



The Hydraulics Research Station

محطة البحوث الهيدروليكية



Enabling the rural poor
to overcome poverty

UNESCO-IHE
Institute for Water Education



Spate Irrigation for Rural Economic Growth and Poverty Alleviation in Sudan (SIREGPA)



Annual Report
2011

Hydraulic Research
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Resources
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Summary

This report starts with a brief introduction of the key stages of the implementation of the project (SIREGPA), the main implementing organization, and the supporting institutes. Then a brief description of the project rationale is presented. The report also discusses the project outputs, achievements, challenges and the way out for each one of the five project activities namely; project management, Solutions oriented researches, Strengthening the spates irrigation network; Capacity building; and cooperation with other IFAD and other country programmes. The budget and activities accomplished with the details has been prepared. Most of the project activities have been done successfully. Few activities are still in progress such as the practical note preparation, printing and dissemination of the translated practical note. Some activities were not planned within 2011 activities such as the implementation of the research activities; the successful start of the research program through national and international students is being highlighted in this report.

1. Introduction

The project Spate Irrigation for Rural Economic Growth and Poverty Alleviation (SIREGPA) has started in January 2011 in four countries Sudan, Yemen, Ethiopia and Pakistan. It is a four year project. This report briefly describes the annual progress, achievements and outputs, problems faced, and budget for the year 2011 in Sudan.

1.1 Key Stages of implementation

Key stages of the implementation of the project (SIREGPA) in Sudan have passed through the following:

1. Attendance of the project inception workshop in Addis Ababa, Ethiopia to introduce the project staff and project documents. January-February 2011.
2. The process of bank account opening started since February 2011 completed in July 2011. There were some difficulties in transferring funds from UNESCO-IHE to Sudan, which were resolved by August, 25, 2011.
3. Site visits to project sites were conducted in February 2011 together with meeting other IFAD funded projects for coordination, e.g., the IFAD project ' GASH Sustainable Livelihood Regeneration Project'.
4. Establishment of contacts with relevant local institutions since February 2011.
5. Stakeholder workshop to formulate research proposals for Spate Irrigation in Sudan, which took place in Kassala city in June 5-6, 2011.
6. Conducting of a seminar at the Hydraulic Research Station (HRS) in Medani to introduce the project and its activities to the local staff from HRS in 26 June, 2011.
7. Two research concept notes were prepared after the stakeholder meetings in July 2011

8. Conducting a research seminar at UNESCO-IHE to introduce research areas to the MSC students and staff in July 2011.
9. Research proposals by UNESCO-IHE students were prepared and formulated in September 2011.
10. 5 MSC students and their mentors visited Sudan in 15 October 2011.
11. Field data collection for the research started in October 2011 for two months.
12. Local MSc students were also involved and joined the researchers' team in October 2011.
13. Two participants from two major stakeholders' organizations were funded by the project to attend a short course at the UNESCO-IHE, Delft, The Netherlands in September 2011.
14. One research grant has started to conduct a research in Water Resource Assessment in GASH, October 2011.

1.2 The implementing organization

The main implementing organization in Sudan is the Hydraulic Research Station. The Hydraulic Research station is (HRS) is a pioneer centre for water research activities in Sudan located in Wad Medani. It is one of the Ministry of Irrigation and Water Resources (MOIWR) general directorates and represents its research arm.

The HRS-Sudan was established in 1976 through a generous help from the United Nations Development Program (UNDP) to lend support for sound and sustainable national water resource development and management. Development of HRS as UNDP/UNESCO assisted project was completed in 1986. By then all responsibilities were turned over to HRS-Sudan.

Over the years, HRS has established a reputable record of research achievements in areas like river training, sediment transport and management, irrigation engineering and management, and water resources planning and management.

HRS acquired this reputation from long practice, experience and excellent performance in solving real life problems. There is a strong link between the applied research activities and the needs to solve real life problems facing water resources development in the country. In addition, the HRS carries out studies for other ministries, governmental and non-governmental bodies and consulting firms. Also, technical training and international cooperation in river engineering subjects have been helpful to build institutional capacity and sustain technology transfer programs.

1.3 The main supporting organizations

- Gash agricultural Scheme GAS.
- GASH river training unit, MoIWR
- Toker Delta Agricultural Scheme (TDAS),
- Khor Abu Habil Agricultural scheme

- University of Gezira
- Agricultural Research Cooperation
- Water User Association of GAS, Kassala

2. Project goal, objectives and purpose

- Form community of practitioners and professionals aiming to improve livelihoods and productivity in spate irrigation resource systems
- Identify opportunities for partnership programmes
- Initiate new activities in support of development in the spate irrigated areas
- Pick up ideas and encourage sharing and documentation, good examples
- Contribute to policy development and agenda setting

3. Project outputs

The project started with a 2011 work plan that consisted of clear set of activities for each of the project outputs, namely: project management, strengthening the spate irrigation network, Capacity building and solutions-oriented research (Table 1). The project implementation went very well and almost all the planned activities have been undertaken with the desired results.

In the following sub-sections, the major achievements are discussed.

Table 1: Work plan 2011 and achievements

Item	Description/Activity	Key deliverables (planned)	Key deliverables (achieved)
1	Strengthening the Spate Irrigation Network	Key deliverables (planned)	Key deliverables (achieved)
1.1	Develop country Network plan 2011-2014	Country network plan stating vision, mission, mandates and major activities (2011-2014)	Completed
1.2	Develop country Database of spate specialists	A spread sheet of names, titles, specialization of 5-10 SPN members	A spread sheet of names, titles, specialization of 31 SPN members
1.3	Identification key Implementing Organization	Preliminary list of relevant key implementing organizations identified	Completed
2	Innovative Action Research Projects	Key deliverables (planned)	Key deliverables (achieved)
2.1	Selection of field assistant(s) for the research activities	A field assistant (F.A.) is selected	Completed; Eng. Mugahid Fuoad
2.2	Collection of existing relevant Information	Documentation of existing data	In progress

2.3	Field assistant management	Supervision and progress reporting	
2.4	Prepare preliminary criteria & identify a menu of action research topics	Criteria and a menu of action research topics listing	Completed
2.5	Stakeholder meetings to identify relevant action research topics	Meetings with stakeholders	Completed; 9 Meetings
2.6	Field visits to identify two action Research topics & pilot area	Two research action topics identified	Completed
2.7	Preparing concept notes & sharing with fellow country project leaders	Two concept note for the action research prepared & shared	Completed
2.8	Develop full action research proposals	Two full action research proposals developed	Seven research proposals completed
2.9	Preliminary data gathering for the research	Preliminary data prepared for the implementation of action research	Completed
2.10	Support to two small research / documentation activities	One small research holder proposed and if possible two	Proposed but not completed
2.10.1	Competitive grant for two applied research projects on two topics	Key deliverables (planned)	Key deliverables (achieved)
2.10.2	Discussion with stakeholders	Two topics identified	Completed : 4 meetings conducted in Khartoum, Medani and Kassala
2.10.3	Preparing detailed notes on (Open Call for proposals)	Document prepared and distributed	Completed; Research proposals announced, and applications received from research organizations
2.10.4	Forming a committee to evaluate proposals	Committee formed and best proposals selected	in progress
3	Capacity Building, Continuous Knowledge Development & Dissemination	Key deliverables (planned)	Key deliverables (achieved)
3.1	Two participants for spate short course attendance at UNESCO-IHE	Two participant will complete short course in spate irrigation at IHE	Completed
3.2	Preparation of one practical note	One practical notes published	Translation completed for one practical note , dissemination on progress, preparation of another practical note on progress.
3.3	Purchasing one laptop, one video camera, one digital camera	laptop, digital camera, video camera purchased	Not Completed, A beamer is purchased
	Sharefair in IFAD, Rome, Spate Irrigation Good for People, Livestock and for the		

	Environment		
4	Project management	Key deliverables (planned)	Key deliverables (achieved)
4.1	Project supervisory committee:	Access to institutions database & a bank account open for the project	
4.1.1	Facilitating access to higher level relevant government institutions	Funded by Ministry of Water Resources	Completed
4.1.2	In kind support: provision of offices, telephones, equipment, guest house, transport	Funded by Ministry of Water Resources	Completed
4.2	Project country team leader activities		
4.2.1	Detailed work plan for 2011	A draft work plan with budget and time of delivery	Completed
4.2.2	organize meetings & workshops	Meetings and \ or workshop conducted	Completed; 4 meetings and one workshop conducted
4.2.3	Financial statement preparation and facilitating auditing	Annual financial statement report	Completed
4.2.4	Develop draft\detailed work plan for 2012	A draft work plan with budget and time of delivery	In progress
4.2.5	Progress and final report writing	A progress or final report describing the progress of project activities	Completed: A progress and final (2011) report completed
4.3	Running Secretariat office	Archiving project documents, dissemination of project output	Just started
4.4	Local Travel And Accommodation	Visit project sites	Completed

3.1 Output 1: Project Management

3.1.1 Activities accomplished and results obtained

- Inception workshop was successfully held in Addis Ababa, Ethiopia in January-February, 2011 attended by all the steering committee members: IFAD Grant Manager, Rudolph Cleveringa, country project team leaders in the four target countries, and project leaders from SpN (UNESCO-IHE and MetaMeta). The main output of the workshop was a detailed 2011 Work plan along with a results-based budget. **Annex 1** has details.
- A draft\detailed work plan for 2012 is developed. Details are shown in **Annex 2**.
- Stakeholder consultation workshop was successfully conducted in Kassala, Sudan in June, 2011 with the objective to identify the main problems faced by spate irrigation communities and accordingly formulate relevant research topics. The project was

introduced to diverse stakeholders: policy makers, engineers, managers, practitioners, farmers; The workshop was attended by the State Minister of Irrigation and Water Resources, the Provincial Minister of Agriculture, higher government officials, water resources management professionals and practitioners as well as WUA leaders and farmers. The stakeholders agreed on four priority research topics: 1) River protection work and irrigation diversion, 2) Irrigation Water distribution, 3) Institutional setups and 4) Aquifer artificial (induced) recharge systems. [Annex 3](#) contains the full workshop report.

- A seminar was conducted at the Hydraulic Research Station (HRS) in Medani to introduce the project and its activities to the local staff from HRS, staff from local universities, water management institutes and Agricultural Research Cooperation in 26 June, 2011.
- A seminar was conducted at UNESCO-IHE to introduce research areas to the MSc students and staff in July 2011 with the objective to find interested students that are willing to make their research using a real problem. The target of the seminar was successfully met and 5 MSc students were interested to answer the research questions raised.
- Visits to local universities to identify local MSc students.
- The field work started in October, 2011. The international students from 4 different countries namely; Ethiopia, Zimbabwe, Yemen and Mozambique, visited Sudan to collect field data from Gash in Kassala, and Delta Toker in PortSudan.
- Seminars to introduce the students and the project progress was conducted in Khartoum and Medani at the Ministry of Irrigation and water Resources (MoIWR), attended by the Undersecretary, HRS Director, HRS staff, Engineers from the Ministry, representatives from Khartoum, Sudan, Omdurman Universities and UNESCO- Chair of Water Resources. Students were able to discuss their research proposals and met many resource persons. Similar seminar was also conducted at Agricultural Research Cooperation as one of the supporting organizations.
- Students made several meetings and discussions with design Engineers from the MoIWR, Project Directorate. Also meetings with old experienced Engineers and staff were organized.
- Field visits to make site selection for pilot area-Kassala& PortSudan and follow up visits.
- Meetings and presentations on the field work progress were arranged with Gash scheme manager and staff from ongoing IFAD project ' Gash Sustainable livelihood regeneration project' in Kassala.

3.1.2 Difficulties met, solutions found and/or suggestions

The process of opening bank account has passed through many difficult rules and bureaucracy. This has been resolved through putting in place the right people who have good contacts with the decision makers in order to facilitate the process. The existing IFAD project (Gash ...) as well as IFAD country representative were of great support to facilitate bank account opening.

Other difficulty were to find a translator who can translate the local language. finding local students as per the request of international student was a challenging job , a lot of visits to universities to propose some students were made, however, trials mostly were unsuccessful. Early start next year searching for suitable candidates is important. The plan for the 2012 year is to have larger number of local students and to start the process from the very beginning.

Another constrain was the late start of students, in September after the flood season makes it impossible to conduct flux measurements. This should be considered next year by employing local students to do necessary measurements.

Attempts to initiate serious research in other spate systems e.g., Toker and Abu Habil were not possible because of budget constraints. Suggestions, to accomplish at least descriptive research were put in place.

Transport for project purposes were not easy. This was solved by using cars of staff, support from MoWR, and short term leasing from the market

3.2 Output 2: Strengthening spate irrigation network

3.2.1 Activities accomplished and results obtained

- Country Network plan 2011-2014 was developed. The process of sharing the network plan with other local and global members is in process. The network plan is attached in [Annex 4](#)
- Country database of 37 spate specialists. This was one of the outcomes of the stakeholder workshop which offered a platform of a good gathering of experts in the spate field. 31 interested relevant participants have become registered members of the Sudan Spate Irrigation Network (Sudan-SpN) and will be updated regularly of ongoing activities. The complete list of the database specialists is [in Annex 5](#).
- Establish and maintain spate irrigation page within the HRS website. Recent and updated news about the spate project and its activities, workshop report, presentation for UNESCO-IHE staff was uploaded in the website. (www.hrs-sudan.sd)
- Several visits were made to identify supporting organizations with the objectives of introducing the project and its activities. Visits were made to Khartoum University, Sudan University, Gezira University, Water management Institute, Khor Abu Habil Scheme in North Kordofan, Delta Toker Scheme and Agricultural Research Cooperation (ARC) in Medani and Kassala. Discussions were made to explore joint activities and collaboration.

3.2.2 Difficulties met, solutions found and/or suggestions

3.3 Output 3: Solutions oriented research

The stakeholder consultation workshop conducted in June, 2011 resulted in four research areas needed to be studied, It was agreed among the stakeholders that the first two researches will be spear headed by the HRS and funded by the spate project in Sudan, while the other two are to be open for competitive research grant amount to a total of 20,000 USD. The budget for the competitive research is funded by the central project budget-UNESCO-IHE.

The two researches to be investigated are: 1) The optimal measures for improving river protection and training works as well as water diversion that could result in minimum flood damage to Kassala town and significantly increase the irrigated command area. 2) Improving Irrigation Water Distribution of Spate Agriculture Schemes in Sudan.

Two concept notes were prepared for the above two research topics in July 2011. Accordingly a number of research questions were raised under those two topics.

3.3.1 Activities Accomplished and results obtained

3.3.1.1 Solution oriented research for 2011

A research programme aimed at contributing to improving agricultural productivity and profitability in the spate irrigated areas in Sudan, concentrating in GAS was conducted through MSc Students. Five MSc students from UNESCO-IHE, the Netherlands in collaboration with three local (Sudanese) MSc students conducted their research in Gash Agricultural Scheme (GAS) and Toker Delta Agricultural Scheme (TDAS), viz:

- Quantify sedimentation problems in irrigation canals, identify optimum water distribution and diversion design alternatives as well as cropping pattern and calendar and soil moisture conservation measures
- Recommend measures that build upon the strengths and address the weaknesses of the institutional arrangements with regard to operation and maintenance
- Formulate spate irrigation relevant cost-benefit analyses methodology and assess profitability of GAS under different cost and benefit scenarios.
- Improve productivity of Gash Agricultural Scheme under scarcity conditions.

The Research programme offered a platform for knowledge and experience sharing among the MSc students who worked as a coherent research team and the staff from the Hydraulic Research Station, Sudan and UNESCO-IHE, the Netherlands who jointly supervised the work of the MSc Students. [Annex 6](#) has all the details.

3.3.1.2 Competitive research

The Hydraulics Research Station (HRS) disseminated call for proposals as part of the applied research component of the 4-year (2011 to 2014) project. HRS in collaboration with UNESCO-IHE and Metameta decided to make an open call for proposals and provide a research grant on competitive bases, for two of the four research topics:

- 1) Innovative institutional set up (include WUAs) for better management of spate irrigated agriculture.
- 2) Spate flow for artificial aquifer recharge for both domestic and agricultural water use.

The full details for the call is in [Annex 7](#).

3.3.1.3 Research grants

The plan for 2011 was that (If possible) two research grants to be offered to interested qualified candidates to conduct research that could support the documentation and assessment of spate system in Sudan. One research grant has started to conduct a research in Water Resource Assessment in GASH system.

3.3.2 Difficulties met, solutions found and/or suggestions

Respond to the open call for proposals was not of a good quality. It is suggested to extend the call for the next year 2012 to give a better possibility of good quality researches, or to modify the approach, e.g., to search for students or make direct appointment of individual consultants for some parts of the two researches. Purchasing field measuring equipments to strengthen student's research could also be an option.

Regarding the first research topic; Gash river training works and irrigation diversion, there is still a need for research to be conducted in this field. Although 5 international students could be found tackling most of research questions, some important topics still couldn't start yet, e.g., river morphology and bank protection; Conjunctive use of groundwater and spate flow, and hydrology of Gash. It is hoped to announce topics to other departments well in time within IHE as well, and to get buy-in by students. The same efforts to be done with interested qualified students from local Sudanese universities.

Another major difficulty is that for the fieldwork few important equipments should have been bought by the project to facilitate field data work. The most important equipments will be prepared for the next year (2012) research.

3.4 Output 4: Capacity building and knowledge dissemination

3.4.1 Activities accomplished and results obtained

Two participants one from the implementing organization (HRS) and the other from one of the supporting organizations; the Hydraulic Research Cooperation, were funded by the project to attend a short course at the UNESCO-IHE, Delft, The Netherlands in September 2011.

One paper with the title ' MEETING CLIMATE CHANGE AND FOOD SECURITY CHALLENGES IN FRAGILE STATES POTENTIAL OF SPATE IRRIGATION FOR RURAL LIVELIHOODS' is being translated to Arabic language and to be printed and disseminated. see [Annex 8](#) for the full paper.

An overview paper of status and potential of spate irrigated areas in Sudan is being prepared and to be printed and disseminated. See [Annex 8](#) for the paper.

A high quality beamer for dissemination of the project activities has been purchased.

Two high quality GPS (Carmin) has been purchased for the facilitation of the field work.

3.4.2 Difficulties met, solutions found and/or suggestions

It was difficult to have good quality printing facilities. It is suggested that a good quality printer/photocopier to be purchased next year (2012).

3.5 Output 5: Cooperation with other IFAD and other country programmes

3.5.1 Activities accomplished and results obtained

In response to the request of the Gash Sustainable Livelihoods Regeneration Project (GSLRP), the Central Spate Irrigation Network (SpN) provided its expertise on WUAs. The SpN expert, based on clearly defined Terms of Reference (ToC), worked closely with relevant GSLRP staff. This cooperation led to identification of the specific weaknesses and strengths of the WUAs in GAS, developed relevant training and coaching documents and suggested a road map for an exit

strategy. Apart from this technical support, the SpN also shared the costs of the assignment - it covered the travel and DSA (Daily Subsistence Allowance) of the Expert. The GSLRP has in writing informed the SpN that the assignment was successfully completed.

Sudan Spate Irrigation Network (SSpN) and GSLRP have developed a joint Proposal for a Farmer to Farmer Knowledge and Experience Sharing. This proposal has already been included in the 2012 first quarter work plans of GSLRP and SSpN. Members of the GAS Apex WUA accompanied by relevant GAS and IFAD institutional and technical experts are to visit the Sheeb Spate Irrigation Scheme in Eritrea and exchange experience and knowledge with the Sheeb WUA in wide ranging issues including, organizational structure, management arrangements and operation and maintenance plans and strategies.