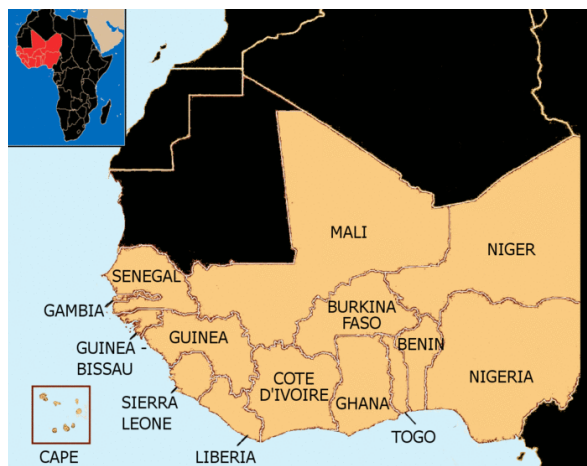


Improving Crop and Seed Production Systems under Water/Irrigation Management in Sub-Saharan Africa



Enhancing capacity of scientists/officials from all participating NARS institutes and farmers of seven countries.



Crops are being tested for demonstration of productivity.

Thematic Area: Crop Productivity and Diversification

Purpose: Assist farmers with adopting sustainable crop and seed production systems to increase farm productivity and year-round agricultural production in Sub-Saharan Africa.

Geographic Scope: Sub-Saharan Africa

Timeline: 2012 - 2015

Partners:

- Islamic Development Bank (IDB)
- Institut de l'Environnement et de Recherches Agricoles (INERA), Burkina Faso
- National Agricultural Research Institute (NARI), Gambia
- l'Institut d'Economie Rurale (IER), Mali; CNRADA-Mauritania
- Institut national de la recherche agronomique du Niger (INRAN), Niger
- National Agricultural Extension and Research Liaison Services (NAERLS), Nigeria
- Institut Senegalais de Recherches Agricoles (ISRA), Senegal.

Project Lead:

Dr. Asad Sarwar Qureshi
a.qureshi@biosaline.org.au

For more information and other publications visit
www.biosaline.org

Sub-Saharan Africa (SSA) is a region plagued by poverty, malnutrition and poor living conditions. Nearly 80% of the population in SSA lives in rural areas and 70% of this population is dependent on food production through farming or livestock keeping. The irrigated areas rely on groundwater or run-off-river pumping systems, but declining precipitation levels have impacted quantity and quality of available water for irrigation, straining local food markets and increasing the rate of malnutrition in poverty stricken areas. Choosing appropriate irrigation technologies and selecting drought-and-salt tolerant crops are two important ways to minimize risks and improve agricultural productivity and farm income.

The International Center for Biosaline Agriculture (ICBA) in collaboration with National Agricultural Research Systems (NARS) in seven SSA countries launched in 2012, the "Improving Crop and Seed Production Systems Under Water/Irrigation Management in Sub-Saharan Africa project." Participating countries include Burkina Faso, Gambia, Mali, Mauritania, Niger, Nigeria and Senegal. An inter-disciplinary approach was employed to improve the performance of these countries' irrigated farming systems which will help achieve food and nutrient security; provide dependable supply of basic agricultural products; and aid in value chain job creation and development.

Activities and Outcomes

In order to rise above the threats and costs related to irrigation technologies in this region, the project is working on:

- > Developing a water resources database for seven West African countries.
- > Identifying appropriate technologies suitable for SSA communities based on water availability, water quality, land and crop suitability, improved crop and seed production, and socio-economic conditions.
- > Identifying packages of diversified crops under different water quality conditions and promoting multiple use of water.
- > Strengthening research capabilities, agricultural extension services, and skills for rural farmers in water and crop management.



building farmer s capacity through training courses, seminars and workshops on integrated on-farm water management practices.

During the first year of the project, data regarding water resources, irrigation, crops, and socio-economic conditions of the farming communities for each collaborating country were collected and stored in a database. Data were analyzed to identify and select appropriate crops and irrigation technologies for field demonstrations. Field trials of irrigation technologies and crops were established in all countries. Irrigation technologies introduced include water lifting devices (i.e. bucket, diesel and solar pumps), water distribution (Californian system), and irrigation methods (i.e. furrow, basin, drip and sprinkler).

Main crops grown in the trial fields include tomato and onion. Initial results show a considerable saving in irrigation water application to onion and tomato crops using Californian and drip irrigation systems as compared to traditional bucket and gravity-pump systems of irrigation. Drip irrigation system was found to be most efficient in water saving without compromising crop yields whereas the Californian system was preferred by farmers due to its ease of operation and lower cost.

During the second and third year of the project, socio-economic surveys were conducted in all countries. The results indicate that in addition to **low fertility of soils** and **low and erratic rainfall conditions**, **non-availability of agricultural equipment** and other farm input, **low genetic yields** of local crop varieties, poor economic condition of farmers and **lack of knowledge** about production and irrigation technologies are the main constraints for the development of small scale irrigation in SSA.

Farmer field days and training sessions were conducted on regular basis to build capacity of farmers, extension workers and project staff. The trainings focused on

irrigation technologies, soil and nutrient management, crop production technologies and the crop agronomy. These trainings, farmers not involved in the project activities included as a means for large scale dissemination of project findings.

During the last year of the project, field surveys are being carried out to evaluate the impact of the project and to formulate strategies for the extension of activities to other countries of the region.

Future Directions

ICBA will continue working with local and international partners to get funding for scaling up successful irrigation technologies and crop management practices in these and other SSA countries. Expanding irrigated areas will help to increase the value of agricultural output by increasing crop yields and crop intensities. Household income is also expected to increase as a result of improved irrigation and crop management. The project will determine the best combination of technology and/or crop diversification that will help to improve the overall livelihood of the rural populations.

Results of field studies will be used to evaluate the impact of different irrigation and crop management activities on socio-economic conditions of poor local farmers in marginal environments. In this context, possible scenarios of agricultural and livestock production systems will be assessed. The scenarios will include public/private/community based irrigation development and management; investment in irrigation technologies and water harvesting; and better integration of crops and feed for livestock production systems. Institutional aspects for sustainable management of land and water resources will also be a top priority.



Considerable savings have been shown using Californian and drip irrigation systems compared to traditional bucket and gravity-pump systems.