilities of INERA and DDI in Burkina Faso for this project include the following:

- Assign appropriate personnel to contribute to the project
- Lead Activity 2.1 (Improving water conveyance and distribution systems, and in-field water management), Activity 2.2 (Strengthening Water Users' Associations) and Activity 2.6 (Enhancing linkages with support services).
- Provide necessary and relevant information to the project.
- Publish project reports in collaboration with the other stakeholders.

The specific roles and responsibilities of other collaborating partners such as ARID, ROPPA and US PVOs include the following:

- Provide necessary and relevant information to the project.
- Disseminate the results of the project through workshops, newsletters, website, etc.
- They will be involved in consultations, policy dialogues and dissemination activities.

## **8. Budget**

US\$ 1.5 million over 12 months.

The detailed budget is attached.

## **References**

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- Van der Schans, M.L., Lemperiere, P. 2006. Manual: Participatory Rapid Diagnosis and Action Planning for Irrigated Agricultural Systems (PRDA). IPTRID/IWMI, Rome.