

Republic of the Sudan

Gash Sustainable Livelihoods Regeneration Project

PROJECT PERFORMANCE ASSESSMENT



Republic of The Sudan
Gash Sustainable Livelihoods Regeneration Project
Project Performance Assessment

Photos of activities supported by the Gash Sustainable Livelihoods Regeneration Project

Front cover: Meeting of the water users' associations with the project performance assessment mission members at Apex Organization office in Aroma.

Back cover: A farmer with sorghum crop in the field in the Tendelai block of the Gash spate irrigation scheme (left); Irrigation structure: Degain off-take structure (right).

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Preface

The Independent Office of Evaluation of IFAD (IOE) undertakes six to eight project performance assessments per year. They are based on a comprehensive desk review of documents, discussions with key informants including the ultimate beneficiaries, as well as field visits to the selected project sites.

The Gash Sustainable Livelihoods Regeneration Project in The Sudan implemented between 2004 and 2012, aimed to regenerate the livelihoods of rural poor people based on equitable, secure, transparent access to land and water. For this, the rehabilitation of the Gash spate irrigation scheme, which was a major part of the investment, was to be accompanied by land tenure reform and institutional-building. In addition, the project also supported financial services, community development and livestock rearing.

The project made an important contribution in terms of setting a reform process in motion and supporting institution-strengthening, notably by introducing irrigation management transfer to newly formed water users' associations and land tenancy reform. Following substantial investment in civil works, capturing of floodwater and potential irrigation capacity have improved, and the towns are better protected from flooding. The project helped improve access to safe water for rural households and contributed to empowering women in a highly conservative society.

The project fell short of its objectives, not least because the initial aim was ambitious and the operational environment was challenging. The design underestimated the complexities of the social, political and institutional contexts; institutions were not adequately analysed, and the work needed to upgrade their capacities was underestimated. Opportunities arising from the significant investments in irrigation infrastructure rehabilitation were not adequately exploited to generate expected results at the farm and household levels. The sustainability of the Gash spate irrigation scheme is a matter of concern.

This project performance assessment was led by Fumiko Nakai, Evaluation Officer, who was supported by Olaf Verheijen, consultant for participatory irrigation development and management, and Mahmoud Husain Numan, consultant for agriculture. Peer reviewers from the Independent Office of Evaluation who commented on the draft were Ashwani Muthoo, Deputy Director, and Cecile Berthaud, Evaluation Officer. Laure Vidaud, Evaluation Assistant, provided administrative support.

The Independent Office of Evaluation is grateful to IFAD's Near East, North Africa and Europe Division, the Government of The Sudan, and in-country stakeholders and partners for their inputs at various stages of the evaluation and the support provided to the mission. In closing, I hope the results of the evaluation will be useful and can help improve ongoing and future IFAD operations and related activities in the agriculture sector in The Sudan.



Oscar A. Garcia
Director

Independent Office of Evaluation of IFAD

Members of a woman's group, near Aroma. The Gash Sustainable Livelihoods Regeneration Project contributed to improving their access to microcredits (from the Agricultural Bank of Sudan).

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Currency equivalent, weights and measures

Currency equivalent

Currency unit = Sudanese Pounds (SDG)

December 2003 (appraisal): US\$1 = SDG 2.65 (Sudanese dinar 265 at the time)

2004: SDG 2.59

2005: SDG 2.44

2006: SDG 2.17

2007: SDG 2.02

2008: SDG 2.09

2009: SDG 2.33

2010: SDG 2.24

2011: SDG 3.00

2012: SDG 3.55

Weights and measures

1 feddan = 1.038 acres = 0.42 hectares

Abbreviations and acronyms

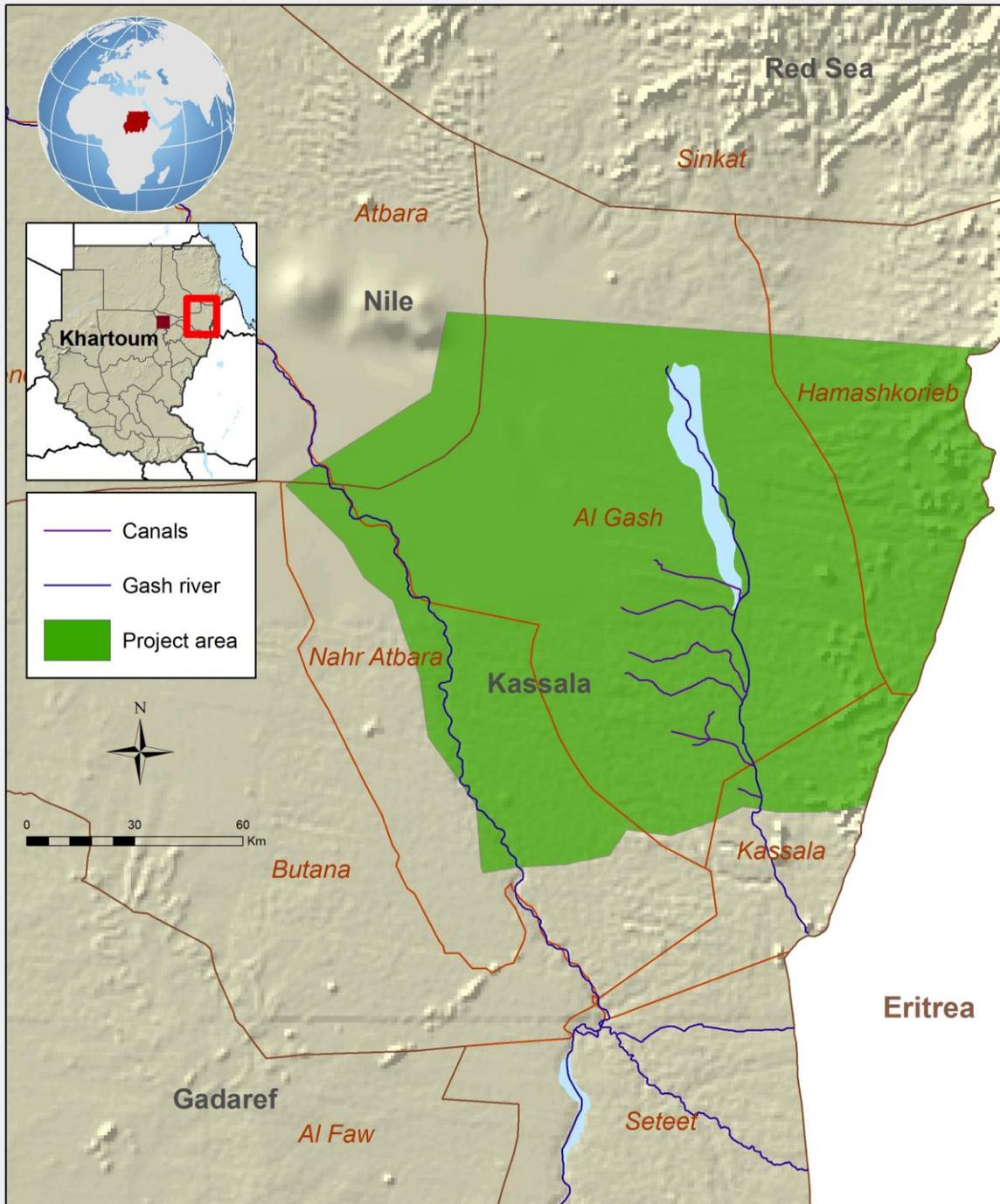
ABS	Agricultural Bank of Sudan
ARFA	Animal Resources and Fisheries Administration
BOD	board of directors (Gash Agricultural Scheme)
CAHW	community animal health worker
CBO	community-based organization
CDC	community development committee
COSOP	country strategic opportunities paper/programme
CPA	Comprehensive Peace Agreement
CTT	core training team
GAS	Gash Agricultural Scheme
GRTU	Gash River Training Unit
IOE	Independent Office of Evaluation of IFAD
LCLR	Legal Committee for Land Reform
LUD	Land Use Department
MAAWI	Ministry of Agriculture, Animal Wealth and Irrigation
MOAF	Ministry of Agriculture and Forestry (federal level)
MOFNE	Ministry of Finance and National Economy
MOIWR	Ministry of Irrigation and Water Resources
MTR	midterm review
NGO	non-governmental organization
O&M	operations and maintenance
PCR	project completion report
PCU	project coordination unit
PFI	participating financial institution
PCRv	project completion report validation
PPA	project performance assessment
RUA	range users association
TTEA	Technology Transfer and Extension Administration
WMII	Water Management and Irrigation Institute (University of Gezira)
WUA	water users' association

Glossary

- farasheen* A member of a specialized team (headed by a *Sheikh El Masqa*) that is responsible for water distribution within the *masqa*.
- haffir* Arabic word for an excavated pond for storing water for the dry season.
- hod* Arabic word for a basin. Also used in the Gash in the specialized sense of an area of land allotment. It contains 25 *Marabbas* of 16 *Gittas*, i.e. a total of 4,000 feddans.
- chor* Arabic word for a watercourse that normally only carries water during the rainy season or sometimes after storms.
- mesquite* A thorny tree (*Accacia propolis*) that was first introduced to control sand dune migration and now infests irrigated lands, irrigation canals and river plain and *Balag* areas.
- masga* Arabic word used in the context of irrigation to describe a secondary distribution channel or the area supplied by such a channel.

Map of the project area

The Sudan Gash Sustainable Livelihoods Regeneration Project



The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.

Map compiled by IFAD | 04-08-2014

Executive summary

1. **Background.** The Independent Office of Evaluation of IFAD (IOE) undertook a project performance assessment (PPA) of the Gash Sustainable Livelihoods Regeneration Project (GSLRP) in The Sudan with the objective of assessing the overall results of the programme and generating findings and recommendations for the implementation of ongoing operations in the country and the design of future operations. This assessment is based on a review of various project-related documents and a mission to The Sudan in November-December 2013, which visited the project area and held interviews and discussions with various key stakeholders, including beneficiaries.
2. **The project.** The project was implemented in Kassala State in the eastern part of The Sudan, where the Gash River and a spate irrigation system in the delta provide an important basis for the local economy and livelihoods. The area is dominated by *Hadendowa*, the main tribe of the *Beja* people, who have a strong tribal hierarchy and power structure. The Gash spate irrigation scheme is based on the capture of annual ephemeral flash floods that occur in the Gash River during the short period from July to September. The scheme was set up by the British colonial government in the 1920s to supply raw cotton for the textile industry – and also to settle poor nomadic people into a cash economy. The scheme went into serious decline in the 1970s mainly due to poor management, and spells of drought and security problems increased population pressure on the scheme. These factors led to the development of an increasingly unfair and non-transparent (annual) land allocation system in favour of tribal leaders and elite groups. It is important to highlight that in spate irrigation the area that can be effectively irrigated varies from one year to another and is dependent on the erratic hydrological regime of the river; and that, traditionally, tenants registered in the scheme were allocated a piece of land through a lottery system. As a result, the location and size of the allocated land that is actually irrigated and cultivated by a given tenant change every year.
3. In this context, GSLRP was designed as a US\$39 million project for implementation over eight years, with the goal of regenerating the livelihoods of the maximum number of poor people in and around the Gash delta, compatible with the efficient and sustainable use of its land and water resources and based upon a shared vision of development and the stability of the related institutional arrangements. The purpose was “to ensure the efficient, equitable and sustainable operation of the Gash Agricultural Scheme and the integration of the scheme into the local economy”.
4. The specific objectives were defined as: (i) the elaboration and maintenance of a shared vision of development in respect of equitable, secure, transparent access to economically viable land and water rights; (ii) establishment of the related institutional arrangements appropriate to the shared vision; (iii) rehabilitated water and other social infrastructure and water-harvesting devices; (iv) improved crop and livestock husbandry practices; (v) establishment of financial services; and (vi) strengthened state planning capacity. The target group was composed of the poor rural households in the project area, estimated at 67,000 households, covering 30,000 scheme tenant farmers who would benefit from more secure and equitable access to irrigated land; 10,000 landless households who were expected to gain access to irrigated land; and 27,000 non-tenant households who would benefit from improved infrastructure for livestock production and non-farm income-generating activities.
5. The project consisted of the following five components: (i) Irrigation infrastructure rehabilitation; (ii) Animal production and rangeland management; (iii) Community development, capacity-building and empowerment; (iv) Financial services and marketing; and (v) Institutional support and management.

6. The project was implemented between 2004 and 2012. Actual project costs amounted to US\$35.65 million against US\$39 million estimated at appraisal. During the project implementation period, there were major developments in overall country context. First, the Comprehensive Peace Agreement (CPA) was signed between the Government of The Sudan and the Sudan People's Liberation Movement in January 2005. The CPA provided the states with autonomy and control over their resources and this had important implications for the operation of the Gash Irrigation Scheme in terms of authority and responsibilities. Second, the Eastern Sudan Peace Agreement was signed in 2006, covering Kassala State. This resulted in improved security in the project area and improved progress in the river training civil works, etc. In summary, there were positive developments in the area over the project period, but the area also experienced flood events in 2003 and 2007, which caused damage, especially in towns.
7. **Performance assessment.** Overall, the project made an important contribution in terms of setting a reform process in motion and supporting institution-strengthening, notably the introduction of irrigation management transfer to newly formed water users' associations (WUAs) and land tenancy reform. Following substantial investment in civil works (river training and irrigation infrastructure rehabilitation), capture of floodwater and potential irrigation capacity have improved, and the towns are better protected from flooding. The project helped improve access to safe water for some 20,000 households. It made notable progress in empowering women in a highly conservative society through increased access to finance through women's savings and credit groups, and skills training.
8. Despite the important steps taken and contributions made by the project, the overall achievements fell short of the set objectives, not least because the initial aspiration was rather ambitious and over-optimistic, and the project environment was challenging. Given the initial request by the Government for the rehabilitation of the Gash Irrigation Scheme with a focus on infrastructure, the choice for IFAD was either to influence the project concept and design, or not to finance a project in Gash/Kassala. IFAD opted for the former, which meant that it had no choice but to engage with the delicate issues of access to land and water resources. On the one hand, this could be considered as a courageous endeavour in pursuit of more equality and betterment of the disadvantaged poor in a society with a strong tribal hierarchy and power structure. On the other hand, project design underestimated the complexities of social, political and institutional contexts. To some extent, it may have been difficult to foresee some of the contextual issues and challenges (for example, in light of the peace-building process in the eastern region, how sensitive the Government could be with respect to tribal leaders). Still, the project design was over-optimistic about such aspects as the preparedness of project stakeholders, and the work needed to put in place appropriate institutional arrangements with adequate capacity (technical and managerial), especially for the Gash Agricultural Scheme (GAS) which is responsible for the scheme management – and for the WUAs. There was insufficient consultation on the sensitive land issue at the design stage, resulting in lobbying by those with vested interest against the project activities once implementation started.
9. Against the backdrop of the Eastern Sudan Peace Agreement in 2006, the major infrastructure works supported by the project (notably, the river control works and the rehabilitation of the Gash Irrigation Scheme) is likely to have made a major contribution to general development in the area. However, the opportunities offered by these investments were not exploited to the extent necessary to achieve expected results at farm and household level due to the limited progress with regard to in-field improvement and land and crop management, and the incomplete land tenancy reform process. Key institutions for the Gash Irrigation Scheme (GAS and WUAs) remain weak. The achievement with respect to the major focus of the project – efficiency, equitability and sustainability in the Gash scheme operation –

was limited. There is still a lack of transparency in the land allocation system, especially given the inability to verify identification of tenant farmers. Sustainability of the scheme's management, operation and maintenance is a serious concern. Overall project achievement is considered moderately unsatisfactory.

10. **Recommendations.** Provided below are some key recommendations for consideration by IFAD and the Government. As IFAD has not pursued follow-on support for GSLRP, nor does it plan to do so, some of the recommendations would be for consideration by the Government in collaboration with other partners, for follow-on support for the Gash scheme, or other agricultural schemes as may be appropriate.
- **Sustainability of the Gash spate irrigation scheme.** IFAD could consider engaging in discussions with the Government to address key outstanding issues threatening the sustainability of the Gash Irrigation Scheme. IFAD decided not to continue supporting the Gash scheme, but as a partner that provided substantial financing under GSLRP and as a major partner in the agricultural sector, IFAD is well-placed to work with the Government to tackle these issues. These include: (i) clarification on the institutional arrangements concerning operation and maintenance (O&M) of the Gash Irrigation Scheme, including the GAS status; (ii) putting in place measures to strengthen institutional arrangements and capacity of both GAS and WUAs; and (iii) critical reflection on how best to bring the land tenancy reform in the Gash Irrigation Scheme to a conclusion.
 - **Irrigation scheme operations and maintenance.** Regarding the possible institutional arrangements, if and when WUAs play a more substantial role in the scheme O&M financed by water fees as envisaged, the roles of public institutions could – and should – focus on the management, operation and maintenance of major infrastructure, including river training works, off-takes and main canals.
 - **Strengthening of WUAs.** To ensure the development of WUAs that are managed in a transparent and accountable manner, it is recommended that further medium-term investment be made under a proposed follow-on project to strengthen their capacities to undertake O&M activities in an effective and efficient manner.
 - **Comprehensive planning for the river basin.** Taking into account (increasing) sediment problems, changes in flood patterns and increasing water demands, it is recommended that a Gash river management plan be developed based on the concept of integrated water resource management. As the Gash river is a transboundary river, this management plan should be prepared in close consultation with Eritrea to ensure (more) sustainable management of the Gash river, including interventions in the catchment area to reduce sediment load in floodwater caused by (increasing) soil erosion.
 - **Irrigated crop production.** In order to enhance the viability and sustainability of the scheme's operation, in the future more attention is required for increasing the returns on irrigated crop production both in terms of yield and of profitability, taking into consideration the issue of access to inputs and markets. This needs to be done in combination with measures to improve irrigation efficiency.

Elevated drinking water tanks in Aroma. The Gash Sustainable Livelihoods Regeneration Project financed the rehabilitation and extension of the pipeline system to improve access to drinking water.

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Republic of The Sudan

Gash Sustainable Livelihoods Regeneration Project

Project Performance Assessment

I. Objectives, methodology and process

- 1. Background.** The Independent Office of Evaluation of IFAD (IOE) undertakes two forms of project evaluations: project completion report validations (PCRVs) and project performance assessments (PPAs). PCRVs consist of a desk review of project completion reports (PCRs) and other supporting documents. PPAs, involving country visits, are undertaken on a number of selected projects¹ for which PCRVs have been conducted. In this context, the Gash Sustainable Livelihoods Regeneration Project (GSLRP) in The Sudan was selected for a PPA.
- 2. Objectives and focus.** The main objectives of the PPAs are to: (i) provide an independent assessment of the overall results of projects; and (ii) generate lessons and recommendations for the design and implementation of on-going and future operations within the country. Amongst others, this PPA focused on selected key issues that emerged in the PCRV, including sustainability, innovation and scaling-up, women's empowerment and targeting.
- 3. Methodology.** The PPA follows the IFAD's Evaluation Policy,² the IFAD/IOE Evaluation Manual³ and the Guidelines for PCRV/PPA.⁴ It adopts a set of internationally recognized evaluation criteria (annex IV) and a six-point rating system (annex I, footnote a). In the process of preparing the PCRV, a desk review of available documents was undertaken.⁵ During the PPA mission's field work, primary data was collected to validate documented information and to allow for an independent assessment of project performance. As normally the case with PPAs, given the time and resource constraints, no quantitative survey was undertaken. Key data collection methods included individual interviews and group discussions with key stakeholders in project sites, Khartoum and Rome.
- 4. Data availability and limitations.** There were constraints in data availability and reliability. Most of the time during project implementation, the performance of monitoring and evaluation (M&E) was assessed as moderately unsatisfactory.⁶ Interviews in the field did not always corroborate the key available data (e.g. basic data availed by the Gash Agricultural Scheme (GAS) or those provided by surveys undertaken under the project).
- 5. Process.** The PPA mission⁷ was undertaken from November-December 2013. Meetings were held in Khartoum on 24-25 November 2013 with the Government officials at federal level and two previous project staff members. Subsequently, the team travelled to the project area in Kassala State from 26 November to 4 December 2013.⁸ In Kassala state, the team had discussions with staff of the State Ministry of Agriculture, Fisheries, Irrigation and Livestock,⁹ Gash Agricultural Scheme (GAS), Gash River Training Unit (GRTU), members of water users'

¹ The selection criteria for PPA include: (i) synergies with forthcoming or ongoing IOE evaluations (e.g. country programme evaluations); (ii) novel approaches; (iii) major information gaps in PCRs; and (iv) geographic balance.

² <http://www.ifad.org/pub/policy/oe.pdf>

³ http://www.ifad.org/evaluation/process_methodology/doc/manual.pdf

⁴ http://www.ifad.org/evaluation/process_methodology/doc/pr_completion.pdf. See annex IV for an extract from the guidelines. "Methodological note on project performance".

⁵ See annex VII for bibliography.

⁶ Project status reports.

⁷ The mission consisted of Fumiko Nakai (lead evaluator, IOE), Olaf Verheijen (participatory irrigation development/management and institutions) and Mahmoud Husein Ali Numan (agriculture and livelihoods).

⁸ The field visits were accompanied by Mr Mohamed Elhag Sirelkhatim (Senior Coordinator, Central Coordination Unit for IFAD-funded projects), Mr Khairi Elzubair (Agricultural Engineer, Project Coordination Unit, Federal Ministry of Agriculture and Irrigation) and Mr Abdelfatah Khairseed (Federal Ministry of Finance and National Economy).

⁹ The current ministry name. It used to be "(State) Ministry of Agriculture, Animal Wealth and Irrigation (MAAWI)" and it is referred as such in this report.

associations (WUAs) at different levels, the Agricultural Bank of Sudan (ABS - Aroma branch), members of women groups and other community members. Two wrap-up meetings were organized for the PPA team to share its preliminary findings: one in Kassala (3 December 2013) and another in Khartoum (5 December 2013).

6. Following the mission, further analysis of the data and findings was conducted to prepare the draft PPA report. The draft was shared with IFAD's Near East, North Africa and Europe (NEN) Division and the Government of The Sudan, and their comments were taken into account when finalizing the report.

II. The project

A. The project context

7. **Project background.** In Kassala state in the eastern part of The Sudan, the Gash River, spate irrigation system and surrounding rangeland resources in the delta provide an important basis for the local economy and livelihoods. The area is dominated by *Hadendowa*, the main tribe of the *Beja* people, with a strong tribal hierarchy and power structure. The Gash spate irrigation scheme was set up by the British colonial government in the 1920s to supply raw cotton for the textile industry - and also to settle poor nomadic people into a cash economy. The scheme went into serious decline in the 1970s mainly due to poor management, and spells of drought and security problems increased population pressure on the scheme. These factors led to the development of an increasingly unfair and non-transparent (annual) land allocation system in favour of tribal leaders and elite groups. The project was designed to address the policy and institutional causes of the degradation of the scheme to improve living standards in the Gash Delta and the adjacent range areas. Also see annex X for more details on the Gash scheme.

Box 1

Salient features of spate irrigation and Gash Irrigation Scheme

- In spate irrigation system, seasonal flood water from mountain catchments is diverted from river beds and spread over large areas. It is a type of water management that is unique to semi-arid environments and found in the Middle East, North Africa, West Asia, East Africa and parts of Latin America. It is distinguished from irrigation with perennial water resources.
- In spate irrigation, uncertainty comes both from the unpredictable nature of floods and the frequent changes to the river beds from which the water is diverted. As a result, the area that could be effectively irrigated is variable from one year to another and is dependent on the erratic hydrological regime of the river.
- The Gash spate irrigation scheme is based on the capture of annual ephemeral flash floods that occur in the Gash River during the short period of July-September through seven off-take works that transfer water to six blocks.
- According to the original design by the British, the scheme was intended to cover 240,000 feddan,* with 80,000 feddan to be irrigated/cultivated annually in three-year rotation, although actually irrigated/cultivated areas were normally less than 80,000 feddan. It was designed for growing cotton but the current cropping pattern is dominated by sorghum.
- In the Gash scheme, traditionally, tenants were registered with land entitlement (i.e. number of feddan) only specifying a block (without a specific location). Every season, using a lottery system a tenant would be allocated a piece of land within the block according to the entitlement, depending on which part of the block has been irrigated, upon payment of the first instalment of water fee. This means that the location and size of the land allocated, actually irrigated and cultivated by a specific tenant changed every year (see annex XI for more details on land allocation mechanisms).

Source: Spate Irrigation Network, project reports.

* One feddan is about 1.038 acres or 0.42 hectares. 240,000 feddan is about 100,000 hectares.

8. **Project objectives.** GSLRP was designed as a US\$39 million project over eight years, with the goal of regenerating the livelihoods of the maximum number of poor people¹⁰ in and around the Gash delta, compatible with the efficient and sustainable use of its land and water resources and based upon a shared vision of development and the stability of the related institutional arrangements. The purpose was "to ensure the efficient, equitable and sustainable operation of the Gash Scheme and its integration of the scheme into the local economy".
9. The specific objectives indicated in the president's report were called "specific outputs" in the appraisal report, with slight differences. These were: (i) the elaboration and maintenance of a shared vision of development [in respect of an equitable, secure, transparent access to economically viable land and water rights];¹¹ (ii) establishment of the related institutional arrangements appropriate to the shared vision; (iii) rehabilitated water and other social infrastructure and water harvesting devices; (iv) improved crop and livestock husbandry practices; (v) establishment of financial services;¹² and (vi) strengthened state planning capacity. At the same time, the logical framework had a set of slightly differently worded "project outputs". The comparison of these is provided in annex VIII.
10. **Project area and target group.** The project area was in Kassala State in the eastern part of The Sudan, covering the entire locality¹³ of Gash and parts of Hamaish Koraib and Kassala localities. It included the entire command area of the Gash spate irrigation scheme, as well as the east bank of the Gash River and the rangelands north and west of the scheme, but excluded Kassala city to the south and its surrounding villages. The target group was the poor rural households in the project area, estimated at 67,000 households out of the total 87,000 households (75,000 rural) in the project area. The targeted 67,000 poor rural households covered: 30,000 tenant farmers who would benefit from more secure and equitable access to irrigated land; 10,000 landless households including some 4,500 woman-headed households who were expected to gain access to irrigated land; and 27,000 non-tenant households who would benefit from improved infrastructure for livestock production and non-farm income-generating activities.
11. **Project approach.** The initial request by the Government was for the rehabilitation of the Gash Irrigation Scheme, but IFAD, based on an inception mission in 2002, suggested that "the project concept should shift...to a focus on addressing the policy and management causes that led to the degradation of the [Gash irrigation] scheme – and the reform of the existing institutional framework to promote an equitable, transparent, stable and sustainable system for resource allocation and management".¹⁴ The project design process was then informed by the "sustainable livelihoods approach".¹⁵ As a result, the project proposal combined rehabilitation of the irrigation system with support for a more equitable land tenure mechanism, as well as other activities beyond spate irrigation. The landless and women in particular, were to be enabled to achieve sustainable livelihoods through support for off-farm income generating activities. These led to the project design that encompassed various sub-sectors: irrigation, animal production and rangeland management, financial services and marketing, and community development, coupled with substantial support for key institutions for the Gash irrigation scheme.
12. There were a number of policy and institutional reform issues that were fundamental for project success. These included: land tenure arrangements on the

¹⁰ The president's report specified "the maximum number of poor people" to be "67,000 poor households".

¹¹ The addition in a parenthesis found only in the loan agreement.

¹² The appraisal report also mentioned a "community initiatives fund", while the loan agreement put this objective (or output) somewhat differently, "access of the tenants and non tenants to formal financial services".

¹³ Locality is a unit that indicates geographical and administrative areas below the State level.

¹⁴ GSLRP appraisal report.

¹⁵ At the time IFAD had partnership arrangements with the Department for International Development (DFID) of the United Kingdom promoting the sustainable livelihoods approach. The partnership covered a secondment of a DFID staff to the then Technical Advisory Division at IFAD and supplementary funding that could be used for studies, etc.

irrigation scheme command area, responsibilities of public institutions for river control and irrigation scheme management, organization and rights of water users' associations (WUAs). The GSLRP was conceived as "an investment project whereby it [would] create opportunities and incentives for reforms rather than relying on measures such as loan conditions and government assurance".¹⁶ The Project Coordination Unit (PCU) and project partners were to be supported by technical assistance, training and studies.¹⁷ An emphasis on institutional building was evidenced by a substantial proportion of the project budget on the "institutional support" component, with over 40 per cent of the estimated total cost.

13. **Project components.** The project consisted of the following five components: (i) irrigation infrastructure rehabilitation; (ii) animal production and rangeland management; (iii) community development, capacity-building and empowerment; (iv) financial services and marketing; and (v) institutional support.
14. **Key institutions.** The key institutions with the project included: (i) Federal Ministry of Agriculture and Forestry (MOAF); (ii) Federal Ministry of Irrigation and Water Resources (MOIWR) responsible for river control; (iii) Ministry of Agriculture, Animal Wealth and Irrigation (MAAWI) of the Kassala State; (iv) GAS, which was incorporated by a decree in 2002 to manage the Gash Irrigation Scheme; (v) GRTU established in January 2004 under MOIWR to mitigate the flood damages and improve the flow of the irrigation water to the Gash scheme; (vi) WUAs; (v) Kassala Drinking Water Corporation; and (vii) ABS for financial services.
15. **Implementation arrangements.** MOAF at federal level was the lead project agency responsible for the implementation of the project, under the oversight of the existing Inter-Ministerial Steering Committee. A PCU was established in Kassala city, the capital of Kassala State.
16. **Changes in the project context.** There were major developments in overall country context during the project: the Comprehensive Peace Agreement (CPA)¹⁸ signed between the Government of The Sudan and the Sudan People's Liberation Movement in January 2005, and the signing of the Eastern Sudan Peace Agreement in 2006 with the Eastern Front¹⁹ for the three states of Kassala, Red Sea and Gedarif. The fact that the CPA provided the states with autonomy and control over their resources had important implications on the management of the Gash Irrigation Scheme; there have been conflicting views and confusion on the status of GAS (i.e. whether it should be under the Federal or the State government) – the situation continuing to date. The Eastern Sudan Peace Agreement resulted in improved security in the project area and improved progress in the river training civil works, etc. In general, there was positive development in the area over the project period, but there were also flood events in 2003 and 2007 causing damages in the area, especially in towns.

B. Project implementation

17. Following the approval in December 2003 and the signing of the loan agreement in January 2004, the IFAD loan was declared effective in August 2004. It should be noted that, even before the loan effectiveness, the Government of The Sudan already started financing some infrastructure rehabilitation works related to the project. The project was completed on 30 September 2012, with the actual project cost of US\$35.65 million against US\$39 million estimated at appraisal (table 1). The disbursement rate of the IFAD loan at closing was 96.5 per cent.²⁰ The financing by the Government was US\$2.1 million (23 per cent) higher than the

¹⁶ GSLRP appraisal report.

¹⁷ The design included a state planning advisor (international technical assistance), which position was never filled due to difficulties in identifying a qualified candidate.

¹⁸ The CPA was meant to end the civil conflict, develop democratic governance countrywide and share oil revenues. It also set a timetable leading to a referendum for the independence of Southern Sudan.

¹⁹ A coalition of rebel groups operating in eastern Sudan along the border with Eritrea.

²⁰ SDR 16.846 million out of the initial allocation of SDR 17.45 million.

appraisal budget, reflecting a significant contribution for irrigation infrastructure rehabilitation. It should be noted that there are other costs incurred by the Government that is not captured in the table below (e.g. river training, mesquite control).

Table 1
Project financing: planned and actual cost (US\$ million)

Component	Planned budget					Actual cost				
	IFAD	GOS	Benef. + PFI	Total	%	IFAD	GOS	Benef.	Total	%
Irrigation infrastructure rehabilitation	6.760	3.976	-	10.735	27.5	4.800	7.252	-	12.052	34
Animal production and rangeland management	2.270	0.525	0.416	3.211	8	1.660	0.255	- ^c	1.915	5
Community development, capacity-building and empowerment	4.067	1.218	0.152	5.437	14	5.178	0.565	0.098	5.840	16
Financial services and marketing ^a	3.287	0.074	0.465	3.827	10	0.177	0.002	-	0.178	<1
Institutional support	8.563	3.134	4.128 ^b	15.824	40.5	12.717	2.948	- ^d	15.665	44
TOTAL	24.946	8.927	5.161	39.034		24.532	11.022	0.098	35.652	
% of total	64%	23%	13%			69%	31%	0.3%		

Source: Appraisal report 2003, PCR 2012, PPA mission.

^a It was expected that a participating financial institution (PFI) would contribute US\$465,500 in the form of credit (cofinancing with IFAD). ABS financed credits from its own source 100 per cent, but this was not captured as part of the project cost in PCR.

^b The project budget envisaged that water fees collected would be used for in-field development work such as *masga* extension, following the 100 per cent IFAD financing of pilot *masga* improvement. (see also paragraph 39)

^c Only two *hafirs/hods* were rehabilitated out of planned ten. In addition, beneficiaries rejected the payment of fees for the use of the rehabilitated *hafirs*.

^d The PCR reported US\$1,812 million as beneficiary contribution under Component 5 and, including this amount, the actual total project cost was reported as US\$37.465 million. However, the PPA confirmed that US\$1.812 million was the amount collected as water fees since the project inception, which was used by GAS for operations and maintenance of the scheme, and not for (rightly) in-field development works (also see note b to this table and paragraph 39). Tenants have always been required to pay water fees that were used for operations and maintenance, with or without the project. Hence, US\$1.812 million was not included in the actual project cost presented in this table.

18. **Component 1: Irrigation infrastructure rehabilitation.** This component was designed to enhance the capture of flood waters through river training and off-take rehabilitation and rehabilitation of the water reticulation network canals and access roads. Another related element was the improvement of field layouts and control of mesquite²¹ invasion of farm lands. In the project documents and various mission reports, there seemed to be some confusion about which component these activities fell under.²² In this PPA report, mesquite control in the irrigation command area is described here.
19. *River training and off-take rehabilitation.* Detail design studies based on updated surveys following the destructive flood in 2003 showed that additional works were needed to ensure that the cities of Kassala, Aroma and Wagar were properly protected.²³ The design studies concluded that the raising of only two off-take structures (e.g. Fota and Metateib) was required to accommodate the increased levels of the Gash riverbed. Due to the complexity of the site and security reasons,

²¹ "Mesquite (*Prosopis chilensis*) was originally planted in GAS in a pilot programme for stabilizing canal banks. Its spread to a large degree reflects poor scheme management and deterioration in the infrastructure which has reduced the area which can be irrigated. Mesquite will be cleared from the scheme and replaced in public areas by other tree species, which may be used for timber and charcoal production. It became an aggressive invasive shrub along the Gash riverbanks and over flood plain..." (Appraisal report, main report, footnote 9).

²² For example, mesquite control in both rangeland and irrigated fields was described under Component 2 "Animal Production and Rangeland Management" in the appraisal report. The budget for improvement in *masga* design and irrigation efficiency was provided under Component 5 (linked to support to Water Users Associations).

²³ Including excavation of about 3.0 million m³ of earthworks instead of the 1.5 planned millions m³; construction/rehabilitation of 25 spurs more than planned 16; and construction of El Gira channel upstream of Kassala town.

the rehabilitation of Hadaliya off-take was seriously delayed, whereas the Government decided to finance the construction of a new off-take next to existing one to increase water diversion capacity. The execution of additional works was possible due to the allocation of extra funds by the Government to GRTU.

20. *Rehabilitation of water reticulation network canals and access roads.* The project undertook rehabilitation works aimed at restoring the original design of the main canals as well as the repair of *masga* inlet structures or the construction of new ones.²⁴ With the rehabilitation work of four out of the six irrigation blocks, the IFAD funds allocated for this purpose were exhausted due to underestimation of the quantities of earthworks needed and escalation of unit prices, particularly for wages and fuel. None of the access roads were constructed or rehabilitated; in fact, the project cost tables in the appraisal report did not make any provision for these.
21. *Field improvements.*²⁵ The extension of *masga* canals was not carried out, mainly due to lack of design parameters, lack of funds and confusion on who should do it and how. No land levelling at *masga* level was undertaken as land levelling and laser equipment purchased by GAS under the project was not adapted to local conditions. Demonstrations of sub-blocks within *masgas* were established in some areas. No significant initiatives were taken by GAS nor Masga WUAs to improve on-farm water use,²⁶ such as reduced water application for sorghum (3,200 m³/feddan instead of 5,200 m³/feddan based on cotton); floodwater is still diverted from the main canal to *masgas* for a period of 25 to 30 days. No strategic plan for reducing mesquite infestation in irrigated fields, public lands and river banks²⁷ was prepared.
22. Under separate funding, the Government cleaned mesquite in about 181,000 feddan in 2004 using contractors. As the works were carried out before WUAs were formed and the cleared land was not managed properly, much mesquite was allowed to grow again. As the cost of mechanical operation was very high (US\$330/ha), the project encouraged WUAs to mobilize free labour for this, with GAS providing some machinery. According to recent GAS data, a total area of 167,036 feddan has been cleaned, whereas 71,176 feddan is still infested with mesquite.
23. **Component 2: Animal production and rangeland management.** This component aimed at improving animal health services, restocking of improved animal breeds, and developing a sound land use policy through the rehabilitation of community stock water facilities, construction of water containment and spreading structures. As per design, the component also covered mesquite control, but this activity in relation to irrigated areas is described under Component 1 in this report.
24. *Animal health and production.* The project support included renovation of two veterinary clinics, provision of two mobile clinics, veterinary equipment and training of community animal health workers (CAHWs). Two artificial insemination units for improving milk production of goats were also established. An attempt was made to establish a drug revolving fund as per design without success. A total of 1,080 awareness sessions for pastoralists and 12 training courses for veterinary staff were conducted. Thirty CAHWs (20 men and 10 women) were trained against the target of 160, but most of them dropped out quickly after the training.

²⁴ These included the removal of 4.4 million m³ of silt from the main canal systems instead of planned amount of 2.7 million m³ as well as the construction/ rehabilitation of 189 structures over the planned 207.

²⁵ In the appraisal report, component 1 summary description refers to improvement of field layout, while most of the specific activities referred to in this paragraph were described and costed under component 5 in the appraisal report (mainly in relation to WUAs).

²⁶ If floodwater was distributed more efficiently (land levelling, extension of *masga* canals) and according to the crop water requirement for sorghum, it would be possible to irrigate a larger area and the average size of irrigated and cultivated land per tenant would be larger. However, it is very difficult to assess how much more.

²⁷ Included under component 2 in the appraisal report.

Subsequently, instead, the Animal Resources and Fisheries Administration (ARFA)²⁸ provided training directly to pastoralists in various topics.

25. *Rangeland management.* Many activities envisaged in the design were not or only partially implemented. Only two out of planned ten *hafirs* (earthen tank) and *hods* (groundwater recharge reservoirs) were rehabilitated.²⁹ The project introduced water harvesting systems to two rangeland users associations (RUAs) in the form of crescent shaped terraces with a total area of 1,000 feddan. Eleven RUAs were formed. Pasture seeds were broadcasted jointly by the Range Management Administration and RUAs covering 4,000 feddan. The Land Use Department (LUD) of MAAWI also introduced the construction of water spreading structures along *khors* for crop production covering about 2,500 feddan. The rangeland management activities covered an insignificant area compared to vast deteriorated areas.
26. **Component 3: Community development, capacity-building and empowerment.** This component was intended to improve access to domestic water supply by local communities and to improve livelihood options of households with no registered land on the Gash scheme. The project design envisaged support for capacity-building (specifically women and non-tenants) and partial financing (75 per cent) for community initiatives (including social and economic infrastructures, means of transport, group-based business activities).
27. The most substantial investment made under the component (over US\$4 million) was for the construction of new water pipeline (Kassala-Aroma-Tendelai) to provide domestic water (for some 20,000 households) and also for animals.
28. The project supported the establishment of 69 community development committees (CDCs) at village level, including those with only women. Women groups through training developed to savings and lending groups. Community members received training in various topics such as water management and sanitation, group formation and management, food processing, business management, handicrafts and home vegetable gardens. A total of 15,239 persons received training, including 9,060 women (59 per cent).³⁰ About 2,500 women and 500 men participated in literacy classes.
29. Some community initiatives were financed by the project,³¹ but overall, the use of the Community Development Fund remained minimal,³² partly due to the inability or unwillingness of communities to contribute 25 per cent, with the presence of other more favoured initiatives (e.g. with requirement of less or no contribution).
30. **Component 4: Financial services and marketing.** The component was intended to facilitate access by the project beneficiaries to financial services, specifically credits. Two modalities for credit operations were envisaged, one for seasonal inputs, and the other as a "Community-based Investment Credit" operated by a participating financial institution (PFI) for groups, such as WUAs or other interest groups, for the acquisition of farm machinery, food processing enterprises, produce marketing or livestock. Approximately US\$2 million of the IFAD loan was initially allocated for credit lines. As for non-WUA community-level organizations, Community Development Facilitators hired under the project were supposed to support community mobilization and capacity-building.

²⁸ This used to be called Animal Health Administration (AHA).

²⁹ According to some supervision reports, the works related to *hafir/hod* was suspended after the renovation of two due to lack of clarity regarding policy and responsibilities for operation and management of stock watering points. The PCR only refers to the limited funding for the sub-component and delays in tendering process as a reason.

³⁰ The number of persons trained was provided in the PCR per training topic and it may have included double-counting (i.e. the same persons receiving different training).

³¹ For example, though the construction of new classrooms, a total of 2,032 students (57 per cent girls) benefited.

³² The disbursement of the IFAD loan for "Community Development Fund" was only 27 per cent of the initial allocation.

31. The ABS was selected as a PFI on a competitive basis and reopened its branch in Aroma in May 2005. The branch started lending using its standard lending procedures with own resources. ABS took a cautious approach and started lending through only a limited number of WUAs in Degain block (5 WUAs reported in January 2008): the performance was discouraging.³³ Lending through WUAs, each with around 300 members most of whose identifications could not be verified, proved to be problematic. Credit committees at village levels were formed earlier in the project, but they did not work well³⁴ and the original idea of supporting community level organizations to perform financial service intermediation was abandoned in the course of implementation.
32. Given the experience, the project shifted its focus to promoting women's groups, rather than WUAs, as a channel for microfinance operations. The project's Community Development Facilitators worked to mobilize and train women's groups in liaison with ABS. At the end of the project, there were 75 women savings and lending groups with a membership of over 2,000. Due to ABS's preference to use its own resources for lending, the original allocation for credit lines was entirely reallocated to other categories. The project support to ABS under this component included office renovation, two vehicles (one to serve as a mobile bank) and staff training. Contrary to the component title, there were little or no activities supporting marketing.
33. **Component 5: Institutional support.** This component was designed to support the establishment and strengthening of an institutional framework for successful project implementation and sustainability of project outcomes. The component was to support the key institutions, i.e. WUAs, GAS, MOIWR, MAAWI (for agricultural services) in terms of hardware (facilities, equipment, vehicles and materials), training, salaries and allowances. Also included was support for the PCU operations. While the land tenancy reform was an important element in the project, project support was not explicitly featured in the design document as a sub-component nor a discernible set of interventions; only a few budget lines were made under the PCU cost, e.g. land tenure committees, legal advisor. Nonetheless, land tenancy reform has been a separate sub-section reported under the institutional support component in supervision mission reports and this PPA report follows this practice.
34. *Land tenancy reform.* The project design emphasized the need for a more equitable land tenure mechanism to accompany irrigation infrastructure rehabilitation. The reform was intended to ensure that "the largest possible number of poor farmers have stable tenure on small but economically viable holdings" (i.e. 3 feddan). The target was to allocate land tenancy rights to a total of 40,000 people,³⁵ including 10,000 landless farmers and 10 per cent women.
35. The Legal Committee for Land Reform (LCLR) was established by a decree in September 2003. A set of eligibility criteria for tenant selection and registration were adopted by stakeholders. The LCLR completed the screening and cleaning of the 1992/93 register books in all six irrigation blocks before the project mid-term review (MTR) with a total number of 56,600 claimants. The screened and cleaned register books approved by GAS Board of Directors (BOD) included 46,273 tenants, and about 10,000 remaining claimants were put on a waiting list. However, the validity of the updated register books has been questioned to a great extent (also

³³ The MTR report noted the repayment rate of 59 per cent and Portfolio at Risk (>90 days) at 100 per cent.

³⁴ "The credit delivery structures, in the form of men's and women's credit committees, special interest groups and WUAs are risky lending propositions as they are conflict ridden, undisciplined, without adequate systems and control mechanisms" (MTR, Working Paper 3).

³⁵ According to the register books of 1992/93 and 2002/03, the number of registered tenants was 31,232 and 39,597, respectively. The appraisal report stated that the 1992/93 register books were considered more reliable than later ones. Based on the assumption that the 1992/93 register books already included some fictitious names (but less than the later register books), it was estimated that there would be about 30,000 eligible tenants. Furthermore, by reducing the size of landholding of those with large areas, it was thought possible to accommodate 10,000 more farmers.

see annex XI). The fixation of plots of land to individual tenants has started in Mekali, Degain and Metateib blocks and it is reportedly completed in Kassala block.

36. *Water Users' Associations*. The project was to support the formation and training of WUAs to take an active part in the operation, maintenance and improvement of the Gash Irrigation Scheme. Furthermore, according to the appraisal report, cost for civil works at *masga*/field level (e.g. extension of *masga* canals and establishment of cross-borders for more effective control of overland flow) was included as part of the project cost under this heading, which was expected to be mostly funded through water fees.³⁶
37. The Gash Delta Agricultural Corporation Water users' Associations Act ("WUA Act", see also annex XII) was approved in 2004. Subsequently, a total of 92 WUAs were established at *masga* level in five of the six irrigation blocks (table 2). The formation of WUAs in Hadaliya block was strongly resisted by large tenants and it did not materialize during the project period. Each of the 92 Masga WUAs is linked to two paired *masgas*, of which one is located in the upper reach of the main canal (higher irrigation probability) and the other in the lower reach (lower irrigation probability) (see also annex X). In addition to WUAs at *masga* level, five WUA Block Committees and a WUA Apex Organization at scheme level were formed. Office buildings were built for them, with office furniture, photocopier and computer. One 4WD pick-up, which was used to facilitate WUA training, was handed over to the WUA Apex Organization after the completion of the training contract.

Table 2

Salient features of WUAs at *masga* level (achieved and planned)

<i>Name of irrigation block</i>	<i>Entitled land (feddan)</i>	<i>Number of Masga WUAs</i>	<i>Average land size of WUA (feddan)</i>	<i>Number of registered farmers</i>	<i>Average number of tenants per WUA</i>
Kassala	18 700	13	1 438	6 239	480
Mekali	28 100	24	1 171	9 360	390
Degain	20 300	18	1 128	6 770	376
Tendalai	28 500	19	1 500	9 505	500
Metatieb	23 900	18	1 328	7 909	439
Hadaliya	19 500	15 ^a	1 300	6 500	433
Total	139 000	107^b	1 324	46 283	433

^a Planned number of WUAs with corresponding number of tenants.

^b The number of WUAs actually formed is 92 without 15 planned in Hadaliya.

Source: PCR 2012.

38. A total of 361 WUA members were trained in various topics during a 4-day course between 2006 and 2008 by the Water Management and Irrigation Institute (WMII) of the University of Gezira. In 2010 and 2011, the remaining Masga WUAs in Mekali and Metateib blocks received 5-day training from the Core Training Team (CTT), which was formed and trained by WMII in December 2009. In 2012, CTT provided training for the five WUA Block Committees and the WUA Apex Organization.
39. The actual expenditure for this sub-component was US\$463,560, 8 per cent of the initial budget, mainly because no works related to pilot *masga* improvement and block development were carried out. The project design envisaged that the cost for the improvement of 174 *masgas* would be largely financed by water fees paid by tenants, which, in the view of the evaluation, was not reasonable, as collected water fees are needed for operations and maintenance, unless the rate is

³⁶ The budget for support for WUAs was approximately US\$5.7 million, of which US\$5.2 million was for civil works and US\$4.1 million (or 73 per cent) was supposed to be financed by beneficiary contribution (namely, water fees).

significantly increased also to cover the investment cost. Understandably, a large share of water fees collected has gone to GAS.

40. *Gash Agriculture Scheme.* Various heavy machinery, vehicles and equipment were provided to GAS. The workshop and stores were renovated with the civil engineers' office at Aroma. The project supported much more technical assistance and training than envisaged at appraisal. The project also supported GAS with recurrent costs. The actual cost for this sub-component was US\$4.537 million (30 per cent higher than the appraisal budget), with 60 per cent for vehicles and equipment.
41. *MOIWR.* As the re-establishment of effective river control structures and stream regulation - both upstream and downstream of Kassala town - was a prime element of optimising the capture of flood water for the Gash spate irrigation scheme and safeguarding inhabited areas from flooding, the project was to support MOIWR Kassala Office through the provision of machinery, equipment and vehicles, re-establishing river gauging stations, support for recurrent costs (allowances and operating costs), technical staff training.
42. MOIWR established GRTU in January 2004 with the mandate to mitigate flood damages and improves the flow of irrigation water to the Gash spate irrigation scheme. The project provided to GRTU earthmoving equipment to execute the river control works utilising force account and reducing its dependence on private contractors, as well as to enable GRTU to undertake annual routine and emergency repairs in a cost-effective manner. The actual cost for support to GRTU was US\$5.614 million, 123 per cent higher than the original budget. The project financed much more machinery, vehicles and equipment than initially budgeted, as a result of the Government taking up a greater portion of the cost for civil works relating to river training (which was costed under Component 1 and not Component 5).
43. *Agricultural services.* In order to assist farmers to exploit the opportunities presented by irrigation scheme rehabilitation, the project was to provide assistance to strengthen research and extension service through provision of vehicles and equipment (e.g. extension communication aids), support for research, demonstration and training, and financing of recurrent costs (allowances and operating costs). The project provided support to the Agricultural Research Station, Technology Transfer and Extension Administration (TTEA), Land Use Department and Office of Registrar (of associations, community-based organizations), mainly in the form of vehicles and equipment.
44. TTEA reportedly conducted 12 farmers' schools, 193 demonstration farms, and 21 field days (33, 46 and 50 per cent of the targets, respectively) between 2006 and 2009. A total of 7,410 farmers were reached, which was equivalent to 18.5 per cent of the target group in the irrigated areas. According to the PCR, the project support to TTEA was suspended after 2009 because the administration failed to report the results of its activities in terms of adoption rates and farmers' gains.
45. The Office of the Registrar succeeded in the formation and registration of 92 Masga WUAs, 5 WUA Block Committees, one WUA Apex Organization, 11 RUAs, 69 CDCs and 70 women's savings and lending groups. It also played a major role in the renewal of the Executive Committees for the registered WUAs and RUAs.
46. *Project Coordination Unit.* The Federal MOAF established a PCU in Kassala town and recruited the core staff in 2004. Some international and technical assistance to PCU envisaged did not materialize, such as an international state planning advisor and a legal advisor. The capacity of PCU was further reduced due to the non-recruitment of another M&E Officer following the resignation of the first one and the downsizing of a considerable number of staff as recommended by MTR. The total actual cost for PCU was US\$4.31 million. Although the number of staff was considerably reduced following MTR, the actual recurrent cost was US\$1.95 million higher than

the budget cost and represented 75 per cent of the PCU cost, mainly owing to increases in salaries and fuel prices during the project period.

Key points

- The project sought to combine the rehabilitation of the Gash spate irrigation scheme with land and water governance reform and livelihoods approach. In relation to the irrigation scheme, it aimed at expanding areas to be irrigated based on rehabilitation works and change in the rotation period (from 3 to 2 year cycle), combined with a reform initiative for more equal access to land on the irrigation command area.
- Although multi-sectoral as a whole, a significant proportion of the project resource was – by design and in reality - directed to infrastructure (river training and irrigation) and institutional support (mostly for equipment and recurrent cost). Implementation of other activities (animal production, rangeland management, community development, financial services and marketing) was limited and the achievements notably lower than originally intended.
- Loan allocation by category changed notably during implementation (annex IX).

III. Review of findings

A. Project performance

Relevance

47. **Relevance of objectives.** At the time the project was designed (2002-2003), the country had been experiencing civil conflict, with restrained external relations leading to aid suspension by many donors, dwindling public resources for development and impoverishment, although the situation was somewhat alleviated by an increase in revenue from the commercial oil exploitation starting in 2000. GSLRP was relevant to the key objective of the Interim Poverty Reduction Strategy Paper (IPRSP) for 2004-2005, i.e. to promote economic growth through rural development and to improve service delivery through decentralisation.
48. In broad terms, the GSLRP objective to regenerate the livelihoods of the poor with consideration for efficient and sustainable use of land and water resources was relevant to the IFAD's first country opportunities and strategic paper (COSOP) approved in 2002. The strategic thrusts identified in the COSOP included support for livelihood strategies of target groups, promoting good local governance and community empowerment. The project objectives were in line with the COSOP also in terms of the following elements: project area in eastern regions considered to be poor, support for land tenure issues, and institutional support for various actors including at local level. Since the Gash delta resources have been the important livelihood base for many rural households in the area (poor, less poor or non-poor), and they have relied - to varied extent, either as tenants or sharecroppers - on the cultivation of crops using floodwaters, the rehabilitation of the spate irrigation infrastructure was broadly relevant for improving their livelihoods.
49. At the same time, in some aspects the extent of alignment with the COSOP was less clear. GSLRP was designed to invest sizable resources for the irrigation scheme rehabilitation and related institutional reforms³⁷ while the 2002 COSOP emphasized the *traditional rainfed sector* based on the IFAD experience with irrigation rehabilitation projects in The Sudan by that time.³⁸ It is questionable if spate irrigation systems, although distinguished from perennial irrigation and the Nile-based irrigation systems, would be categorized as "traditional rainfed sector".³⁹ The

³⁷ The budget for the "Irrigation Scheme Rehabilitation" component and institutional support for the GAS and MOIWR/GRTU was 44 per cent of the total estimate. The actual expenditure for the same was over 60 per cent.

³⁸ "Projects (financed by IFAD earlier) in the rainfed sector were able to reach a larger number of households compared to irrigation rehabilitation projects" (2002 COSOP).

³⁹ It is noted that NEN/IFAD maintains that in the Sudan context "any activity or area that is not getting its water source from the Nile is considered to be part of the traditional rain fed sector". (comments on the draft PPA report)

COSOP also placed an emphasis on livestock development in view of prevailing livelihoods of the rural poor, but GSLRP support in this regard was insignificant.

50. **Relevance of design.** Given the initial request by the Government, the choice for IFAD was either to influence the project concept and design, or not to finance a project in Gash/Kassala; IFAD opted for the former, which meant that it had no choice but to engage with the delicate issues of access to land and water resources. On the one hand, this could be considered as a courageous endeavour in pursuit of more equality and betterment of the disadvantaged poor in a society with a strong tribal hierarchy and power structure. On the other hand, project design underestimated the complexities of social, political and institutional contexts. To some extent, it may have been difficult to foresee some of the contextual issues and challenges (for example, in light of the peace-building process in the eastern region, how sensitive the government could be with respect to tribal leaders). Still, the project design was over-optimistic about such aspects as the preparedness of project stakeholders, and the work needed to put in place appropriate institutional arrangements with adequate capacity (technical and managerial),⁴⁰ especially for GAS which is responsible for the scheme management - and for the WUAs. While there was an emphasis on a shared vision for the development of the Gash Delta and on related institutional arrangements, there was little in proposed project approach and activity that would effectively support such "soft" aspects. A bulk of the project cost was allocated for hardware by design (70 per cent of the total cost). It is understandable that infrastructure and hardware was an important element of the investment package and the timeliness of infrastructure rehabilitation works was also of importance given seasonal flooding. Not necessarily because of a high proportion of project cost for hardware, but a review of the project design indicates that there was insufficient attention on "soft" areas, in particular, institutional assessment and adequate measures for their strengthening that should have accompanied the investment on hardware. Linkages between the multi-sectoral interventions and expected outcomes were not always clear, in absence of a well-articulated theory of change. There were confusion and inconsistencies between the various basic project documents as to what were the objectives, outcomes or outputs, long-term or short to medium term effects and what would lead to what (see annex VIII for comparison of different documents).⁴¹
51. Moreover, some design features had not been carefully thought through, e.g. the unrealistic target of a maximum of 120,000 feddan to be irrigated annually after rehabilitation,⁴² which was the basis for setting the number of tenants to be accommodated (also see annex XI). It was also not reasonable to expect infrastructure works for in-field improvements (irrigation command area) to be

⁴⁰ The Sudan CPE 2009 also noted that "...the GSLRP design failed to target the full Gash river catchments' system for more efficient flood control, and did not reflect the full scale of the problems faced, related to Gash river control, spate irrigation infrastructures, and mesquite eradication. Moreover, the GSLRP required high technical competency (in engineering, hydrological expertise and agriculture) which was not available in the programme area. It is an integrated scheme where success in any area is dependent on good and timely implementation in all other areas, and there is no room for flexibility. Current implementation constraints demonstrate the over-optimistic assumptions in terms of management capacity and preparedness of partner authorities and project stakeholders."

⁴¹ For example, "Rehabilitated water and other social infrastructure and water harvesting devices" is called "a specific objective" in the President's Report and "an output" in another document.

⁴² The annual target of 120,000 feddans was already recognized as unrealistic also by earlier missions (e.g. mid-term review, subsequent supervision missions), especially when the intention of the project design was "to support the engineering design and earthworks for main canals to be reformed to their *original design*" which was for 80,000 feddans. In this regard, the project design may not have been coherent, as it would be difficult to command 120,000 feddans without remodelling the main canals by increasing their capacity (even with improved water use efficiency). If water were to be directed to spread over larger areas up to 120,000 feddans without increasing the main canal capacity, this would result in "under-irrigation". It should also be pointed out that economic and financial analysis in the project design was indeed based on the assumption that annual crop production takes place on 120,000 feddans, 3 feddans by each of 40,000 farmers, rather than using a more modest figure for cultivated area, recognising the inherent variability in spate irrigation. Furthermore, it is important to bear in mind that using more water from the Gash river for irrigation would reduce the availability for other important uses (see also paragraph 158).

financed mostly by water fees paid by tenants, which should be for continuous operation and maintenance (O&M).

52. **Overall assessment of relevance.** Based on the above, the PPA rating for relevance is 3 (moderately unsatisfactory).

Effectiveness

53. Project effectiveness is assessed by examining to what extent the intended project objectives were achieved at the time of evaluation. Basically, this section is organized by the six "specific objectives" stated in the president's report, but due to their poor formulation and incoherence, the assessment of effectiveness required some interpretations and expansion of the stated objectives.
54. **Objective 1: The elaboration and maintenance of a shared vision of development [in respect of an equitable, secure, transparent access to economically viable land and water rights].**⁴³ This was a rather peculiar way of stating a project objective - vague, at high level and a very long-term and continuous undertaking. The logical framework contains a similar but differently worded "output"⁴⁴ with unclear two indicators: "a charter signed by concerned parties making the vision for the development of the Gash resources explicit", and "annual monitoring system in place to assess compliance with charter and emerging issues". Nowhere in the appraisal report is it explained what this "charter" is supposed to look like or how it should be developed.
55. Based on the wording added in the loan agreement in relation to land and water rights, this objective is interpreted to cover the aspiration for more equitable access to farmland in the Gash Irrigation Scheme and this aspect needs to be assessed. The project aimed at facilitating secure access to irrigated land of minimum 3 feddan (annually) for 40,000 people (30,000 previous tenants and 10,000 landless). The target of 40,000 farmers was based on the following assumptions made in the project design: (i) there would be about 30,000 existing legitimate tenants (after a "clean-up" of the existing register books); and (ii) after the rehabilitation, 120,000 feddan could be irrigated.⁴⁵ Neither assumption proved to be valid as explained in the following paragraphs and also in annex XI (see also footnote 45).
56. *Reallocation of land tenancy rights.* There are some data available on access to land before and after rehabilitation in the 2011 Annual Impact Assessment (AIA) report, which showed a change in the land allocation "in favour of those who used to own less than 3 feddan". However, the data reliability is highly questionable (see also annex XI). Issuance of identification cards to verify the identities was discussed repeatedly during the project without success, mainly due to resistance by vested interest groups, who presumably have access to land under fictitious or other names. As a result, the register books approved by GAS-BOD are still considered provisional. It is widely believed that not a small proportion of the tenants have obtained more than one plot of land under different names, but the extent of this, too, cannot be known. It seems to be a common knowledge that some government officials and GAS staff – not farmers – also have land in the scheme. It is possible that access to land in the Gash Irrigation Scheme has become less skewed, but it is impossible to confirm this or to know to what extent.
57. Since there were 46,273 farmers (provisionally) approved as eligible tenants out of 56,600 people claiming tenancy rights (i.e., many more than 30,000 as had been

⁴³ The wording in the parenthesis added in the loan agreement.

⁴⁴ "Vision for the development of the Gash Delta elaborated in a collective and collaborative manner" (logframe).

⁴⁵ The appraisal report referred to an "economic farm size of 3 feddans". One of the farm models on the Gash scheme used for financial and economic analysis was based on the production on 3 feddan farm (1 feddan each for grain sorghum, forage sorghum and forage legume), not taking into account variability in spate irrigation. It is known that the intended annual command area is hardly ever entirely irrigated even with good rain (and the irrigated areas are not entirely cultivated).

projected at the design stage), there is a question whether this meant that about 10,000 claimants who were put on a waiting list lost out the access to land they had - if all or part of them were legitimate and eligible.

58. *Access to irrigated land by landless farmers.* Since there were many more people claiming tenancy rights (56,600) than estimated (30,000), it was not impossible to accommodate landless farmers. However, as sharecropping is still very common,⁴⁶ it is likely landless households have indirectly benefitted due to better access to irrigated land to be cultivated as sharecropper. As a result of the increased cultivated area, landless households also have better income opportunities as daily labourers due to an increased demand, especially at harvesting time.
59. *Overall*, the progress made on the first objective was limited. The project was not effective in facilitating the elaboration of a shared vision of development, with which it would have encountered less obstacles and less protestation in the course of implementation. Although reliable quantitative data are not available, the indication is that real progress in land tenancy reform for more equitable access to irrigated land has been more limited than it may have appeared.
60. **Objective 2: The establishment of the related institutional arrangements appropriate for the shared vision.** The objectively verifiable indicators for this in the logframe are again not clear. The key institutions related to the Gash Irrigation Scheme supported by the project were WUAs, GAS, GRTU/MOIWR and agricultural extension services. For the "shared vision" of development in the area beyond the spate irrigation system, community organizations and other sections of MAAWI would also be included, but the PPA assessment focuses on the extent to which capacity of the key institutions related to the Gash scheme has been strengthened and their roles and relationships clarified.
61. *Masga WUAs.* The project supported training of Masga WUAs leaders by WMII and CTT. Interviews with WUAs indicated that, as pointed out by supervision missions, in general training was not very effective: too many topics (including those not so relevant) in a too short period, lecture-based and not practical, and too many participants in one session. Farmers considered the training by CTT more useful as it was conducted in their villages with practical sessions using the local language (Progress Report 2010), although still too many topics and too many participants.
62. The legislative framework for WUAs at the State level was found inadequate (see annex XII). The submission of the draft legislation to IFAD was one of the conditions for loan effectiveness and it is plausible that the bill was prepared in haste. There was no project support for developing bylaws for Masga WUAs together with internal rules and regulations, even though this should have been a fundamental element for their institutional strengthening. The WUA Act stipulates that Masga WUAs would be responsible for *masga* O&M and water fee collection, but most of these tasks are still carried out by GAS, and Masga WUAs are only responsible for water spreading in the *masga*. At present, the financial capacity of most Masga WUAs is still very weak as they are not entitled to a fixed proportion of the collected water fees.⁴⁷ A limited number of Masga WUAs reportedly collect money (e.g. SDG 5 to 10 per feddan) among their members separately from water fees to finance their activities, e.g. salaries of *Farasheen* responsible for water spreading in the *masga*.
63. Representatives of WUAs met by the PPA mission reported the following benefits from the formation of Masga WUAs with two paired *masgas*: (i) more efficient water spreading in *masga* due to close monitoring; (ii) improved removal of mesquite and weeds; (iii) less water-related disputes between Masga WUAs;

⁴⁶ A report on the study conducted in relation to the project (Egemi O. 2007) indicated that it was practiced by not less than 50 per cent of the tenants.

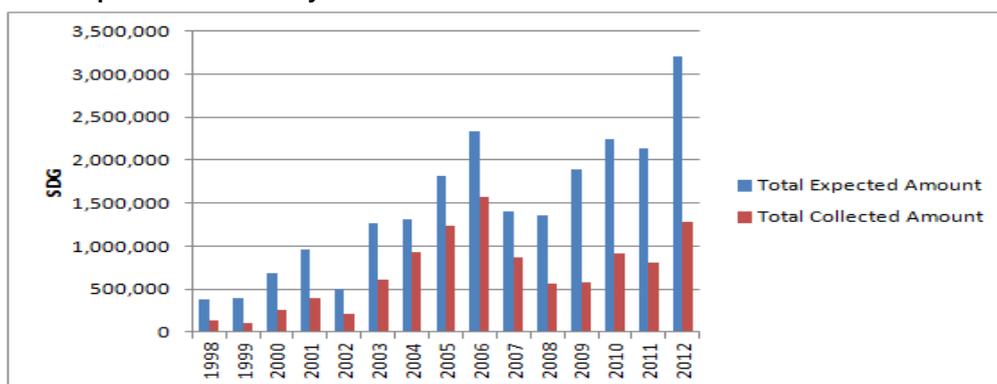
⁴⁷ Only if 80 per cent or more of the due amount of water fees is actually collected, the Masga WUAs are entitled to receive 10 per cent of the collected amount.

- (iv) allocation of land plots by Masga WUA in a more transparent manner; (v) improved land management by individual tenants due to fixation of land plots by increasing number of Masga WUAs; (vi) improved resolution of water-related conflicts between tenants; and (vii) prompt reporting of any damage to irrigation infrastructure or crops to GAS and other authorities.
64. While most of Masga WUAs are reportedly operational and organize water spreading within their respective *masgas*, their institutional, technical and financial capacity is still weak.
 65. *WUA Block Committees*. According to the WUA Act, the WUA Block Committees would be responsible for O&M of the (main) canals under supervision of the GAS director and the coordination of water distribution between *masgas* together with the GAS-BOD. At present, GAS is still responsible for this and it may not be feasible to transfer this responsibility to Block Committees in the short- or medium-term due to the organizational and technical complexity of the works. Based on the interview with the Kassala Block Committee, the main responsibilities and functions of the WUA Block Committee currently include: (i) participating in maintenance inspections and prioritisation of identified maintenance requirements together with GAS staff; (ii) monitoring maintenance works by GAS; (iii) monitoring the water distribution between *masgas* along the main canal by GAS; (iv) resolving (water-related) conflicts between Masga WUAs; (v) reporting any (operational) problems along main canal to Block Inspectors; and (vi) liaising with GAS and MAAWI.
 66. Like Masga WUAs, the WUA Block Committees do not have bylaws. They also lack funds to finance their activities and recurrent costs, including the operation of their offices. The institutional, technical and financial capacity of the WUA Block Committees is still weak, although they seem to be actively involved in planning and monitoring of the maintenance works as well as the supervision of water distribution along the main canals.
 67. *WUA Apex Organization*. According to representatives of the WUA Apex Organization, the main tasks and responsibilities include (i) supervision of the performance of Masga WUAs; (ii) conflict resolution between Masga WUAs; (iii) resolution of disputes between GAS and Masga WUAs; and (iv) participation in meetings of the GAS-BOD. Reportedly, they have six meetings annually. The apex is better-off than at *masga* and block level, with income of a fixed portion of water fees and office structure, but it is uncertain if it has the necessary institutional capacity to undertake the aforementioned tasks and responsibilities effectively.
 68. *Gash Agricultural Scheme*. No institutional assessment of GAS was carried out during the design or the start of the project to determine the capacity gaps (e.g. related to management, engineering, scheme operation, infrastructure maintenance, work planning, supervision as well as financial planning). The need was seriously underestimated at appraisal as only US\$61,000 was allocated for technical assistance, studies and training: the idea seems to have been that the capacity of GAS could be strengthened mainly through the provision of hardware (e.g. workshop, machinery and equipment) and support for recurrent costs. Despite the project support for technical assistance and training to GAS staff which cost was in the end substantially higher than the budget (US\$1 million), the technical and managerial performance of GAS is still weak due to a number of factors: (i) lack of qualified key staff as it is not attractive for professional staff to work for GAS due to limited promotion opportunities and harsh working conditions; (ii) lack of political leadership at State or Federal level,⁴⁸ in particular with regard to the status of GAS and the approval of the new GAS charter; and (iii) lack of commitment from the GAS-BOD, which did not have a meeting since May 2009.

⁴⁸ Apparently, there have been conflicting views on whether the Federal or the State government should be responsible for GAS, affecting instability in the GAS management.

69. The operational capacity of GAS to undertake O&M activities is seriously affected by a structural shortage of funds. Currently, most of its budget goes to staff salaries: in fact, it has even become necessary to use collected water fees for staff salaries.⁴⁹ To finance O&M of irrigation infrastructure and associated structures, GAS has two sources of revenue: (i) fixed annual allocation of SDG 1 million from the Ministry of Finance and National Economy (MOFNE); and (ii) collected water fees. Although the fixed allocation from MOFNE is supposed to be transferred in January of each year, GAS receives it only just before the flood season (May/June). Actual income from water fees varies from year to year as it depends on actually cultivated area, water fee rate, and actual water fee recovery rate. Between 1998 and 2012, the water fee was gradually increased from SDG 12 to SDG 40 per feddan.⁵⁰ The total expected amount of water fees and the actual collected amount of water fees for the period 1998 to 2012 are presented in figure 1.

Figure 1
Total expected and actually collected amount of water fees



Source: Egemi 2007, Pre-PCR 2011, GAS

70. At the start of the project, the water fee collection rate increased sharply from 48 per cent in 2003 to 71 per cent in 2004 and it remained relatively high until 2007. From 2008 onwards, however, the collection rate dropped to around 40 per cent.⁵¹ One of the possible explanations for this is the fixation of land plots removing the incentive for farmers to pay water fees. Due to its inability to collect all water fees, GAS has insufficient budget to undertake necessary maintenance and repair works, including annual removal of all sediment in the main and *masga* canals.
71. In terms of hardware (infrastructure and equipment), GAS is certainly better equipped, but their managerial, technical and financial capacity is still very weak. GAS also lacks an effective M&E system or management information system to collect and analyse data with regard to machinery operation, water distribution, irrigated and cultivated area and cropping patterns.
72. *Gash River Training Unit*. The provision of machinery, vehicles and equipment has strengthened the physical capacity of GRTU to undertake the construction and rehabilitation of river training structures as well as their annual maintenance, which is carried out between December and June. At present, GRTU employs 12 engineers as well as three operators per heavy machinery and 9 administrative and financial support staff. For maintenance works before the flood season, GRTU also employs 70 to 100 skilled and unskilled staff on a temporary basis. GRTU is relatively well-equipped and technically competent, but its capacity to carry out

⁴⁹ At the time of the PPA mission in November 2013, GAS employed about 339 persons, including 76 professional staff and 176 field staff, and the annual budget for salaries was about SDG 3 million.

⁵⁰ According to information obtained from GAS, the current water fee SDG 32 per feddan of the current total water fee rate of SDG 40 is allocated to GAS for O&M of irrigation infrastructure, SDG 5 is allocated to the WUA Apex Organization and FU (SDG 2 and 3 for the Apex Organization and FU, respectively), SDG 1 to the Localities, SDG 1 for education and SDG 1 for crop protection.

⁵¹ In an interview, GAS General Manager claimed that the water fee collection rate was about 80 per cent, not matching the data from GAS.

required tasks is constrained as only a fraction of the requested budget (e.g. for annual maintenance of the flood protection and river training structures, e.g. spurs) is actually made available by the MOFNE at federal and state level.

73. *Agricultural Services.* The project supported MAAWI to provide agricultural services to farmers in the project area as well as to undertake a few new activities, such as the registration of CBOs (e.g. WUAs and RUAs) and M&E. Some research and extension activities were conducted but there was little sign that these led to crop husbandry improvement or diversification to cash crops (e.g. cotton, sunflower). The capacity of MAAWI to provide essential extension services through TTEA is still weak. The Office of the Registrar made important contribution to the formation and registration of WUAs, RUAs, CDCs and women's savings and lending groups, but it lacks sufficient budget, staff and vehicles to undertake all its activities properly.
74. *Overall comment on objective 2.* The strengthening of an institutional framework for the management of the Gash Irrigation Scheme was a major element of the project. The introduction of WUAs was an important step supported by the project, but their capacity is still very weak, and so is the capacity of other institutions. At project completion the progress was still far from the intended outcome.
75. **Objective 3: Rehabilitated water and other social infrastructure and water harvesting devices.** This is another poorly formulated "objective". First, the way it was stated was more like an output. Second, it is not clear what this was meant to cover: domestic water supply, other social infrastructure, water harvesting devices (for crop, animal or domestic purpose?), and/or spate irrigation system. Given the project activities and coverage by other objectives, the PPA looked at the extent of achievement with respect to the following two reformulated outcomes: (i) capturing of flood waters and scheme irrigation capacity enhanced; and (ii) access to water and social infrastructure by local communities improved.
76. As for the first area (irrigation capacity), the main project intervention was the irrigation infrastructure rehabilitation under Component 1. The appropriate indicator to assess the achievement would be the trend in the size of actually irrigated and cultivated land within the scheme command area. It is, however, important to bear in mind that actually irrigated area varies from one year to another due to the erratic hydrological regime of the Gash River.⁵²
77. The Gash scheme was originally designed to irrigate up to 80,000 feddan annually based on a 3-year rotation based on crop water requirement of 5,200 m³ per feddan for cotton.⁵³ The main intention of the rehabilitation works was to restore the original design of the main canal system and *masga* canals. According to data available from GAS, average areas irrigated and cultivated between the pre-project period (1993-2003) and the project period (2004-2013) increased (table 3). However, information from the field through interaction with WUA members and GAS field staff casts some doubts on the accuracy of these data, as the figures reported by GAS seem too good. One of the first IFAD missions (in 2005) proposed the use of satellite imagery to support the confirmation of progress made on improvement in irrigated and cultivated area, but the PCU did not pursue this recommendation by contacting the Remote Sensing Centre in Khartoum. One possible explanation for seemingly too high reported figures for the areas irrigated and cultivated may be that Masga WUAs have tried to irrigate as much land as possible with available floodwater resulting in under-irrigation. This may also explain the observed decrease in crop yields from around 12 to 8 bags of *Aklamoi* sorghum during the last 10 to 15 years.

⁵² The average annual discharge of the Gash River is around 680 million m³, but it varies considerably between years. Between 1978 and 2013, the recorded discharge ranged from 232 million m³ in 2008 to 1,432 million m³ in 1983.

⁵³ A larger area could be irrigated if the crop water requirement of 3,500 m³ per feddan for sorghum would be supplied by reducing the watering period accordingly. However, it is very difficult if not impossible to assess exactly how much water is actually supplied to farmland and farmers may prefer to spread more than less water on their fields.

Table 3

Average areas irrigated and cultivated: 1993-2003 and 2004-2013

	Irrigated area (feddan)	Cultivated area (feddan)	Cultivated area/ irrigated area
Average 1993-2003	60 871	48 370	79%
Average 2004-2013	75 815	63 229	83%
Increase between two periods	25%	31%	

Note: Due to variability of water availability in spate irrigation, average figures over certain periods are compared rather than annual movements.

Source: GAS

78. Annual data on irrigated and cultivated areas show that on average, about 80 per cent of the actually irrigated area has been cultivated, although it varied from as low as 53 per cent in 1993 to as high as 98 per cent in 2011. The main reasons for not cultivating part of the irrigated area are: (i) insufficient irrigation of the land, partly due to lack of proper land levelling; and (ii) mesquite infestation of farmland.
79. In summary, capturing of flood waters and irrigation capacity has improved due to the infrastructure rehabilitation, although its extent is not clear given some doubts on the reported data related to irrigated (and cultivated) areas. If capturing of flood waters has indeed improved, then the subsequent question is to what extent that led to improved productivity (see assessment on the next objective).
80. As regards access to water and social infrastructure by local communities, the rehabilitation and construction of water pipeline system improved access by about 20,000 households to clean drinking water for communities, as well as for animals by establishing water points dedicated to animals linked to the pipeline. The PCR expressed concern that limited supply for water for livestock was increasing the pressure on the new/rehabilitated systems.⁵⁴ Interaction with stakeholders by the PPA mission indicates improved access to safe water was one of the most important project contributions.
81. **Objective 4: Improved crop and livestock husbandry practices.** Related project intervention was the support for agricultural services including research (component 5), combined with enhanced irrigation capacity, and component 2. The PPA looked at to what extent the project was effective in improving crop production and productivity, as well as animal husbandry and rangeland management.
82. The main crop grown on the Gash Irrigation Scheme is sorghum, mainly the *Aklamoi* variety. PCR indicated an increase in the annual average productivity from 7.9 bags per feddan (1996-2001) to 9.74 bags (2004-2011) although it did not specify the sorghum variety. At the same time, AIA 2010 and 2011 based on questionnaire-based interviews with farmers reported a decline in *Aklamoi* productivity, which is more in line with the PPA mission observations in the field. Apart from possible causes such as shortened fallow period or under-irrigation, this low (and declining) productivity seems to be also due to poor on-farm crop management (e.g. land preparation, row and plant spacing, seed rate and dressing) and seed quality deterioration due to the use of saved/recycled seeds.
83. Another recently introduced sorghum variety is *Tabat*, which normally offers higher yields (15 bags per feddan against 8.5-10 bags for *Aklamoi* (GAS reports 2005 to 2011)). So far, farmers are reluctant to replace their traditional *Aklamoi* variety with *Tabat* for the following reasons: (i) lack of quality seed at time of planting; (ii) taste of *Asida* made from *Aklamoi* is preferred by people in the area; and (iii) *Aklamoi* sorghum produces more stalk used as fodder for livestock. In recent

⁵⁴ To decrease the incidences of pipe breaches, KDWC reportedly deployed guards, whereas additional *hafirs* were constructed in 2012 under the Agriculture Revival Programme to reduce the pressure of livestock on drinking water. This is a programme under the Supreme Council for Agricultural Revival and chaired by the Vice President of Sudan.

years, however, farmers are increasingly realising that the market price for *Tabat* sorghum is higher than *Aklamo* in addition to higher yield. As a result, there is slow increase in the area cultivated with *Tabat* sorghum.

84. Based on 16 farm trials for various cash and food crops executed by the Agricultural Research Station in Kassala, two varieties for cotton and sesame were approved by the national Agricultural Research Centre as alternative cash crops for the Gash spate irrigation scheme. Following attempts to introduce cotton and sunflower in 2007, they were not repeated due to uncertainty among farmers regarding the prices and marketing.⁵⁵ Thus, overall, the progress with regard to improving crop production and productivity was limited.
85. Project activities related to livestock and rangeland management were limited, with 5 per cent of the total project cost. Available reports⁵⁶ indicate that project support for veterinary services (notably two mobile veterinary clinics) contributed to a decline in animal mortality rate in the project area (from 7 to 2 per cent, according to the PCR). The extent of project contribution is difficult to know, however. Encouraged by project support, ARFA reportedly increased the number of veterinary personnel in the project area considerably. As for the training of CAHWs, not only the physical achievement was well below the target (30 against 160), but even those trained - most if not all - did not perform well mainly due to inappropriate selection of trainees.
86. It was reported that due to rangeland management interventions⁵⁷ and the formation of 11 RUAs, the productivity of fodder on around 10,000 feddan increased by 2-3 tons per feddan benefitting around 8,000 families and 62,240 heads of animal (PCR). The broadcasting of pasture seeds resulted in prolonging the grazing period from February until May.
87. While there was an indication that mobile veterinary clinics contributed to improved animal health service delivery, overall effectiveness of livestock-related project interventions (e.g. veterinary care, artificial insemination, rangeland management, etc.) was limited as there was lack of synergy between different activities and were not provided as one package targeting the same communities.
88. **Objective 5: Establishment of financial services.** The design envisaged that 24,000 farmers, out of 40,000 tenant farmers benefiting from the irrigation scheme rehabilitation, would be accessing credit made available under the project. In the end, the credit lines were cancelled; the implementation modality of this component changed from the original design, and the activities under the component remained at a very small scale, with a focus on mobilizing women's groups and facilitating their access to ABS.
89. At project completion, there were 75 women groups with a membership of over 2,000 that were borrowing from ABS to finance various income generating activities, such as handicrafts, small trading and small ruminants. The loan size ranged between SDG 500 and 3,000. While withdrawing from lending through WUAs as it proved to be problematic, ABS pursued lending to smaller groups of farmers, directly dealing with heads/representatives of groups.
90. The total amount of loans outstanding from the branch as at project end was SDG 4 million, catering estimated 4,000 borrowers.⁵⁸ The progress made in rural lending by ABS, especially to women, was largely owing to the commitment and interest of

⁵⁵ The efforts to introduce alternative cash crops on the Gash Irrigation Scheme are still continuing after GSLRP. In 2013, FAO in coordination with TTEA and JICA introduced two varieties of sunflower in Mekali block through demonstration plots covering 90 feddan.

⁵⁶ Including the PCR and the 2010 supervision mission report.

⁵⁷ The 2010 supervision mission reported the clearance of mesquite of 10,000 feddan along Gira canal and in the rangelands (i.e. outside the irrigation scheme command area) and subsequent afforestation.

⁵⁸ In the ABS record, "borrowers" count members of groups, or only representatives of groups. Therefore, the number of people borrowing would be more than 4,000 people.

the branch manager, while the project provided modest support. To the extent permitted within overall rules and procedures of the bank and while respecting the Islamic banking principles, the branch tried and introduced a number of “innovative” products such as group lending for women, a combination livestock credit and insurance. Access to financial services was improved for some 2,000 women, who previously had no access to bank financing, and here, the group mobilization supported under the project had an important role. The achievement in relation to this outcome was modest in number, but it had a significant impact in terms of women’s empowerment (see also sub-section on Gender Mainstreaming and Women’s Empowerment).

91. **Objective 6: Strengthened [Kassala] state planning capacity.**⁵⁹ There was little in the project design and actual implementation that would specifically contribute to this objective. In a way, this would also overlap with objective 2 with regard to institutional arrangements. The only directly relevant planned project support was for the international recruitment of a state planning advisor who was to be part of the PCU but this recruitment never materialized.
92. **Overall assessment - effectiveness.** The project made a number of important outputs and achievements, such as rehabilitation of most of the canals, river training works, establishment of WUAs, and initiating the land reform (but not completed), improved access to drinking water and improved access to finance by women. The major infrastructure works supported by the project (notably, the river control works and the rehabilitation of the Gash Irrigation Scheme) is likely to have made a major contribution to general development in the area. However, the opportunities offered by these investments were not exploited to the extent necessary to achieve expected results at farm and household level without effective in-field improvement and land and crop management, and with incomplete land tenancy reform process. Key institutions for the Gash Irrigation Scheme (GAS and WUAs) remain weak. Equitability, efficiency and sustainability in the Gash irrigation scheme operations were considered to be fundamental (as reflected in the project goal and purpose), but achievements in these aspects were limited. Based on the foregoing, the effectiveness is rated as moderately unsatisfactory (3).

Efficiency

93. Efficiency is a measure of how economically resources and inputs (funds, expertise, time, etc.) are converted into results. Here, this criterion will be looked at in the following aspects: (i) timeliness and process; (ii) cost of providing project services; and (iii) benefits generated.
94. **Time dimension.** The loan for GSLRP became effective 8 months after the approval and 6.5 months after the signing of the loan agreement. This is less than IFAD average (12.1 months after the approval and 7.7 months after the signing) and the average for the Near East, North Africa and Europe Division (11.3 and 8 months, respectively).⁶⁰ Considering that there were a number of conditions of effectiveness,⁶¹ this was a notable achievement.
95. **Project cost.** Actual project cost was US\$35.65 million. The disbursement rate of the IFAD loan at closing stood at 96.5 per cent, but the implementation progress at MTR had been unbalanced - high level of expenditures for civil works and equipment, and low expenditure for software.⁶² Flooding events in 2003 and 2007

⁵⁹ The appraisal report working paper 8 (Project Organization) stated as follows: “...coordination of the project needs to be done in reference to a strategic vision of development and should promote synergy between the interventions of different state agencies. Hence, the recruitment of a state planning advisor is proposed as part of PCU”.

⁶⁰ PPMS. Data based on all projects up to April 2013.

⁶¹ The conditions included the submission of the tenant registry book of the first block (in the Gash Irrigation Scheme) and the agreed modalities for tenant selection and registration, the submission of the draft legislation for WUAs.

⁶² At MTR in 2008, the IFAD loan disbursement rate was already 73 per cent. At this point, the original budget for the following sub-components had been exhausted (with actual expenditure and commitments at the time): irrigation scheme rehabilitation (106.4 per cent), institutional strengthening for GAS (147 per cent) and MOIWR/GRTU (411 per cent). On the other hand, the fund utilisation for some sub-components was negligible at MTR, for example, river

also necessitated urgent and more spending on civil works. In fact, the revised allocation of the IFAD loan looks quite different from the original allocation for some categories (annex IX). The actual costs for the different loan categories (table 4) indicate that 75 per cent of the total cost was for hardware (civil works, vehicles, machinery and equipment). The recurrent cost (16 per cent of the total project cost) included allowances and operation and maintenance concerning all institutions and activities. The cost for the PCU was about 11.5 per cent of the total project cost, comparable enough to what is considered to be acceptable.⁶³

Table 4
Actual costs per loan category (US\$ million)

<i>Loan category</i>	<i>Actual Cost</i>	<i>% Total</i>
Civil works	17.902	50%
Vehicles, machinery and equipment	9.048	25%
TA, training and studies	2.845	8%
Community investment fund	0.277	1%
Recurrent	5.579	16%
TOTAL	35.651	-

Source: PCR 2012

96. *Irrigation scheme rehabilitation.* The actual cost of the irrigation infrastructure rehabilitation was US\$8.45 million against the appraisal budget of US\$4 million, although not all rehabilitation works in Metatieb and Hadaliya blocks were completed. It is also noted that this does not include the costs related to the rehabilitation of three off-take structures, which were funded under river control. Based on US\$8.45 million, the actual irrigation scheme rehabilitation costs per feddan and hectare are presented in table 5.

Table 5
Actual irrigation scheme rehabilitation cost per feddan and hectare

	<i>Designed area</i>	<i>Appraisal target</i>	<i>Average irrigated area (2004-13)</i>	<i>Average cultivated area (2004-13)</i>
Size (feddan, annual)	80 000	120 000 ^a	75 815	63 229
Appraisal plan: US\$/feddan	50	33	-	-
Actual: US\$/feddan	106	70	111	134
Actual: US\$/ha	251	168	265	318

^a As pointed out elsewhere, this target was not a realistic.

97. Rehabilitation cost of US\$251 per hectare (based on the originally designed area of 80,000 feddan) is not high, but it would have been higher if all planned rehabilitation works in Metatieb and Hadaliya blocks had been executed. The planned works at *masga* level (US\$4.86 million budgeted under WUA sub-component) were not implemented either. If the estimated costs for planned works at *masga* level were added, the total rehabilitation cost would have been US\$13.31 million or US\$396 per hectare. In comparison with the rehabilitation costs for spate irrigation schemes in other countries (table 6), the costs for the Gash Irrigation Scheme were comparable to those in Yemen, Tunisia and Morocco.

control (3.5 per cent) and financial services (3.5 per cent). The river control activities were in the end mostly funded by the Government.

⁶³ The benchmark for the proportion of project management cost normally used at IFAD is 10 per cent of the total.

Table 6
Rehabilitation costs for spate irrigation schemes in other countries

Country	Scheme name	Rehabilitation cost (US\$/ha)	Type of works
Yemen	Dameers Hadramawt	90 - 151	Small systems
Yemen	Wadi Tuban, Wadi Zabid	150 - 300	Command area works
Tunisia	Sidi Bouzi	252	Small system
Morocco	Oum Aghanim	620	Diversion weir, canals and distribution structures
Morocco	Tambardoute	699	
Morocco	Touizgui	628	
Morocco	Afra	895	Diversion weir, protection bunds, distribution structures

Source: FAO 2010.

98. **Management and process issues.** Available project reports indicated some deficiencies and inefficiencies in a number of areas such as procurement (delays, or non-adherence to the guidelines leading to ineligible expenditures), financial management, monitoring and evaluation, in addition to cost overrun (especially for civil works).
99. **Benefits.** At the project design stage, the economic internal rate of return (EIRR) was estimated at 12.7 per cent at base scenario. The main benefit streams taken into account in the analysis were: (i) incremental agricultural crop production on GAS; (ii) increased livestock production the Gash Die and rangeland; (iii) horticultural production in Kassala area; and (iv) increased income from off-farm activities; while other expected benefits were also noted such as better nutritional status and human health from the improved domestic water supplies.
100. At project completion, an analysis was run over a 20-year period as was done at appraisal based on the actual investment and available data. The analysis included incremental production of sorghum and fodder on the irrigation scheme (areas and yield) and incremental livestock sales. The simulation at design included sunflower and horticulture, but these activities were not undertaken and hence, excluded from the analysis at completion. The PCR gave the EIRR of 14.88 per cent, higher than the projection at design. The PCR attributed such difference to modest assumptions made at design (e.g., pace of productivity increase). However, a number of factors raise questions on this positive assessment, such as a reported general decline in sorghum productivity based on the accounts from the field and AIA reports (contrary to positive GAS/Ministry data used in the PCR analysis), serious mesquite infestation reducing the areas for cultivation, concern on O&M to maintain the irrigation capacity.
101. On the other hand, there were other benefits not included in the economic analysis. These include protection of Kassala towns and other towns and villages against floods the river training works and improved access to safe water. In addition, the farmers growing horticultural crops in the vicinity of Kassala town using groundwater also greatly benefitted from improved flood protection as they experienced less damage to fruit trees and wells. In 2003 and 2007, the estimated losses were around SDG 27 million and SDG 14 million respectively, whereas it was only SDG 1 million in 2010.⁶⁴
102. **Overall assessment.** The loan effectiveness was timely and the disbursement rate remained overall satisfactory throughout the project period also due to heavy expenditure on infrastructure rehabilitation. While there were some notable

⁶⁴ Project completion report.

benefits such as flood protection and the unit cost of irrigation infrastructure rehabilitation was comparably low, the benefits generated in terms agricultural and livestock production was lower than intended. Based on the above, efficiency is rated as moderately satisfactory (4).

B. Rural poverty impact

103. Impact, or the changes that have occurred as a result of the project (whether positive or negative, direct or indirect, intended or unintended) in terms of rural poverty is assessed for the following five domains: (i) household income and assets; (ii) human and social capital and empowerment; (iii) food security and agricultural productivity; (iv) natural resources, the environment and climate change; and (v) institutions and policies.
104. This section largely draws from the PCR, the baseline survey of 2005,⁶⁵ Annual Impact Assessment (AIA) 2011 and 2010⁶⁶ and the surveys based on the methodology and questionnaire developed under the IFAD's Results and Impact Management System (RIMS, 2006, 2008 and 2011), complemented by their review and observations in the field by the PPA mission. The main difficulties in using these are that: (i) the 2005 and the AIAs were conducted with different approaches by different consultants (while all RIMS surveys were conducted by the same company); (ii) some questions may be raised on the soundness and rigor of survey methodologies; (iii) none of these surveys had any comparison/control group; and (iv) the baseline survey, AIAs and RIMS surveys contain overlapping or similar questions but reported data are inconsistent (and the PCR uses them in a rather selective manner). Hence, this section presents the data reported in various reports together with critiques and assessment, complemented by other documents, observations and discussions in the field.
105. **Household income and assets.** The baseline survey of 2005 reported that the average income of the sampled 973 households was translated into US\$1 per household a day. This is compared by the AIA 2011 (300 respondents) which reported the figure of US\$7.6. Without studying closely the sampling methodologies and the questionnaires used in both surveys, it is difficult to assess the reliability and comparability of the data at the two points. At first sight, there is also a question on the reliability of information given by households on incomes "in the last 12 months".
106. *Household assets.* The RIMS surveys conducted in 2006, 2008 and 2011 show some changes in the household asset ownership as shown in table 7. According to this, the only asset for which significant increase was noted was mobile phone.
107. Although the table does not show any significant change in the assets listed except for mobile phones, women in savings and lending groups interviewed by the PPA mission almost unanimously indicated that, with multiple loans of progressively increasing amounts supporting growing and diversifying income generating activities, they were able to purchase household assets (such as furniture, which is not included in the above list), as well as small ruminants.

⁶⁵ The report has not been located by NEN to be made available to IOE. However, a power point presentation on the findings of the study (presumably prepared by the consultant who undertook it) was availed to IOE.

⁶⁶ Both prepared by Abdelmajid Khojali, Development Consultant.

Table 7

Percentage of interviewed households owning assets: RIMS survey results

	2006	2008	2011
Radio	29	25	23
Television	3	2	4
Mobile phone	6.3*	18	34
Bicycle	4	4	3
Motorcycle	1	0	0
Vehicle	3	0	1

Source: RIMS survey reports, 2006, 2008 and 2011.

* Calculated based on the available data. The RIMS 2011 report does not show the figure from 2006. In the 2006 report, cellular phone was included in the questionnaire and it was reported that 31.3 per cent of the 180 households categorized in the 5th quintile (i.e. the best-off amongst those surveyed) owned cellular phone. Thus, it is translated into 6.3 per cent of the total sample (900 households).

108. *Livestock assets.* There are some data on livestock ownership in the RIMS surveys (900 persons interviewed) and AIA 2011 (300 persons interviewed). The comparison of the historical RIMS surveys showed an increase of the percentage of households owning chicken and cattle but a decrease for sheep and goats. The percentage of households owning livestock reported in AIA 2011 is more or less comparable to the RIMS surveys, except for poultry (34.6 per cent in the 2011 RIMS survey and 8.3 per cent in the AIA 2011). The AIA 2011 also reported that the "average" animal ownership per household increased to 7.78 heads from 3.2 in 2005 (baseline survey), but it did not explain how heads of different animals were counted and hence, it is difficult to interpret the figures. The historical RIMS surveys showed that the average number of livestock in general increased between 2006 and 2008 but then decreased in 2011 from the 2008 level. It is difficult to draw any conclusion about the change in livestock ownership.

Table 8

Percentage of the households with livestock/ animals and mean number owned per household

Category	RIMS 2006		RIMS 2008		RIMS 2011		AIA 2011	
	% household owned livestock	Average no owned livestock	% household owned livestock	Average no owned livestock	% household owned livestock	Average no owned livestock	% household owned livestock	Average no owned livestock*
Chicken/poultry	25.7	3.0	32.8	4.7	34.6	3.7	8.3	- (3.6)
Sheep	32.8	5.91	39.4	7.6	27.1	5.4	33	7 (2)
Goats	56.1	4.77	63.6	5.7	49.8	4.4	54	6 (3)
Cattle	33.1	3.09	32.0	4.1	40.1	2.8	38	3 (1)

Source: GSLRPRIMS Survey 2011, 2008 and 2006 and AIA 2011.

* The numbers in parentheses are the average across all respondents (including those not owning respective livestock).

109. *Access to land on the Gash Irrigation Scheme.* The AIA 2011 data indicated some changes in access to land generally in favour of those previously disadvantaged. However, with questions on the reliability of the available data – both those from the old land registries and surveys – it is difficult to draw conclusions regarding change in access to land (see annex XI for more detailed commentary).
110. *Financial assets.* According to the PCR, by the end of 2011, ABS (Aroma Branch) disbursed around 8,629 loans amounted to around SDG 14.7 million. The loans were used in farm production, purchase of livestock and fodders, trading, processing, and service enterprises. Client deposits amounted to US\$2.2 million and the number of accounts was 2,793. Deposits of women's groups amounted to

SDG 120,000 as at December 2011. The AIA 2011 revealed that around 57 per cent of the interviewees confirmed that their primary source of borrowing was ABS. ABS clients reported that they utilized part of the profits of businesses established with ABS loans in renewal of house furniture and equipment, house renovation and addition of new buildings, and improved meals.

111. *In summary*, while there is an indication that ABS loans to women contributed to improved incomes and assets, they were a small proportion of the project beneficiaries and it is hard to find such evidence for other beneficiaries. Data and information from various data are inconsistent. The PPA refrains from rating the project performance on household income and assets.
112. **Human and social capital and empowerment.** It was reported that the project provided training to more than 15,000 persons⁶⁷ in various areas, such as women awareness raising, literacy training, food processing, handcrafts and vocational training, water management and sanitation. The AIA 2011 indicated that out of those interviewed, 52 per cent of 223 male respondents and 78 per cent of 77 female respondents indicated that their families gained benefits from the skills acquired: according to this, women were more appreciative of the training support.
113. The project supported the formation of various grassroots organizations, including 69 CDCs (including those with only women), 95 savings and lending groups⁶⁸ with a total membership of 2094 mostly women, 98 WUAs, and 11 RUAs, as well as water management and sanitation committees (number unknown) which were active in monitoring the operation of the water points supplied from Kassala-Aroma-Tindilia pipeline.⁶⁹ The project support for WUAs to take more responsibilities for O&M of the irrigation scheme was an important contribution, but their capacity is still very weak as discussed elsewhere in this report. Through women's savings and lending groups, women accumulated savings and were able to borrow from the bank.
114. Overall in the project area, the RIMS surveys showed that there was a slight decline in the percentage of households with access to safe water source (34 per cent compared with 39 per cent in 2008 and 37 per cent in 2006). Despite these figures, during the PPA mission, the general appreciation for improved access to drinking water through the rehabilitation and construction of water pipelines supported under the project was evident. It was reported that about 120,000 persons or 20,000 households benefited and indeed, this was often mentioned as one of the important project achievements.
115. Although the project supported an important step for the WUA development and improved access to safe water, given insufficient achievement in grassroots organizational strengthening, the project is rated as 4 (moderately satisfactory) with regard to human and social capital and empowerment.
116. **Food security and agricultural productivity.** This is another impact domain where available data are not consistent and inconclusive. Average annual irrigated and cultivated areas are reported by GAS to have increased from 63,679 and 49,201 feddans respectively (average for 1996-2003) to 76,239 and 62,699 feddans (average for 2004-2011). The PCR also indicated sorghum productivity on irrigated land increased from 7.9 per feddan (1996-2001 average) to 9.74 bags (2004-2011 average) based on the data by Federal Ministry of Agriculture, but the AIA 2011 (970 farmers interviewed) presented a different picture, i.e., general

⁶⁷ The PCR contains a table showing the training topics and the number of people trained in each of them (men and women). The total number is shown 15,239 but it is not clear whether this could include some double-counting and if so, to what extent.

⁶⁸ The PCR also refers to 70 Women Savings and Lending Groups. It is not clear whether 70 groups are part of 95 savings and lending groups mentioned here. It does not add up, however, with the description of 95.5 per cent of women membership of the groups.

⁶⁹ Project completion report.

decreases in productivity of sorghum (10.6 to 6.6 bags) and fodder (729 to 644 bundles), comparing before and after the rehabilitation (thus not necessarily limited to specific one season prior to the survey). Indications from interaction with farmers and GAS staff in the field by the PPA mission are more inclined towards the AIA 2011 findings, i.e., declining productivity. The AIA conducted in the previous year (2010) had also indicated that farmers interviewed reported decreasing yield. Possible causes for this could include mono-cropping, shortened fallow period (2 to 1 year), and under-irrigation as a result of trying to irrigate as much land as possible, as land plots were getting fixed to individual tenants replacing previous lottery system. These are also largely consistent with what was documented in the AIA 2011 as issues emerging from the focus group discussions.⁷⁰

117. On the other hand, the AIA 2011 provides more encouraging data on the productivity of sorghum and fodder in *rain-fed farming*: those farmers interviewed practicing rain-fed farming who reported to have received project support (14 per cent of the total of 300 people interviewed) reported an increase in the average yields of sorghum from 4.5 to 7 bags and fodder production from 363 to 490 bundles per feddan, due to the introduction of rain-fed water conservation techniques supported by the project, according to the PCR.
118. Also on the food security, the pictures are mixed depending on the data sources. The PCR used the AIA 2011 data on consumption level of food items and responses regarding hungry seasons. The AIA 2011 indicated increase in food consumption compared to the baseline data,⁷¹ but it is difficult to assess the reliability and comparability with the baseline data.⁷² In the AIA survey questionnaire, there were also questions on hungry season but due to the way they were asked, interpreting the data is tricky.⁷³
119. The AIA 2011 also asked 300 respondents about their perception on various "development indicators" before and after the project. The areas perceived to have improved compared to "before project" by more respondents were mostly related to social development, e.g. women awareness and organization (80 per cent), children going to schools (78 per cent), etc. On the other hand, those areas perceived to have worsened or stayed the same by more than 60-70 per cent of the respondents were: animal production; sorghum productivity and production; milk production; and condition of pastures.⁷⁴ Of course, the number of respondents is relatively small and these are based on perception, but still, it is indicative and not encouraging that around 40-50 per cent of the interviewees stated that the

⁷⁰ The reasons for decreased productivity given by WUA committee members and farmers through focus group discussions in the 2011 AIA survey included shortened rotation period, flooding more areas without increasing the amount of water for flooding (i.e. under irrigation), silting in masgas and mesquite infestation.

⁷¹ The AIA 2011 report indicated that the consumption of sorghum increased from 11 to 14.88 bags per household per year, the consumption of meat increased from 65 to 96 kg per household per year, and around 41 per cent of the interviewees confirmed that food consumption increased after the project. But there are questions on the comparability with the baseline data (see the next footnote).

⁷² The PPA mission had access only to the power point presentation made on the baseline survey. With respect to sorghum consumption, for example, the power point presentation stated that "the [annual] averages for the respondents [who responded to this specific question, i.e., who reported to consume sorghum] and for the all households [all survey interviewees] are 17 and 11 sacks a year respectively". This notable difference is questioned given that most, if not all, households eat sorghum as a main staple food in the project area; the difference, if any, would have been expected to be minimal. The AIA 2011 reported the average annual sorghum consumption to be 14.88 bags per household, based on the responses from 98.7 per cent of all survey interviewees, and compared it with 11 bags from the baseline survey. The comparable baseline figure would have been 17 (average of the respondents to this specific question) and not 11 (average of all survey interviewees), although 17 bags seem to be on the high side. These raise questions on the reliability of data and comparability.

⁷³ One question was about the frequency of hungry period, and the other was on the length of hungry period. It seems that the respondents were given only two options for response: either "more frequent" or "less frequent" after the project, and either "became longer" and "became shorter". There was no response to indicate "no or little change". Around 54 per cent of the surveyed households indicated that hunger periods were less frequent and 55 per cent thought the hungry period became shorter after the project: nonetheless, the other side of the coin is that, according to the literal interpretation, for 45-46 per cent of the interviewees, hunger periods became more frequent and longer.

⁷⁴ The percentage of respondents who thought that the situation worsened, and those who felt the situation did not change were as follows, respectively: 39 and 32 per cent for animal production; 39 and 32 per cent for sorghum productivity and production; 42 and 30 per cent for milk production; 51 and 28 per cent on the condition of pastures.

situation worsened with regard to various parameters related to agricultural production.

120. There are additional data on food security in the RIMS surveys conducted in 2006, 2008 and 2011. Households were asked if they had experienced a hungry season in the last 12 months and those who experienced a hungry season were asked if they had faced a second hungry season (table 9). According to the table, the 2008 data seem to be out of line. The 2008 RIMS survey was carried out in March 2008. It could have been related to the damaging flooding event in August 2007 but the RIMS surveys or PCR do not provide any explanation behind the figures.

Table 9

Percentage of households who experienced hungry season

	2006	2008	2011
Experienced first hungry season	58	72	56
Experienced second hungry season	20	6	12

Source: RIMS surveys

121. The data on child malnutrition available from the RIMS surveys (table 10) indicated that only the height-for-age index improved consistently over the period. Children with low weight-for-age (44 per cent) increased compared to 2008 but it is still notably lower than the level reported in 2006 (53 percent).

Table 10

Percentage distribution children 0-59 months classified as malnourished

	2006			2008			2011		
	Weight-for-Height	Height-for-Age	Weight-for-Age	Weight-for-Height	Height-for-Age	Weight-for-Age	Weight-for-Height	Height-for-Age	Weight-for-Age
Male	30	59	64	22	49	43	29	44	47
Female	22	43	49	18	41	37	28	39	40
Total	25	48	53	20	46	40	28	42	44

GSLRP RIMS Survey, 2011, 2008 and 2006

122. As seen above, there are data related to food security and agricultural productivity on different parameters, but they are not consistent and their reliability is questioned in some cases. While a bulk of the project investment was directed at increasing productivity in the Gash Irrigation Scheme, there is little evidence that significant progress was made; in fact, the indication from the field together with the 2010 and 2011 AIA findings rather points to declining productivity on irrigated land. Also, the general perception by people about development before and after the project seems to be more positive about social development but much less so about agricultural productivity improvement (paragraph 119). The project is rated as 3 (moderately unsatisfactory) with regard to food security and agricultural productivity.
123. **Natural resources, the environment and climate change.** The project supported the rehabilitation of the spate irrigation scheme, to be accompanied by mesquite control, and rangeland management outside the irrigation command area. Some activities were undertaken such as broadcasting of pasture seeds and the formation of RUAs, but their extent was small and there has been limited impact.⁷⁵ Mesquite clearance was done to some extent (mostly mechanically), but

⁷⁵ "...the range management activities implemented were very limited covering an insignificant area compared to the vast and deteriorated rangelands and animals within GSLRP mainly because of the limited funding availed for the Rangeland Management Administration and the delayed tendering and disbursements of funds for direct execution. Mesquite control on the GAS was funded by GOS. The exercise proved costly, inefficient, and was ineffective in

due to insufficient maintenance of cleared land by WUAs, the problem of mesquite regrowth and infestation was evident during the PPA mission, thus reducing the field-level benefits of improved capturing of floodwater at off-take structure. Although not explicitly intended in the design, the river control works contributed to better protection of towns (Kassala, Aroma and Wagar) from flooding. There were no major project activities that could have had negative consequences on the environment.

124. Given limited achievements of the related project interventions (e.g., ineffective mesquite control which is reducing cultivable irrigated areas, limited activities and progress in rangeland management), the performance of this project in this impact domain is rated as 3 (moderately unsatisfactory).
125. **Institutions and policies.** *Land tenancy reform.* The land tenancy reform aimed at more equitable and secure access to economically viable landholdings by poor farmers, including those who were landless. The process was challenging, encountering lobbying against the project by those with access to larger land areas. The 1992/93 register books were reportedly screened and cleaned,⁷⁶ and land tenancy rights were reallocated based on agreed eligibility criteria. As the number of claimants (about 56,600) was much higher than envisaged (30,000), it was impossible to allocate land to 10,000 landless households. In any case, it is difficult to say if access to land has become more equitable or not, as the project/LCLR has not been able to verify the identities of the tenants, due to the rejection by farmers to the issuance of identity cards for this purpose.
126. The project promoted the fixing of land plots to individuals for tenure security and improved land management. This has started in Mekali, Degain and Metateib blocks and it is reportedly completed in Kassala block. However, fixing of land plots can be tricky in spate irrigation system without guaranteed secure access to water by each tenancy⁷⁷ (see also annex XI).
127. *Irrigation management transfer.* The project introduced the concept of irrigation management transfer, whereby specific O&M responsibilities would be handed over from a (semi-)government institutions (i.e. GAS) to farmers organized in WUAs. To provide a necessary legal framework, the Government drafted and adopted the 2004 WUA Act, which was a condition for loan effectiveness. The Government also established an Office of the Registrar for Community-Based Organizations within the State MAAWI to facilitate the establishment and registration of WUAs as legal entities under the WUA Act. At project completion, however, Masga WUAs have been made responsible only for water spreading within the respective *masga*.
128. *GAS.* While the project provided a wide range of support to GAS (13 per cent of the total cost), GAS is far from being an institution with the necessary managerial, technical and financial capacity required for the provision of reliable irrigation services to the farmers. This was largely due to weak management and technical competencies (e.g. engineering, hydrology), as well as lack of clarity about the GAS institutional setting and governance (such as legal status, source of financing, the adoption of a GAS Charter, composition and roles of the BOD). These problems

controlling mesquite trees" (PCR). It was also pointed out that the fact that nomadic communities of the Red Sea and Nile States graze their animals in the Project area during the rainy season was not considered at appraisal.

⁷⁶ One supervision report noted that the screening and appeal process had been stopped when the number of claimant tenants exceeded by far the appraisal estimate and it was difficult to confirm the eligibility of farmers who lacked documents to identify the validity of their declaration.

⁷⁷ "The uncertainties in such an irrigation system are twofold. Firstly, the total area which will be irrigated in the scheme, per block, or per rotation cannot accurately be predicted. Secondly, the quality of irrigation per rotation and within *masgas* is variable: the head of the *masgas* will be well-irrigated (if not over-irrigated) but due to erratic flows, consequent off-take and the distance involved, the tail-ends of the *masgas* might often not receive sufficient water." "The major risk associated with fixing the location of the tenancy is the high probability of not getting water, due to the location of tenancy. All stakeholders recognize the benefits of fixing tenancy location on the two *masgas*, however most of them prefer a flexible system where when the *masga* is partially irrigated, the WUA redistributes the wet portion among members according to the individual holding size and percentage of irrigated portion of the *masga* and using the traditional *Gura'á* mode of plots allocation" (pre-PCR mission report, draft, August 2011, footnote 9 and paragraph 101).

were continuously pointed out throughout the project period but remained unsolved with little progress until the project completion and beyond.

129. *Water Uses Associations*. The introduction of the concept of WUAs to facilitate more participation of farmers in O&M of the irrigation scheme, and support for their formation was an important contribution by the project. The project was largely successful in the establishment of Masga WUAs and WUA Block Committees in five out of the six irrigation blocks. They contributed to improving sense of ownership by the farmers and highlighting the roles of farmers in water management. As highlighted in this report earlier, however, the time and resources needed for their capacity-building was grossly underestimated, and their needs were not properly assessed. WUAs are still very weak.
130. *In summary*, the project made significant contribution in terms of setting the reform process in motion and supporting institution-strengthening, notably the introduction of WUAs and land tenancy reform. Although the impact on institutions and policies was still far from the intended level, given the daunting tasks in the challenging environment and important steps made, the project performance with regard to institutions and policies is rated 4 (moderately satisfactory).
131. **Overall assessment: rural poverty impact**. Against the backdrop of the Eastern Sudan Peace Agreement in 2006, improved security and the major infrastructure development supported by the project is likely to have made a major contribution to general development in the area (e.g. better protection of towns from floods). The project had some positive impact on grassroots organizations and institutions and women's empowerment. However, there has been limited notable impact in terms of agricultural productivity and natural resource management. The project is rated moderately satisfactory (4) for overall rural poverty impact.

C. Other performance criteria

Sustainability

132. Sustainability relates to the likelihood that the benefit streams generated by the project would continue after the project closure. While the project embarked on important initiatives and reform process, there are a number of issues and concerns with regard to sustainability at the time of evaluation.
133. *Gash spate irrigation scheme operations and maintenance*. Designed discharge capacity of canal system of Gash spate irrigation scheme is gradually decreased due to deferred maintenance as GAS has insufficient budget to undertake all necessary maintenance works, especially the desilting of the main canals and *masga* canals. Not only with regard to its budget and financial capacity, but the overall institutional sustainability of GAS is highly questionable (paragraph 68-71).
134. In 2011, MOIWR and GAS signed an agreement for a period of five years for providing technical expertise and support for maintenance of the main irrigation infrastructure through GRTU. The project financed such cost for the first year (2012), based on the assumption that MOFNE would pick it up for the remaining four years. In 2013, however, GRTU had to suspend its support to GAS as MOFNE did not make the funds available. This raises a concern.
135. Irrespective of actually irrigated and cultivated area, annual O&M costs for GAS and Masga WUAs are more or less fixed. However, GAS's O&M budget largely depends on the collection of water fees based on the actually cultivated area, which varies considerably from year to year. Moreover, not only the current water fee levels are not sufficient to cover O&M costs but also the collection rate is declining (figure 1 earlier). As a result, there is a concern regarding O&M financing. Furthermore, both GAS and GRTU do not have a capital reserve required to replace their heavy machinery, vehicles and equipment at the end of their economic life.

136. *Masga WUAs*. The sustainability of Masga WUAs is uncertain due to following reasons: (i) lack of bylaws and internal rules and regulations; (ii) insufficient provision of training and technical support; (iii) partial transfer of O&M responsibilities; and (iv) lack of funds.
137. *Increased sediment load*. Annual sediment load in floodwater seems to be increasing due to deforestation in the catchment area of the Gash river located in Eritrea resulting in gradual increase of the riverbed level (i.e. 1.61 metre at Kassala bridge between 1949 and 2008) and development of increasingly unstable and meandering river that regularly changes its direction. In addition to higher maintenance costs due to more desilting requirements in canal system, the increased sediment load in the floodwater may also make it more difficult to divert floodwater into the main canals due to changing riverbed levels and changes in course of the Gash river itself.
138. *Land tenancy reform*. The reform process was initiated but was faced with difficulties, including resistance from those with vested interest. It is not entirely clear how – and whether - this process could be completed in a transparent and fair manner.
139. *Sustainability of benefits from irrigation infrastructure rehabilitation (i.e. better capturing of floodwater)*. This is a serious concern, also related to most of the issues mentioned above. Without drastic improvements in institutional framework and capacity of the relevant institutions under the Government leadership, especially at the level of GAS and WUAs, there is a risk that the scheme would deteriorate back to the pre-project state.
140. Based on the above, the project is rated as unsatisfactory (2) for sustainability.

Innovation and scaling up⁷⁸

141. There were a number of project initiatives that were innovative and also challenging given the context. These include the land reform process aimed at providing poor farmers with more equitable and secure access to land, the introduction of WUAs responsible for the development, maintenance and operation of irrigation activities, as well as empowerment of women and promotion of women's savings and lending groups. It is understood that women's groups for savings and lending have been actively pursued in other IFAD-supported projects and also by the ABS in other parts of the country. Apart from this, there is little indication that other initiatives have been or are likely to be scaled up, although there are opportunities for learning and scaling up especially with regard to WUAs development and land allocation in spate irrigation in other schemes.
142. On innovation and scaling up, the project is rated 3 (moderately unsatisfactory).

Gender equality and women's empowerment

143. The PCR reported that some 15,000 people were trained in different fields and women represented 59 per cent of these. It is impossible to verify whether these figures included double-counting and to what extent. It was reported that due to lack of appropriate venues in villages, training usually took place in schools after the lessons were finished and this affected the participation of women negatively due to time constraints. Nevertheless, in general, interactions with women's groups in the field conveyed the sense that they were highly satisfied with skills training and improved (or rather, "newly introduced") access to microcredit.
144. The women met by the PPA mission reported there had been no problem with their husbands about their participation in training activities. According to the AIA 2011,

⁷⁸ One of the sections missing in the PCR, in light of the PCR guidelines, is "innovation, replication and up-scaling".

of the total respondents,⁷⁹ 75 per cent said they would accept the participation of women in committees, of whom only 25 per cent said they would have accepted it before the project. Sixty-four per cent of the respondent supported the participation of women in the project activities. However, this was the percentage of all respondents (male and female), and therefore, if we assume that all female respondents (78 out of 300) supported women's participation, it would have been 51 per cent of male respondents who supported women's participation. Still, given the conservative nature of the *Hadendowa* tribe with regard to women's participation in public issues, there was a major change in the general attitude. At the same time, the discussions by the PPA mission with key informants in the area seem to indicate that this may have been a general trend in the area, also experienced by other development agencies.

145. There is some reference to the progress with the registration of land in women's own names in some earlier project documents. The LCLR instituted a sub-committee for women and at MTR point, 1 per cent of registered tenants were women – a small but encouraging step in a highly conservative society.
146. Overall, on gender equality and women's empowerment, given the achievement in a conservative society, the project is rated as satisfactory (5).

D. Performance of partners

147. **IFAD.** IFAD played an important role in guiding the project design and advising on the implementation as indicated by the number of missions fielded from inception to loan signing, and later on during the implementation phase, especially after it took over direct supervision from the previous Cooperating Institution, the United Nations Office of Project Services (UNOPS) in 2008. The project had not only periodic annual supervision missions, but also numerous implementation support and follow-up missions,⁸⁰ reflecting the challenges faced. Nevertheless, these frequent missions did not succeed in prompting a breakthrough in resolving some of the fundamental issues for enabling framework and environment (e.g. GAS status, delayed and incomplete process of land tenancy reform), despite repeated recommendations and management letters on the same issues.
148. By influencing the project design, IFAD contributed to bringing in important policy reform issues and livelihoods approach, with an intention to address the needs of the rural poor in a more inclusive and comprehensive manner. On the other hand, in hindsight, the design underestimated the complexities of the social, political and institutional issues, as well as the requirements of technical and managerial competencies. IFAD's performance is rated as moderately satisfactory (4).
149. **Government.** The Government support and contribution to the project, at Federal and State level, was in particular notable in terms of counterpart contribution over the initial budget, especially for civil works (river control and mesquite control). The PCR also indicated the following positive inputs by the Government: the deployment of required staff to the area and monitoring project performance through the regular monitoring visits by the Federal Ministries. At the state level, there were contributions by the Project Executive Board until it was dissolved.⁸¹ The Government agencies supported the important steps for the reform process, such as the issuance of the State Law on WUAs (as inadequate as it may have been – see annex XII), the establishment of the Office of Registrar and LCLR.
150. It is not straightforward to assess the performance of "the Government", which included a number of institutions at Federal and State levels. Regardless of where the main responsibilities lie, where it may have fallen short of the expected role is

⁷⁹ There were 300 interviewees, of which 74 per cent was male. It is not clear whether the same question ("would you accept women participation in committees now and would you have accepted before the project?") was asked to both men and women.

⁸⁰ It also drew support from the Technical Advisory Division for supervision and follow-up missions.

⁸¹ This was based on the recognition of overlapping roles and responsibilities with the GAS Board of Directors.

its inability to resolve the impasse and lack of pro-activity to push reform agendas. For example, the problem in the institutional setting of GAS (e.g. unclear legal status) was raised as far back as 2008 by IFAD missions but this was not solved till the end of the project - and also at the time of the PPA mission. These would indeed have been fundamental for project success and sustainability. The performance of the Government is rated moderately unsatisfactory (3).

E. Overall project achievement

151. The project made an important contribution in terms of setting some reform process in motion and institutional strengthening, notably the introduction of irrigation management transfer to newly formed WUAs and land tenancy reform. Following substantial investment in civil works (river training and irrigation infrastructure rehabilitation), capturing of floodwater and potential irrigation capacity has improved, and the towns are better protected from flooding. The project contributed to improving access to safe water by some 20,000 households. It made notable progress in empowering women in a conservative society.
152. Despite important steps taken and contributions made by the project, the overall achievements notably fell short of the set objectives, not least because the initial aspiration was rather ambitious and over-optimistic. The achievement with respect to the important focus of the project – efficiency, equitability and sustainability in the Gash scheme operation - was limited. There is still a lack of transparency in the land allocation system, especially given the inability to verify identification of tenant farmers. Sustainability of the scheme management, operation and maintenance is a serious concern. The PPA’s rating for the project’s overall achievement is moderately unsatisfactory (3).

Key points

- The project objectives in terms of livelihood regeneration with equity concerns were broadly relevant. However, not only the design was over-optimistic but also the theory of change and some key design features were not carefully thought through. The relevance is rated as 3 (moderately unsatisfactory).
- The project made important contribution in setting the reform process in motion and some institutional strengthening (especially WUAs), but in most aspects tangible outcomes fell short of the set objectives. The effectiveness is rated moderately unsatisfactory (3).
- The loan effectiveness was timely and the disbursement rate remained at satisfactory level, also due to heavy expenditure on infrastructure rehabilitation. However, the benefits in terms of increased crop and livestock productivity were comparably low. The efficiency is rated moderately satisfactory (4).
- The overall assessment of rural poverty impact is moderately satisfactory (4).
- Sustainability is a serious concern and rated unsatisfactory (2).
- The performance of IFAD is rated moderately satisfactory (4), while that of the Government moderately unsatisfactory (3) given that fundamental institutional issues which required the Government leadership have been left unresolved despite repeated requests by IFAD.

IV. Conclusions and recommendations

A. Conclusions

153. GSLRP was a well-intended and courageous, but over-ambitious project. The project effectiveness relative to the objectives was constrained on the whole due to the slow pace of the reform process (and lack of a shared vision therefor) that was to accompany the investment in hardware and institutional strengthening, as well

as limitation on qualified staff resources in public institutions. At field level, local politics and power structure seriously hindered the efforts for the reform process.

154. **The project design underestimated the complexities of social, political and institutional contexts and what it would have taken for putting in place appropriate institutional arrangements with adequate capacity (technical and managerial)** (paragraphs 50-51, 55-74, 125-129) . More investment in the project preparation and initial phase could have injected realism into what could be expected at what pace and in what sequences (or, in the extreme case, whether IFAD should finance a project in Gash). The areas that would have required more preparatory work include the following. First, to develop a shared understanding amongst the key stakeholders. As highlighted in the PCR, there was insufficient consultation on the sensitive land issue at the design stage, resulting in lobbying by those with vested interest against the project activities once the implementation started. Sufficient buy-in from tribal leaders was – and still is - a “killer assumption” for pushing the land tenancy reform to a conclusion. Second, once a shared understanding was developed, more groundwork would have been required prior to the commencement of irrigation infrastructure rehabilitation works (e.g. clarifying the roles and responsibilities, getting the groundwork done for land tenancy reform, etc.). Third, a more thorough institutional analysis would have been required at the design stage, to be updated during the implementation, including due diligence and capacity assessment of implementing partners. Given the current unclear situation of GAS and weak capacity, combined with still weak WUAs, there is a risk that the scheme would deteriorate back to the pre-project state.
155. **The introduction of WUAs, their establishment and development, was an important achievement of the project to facilitate irrigation management transfer, but their capacity is still weak** (paragraphs 36-39, 61-67, 128, 136). The intention was that WUAs would have more roles and responsibilities with regard to the management, operation and maintenance of the Gash Irrigation Scheme, but the capacity-building support for WUAs provided under the project was insufficient. The time and resource required for such efforts were underestimated. The project support was not always tailored to their needs. The legislative framework for WUAs at the State level was also found inadequate (annex XII).
156. **The farmers in principle recognized the benefits of fixing tenancy location in the two paired *masgas*, but many of them remained hesitant without being assured of secure annual water availability** (paragraphs 116, 126, annex XI). In recent years, more farmers seem to have accepted fixed plots of land in at least four irrigation blocks. It however remains important to have a mechanism to manage the variability of water availability in a fair manner, in addition to proper infrastructure maintenance. Another downside of land fixation is that farmers would have less incentive to pay water fees, which was previously a precondition to be included in the lottery-based land allocation system. This is where the roles of WUAs become important in terms of rules and regulations and their enforcement.
157. **Irrigation infrastructure rehabilitation and some improvement in the scheme irrigation capacity were not accompanied by improved irrigation efficiency or improved farming practices** (paragraphs 43-44, 82-84, 116). Due to lack of investment in better on-farm water management (e.g. land levelling, *masga* canal extension, mesquite clearance) and limited research and extension activities with little impact on crop production and productivity, the benefits of better capturing of floodwater were not exploited at the intended level. Crop productivity and increase in net farm income is closely linked to the ability to pay for water fees at real cost and thus, the issue of sustainability. After cotton was abandoned at the end of the 1960s and castor oil became less attractive during

early 1980s, the predominant crop is sorghum since mid-1980s. The historical data on yields are not conclusive, but in general, farmers are reporting deterioration in the sorghum yield. This may be related to mono-cropping on two-year rotation instead of three-year cycle as was practiced before, as well as the use of farmers' saved seeds. There are opportunities for introducing other cash crops such as sunflower, also for crop rotation for better land management.

158. **It is important to note the multiple use of floodwater in the Gash river** (paragraph 137, annex X), not only for irrigation of farmland in the Gash Irrigation Scheme, but also for refilling *haffirs*, recharging groundwater and supplying water to rangeland and natural forests in the Gash Die area. Historical data shows changing and more erratic behaviour of the Gash River. The flood patterns and floodwater discharge (average 680 million m³ per year) is changing due to climate change and increasing water use in Eritrea. The sediments (5.5 million m³ per year) are increasing due to deforestation in catchment area (Eritrea). This points to the need for a comprehensive and strategic planning for the whole river basin.

B. Recommendations

159. Provided below are some key recommendations for consideration by IFAD and the Government. As IFAD has not pursued a follow-on support for GSLRP nor does it have a plan to do so, some of the recommendations would be for consideration by the Government in collaboration with other partners, for the follow-on support for the Gash scheme,⁸² or other agricultural schemes as may be appropriate.
160. **IFAD could consider engaging in discussion with the Government** to address key outstanding issues threatening the sustainability of the Gash Irrigation Scheme (paragraph 154). IFAD decided not to continue supporting the Gash scheme; however, as a partner that provided substantial financing under GSLRP and as a major partner in the agricultural sector, IFAD is well-placed to work with the Government to tackle these issues. These include: (i) clarification on the institutional arrangements concerning O&M of the Gash Irrigation Scheme, including the GAS status; (ii) putting in place measures to strengthen institutional arrangements and capacity of both GAS and WUAs; and (iii) critical reflection on how best to bring the land tenancy reform in the Gash Irrigation Scheme to a conclusion, based on an comprehensive assessment of the interests of all concerned stakeholders, together with consultations with key influential stakeholders to obtain their endorsement.
161. **Regarding the possible institutional arrangements, if and when WUAs play a more substantial role in the scheme O&M financed by water fees as envisaged, the roles of public institutions could – and should - focus on the management, operation and maintenance of major infrastructure** (paragraphs 154-155), including river training works, off-takes and main canals. In this regard, consideration may be given to merging the current GRTU and GAS (in a down-scaled form) for this purpose, placed under the Federal Government or the State Government. Placing it under the Federal Government may seem contrary to the general direction of decentralisation, but it is not uncommon to keep the responsibilities for major infrastructure at central level as it is the case for other agricultural schemes. Another option may be a public-private partnership, whereby a private party will be responsible for the management, operation and maintenance of the major irrigation infrastructure (e.g. off-takes and main canals) under a service contract or lease agreement with the Federal/State Government.
162. **To ensure the development of WUAs that are managed in a transparent and accountable manner, it is recommended that further medium-term investment be made under a follow-on project to strengthen their capacities to undertake O&M activities in an effective and efficient manner**

⁸² It is proposed that the Islamic Development Bank through the Eastern Sudan Reconstruction and Development Fund will finance further upgrading of the Gash irrigation scheme.

(paragraphs 155-156). There should be a distinct unit or section in a public entity that supports WUAs with sufficient staff (e.g. subject matter specialists and social/community organizers), equipment and budget, which should be fully responsible for the establishment and (continuous) capacity-building of WUAs through the provision of module-based, practical training courses using participatory training techniques, technical support and monitoring. A WUA unit was established within GAS towards the end of the project, but without clarification of the GAS status and mandate, it is not clear if GAS will be the right home for such WUA unit or if the State Ministry may be a more appropriate place. Further reflection on appropriate institutional arrangements for supporting WUAs would be required.

163. **Taking into account (increasing) sediment problems, changes in flood patterns and increasing water demands, it is recommended that a Gash river management plan be developed based on the concept of integrated water resource management** (paragraph 158) with a detailed analysis of current and future use of floodwater for irrigation, groundwater recharge, watering of rangelands and natural forest and domestic use in urban areas as well as the impact of different water availability scenarios. As the Gash river is a trans-boundary river, a Gash river management plan should be prepared in close consultation with Eritrea to ensure (more) sustainable management of the Gash river, including interventions in the catchment area to reduce sediment load in floodwater caused by (increasing) soil erosion.
164. **In order to enhance the viability and sustainability of the scheme's operation, in the future more attention is required for increasing the returns on irrigated crop production** (paragraph 157) both in terms of yield and also profitability, taking into consideration the issue of access to inputs and markets. This needs to be done in combination with measures to improve irrigation efficiency. The key question is, who should be best placed to provide support for research and extension? The PCR recommended that GAS establishes its own agricultural extension unit. In view of this evaluation, further consideration is required on this point, also in connection with the clear definition of the mandate of what currently exists as GAS and its future. It may have made sense for an entity like GAS to provide extension services when cropping patterns were centrally planned (like the time of cotton) and when the entity had a role in providing inputs and marketing. However, when farmers grow what they want, the need for extension services that are distinguished from those for other farming areas (i.e. by the ministry) may be questioned - unless there are specialized crops that can be grown in the spate irrigation areas.

Rating comparison

<i>Criteria</i>	<i>IFAD-PMD rating^a</i>	<i>PPA rating^a</i>	<i>Rating disconnect</i>
Project performance			
Relevance	4	3	-1
Effectiveness	4	3	-1
Efficiency	5	4	-1
Project performance^b	4.33	3.33	-1
Rural poverty impact			
Household income and assets	5	n.p.	n.a.
Human and social capital and empowerment	4	4	0
Food security and agricultural productivity	5	3	-2
Natural resources environment and climate change	5	3	-2
Institutions and policies	3	4	+1
Rural poverty impact^c	4	4	0
Other performance criteria			
Sustainability	3	2	-1
Innovation and scaling up	3.5 ^d	3	-0.5
Gender equality and women's empowerment	5	5	0
Overall project achievement^e	4	3	-1
Performance of partners^f			
IFAD	5	4	-1
Government	4	3	-1
Average net disconnect			-0.79

^a Rating scale: 1 = highly unsatisfactory; 2 = unsatisfactory; 3 = moderately unsatisfactory; 4 = moderately satisfactory; 5 = satisfactory; 6 = highly satisfactory; n.p. = not provided; n.a. = not applicable.

^b Arithmetic average of ratings for relevance, effectiveness and efficiency.

^c This is not an average of ratings of individual impact domains.

^d The PMD rating is provided separately for "Innovation" (3) and "Replicability and scaling up" (4). Hence, the average is taken.

^e This is not an average of ratings of individual evaluation criteria but an overarching assessment of the project, drawing upon the rating for relevance, effectiveness, efficiency, rural poverty impact, sustainability, innovation and scaling up, and gender.

^f The rating for partners' performance is not a component of the overall assessment ratings.

Ratings of the PCR document

<i>Ratings of the PCR document quality</i>	<i>PMD rating</i>	<i>IOE PCRV rating</i>	<i>Net Disconnect</i>
(a) Scope	5	4	-1
(b) Quality (methods, data, participatory process)	4	4	0
(c) Lessons	5	4	-1
(d) Candour	6	5	-1
Overall rating PCR document		4	

(a) Scope: The PCR covers most of the elements outlined in the IFAD's guidelines for project completion report, except for a section on innovation, replication and scaling-up.

(b) Quality: There could have been a more critical review and analysis of available data and information, especially those related to baseline and impact. The PPA team found that the pre-PCR mission report from August 2011 highly analytical containing interesting observations and issues (although not all sections were completed) and it is a pity that the report was never finalized.

(c) Lessons: The PCR presents useful lessons on a wide range of issues. Some of them would have benefited from further unpacking. One of the critical issues and lessons relating to the requirements for institutional building, mainly GAS and WUAs (e.g. the kind of support needed, time, resource and expertise required for such process) was not given sufficient attention.

(d) Candour: The PCR is relatively candid, but there could have been more in-depth reflection and analysis of some of the critical issues, also including some aspects of the project design (in addition to the design and preparatory process).

Basic project data

			Approval (US\$ m)		Actual (US\$ m)	
Region	Near East, North Africa and Europe	Total project costs	39.0		35.652	
Country	The Sudan	IFAD loan and percentage of total**	24.95	64%	24.53	69%
Loan number	Loan 630-SD	Borrower	8.93	22.9%	11.02	31%
Type of project (subsector)		Cofinancier 1 (PFI-ABS)	0.47	1.2%	0	0%
Financing type	IFAD exclusive	Cofinancier 2				
Lending terms*	H. concessional	Cofinancier 3				
Date of approval	18 December 2003	Cofinancier 4				
Date of loan signature	27 January 2004	Beneficiaries	4.7	12%	0.1	0.3%
Date of effectiveness	12 August 2004	Other sources				
Loan amendments	7 November 2007 19 April 2009 December 2009*	Number of beneficiaries	67 000 HHs		56 746 HHs (PCR)	
Loan closure extensions	NA					
Country programme managers	Mr Khalid Eli-Harizi Ms Rasha Omar Mr Mohamed Abdelgadir (ad interim)	Loan closing date	31 March 2013		31 March 2013	
Regional director(s)	Ms Mona Bishay Mr Nadim Khori Ms Khalida Bouzar	Mid-term review			October 2008	
Project completion report reviewer	Fumiko Nakai	IFAD loan disbursement at loan closing (%)			96.5% (in SDR figure)	
Project completion report quality control panel	Ashwani Muthoo Cécile Berthaud	Date of the project completion report			October 2013	
<p>* The official communication to the Government to inform the reallocation is not located in the IFAD record, but the internal approval has been.</p> <p>** The actual figure does not exactly correspond to the disbursement rate of 96.5% due to fluctuation of exchange rate for SDR:USD.</p>						

Sources: LGS, PPMS, PCR

There are four types of lending terms: (i) special loans on highly concessional terms, free of interest but bearing a service charge of three fourths of one per cent (0.75%) per annum and having a maturity period of 40 years, including a grace period of 10 years; (ii) loans on hardened terms, bearing a service charge of three fourths of one per cent (0.75%) per annum and having a maturity period of 20 years, including a grace period of 10 years; (iii) loans on intermediate terms, with a rate of interest per annum equivalent to 50% of the variable reference interest rate and a maturity period of 20 years, including a grace period of 5 years; (iv) loans on ordinary terms, with a rate of interest per annum equivalent to one hundred per cent (100%) of the variable reference interest rate, and a maturity period of 15-18 years, including a grace period of three years.

Terms of reference

I. Background

1. The Independent Office of Evaluation of IFAD (IOE) undertakes two forms of project evaluations: Project Completion Report Validations (PCRVs) and Project Performance Assessments (PPAs). PCRVs consist of a desk review of Project Completion Reports (PCRs) and other supporting documents. PPAs, involving country visits, are undertaken on a number of selected projects¹ for which PCRVs have been conducted. In general terms, the main objectives of PPAs are to: (i) provide an independent assessment of the overall results of projects; and (ii) generate lessons and recommendations for the design and implementation of on-going and future operations within the country. A PPA is conducted after a desk review of the PCR and other available documents, with the aim of providing additional evidence on project achievements and validating the conclusions of the PCR. In this, the Gash Sustainable Livelihoods Regeneration Project (GSLRP) in The Sudan has been selected for a PPA.

II. Country context and project overview

2. **Country context.** Since the project was designed and during the implementation, the country context has changed significantly, especially in connection with the secession of South Sudan in July 2011, including the loss of human and land resources and the oil revenue. The Sudan has been severely affected by armed conflict for more than two decades, which had devastating effects on rural livelihoods. This continues to exist in border areas post secession. Conflicts among pastoralists, agro-pastoralists and farmers are widespread due to disputes over ownership and use of natural resources. Land tenure practices are another cause of conflict. The poverty rate is high: it was estimated that in 2009, 57.6 per cent of the rural population was living under the national poverty line, much higher than the national average figure of 46.5 per cent.²
3. The agricultural sector makes an important contribution to the national economy, about 25-30 per cent of the Gross Domestic Product (GDP).³ The sector provides important sources of livelihoods for the majority of the rural population. In 2009 the largest share of agricultural GDP was derived from livestock production (47%), followed by large-scale irrigation (28%), traditional rain-fed farming (19%), forest products (7%) and semi-mechanized farming (3%).⁴ Large-scale irrigation accounts for only 9% of cultivated land area but it receives most public agricultural spending.
4. The rain-fed sector is typically divided into semi-mechanized farming, traditional crop production, and livestock. The traditional rain-fed farming subsector covers around 10 million ha and is made of family households of 2-50 ha. Productivity is low due to land degradation, lack of access to technologies, unpredictability of rainfall and pests. Livestock production is an important component of the traditional rain-fed sector and are raised mostly by nomadic or semi-nomadic pastoralists practicing transhumance within The Sudan or crossing borders into neighbouring countries.
5. **Project context.** Where the project was located (Kassala State in eastern part of The Sudan), the Gash river and spate irrigation system in the delta provides an important basis for local economy and livelihoods. This large irrigation scheme was

¹ The selection criteria for PPA include: (i) synergies with forthcoming or ongoing IOE evaluations (e.g., Corporate Level Evaluations, Country Programme Evaluations); (ii) novel approaches; (iii) major information gaps in PCRs; and (iv) geographic balance.

² World Bank databank.

³ The figures are varied across the sources, such as 33.1 per cent in 2011 (Africa Economic Outlook), 25 per cent and 24 per cent in 2010 and 2011, respectively (World Bank databank).

⁴ World Bank. 2009. Sudan - Towards Sustainable and Broad-based Growth. Report No. 53514-SD. Dec. 2009

set up by the British colonial government in the 1920s mainly to supply raw cotton for the textile industry - and also to settle poor nomadic people into a cash economy growing cotton. A majority of the local population in the area is from the *Hadendowa* tribe, who were originally highly mobile agro-pastoralists who farmed sorghum and raised livestock. The Gash spate irrigation scheme went into serious decline in the 1970s, and further drought spells and security problems have led to increased pressure on meagre resources. Many of the poorest farmers were relying on small plots of land occasionally allocated to them. Furthermore, the public sector organization managing the scheme has changed often, and has not demonstrated effective management of the scheme.

6. Initially, the Government of the Sudan (GOS) requested IFAD's assistance specifically for the rehabilitation of the Gash flood irrigation scheme, given that the economic base of the Gash river delta had been severely affected by recurrent drought, population pressure and deterioration in the infrastructure of its flash irrigation scheme. Following the inception mission fielded by IFAD, the project concept shifted the focus from the rehabilitation of the irrigation scheme to more broadly addressing the policy and institutional reforms surrounding land and water governance along irrigation infrastructure rehabilitation. In light of unsuccessful experience with rehabilitated irrigation projects, it was considered important to explicitly incorporate some reform agenda mainly related to land issues and water fees.
7. In the above context, the project was designed "*to address the policy and institutional causes of the degradation of the Gash Flood Irrigation Scheme in order to improve living standards in the Gash Delta and the adjacent range areas*".⁵ A sustainable livelihoods assessment⁶ was undertaken to inform the project design.
8. **Project overview.** The Gash Sustainable Livelihoods Regeneration Project (GSLRP) was a US\$39 million project over eight years, with the goal "*to regenerate the livelihoods of the maximum number of poor people in and around the Gash delta, compatible with the efficient and sustainable use of its land and water resources and based upon a shared vision of development and the stability of the related institutional arrangements*". The project purpose⁷ was "*to ensure the efficient, equitable and sustainable operation of the Gash Scheme and its integration of the scheme into the local economy*".
9. *Project area and target group.* The project area is located in the Kassala State in the eastern part of The Sudan, covering the entire locality⁸ of Gash and parts of Hamaish Koraib and Kassala localities. It included the entire command area of the Gash Agricultural Scheme (GAS), as well as the east bank of the Gash River and the rangelands north and west of the scheme, but excluded the Kassala city to the south and its surrounding villages. The project target group was the poor rural households in the project area, estimated to be 67,000 households out of the total 75,000 rural households in the project area. It was estimated that the targeted 67,000 poor rural households covered: 30,000 tenant farmers who would benefit from more secure and equitable access to economically viable and irrigated landholdings; 10,000 landless households including some 4,500 woman-headed households who were expected to gain legally recognized and secure access to irrigated land; and 27,000 non-tenant households who would benefit from improved infrastructure for livestock production and non-farm income-generating activities.

⁵ President's Report, para 10.

⁶ This was financed by with the Department of International Development (DFID) of the Government of the United Kingdom. At the time the project was designed, IFAD had partnership arrangements with DFID to promote sustainable livelihoods approach. This included a technical advisor seconded to IFAD from DFID and supplementary funding from the DFID to be drawn on for studies and assessment relating to sustainable livelihoods approach.

⁷ The wording according to the Appraisal Report.

⁸ Locality is a unit that indicates geographical and administrative areas below the State-level.

10. *Project components.* The project consisted of the following five components:
- (i) *Irrigation infrastructure rehabilitation*, to enhance the capture of flood waters through better control of river flow, reconstructing the water reticulation network canals and access roads, and improve field layouts;
 - (ii) *Animal production and rangeland management*, to improve animal health services, restock men and women with improved animal breeds, and develop a sound land use policy through the rehabilitation of community-owned livestock water facilities, construction of water containment and spreading structures, and control of mesquite invasion
 - (iii) *Community development, capacity-building and empowerment*, to increase drinking water supply and quality by refurbishing existing facilities, build the capacity and empower communities through training both men and women, group formation and provision of community initiative grants – on a matching basis – for social services support;
 - (iv) *Financial services and marketing*, to allow the target group the resources to increase their productivity through the provision of credit lines for improved crop inputs and a community based investment credit operated by a participating financing institution (PFI) for groups such as WUAs for the acquisition of farm machinery, food processing enterprises and pre-financing for produce marketing and for poor men and women acquisition of livestock, food processing equipment, micro-enterprises and income generating activities
 - (v) *Institutional support*, to encompass the formation and empowerment of WUAs, GAS, State Line Ministries and agencies, and the Project Coordination Unit to assure that the Project parties can achieve the objectives.
11. *Project stakeholder institutions.* The project had a number of stakeholder institutions at different levels, amongst others including: (a) Federal Ministry of Agriculture and Forestry (MOAF), which was the Lead Project Agency; (b) Federal Ministry of Irrigation and Water Resources (MOIWR), responsible for river control; (c) Ministry of Agriculture and Animal Wealth and Irrigation (MAAWI) of the Kassala State; (d) Gash Agricultural Scheme (GAS) (or Gash Delta Agricultural Corporation (GDAC)); (e) Gash River Training Unit (GRTU); (f) Water User Associations (WUAs); (g) farmers union; and (h) Kassala Drinking Water Corporation. A Project Coordination Unit (PCU) was established in Kassala, the capital of the Kassala State.
12. *Timeline.* The project was implemented over eight years as envisaged. The IFAD loan of SDR 17.45 million (equivalent to approximately USD 24.9 million) became effective on 12 August 2004 and the project was completed on 30 September 2012.

III. Scope and methodology

13. The PPA exercise will be undertaken in accordance with the IFAD's Evaluation Policy,⁹ the IFAD Evaluation Manual¹⁰ and the Guidelines for PCR/PPA.¹¹
14. **Scope.** In view of the time and resources available, the PPA is generally not expected to undertake quantitative surveys or to examine the full spectrum of project activities, achievements and drawbacks. Rather, it will focus on selected key issues. The PPA will take account of the preliminary findings of the PCR based on a desk review and interviews at IFAD headquarters. During the PPA mission, additional evidence and data will be collected to verify available information and each an independent assessment of performance and results.

⁹ <http://www.ifad.org/pub/policy/oe.pdf>

¹⁰ http://www.ifad.org/evaluation/process_methodology/doc/manual.pdf

¹¹ http://www.ifad.org/evaluation/process_methodology/doc/pr_completion.pdf. See annex 1 to this document for an extract from the guidelines, "Methodological Note on Project Performance".

15. **Evaluation criteria.** In line with the evaluation criteria outlined in IOE's Evaluation Manual (2009), added evaluation criteria (2010)¹² and IOE Guidelines for PCRV and PPA (January 2012), the key evaluation criteria applied in this PPA will include:
- (a) **Relevance**, which is assessed both in terms of alignment of project objectives with country and IFAD policies for agriculture and rural development and the needs of the rural poor, as well as project design features geared to the achievement of project objectives.
 - (b) **Effectiveness**, which measures the extent to which the project's immediate objectives were achieved, or are expected to be achieved, taking into account their relative importance.
 - (c) **Efficiency**, which indicates how economically resources/inputs are converted into results.
 - (d) **Rural poverty impact**, which is defined as the changes that have occurred or are expected to occur in the lives of the rural poor (whether positive or negative, direct or indirect, intended or unintended) as a result of development interventions. Five impact domains are employed to generate a composite indication of rural poverty impact: (i) household income and assets; (ii) human and social capital and empowerment; (iii) food security and agricultural productivity; (iv) natural resources, (v) environment and climate change; and (vi) institutions and policies.
 - (e) **Sustainability**, indicating the likely continuation of net benefits from a development intervention beyond the phase of external funding support. It also includes an assessment of the likelihood that actual and anticipated results will be resilient to risks beyond the project's life.
 - (f) **Pro-poor innovation and scaling up**, assessing the extent to which IFAD development interventions have introduced innovative approaches to rural poverty reduction and the extent to which these interventions have been (or are likely to be) replicated and scaled up by government, private sector and other agencies.
 - (g) **Gender equality and women's empowerment.** This criterion is related to the relevance of design in terms of gender equality and women's empowerment, the level of resources committed, and changes promoted by the project.
 - (h) **Performance of partners**, including the performance of IFAD and the Government, will be assessed on an individual basis, with a view to the partners' expected role and responsibility in the project life cycle.
16. **Data collection.** The PPA will be built on the initial findings of the PCRV. For further information, interviews will be conducted both at IFAD headquarters and in The Sudan. During the in-country work, additional primary and secondary data will be collected in order to reach an independent assessment of performance and results. Data collection methods will mostly include qualitative participatory techniques. The methods deployed will consist of individual and group interviews with project stakeholders, beneficiaries and other key informants and resource persons, and direct observations. The PPA will also make use – where applicable – of additional data available through the programme's monitoring and evaluation (M&E) system. Triangulation will be applied to verify findings emerging from different information sources.
17. **Stakeholders' participation.** In compliance with the IOE Evaluation Policy, the main project stakeholders will be involved throughout the PPA. This will ensure that the key concerns of the stakeholders are taken into account, that the evaluators fully understand the context in which the programme was implemented, and that

¹² Gender, climate change, and scaling up. See annex II of the document found on the following link: <http://www.ifad.org/gbdocs/eb/ec/e/65/EC-2010-65-W-P-6.pdf>

opportunities and constraints faced by the implementing institutions are identified. Regular interaction and communication will be established with the Near East, North Africa and Europe Division (NEN) of IFAD and with the Government. Formal and informal opportunities will be explored during the process for the purpose of discussing findings, lessons and recommendations.

IV. Evaluation process

18. Following the PCRV based on desk review, the PPA will involve following steps:
- **Country work.** The PPA mission is scheduled for 24 November -5 December 2013. It will interact with representatives from the government and other institutions, beneficiaries and key informants, in Khartoum and in the project area. At the end of the mission, wrap-up meetings will be held both in Kassala and in Khartoum to summarize the preliminary findings and discuss key strategic and operational issues.
 - **Report drafting and peer review.** After of the field visit, a draft PPA report will be prepared and submitted to IOE internal peer review for quality assurance.
 - **Comments by NEN and the Government.** The PPA report will be shared with NEN and thereafter with the Government for comment. IOE will finalize the report following receipt of the Government's comments and prepare the audit trail.
 - **Communication and dissemination.** The final report will be disseminated among key stakeholders and the evaluation report published by IOE, both online and in print.

V. Key issues for investigation

19. Based on desk review, a number of issues upon which the PPA mission could focus have been identified. These are provided in the below but may be adjusted in the process based on the NEN comments on the draft PCRV or emerging issues based on additional information:
- (a) **Water users' associations.** The PPA will assess the contributions made and challenges faced by the project with regard to the promotion, formation and development of Water Users' Associations (WUAs) at different levels (masga, block and apex) for irrigation management. The issue of management and governance in WUAs, inclusiveness and equity, and their sustainability will also be reviewed.
 - (b) **Land tenure issues.** The project was to support the reform of land and water governance along irrigation infrastructure rehabilitation. Without the former accompanying the latter effectively and timely, achieving the project objectives was to be challenged. In particular, land reform involving land tenure arrangements and land allocation system was to be an important element for promoting equitable and transparent resource allocation, but this is understood to have been a challenging area in the project. This issue is also related to the above point on WUAs. The PPA will assess the progress and any contribution to policy dialogue made by the project in this regard and issues faced in order to draw lessons.
 - (c) **Targeting.** The project was to target three categories of poor rural households: (i) 30,000 tenant farmers who would benefit from more secure and equitable access to economically viable and irrigated landholdings; (ii) 10,000 landless households including some 4,500 woman-headed households who were expected to gain legally recognized and secure access to irrigated land; and (iii) 27,000 non-tenant households who would benefit from improved infrastructure for livestock production and non-farm income-generating activities. To the extent possible based on the available data and interviews,

the PPA will assess the extent of outreach of the project benefits to these categories of rural households and the inclusiveness.

- (d) **Women's empowerment.** The *Hadendowa* is the main tribe in the project area and they are known to be conservative when it comes to women's participation in public issues. The PCR indicates the significant progress made on women's empowerment and resulting impact such as improvement of child nutrition. The PPA will assess whether, how and to what extent the project has contributed to gender mainstreaming and women's empowerment.
- (e) **Sustainability of GAS.** The PCR highlighted a number of actions required to enhance the sustainability of the Gash Agricultural Scheme (GAS), including reforms and organizational development needed for the institutions with stakes at the management of the scheme. The issue of water fee structure and collection mechanism is also of relevant to this issue. The PPA will obtain updated information and assess the likelihoods of the GAS sustainability.
- (f) **Rural financial services.** The project reports including the PCR indicate that lending (through the Agricultural Bank of Sudan) to certain beneficiary groups (e.g. WUAs) was more challenging than others (e.g., Women's Savings and Lending Groups). PPA will review the experience and key issues to draw lessons.

VI. Evaluation team

20. Ms. Fumiko Nakai, IOE Evaluation Officer has been designated as lead evaluator for this PPA and will be responsible for delivering the final report. She will be assisted Olaf Verheijen (participatory irrigation development/management and institutions, IOE consultant) and Mr Mahmoud Husein Ali Numan (agriculture and livelihoods, IOE consultant).¹³ Ms Laure Vidaud, IOE Evaluation Assistant, will provide research and administrative support.

VII. Background documents

21. The key background documents for the exercise will include the following:

General

- IFAD (2009). Evaluation Manual. Methodology and processes.
- IOE (2012). Guidelines for the Project Completion Report Validation (PCRv) and Project Performance Assessment (PPA).
- IFAD (2011). IFAD Evaluation Policy.
- Various IFAD Policies and Strategies, in particular, Strategic Framework (2007-10), Promoting Access to Land and Tenure Security, Targeting, Gender Equity and Women Empowerment.

IFAD documents - country and project specific:

- The Sudan: Country Programme Evaluation (2009)
- The Sudan: Country Strategic Opportunities Papers 2002 & 2009
- Project Completion Report Validation (2013)
- GSLRP – Appraisal Report (2003)
- GSLRP - President's Report (2003)
- Project loan agreement (2004) and amendments
- Supervision Mission Aide Memoire and Reports
- Mid-term review report
- Project Completion Report (Main report and annexes) (2013)
- Project Status Reports

¹³ The TORs for the PPA mission with specific responsibilities of each mission member are also prepared, supplementing the overall PPA TORs.

Methodological note on project performance assessments

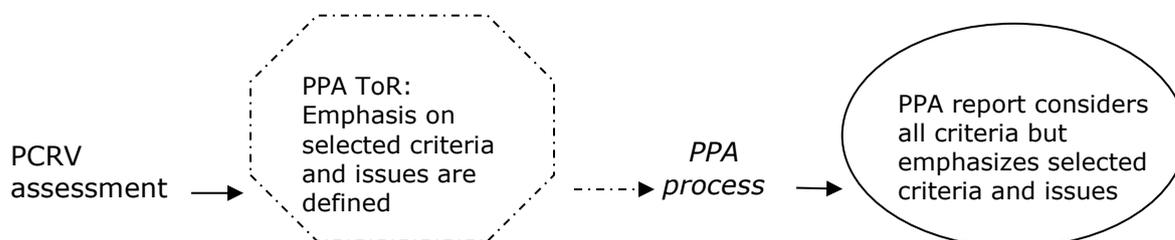
A. What is a project performance assessment?¹

1. The project performance assessment (PPA) conducted by the Independent Office of Evaluation of IFAD (IOE) entails one mission of 7-10 days² and two mission members³. PPAs are conducted on a sample of projects for which project completion reports have been validated by IOE, and take account of the following criteria (not mutually exclusive): (i) synergies with forthcoming or ongoing IOE evaluations (e.g. country programme or corporate-level evaluations); (ii) major information gaps in project completion reports (PCRs); (iii) novel approaches; and (iv) geographic balance.
2. The objectives of the PPA are to: assess the results and impact of the project under consideration; and (ii) generate findings and recommendations for the design and implementation of ongoing and future operations in the country involved. When the PPA is to be used as an input for a country programme evaluation, this should be reflected at the beginning of the report. The PPA is based on the project completion report validation (PCR/V) results, further desk review, interviews at IFAD headquarters, and a dedicated mission to the country, to include meetings in the capital city and field visits. The scope of the PPA is set out in the respective terms of reference.

B. Preparing a PPA

3. Based on the results of the PCR/V, IOE prepares brief terms of reference (ToR) for the PPA in order to sharpen the focus of the exercise.⁴ As in the case of PCR/Vs, PPAs do not attempt to respond to each and every question contained in the Evaluation Manual. Instead, they concentrate on the most salient facets of the criteria calling for PPA analysis, especially those not adequately explained in the PCR/V.
4. When preparing a PPA, the emphasis placed on each evaluation criterion will depend both on the PCR/V assessment and on findings that emerge during the PPA process. When a criterion or issue is not identified as problematic or in need of further investigation, and no additional information or evidence emerges during the PPA process, the PPA report will re-elaborate the PCR/V findings.

Scope of the PPA



¹ Extract from the PCR/V and PPA Guidelines.

² PPAs are to be conducted within a budget ceiling of US\$25,000.

³ Typically, a PPA mission would be conducted by an IOE staff member with the support of a consultant (international or national). An additional (national) consultant may be recruited if required and feasible within the evaluation budget.

⁴ Rather than an approach paper, IOE prepares terms of reference for PPAs. These terms of reference ensure coverage of information gaps, areas of focus identified through PCR/Vs and comments by the country programme manager, and will concentrate the PPA on those areas. The terms of reference will be included as an annex to the PPA.

C. Evaluation criteria

5. The PPA is well suited to provide an informed summary assessment of project relevance. This includes assessing the relevance of project objectives and of design. While, at the design stage, project logical frameworks are sometimes succinct and sketchy, they do contain a number of (tacit) assumptions on mechanisms and processes expected to generate the final results. At the post-completion phase, and with the benefit of hindsight, it will be clearer to the evaluators which of these assumptions have proved to be realistic, and which did not hold up during implementation and why.
6. For example, the PPA of a project with a major agricultural marketing component may consider whether the project framework incorporated key information on the value chain. Did it investigate issues relating to input and output markets (distance, information, monopolistic power)? Did it make realistic assumptions on post-harvest conservation and losses? In such cases, staff responsible for the PPA will not be expected to conduct extensive market analyses, but might consider the different steps (e.g. production, processing, transportation, distribution, retail) involved and conduct interviews with selected actors along the value chain.
7. An assessment of effectiveness, the extent to which a project's overall objectives have been achieved, should be preferably made at project completion, when the components are expected to have been executed and all resources fully utilized. The PPA considers the overall objectives⁵ set out in the final project design document and as modified during implementation. At the same time, it should be flexible enough to capture good performance or under-performance in areas that were not defined as an objective in the initial design but emerged during the course of implementation.
8. The PPA mission may interview farmers regarding an extension component, the objective of which was to diffuse a certain agricultural practice (say, adoption of a soil nutrient conservation technique). The purpose here would be to understand whether the farmers found it useful, to what extent they applied it and their perception of the results obtained. The PPA may look into reasons for the farmers' interest in new techniques, and into adoption rates. For example, was the extension message delivered through lectures? Did extension agents use audio-visual tools? Did extension agents engage farmers in interactive and participatory modules? These type of questions help illustrate *why* certain initiatives have been conducive (or not conducive) to obtaining the desired results.
9. The Evaluation Manual suggests methods for assessing efficiency, such as calculating the economic internal rate of return (EIRR),⁶ estimating unit costs and comparing them with standards (cost-effectiveness approach), or addressing managerial aspects of efficiency (timely delivery of activities, respect of budget provisions). The documentation used in preparing the PCRV should normally provide sufficient evidence of delays and cost overruns and make it possible to explain why they happened.
10. As far as rural poverty impact is concerned, the following domains are contemplated in the Evaluation Manual: (a) household income and assets; (b) human and social capital and empowerment; (c) food security and agricultural

⁵ Overall objectives will be considered as a reference for assessing effectiveness. However, these are not always stated clearly or consistent throughout the documentation. The assessment may be made by component if objectives are defined by components; however the evaluation will try to establish a correspondence between the overall objectives and outputs.

⁶ Calculating an EIRR may be challenging for a PPA as it is time consuming and the required high quality data are often not available. The PPA may help verify whether some of the crucial assumptions for EIRR calculation are consistent with field observations. The mission may also help shed light on the cost-effectiveness aspects of efficiency, for example whether, in an irrigation project, a simple upgrade of traditional seasonal flood water canalization systems might have been an option, rather than investing on a complex irrigation system, when access to markets is seriously constrained.

productivity; (d) natural resources, the environment and climate change;⁷ and (e) institutions and policies. As shown in past evaluations, IFAD-funded projects generally collect very little data on household or community-level impact indicators. Even when impact data are available, both their quality and the methodological rigour of impact assessments are still questionable. For example, although data report significant increases in household assets, these may be due to exogenous factors (e.g. falling prices of certain commodities; a general economic upturn; households receiving remittances), and not to the project.

11. PPAs may help address the "attribution issue" (i.e. establishing to what extent certain results are due to a development intervention rather than to exogenous factors) by:
 - (i) following the logical chain of the project, identifying key hypotheses and reassessing the plausibility chain; and
 - (ii) conducting interviews with non-beneficiaries sharing key characteristics (e.g. socio-economic status, livelihood, farming system), which would give the mission an idea of what would have happened without the project (counterfactual).⁸
12. When sufficient resources are available, simple data collection exercises (mini-surveys) may be conducted by a local consultant prior to the PPA mission.⁹ Another non-mutually exclusive option is to spot-check typical data ranges or patterns described in the PCR by means of case studies (e.g. do PCR claims regarding increases in average food-secure months fall within the typical ranges recorded in the field?). It is to be noted that, while data collected by a PPA mission may not be representative in a statistical sense, such data often provide useful reference points and insights. It is important to exercise care in selecting sites for interviews in order to avoid blatant cases of non-beneficiaries profiting from the project.). Sites for field visits are selected by IOE in consultation with the government concerned. Government staff may also accompany the PPA mission on these visits.
13. The typical timing of the PPA (1-2 years after project closure) may be useful for identifying factors that enhance or threaten the sustainability of benefits. By that stage, the project management unit may have been disbanded and some of the support activities (technical, financial, organizational) terminated, unless a second phase is going forward or other funding has become available. Typical factors of sustainability (political support, availability of budgetary resources for maintenance, technical capacity, commitment, ownership by the beneficiaries, environmental resilience) can be better understood at the ex post stage..
14. The PPA also concentrates on IFAD's role with regard to the promotion of innovations and scaling up. For example, it might be observed that some innovations are easily scaled up at low cost (e.g. simple but improved cattle-rearing practices that can be disseminated with limited funding). In other cases, scaling up may involve risks: consider the case of a high-yield crop variety for which market demand is static. Broad adoption of the variety may be beneficial in terms of ensuring food security, but may also depress market prices and thereby reduce sale revenues for many households unless there are other, complementary activities for the processing of raw products.
15. The PPA addresses gender equality and women's empowerment, a criterion recently introduced into IFAD's evaluation methodology. This relates to the emphasis placed on gender issues: whether it has been followed up during

⁷ Climate change criterion will be addressed if and when pertinent in the context of the project, as most completed projects evaluated did not integrate this issue into the project design.

⁸ See also the discussion of attribution issues in the section on PCRVs.

⁹ If the PPA is conducted in the context of a country programme evaluation, then the PPA can piggy-back on the CPE and dedicate more resources to primary data collection.

implementation, including the monitoring of gender-related indicators; and the results achieved.

16. Information from the PCRV may be often sufficient to assess the performance of partners, namely, IFAD and the government. The PPA mission may provide further insights, such as on IFAD's responsiveness, if relevant, to implementation issues or problems of coordination among the project implementation unit and local and central governments. The PPA does not assess the performance of cooperating institutions, which now has little or no learning value for IFAD.
17. Having completed the analysis, the PPA provides its own ratings in accordance with the evaluation criteria and compares them with PMD's ratings. PPA ratings are final for evaluation reporting purposes. The PPA also rates the quality of the PCR document.
18. The PPA formulates short conclusions: a storyline of the main findings. Thereafter, a few key recommendations are presented with a view to following up projects, or other interventions with a similar focus or components in different areas of the country.¹⁰

¹⁰ Practices differ among multilateral development banks, including recommendations in PPAs. At the World Bank, there are no recommendations but "lessons learned" are presented in a typical PPA. On the other hand, PPAs prepared by Asian Development Bank include "issues and lessons" as well as "follow-up actions" although the latter tend to take the form of either generic technical guidelines for a future (hypothetical) intervention in the same sector or for an ongoing follow-up project (at Asian Development Bank, PPAs are undertaken at least three years after project closure).

Definition of the evaluation criteria used by IOE

<i>Criteria</i>	<i>Definition^a</i>
Project performance	
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, institutional priorities and partner and donor policies. It also entails an assessment of project design in achieving its objectives.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted into results.
Rural poverty impact^b	Impact is defined as the changes that have occurred or are expected to occur in the lives of the rural poor (whether positive or negative, direct or indirect, intended or unintended) as a result of development interventions.
<ul style="list-style-type: none"> Household income and assets 	Household income provides a means of assessing the flow of economic benefits accruing to an individual or group, whereas assets relate to a stock of accumulated items of economic value.
<ul style="list-style-type: none"> Human and social capital and empowerment 	Human and social capital and empowerment include an assessment of the changes that have occurred in the empowerment of individuals, the quality of grassroots organizations and institutions, and the poor's individual and collective capacity.
<ul style="list-style-type: none"> Food security and agricultural productivity 	Changes in food security relate to availability, access to food and stability of access, whereas changes in agricultural productivity are measured in terms of yields.
<ul style="list-style-type: none"> Natural resources, the environment and climate change 	The focus on natural resources and the environment involves assessing the extent to which a project contributes to changes in the protection, rehabilitation or depletion of natural resources and the environment as well as in mitigating the negative impact of climate change or promoting adaptation measures.
<ul style="list-style-type: none"> Institutions and policies 	The criterion relating to institutions and policies is designed to assess changes in the quality and performance of institutions, policies and the regulatory framework that influence the lives of the poor.
Other performance criteria	
<ul style="list-style-type: none"> Sustainability 	The likely continuation of net benefits from a development intervention beyond the phase of external funding support. It also includes an assessment of the likelihood that actual and anticipated results will be resilient to risks beyond the project's life.
<ul style="list-style-type: none"> Innovation and scaling up 	The extent to which IFAD development interventions have: (i) introduced innovative approaches to rural poverty reduction; and (ii) the extent to which these interventions have been (or are likely to be) replicated and scaled up by government authorities, donor organizations, the private sector and others agencies.
<ul style="list-style-type: none"> Gender equality and women's empowerment 	The criterion assesses the efforts made to promote gender equality and women's empowerment in the design, implementation, supervision and implementation support, and evaluation of IFAD-assisted projects.
Overall project achievement	This provides an overarching assessment of the project, drawing upon the analysis made under the various evaluation criteria cited above.
Performance of partners	This criterion assesses the contribution of partners to project design, execution, monitoring and reporting, supervision and implementation support, and evaluation. It also assesses the performance of individual partners against their expected role and responsibilities in the project life cycle.
<ul style="list-style-type: none"> IFAD Government 	

^a These definitions have been taken from the OECD/DAC *Glossary of Key Terms in Evaluation and Results-Based Management* and from the IFAD Evaluation Manual (2009).

^b The IFAD Evaluation Manual also deals with the "lack of intervention", that is, no specific intervention may have been foreseen or intended with respect to one or more of the five impact domains. In spite of this, if positive or negative changes are detected and can be attributed in whole or in part to the project, a rating should be assigned to the particular impact domain. On the other hand, if no changes are detected and no intervention was foreseen or intended, then no rating (or the mention "not applicable") is assigned.

List of key persons met

A. In Khartoum (24-25 November 2013, 5 December 2013)

Ministry of Agriculture and Irrigation (MOAI)

Mr Abdelrahman Mohamed Salih, Director General, Directorate of International Cooperation and Investments (ICI), MOAI

Mrs Alawia Hassan, Director of Project Coordination Unit, ICI, MOAI

Mrs Asma Ali Elhassan, Agricultural Engineer, Project Coordination Unit, ICI, MOAI

Mr Khairi Elzubair, Agricultural Engineer, Project Coordination Unit, ICI, MOAI

Ministry of Livestock and Fisheries (MOLF)

Dr Ahmed Mohamed, Undersecretary, MOLF

Mr Gehad Sayed, Director of Planning Department, MOLF

Eastern Sudan Reconstruction Development Fund (ESRDP)

Mr Mohamed Ahmed Eltahir, Financial Manager, ESRDP

Mr Elamin Tahir Elamin, Deputy Director, ESRDP

Mr Sadig Abdelmarouf, Donors Coordinator, ESRDP

Gash Agricultural Scheme

Mr Kamal Ali A/Gadir, General Manager

Agricultural Bank of Sudan

Mr Mohamed Hussein Adam, ABSUMI Manager, ABS

Mr Muhasin Giha, ABSUMI Asst. Manager, ABSUMI, ABS

IFAD

Mr Hani Elsadani, Country Director

Mr Ahmed Gaber Sobahi, Country Programme Officer

Former GSLRP Project Coordination Unit staff

Mr Abdu Abbas Elrafeig, previous Project Coordinator

Mrs Aisha Adam Sidee, previous Community Development Officer

Central Coordination Unit for IFAD-Projects

Mr Mohamed Elhag Sirelkhatim, Senior Coordinator, Central Coordination Unit

IFAD consultant

Dr Sayed Ali Zaki, Executive Director, Mamoun Behairi Center for Social Economic in Africa (Ex-Consultant, IFAD)

B. In Kassala (27 November – 3 December 2013)

State Ministry of Agriculture, Fisheries, Irrigation and Livestock (MOAFIL)

H.E. Magzoub Abu Musa, Minister of Agriculture, Kassala State

Mr Ali Mohamed Ali, Director General, MOAFIL

Mr Abdelhafeez Osman, Registrar of Associations, MOAFIL

Dr Imithal Taha, Director, Animal Resources

Mr Abdelfatah Khairseed, MOFNE

Mr Ali Eisa Hussein, Director, Range and Pasture Department

Mrs Asha Mohamed Dean, Director, Land Use Department

Mr Elgaali Ibrahim, Director, TT&AE Department

Dr Anwar Mohamed Osman, Director, Planning Department

Mr Awad Mohamed Elhassan, Manager, Minister of Agriculture Office

Gash River Training Unit (GRTU), Ministry of Water Resources and Dams

Mr Saied Magzoub Saied, GRTU Engineer, Ministry of Water Resources and Dams
Mr Eltayeb Mohamed Yousif, Executive Manager, GRTU

Gash Agricultural Scheme (GAS)

Mr Mohamed Ali Mohamed, Field Director, GAS
Mr Abdalla Ibrahim Abdalla, Accountant, GAS
Mr Mohamed Abdalla Ahmed, GAS
Mr Osman Ohag Osman, Finance Controller, GAS
Mr Mahgoub Ahmed Hamid, Workshops Director, GAS
Mr Mohamed Tahir Osman, Asst. Field Manager, GAS
Dr Zeinab Abdalla, M&E GAS
Mr Zakaria Abdelrasheed, Accountant, GAS
Mr Abdelgadir Idris Mohamed, Finance Inspector, GAS
Mr Salih Mohamed Salih, Manager ABS, Aroma Branch

Water Users' Association members (at Apex Organization office in Aroma)

Mr Ahmed Bakheit Abakaray, Executive Manager, Higher council for WUA
Mr Mohamed Eisa Adam, Coordinator of WUA, GAS
Mr Mohamed Hamid Mohamed, WUA, member Tindelai
Mr Mohamed Karar Mohamed Tahir, WUA, member Degain
Mr Ali Mohamed Ohag, WUA, President, Degain
Mr Mohamed Ahmed M Sharief, WUA, Treasurer, Degain
Mr Saidna Gaakar, WUA member, Degain
Mr Abdelgadir M Tukur, WUA, member Degain
Mr Mohamed Mahmoud A/Gadir, WUA, member Degain
Mr Ali Adam Ahmed Idris, WUA, member, Makali
Mr Abdelgadir Mohamed Ohag, WUA, member, Makali
Mr Mohamed Mahmoud, WUA, member Makali
Mr Onour Adam, WUA, member, Makali
Mr Ahmed Elnour, WUA, member, Matataib
Mr Mohamed Karar Mohamed, WUA, member Degain
Mr Idris Abu Asha Mohamed, WUA, member Degain
Mr Abu Zeinab Karar Mohamed, WUA, member Degain
Mr Mahgoub Maragan, WUA, member Degain
Mr Mohamed Tahir Osman, WUA, member Degain
Mr Ahmed Ali Ahmed, WUA, member Degain

Degain Block

Mr. Ahmed Abu Tahir, Block Inspector

Water Users' Association, Metataib Block

Mr Ahmed Faragay, member
Mr Hussein Ahmed Onour, member
Mr Mohamed Mahmoud Abu Tahir, member
Mr Abdelbasit Yassin, member
Mr Abdelgadir Ahmed Mohamed, member
Mr Ahmed Karar, member
Mr Mahmoud Musa, member
Mr Mohamed Dien, member
Mr Onour Mohamed, member
Mr Mohamed Eissa, WUA Coordinator

Tendelai Block

Mr Adam Hag Yousif, Block Inspector
Mr Mohamed Osman,

Water Users' Association, Tendelai Block

Mr Mohamed Hassan, Block WUA, member
Mr Said Adrop, WUA, member
Mr Idris Shimlay WUA, member,
Mr Onour Abu Idris, WUA, member
Mr Ali Birag, member, WUA, member
Mr Mohamed Ali, member, WUA, member
Mr Mohamed Sidna, member, WUA, member

Kassala Block

Mr Mohamed Ahmed Abdalah, Block Inspector, GAS
Mr Eltayeb Ibrahim Eltayeb
Mr Adam Obaid Kabashi

Water Users' Association, Kassala Block

Mr Omer Mohamed Adam, WUA, member
Mr Ali Abu Mohamed Salih, WUA, member
Mr AbuAsha Ibrahim, WUA, member
Mr Karar Saidna Mohamed, WUA, member
Mr Shorani Ibrahim, WUA, member
Mr Mustafa Mahgoub, farmer
Mr Mohamed Makawi Mohamed, farmer

Veterinary Hospital in Kassala

Mr Gailani Mohamed Tahir, AH Technician

Makali Block

Mr Mohamed Abdelgadir Shenai, Block Inspector
Mr Ibrahim Mahil Babiker, Asst. Inspector
Mr Hamza Ibrahim, Accountant
Mr Musa Mohamed Musa, Accountant

Water Users' Association, Makali Block

Mr Saidna Abdalla Ahmed Omer, WUA, member
Mr Ahmed Osheikh Abdalla, WUA, member
Mr Idris Ahmed Mohamed Elhassan, WUA, member
Mr Hassan Abdelrahim, WUA, member
Mr Badereldin Mohamed Sheraif, WUA, member
Mr Eltahir Abdelrahman Banaga, WUA, member
Mr Mohamed Tahir Barokin, WUA, member
Mr Onour Adam, WUA, member
Mr Ahmed Mahmoud Musa, WUA, member
Mr Mohamed Abdalla Ahmed Omer, WUA, member

Community Development Committee- Makali

Mr Hassan Abdelrahim, CDC, member
Mr Eltahir Abdelrahman Banaga, CDC, member
Mr Mohamed Tahir Barokin, CDC, member

Community Development Committee- Makali

Mr Sheikh Abdalla, CDC, Vice President

Kassala Drinking Water Corporation (KDWC)

Mr Hashim Mohamed Abdelatif, Director General, KDWC

Women Groups in Aroma

Women Groups in Matataib

Women Groups in Tendelai

Pastoralist group at Gardaieb

FAO/Kassala

Mr Wegdan Abdulrahman, Team Leader, FAO

Mr Salih Orabi, NPC, FAO

Mr Banaga Hago, Field Technical Officer, FAO

JICA-supported Capacity Development Project for the Provision of Services for Basic Human Needs in Kassala

Mr Naoki Koga, Agricultural Development Programme / Water Harvesting

Mr Ippei Itakura, Agriculture Marketing

C. Participants at wrap-up meeting/ Kassala, 3 December 2013

H.E. Magzoub Abu Musa, Minister of Agriculture, Kassala State

Mr Ali Mohamed Ali, Director General, MOAFIL

Mr Abdelhafeez Osman, Registrar of Associations

Mrs Asha Mohamed Deen, Director, Land Use, MOAFIL

Mr Ali Eisa Hussein, Director, Range and Pasture Admin, MOAFIL

Mr Eltayeb Mohamed Yousif, GRTU Executive Manager, MIWR

Mr Hashim Adam, Agricultural Manager, GAS

Mr Mohamed Ali Mohamed, Field Manager, GAS

Mr Abdalla Ibrahim Abdalla, Accountant, GSLRP

Mr Ahmed Bakhiet Abakarai, Executive Manager, Higher Council for Association

Mr Berair Adarop Mustafa, Treasurer, Higher Council for Association

Mr Mahmoud Adam Mohamed, General Secretariat, Higher Council for Association

Mr Awad Mohamed Elhassan, Manager, Office of Minister, SMOAFIL

Mr Khairi Elzubair, Agricultural Engineer, Project Coordination Unit, ICI, MOAI (Federal)

D. Participants at wrap-up meeting in Khartoum 5 December 2013

Mr Abdalla Ibrahim Abdalla, Accountant, GSLRP, Kassala

Mr Abdelhafeez Osman, Registrar of WUAs, Kassala

Mr Kamal Ali A/Gadir, DG, GAS, Kassala

Mr Abdu Abbas Elrafeig, Ex-Coordinator of GSLRP, IFAD

Mrs Alawia Hassan, Director of Project Coordination Unit, ICI, MOAI

Mrs Asma Ali Elhassan, Agricultural Engineer, Project Coordination Unit, ICI, MOAI

Mr Khairi Elzubair, Agricultural Engineer, Project Coordination Unit, ICI, MOAI

Mr Abdelfatah Khairelseed, MOFNE

Mr Eltayeb Mohamed Ibrahim, Director/ International Organization, MOFNE

Mr Mohamed Ahmed Elfadil, Economist, MOFNE

Mr Hani Elsadani, Country Programme Manager, IFAD, Khartoum

Project performance assessment team

Ms Fumiko Nakai, Independent Office of Evaluation, IFAD

Mr Olaf Verheijen, Consultant, Team member

Mr Mahmoud Numan, Consultant, Team Member

Accompanied by:

Mr. Mohamed Elhag Sirelkhatim, Senior Coordinator, Central Coordination Unit for IFAD-financed projects

Mr Khairi Elzubair, Agricultural Engineer, Project Coordination Unit, ICI, MOAI

Mr Abdelfatah Khairelseed, IC, MoFNE

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Project logics: comparison of different basic project documents

<i>Appraisal Report main text</i>	<i>Logframe in Appraisal Report</i>	<i>President's Report</i>	<i>Loan Agreement</i>
<p>Overall goal</p> <p>To regenerate the livelihoods of <u>the maximum number of poor people</u> in and around the Gash delta, compatible with the efficient and sustainable use of its land and water resources and based upon a shared vision of development and stability of the related institutional arrangements</p>	<p>Goal</p> <p>To regenerate the livelihoods of <u>67,000</u> tenant, herder and landless households in the Gash Delta area</p>	<p>Overall goal</p> <p>To regenerate the livelihoods of <u>67,000 poor households</u> in and around the Gash Delta in a manner compatible with the efficient and sustainable use of the land and water resources and based upon a shared vision of development and the stability of the related institutional arrangements</p> <p><i>NB: The logframe attached to the President's Report has the same description as the logframe in the appraisal report.</i></p>	<p>Goal</p> <p>To regenerate the livelihoods of <u>the maximum number of poor people</u> in and around the Gash Delta, compatible with the efficient and sustainable use of its land and water resources and based upon a shared vision of development and stability of the related institutional arrangements</p>
<p>Purpose</p> <p>To ensure an efficient, equitable and sustainable operations of the Gash Agricultural Scheme and its integration into the local economy</p>	<p>Purpose</p> <p>To ensure an efficient, equitable and sustainable operation of the Gash flash irrigation scheme and its integration in the local economy</p>	<p>Purpose</p> <p>To ensure the efficient, equitable and sustainable operation of the Gash Agricultural Scheme and the integration of the scheme into the local economy.</p>	<p>Purpose</p> <p>To ensure an efficient, equitable and sustainable operation of the Gash flash irrigation scheme and its integration in the local economy, through:</p>
<p>Specific outputs</p> <p>(i) the elaboration and maintenance of a shared vision of development;</p> <p>(ii) establishment of the related institutional arrangements appropriate to the shared vision;</p> <p>(iii) rehabilitated water and other social infrastructure and water harvesting devices;</p> <p>(iv) improved crop and livestock husbandry practices;</p> <p>(v) establishment of financial services and a community initiatives fund; and</p> <p>(vi) strengthened state planning capacity</p>	<p>Project outputs</p> <p>(i) Rehabilitated and user/GAS co-managed flsh irrigation infrastructure</p> <p>(ii) Rehabilitated and user managed rangelands</p> <p>(iii) Improved crops, mesquite/forestry, and livestock husbandry</p> <p>(iv) Improved access of non-tenant households to productive and social assets</p> <p>(v) Improved access of local communities to safe and reliable domestic water supply</p> <p>(vi) Improved outreach of rural financial services to small tenants, small herders, non-tenant households and women</p> <p>(vii) Vision for the development of the Gash Delta elaborated in a collective and collaborative manner</p> <p>(viii) Institutional arrangements appropriate to the realisation of the shared vision are established and enforceable by law</p>	<p>Specific objectives</p> <p>(i) the elaboration and maintenance of a shared vision of development;</p> <p>(ii) the establishment of the related institutional arrangements appropriate to the shared vision;</p> <p>(iii) rehabilitated water and other social infrastructure and water harvesting devices;</p> <p>(iv) improved crop and livestock husbandry practices;</p> <p>(v) establishment of financial services; and</p> <p>(vi) strengthened state planning capacity,</p>	<p>(i) the elaboration and maintenance of a shared vision of development in respect of an equitable, secure, transparent access to economically viable land and water rights;</p> <p>(ii) establishment of the related institutional arrangements appropriate to the shared vision;</p> <p>(iii) rehabilitated water and other social infrastructure and water harvesting devices;</p> <p>(iv) improved crop and livestock husbandry practices;</p> <p>(v) access of the tenants and non-tenants to formal financial services; and</p> <p>(vi) strengthened state planning capacity.</p>

Changes in IFAD loan allocation by category

<i>Loan allocation and reallocation of funds in SDR</i>					
Loan category	Original allocation	Reallocation 1	Reallocation 2	Variation form original	
				+/-	%
1. Civil works					
a. Buildings, earth works and structures	2 320 000	2 320 000	3 250 000	930 000	40%
b. Works other than buildings	2 170, 00	2 170 000	3 800 000	1 630 000	75%
c. River control	1 670 000	82 000	82 000	-1 588 000	-95%
2. Vehicles and equipment	2 470 000	5 128 000	4 750 000	2 280 000	92%
3. Technical assistance, training and studies	2 030 000	2 030 000	2 030 000	-	-
4. Credit line					
a. Produce marketing and livestock acquisition	680 000	680 000	-	-680 000	-100%
b. Long term credit	1 050 000	1 050 000	-	-1 050 000	-100%
5. Community Development Fund					
a. Rewards	240 000	240 000	50 000	-190 000	-79%
b. Initiatives	260 000	260 000	210 000	-50 000	-19%
6. Incremental operating costs					
a. Salaries	490 000	490 000	550 000	60 000	12%
b. Allowances	370 000	370 000	550 000	180 000	49%
c. Operation and maintenance	1 030 000	1 030 000	1 600 000	570 000	55%
7. Unallocated	2 670 000	1 600 000	578 000	-2 092 000	-78%
Total	17 450 000	17 450 000	17 450 000	-	-

Up to end of September 2012.
Source: PCR

Reallocation 1: 2007

Reallocation 2: 2009

Gash spate irrigation scheme

Water source

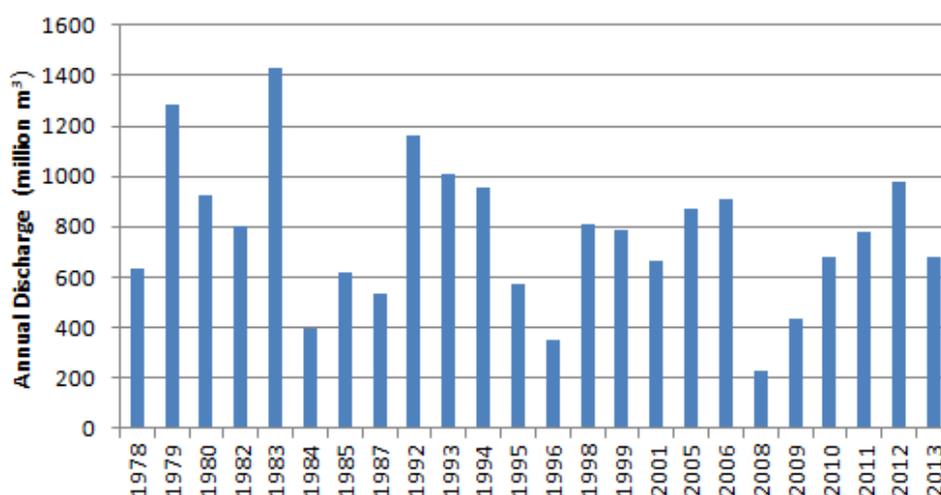
1. The Gash river¹ rises in the Ethiopian-Eritrean highlands some 24 km south of Asmara at an altitude of more than 2,000 meters above sea level. The size of the catchment area is about 21 000 km³. Initially, the Gash river flows through a relatively narrow valley until it reaches Haykota, where it gradually widens into the Tesseney-Omhajer plain. From the border down to the Gash Die Delta, the length of the river is 121 km. The Gash river flows intermittently for 3 months from late June until the end of September with the most significant floods occurring from July to September. The Gash river is known for its uncontrollable intense floods as it responds rapidly to storm rainfall in the catchment area. Large floods always caused much damage but it seems that the frequency has increased sharply since 1983, including the 2003 flood resulting in 91 casualties and US\$168 million loss in property.

Annual discharge

2. The minimum recorded discharge was 140 million m³ in 1921, whereas a maximum discharge of 1,430 million m³ was measured in 1983. The average annual discharge near the Eritrean border has been computed at 1,000 million m³, but it is reduced to around 680 million m³ when it reaches Kassala bridge due to percolation of some 320 million m³ recharging the aquifers upstream of Kassala town. The average annual discharge of the Gash river recorded at Kassala bridge is around 680 million m³, but it varies considerably between years, which is shown in figure 1.

Figure 1

Annual discharge of Gash river measured at Kassala bridge



Note: No data available for 1981, 1986, 1988-1991, 1997, 2000, 2002-2004 and 2007

Source: AR 2003, GRTU

3. Historically, floods were continuous over the three-month period once the flow had started. Due to climate change and increasing water abstractions in Eritrea, however, the patterns of floods in the Gash river have changed over the last 15 years. As a result, the floods in the Gash river are no longer continuous throughout the entire flood season.

Sediment

4. Another characteristic of the Gash river is the transport of considerable amounts of sediment. It is estimated that about 5.5 million tons of sediment passes the Kassala Bridge annually. As soon as the Gash river crosses the border, its slope

¹ Known as Mareb river in Eritrea.

reduces significantly and the sediment is deposited in the riverbed and the lower Gash Die Delta. The result is not only a gradual increase of the riverbed level (e.g. 1.61 metre at Kassala bridge between 1949 and 2008) but also the development of an increasingly unstable and meandering river that regularly changes its direction.

Multiple use of floodwater

5. About 30 to 40 per cent of the average annual discharge of 680 million m³ (e.g. 204 to 272 million m³) is diverted to the Gash spate irrigation scheme. Before dissipating in the terminal fan some 100 km north of Kassala town, floodwater also provides moisture for pasture and seasonal wetlands crop production as well as natural forest close to Iggir, Saboon and Oleib. Floodwater also recharges the aquifers in the Gash basin and the depth of the upper (shallow) aquifers ranges between 6 and 30 metres. During the construction of the Gash Irrigation Scheme in the 1920s, a groundwater recharge basin with a total size of 5,000 feddan was built along the Tograr main canal in Kassala block to ensure that sufficient drinking water would be available.
6. Along the river in the Kassala area and on the flood plain, these aquifers are being exploited by pumping groundwater from shallow wells for horticulture and human consumption. Just north of Kassala town along the Gash river, an area of about 20,000 feddan is used for the cultivation of vegetables (e.g. onions, tomatoes, okra, watermelon, honeydew melon and eggplant) and fruit crops (e.g. mango, banana, grapes and citrus).



Groundwater-irrigated field with onion (left) and orchard (right) © IFAD/Olaf Verheijen

7. In the project area, *hafirs* (earthen tank) and *hods* (groundwater recharge reservoirs) are used for water storage and they are recharged from either outflow from irrigation canals where they are adjacent to the Gash spate irrigation scheme or from rainfall runoff. Because of the high potential evapo-transpiration and seepage, they only hold water for a limited period in the dry season.



Hafir close to Aroma town (left) and open well in *hod* (right) © IFAD/Olaf Verheijen

8. It is important to take into account that flows in the Gash river in excess of the (current) irrigation needs of the Gash spate irrigation scheme (39 per cent of total annual flood volume) are crucial for the recharge of the (shallow) aquifers (28 per cent) and supplying water to grazing lands and natural forests in the Gash Die area (33 per cent). The aforementioned changes in the flow pattern over the last 15 years will have a significant impact on the amount of annually irrigated land and the level of groundwater recharge against increasing water demands for irrigated horticulture and domestic use in Kassala city and main towns in the Gash Delta.

Gash spate irrigation system

9. The Gash spate irrigation scheme was developed in 1924 by the British colonial government to settle the nomadic population into the cash economy and to facilitate the commercial production of cotton for the textile industry. Together with the Tokar scheme, the Gash Irrigation Scheme marked the beginning towards commercialisation of land use and modernisation of the economy in East Sudan. The Gash spate irrigation scheme is based on the capture of the annual ephemeral floods that occur in the Gash river over an effective period of 60 to 70 days from July to September.

Irrigation blocks

10. Through seven off-take structures, spate water is diverted to the command area, which is subdivided into six irrigation blocks. The location of the seven off-take structures and layout of the main canal systems is shown on a map in appendix 1 to this annex. The salient features of the six irrigation blocks are presented in table 1.

Table 1
Salient features of irrigation blocks

<i>Name of irrigation block</i>	<i>Name of off-take structure</i>	<i>Number of Masga</i>	<i>Number of Masga intakes</i>	<i>Command area (feddan)</i>
Kassala	Fota & Salam Aleikum	27	27	46 630
Mekali	Mekali (Dar el Mac)	48	49	37 200
Degain	Degain (Magawda)	36	51	51 200
Tendelai	Tendelai (Aashera Mawasir)	38	39	49 800
Metateib	Metateib (Umbarasei)	36	38	42 300
Hadaliya	Hadaliya	28	29	70 230
Total		213	233	297 360

Source: MetaMeta PowerPoint presentation (2005) and Anderson (2011)

11. The total net irrigable area equipped with irrigation distribution network (e.g. canals) is estimated at 240,000 feddan (100,800 ha). Under the original scheme design, land was cultivated every three years, so that 80,000 feddan out of the total area of 240,000 feddan were farmed annually. The total command area and annually irrigated area per irrigation block together with the design discharge are shown in table 2.

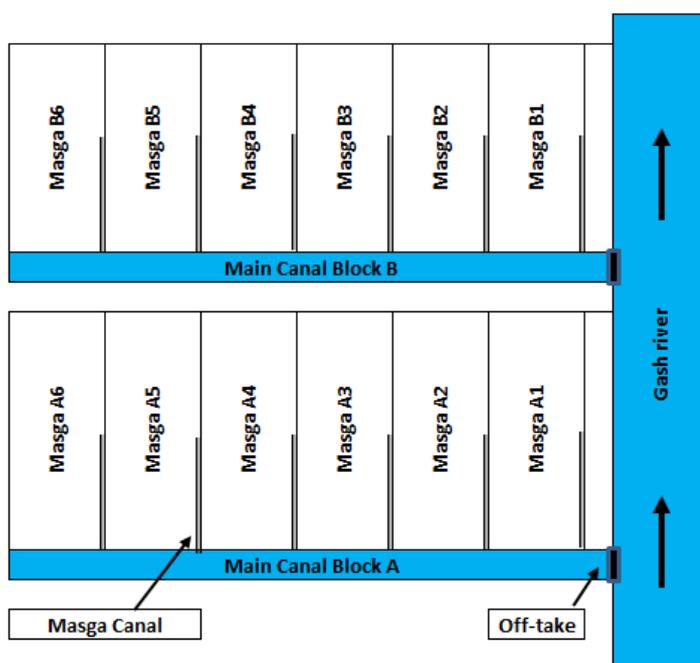
Table 2
Net command area and annual rotation area

<i>Irrigation block</i>	<i>Design discharge (m³/s)</i>	<i>Command area (feddan)</i>	<i>Rotation area (feddan)</i>
Kassala	20	33 000	11 000
Mekali	15	42 000	14 000
Degain	15	33 000	11 000
Tendelai	20	48 000	16 000
Metateib	20	42 000	14 000
Hadaliya	15	42 000	14 000
Total	105	240 000	80 000

Source: AR 2003.

Layout

12. The main components of the Gash spate irrigation scheme include (i) river off-take structure; (ii) main canal system; and (iii) *masga*. A simplified scheme layout is shown below:

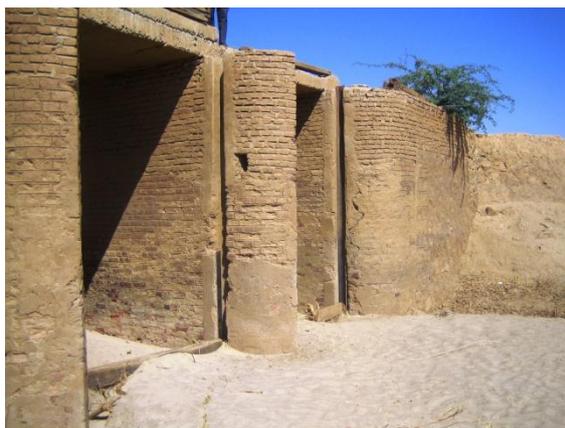


River off-take structures

13. Floodwater is diverted in the main canal systems by river off-take structures located on the left bank (Western side) of the Gash river. The location of the seven off-take structures can be found on a map in appendix 1. Although these off-take structures were designed to divert a maximum of 10 to 20 m³/s, it is reported that the discharge of Degain off-take structure is nearly 60 m³/sec at full capacity. The off-take structure is a strong (masonry) structure consisting of brick abutments and piers on a reinforced concrete slab with 2 to 8 openings that are 2.5 metres in width and 3 to 5 metres in height. These openings can be closed by using wooden stop-blocks or drop-logs, which are dropped into grooves in the brick work.



Degain off-take structure with drop-logs (left) and Salam Aleikum off-take (right) © IFAD/Olaf Verheijen



Drop-logs (left) and grooves for installing drop-logs (right) © IFAD/Olaf Verheijen

Main canal systems

14. A system of main, link and branch canals convey the diverted floodwater through the six irrigation blocks. The length of individual main, link and branch canals varies from 1.15 km (Fota main canal) to 33.3 km (Degain main canal) and 34.0 km (Metateib main canal). The total length of all main, link and branch canals together is 330.54 km.



Main canal in Degain block (left) and Tendelai main canal (right) © IFAD/Olaf Verheijen

15. Cross-regulators have been constructed along the main, link and branch canals to ensure that all *masgas* receive the full designed amount of floodwater.



Cross-regulators along main canal in Kassala Block © IFAD/Olaf Verheijen

Masgas

16. The main, link and branch canals supply floodwater to *masgas*, which are large tracts of farmland surrounded by earthen bunds. As the *masgas* usually are 1 km wide and 5 to 10 km long, their size varies from 1,000 to 2,000 feddan. To facilitate the supply of flood water to the *masgas*, masonry intake structures have been installed along the length of the main canal system. Wooden stop-blocks are used to regulate the amount of floodwater that is diverted into the *masga*.



Masga intake structures in Degain block (left) and Kassala block (right) © IFAD/Olaf Verheijen

17. *Masga* canals have been constructed to facilitate the conveyance of diverted floodwater inside the *masga*. The length of most *masga* canals is not more than 50% of the total length of the *masga*.



Masga canals in Kassala block (left) and Degain block (right) © IFAD/Olaf Verheijen

Water distribution

Gash river

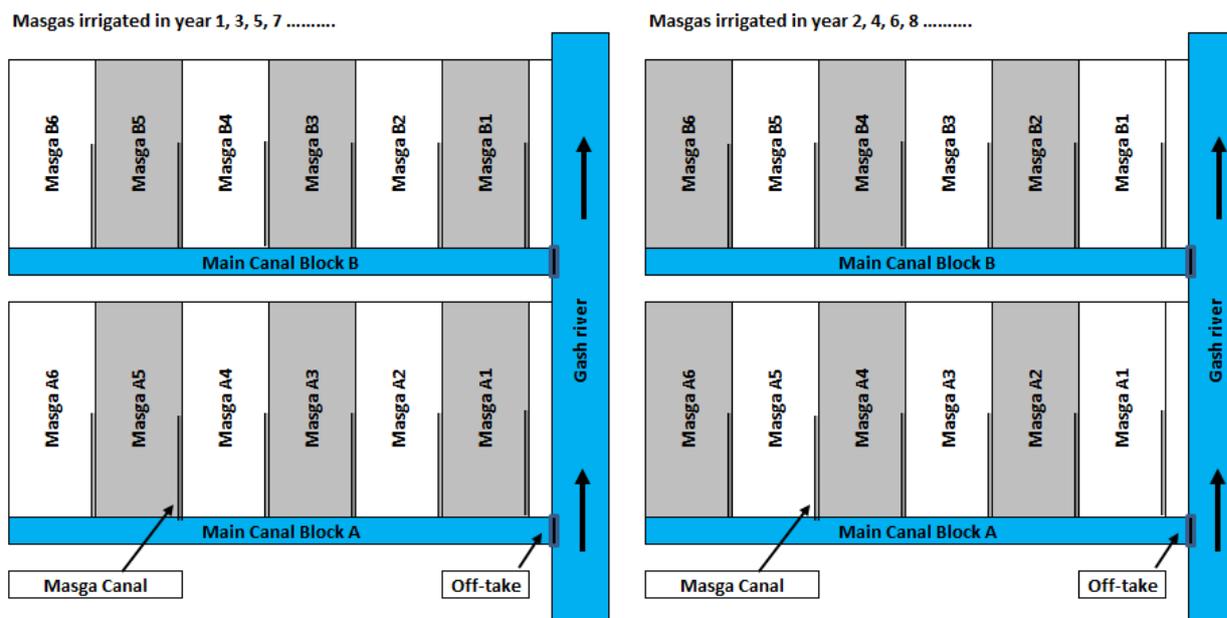
18. According to *Hadendowa* water governance rules in place since 1840, the first flood in the Gash river would be directed to the tail reach of the Gash Irrigation Scheme to stock drinking water for livestock in hafirs and grow grass that would keep the cattle away from the crops. The GRTU General Manager confirmed that the first flood is exclusively used for filling the *hafirs* and watering the rangelands for seven days and that no farmer is allowed to divert any water from the main canals to his field. In years with less than normal floods, the filling of the *hafirs* and groundwater recharge have the highest priority and irrigation would not be allowed or to a limited extent. However, these operational rules are not applied any more as no institution takes the responsibility to stop farmers from irrigating their fields.
19. Reportedly, no specific operational rules exist for the distribution of flood water in the Gash river between the seven off-take structures.

Main canal

20. In accordance with the two-year rotation, half of all *masgas* are irrigated each year. As the Gash river has more floodwater during the first half of the flood season, the *masgas* due to be irrigated are divided into two groups. About 70 per cent of the *masgas* to be irrigated in a given season are irrigated in the first half of the flood season (first irrigation), which starts in July and continues to the beginning or the middle of August depending upon the flood stage. The remaining 30 per cent of *masgas* to be irrigated in a given season are irrigated during the second half of the flood season starting from mid-August until mid-September (second irrigation), which is considered less reliable. Based on a two-year rotation, the cycle of a *masga* is as follows:

<i>Year</i>	<i>Masga cycle</i>
1	First irrigation
2	Fallow
3	Second irrigation
4	Fallow
5	First irrigation

21. The two-year rotation for the irrigation of all *masgas* is also illustrated in the following schematic:



Masga

22. Within each *masga*, floodwater is distributed from the top to bottom for a period of 25 to 30 days. During this watering period, the upper two-third of the *masga* is first irrigated until it has received sufficient water, whereas the lower one-third of the *masga* is irrigated during the remaining time of the watering period of 25 to 30 days. As the *masga* canals do not reach further than halfway the *masgas*, the middle part of the *masgas* is over-irrigated as floodwater has to flow over this part of the *masga* to reach the lower reach. To ensure that water is spread equally within the *masga*, including the higher spots, small guide bunds are constructed within the *masga*.
23. As the land in the Gash spate irrigation scheme slopes at 38 to 41 cm per km, control over water is difficult. Therefore, water distribution within the *masga* is conducted by specialized teams of *Farasheen* that guide the flood water closely following the *masga* contour. Each team is headed by a *Sheikh El Masga*, who accumulated over time considerable experience in field water management. The *Sheikh El Masga* is still employed by GAS, but the *Farasheen* are paid for the services rendered by the Masga WUAs either in cash (e.g. SDG 10 per day or SDG 5 per feddan) and/or in kind (e.g. 2 feddan of farmland).
24. Crop cultivation usually starts about one week after irrigation when tractors can enter the *masgas*.

Cropping patterns

25. Under the original farming system, each tenant grew a regulated amount of cotton (10 feddan) as a cash crop and an area of sorghum (1 feddan) for food self-sufficiency. The water requirement of one feddan of cotton is 5,200 m³ and that of sorghum is 3,200 m³ and the irrigation system and capacity was designed accordingly.
26. When the cotton prices fell during the late 1960s, the cultivation of castor (oilseed) was introduced, but it lost popularity during the first half of the 1980s. Since mid-1980s, the farming system has relied on sorghum due to the overwhelming need for food crops and the tenancy land allocations have been fragmented due to pressures from *Hadendowa* households moving onto the Gash flood plain. Silt

deposits from the flood water have provided sustainable production for some 80 years with no perceivable deterioration in soil fertility.



Field with *Aklamoy* sorghum (left) and *Tabat* sorghum (right) © IFAD/Olaf Verheijen



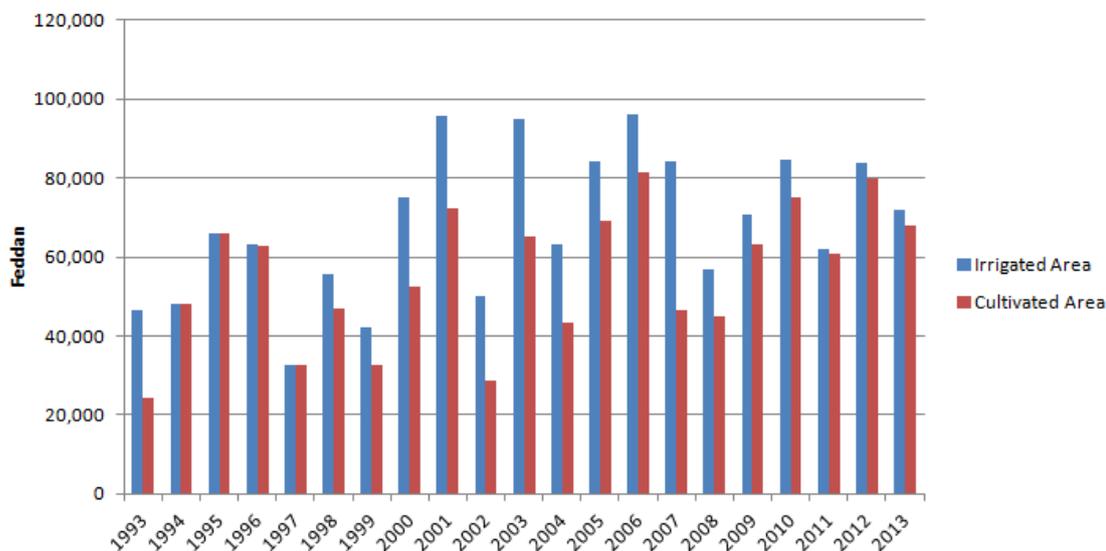
Aklamoy sorghum variety (left) and *Tabat* sorghum variety (right) © IFAD/Olaf Verheijen

Irrigated and cultivated area

27. GAS was originally designed to irrigate 80,000 feddan annually based on a 3-year rotation and crop water requirement of 5,200 m³ per feddan for cotton.² The main aim of the rehabilitation works undertaken under the GSLRP Component 1 was to restore the original design of the main canal system and *masga* canals. The average irrigated area between 1993 and 2003 (i.e. prior to project implementation) was 60,871 feddan, which is equivalent to 76 per cent of the intended irrigated area of 80,000 feddan. Due to execution of irrigation rehabilitation works during Project implementation, the average irrigated area increased by 25% to 75,815 feddan (95 per cent of designed irrigated area).
28. Between 1993 and 2003, the average cultivated area was 48,370 feddan, which is 79 per cent of the average irrigated area. During the Project implementation period (2004 to 2013), the average cultivated area increased by 31% to 63,229 feddan, which is 83 per cent of the average irrigated period during that period. Both the reported irrigated and cultivated areas between 1993 and 2013 are shown in figure 2.

² A larger area could be irrigated if the crop water requirement of 3,500 m³ per feddan for sorghum would be supplied by reducing the watering period accordingly. However, it is very difficult if not impossible to assess exactly how much water is actually supplied to farmland and farmers may prefer to spread more than less water on their fields.

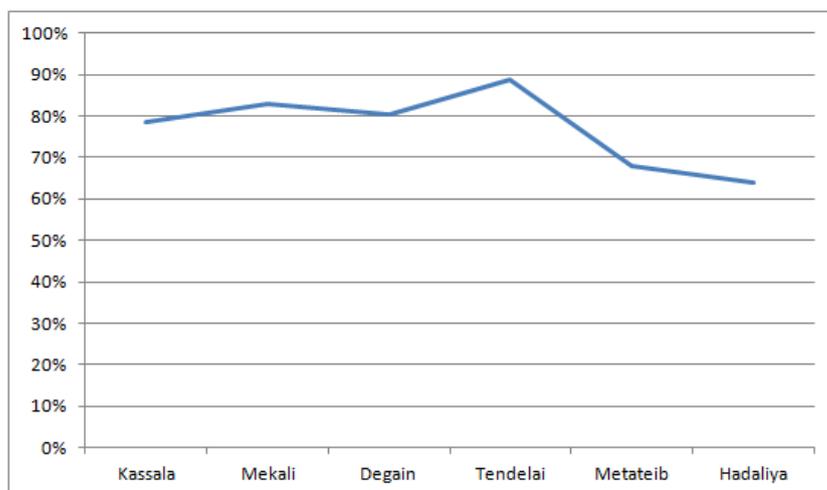
Figure 2
Irrigated and cultivated areas in Gash spate irrigation scheme



Source: Pre-PCR 2011, GAS.

29. On average, about 80% of the actually irrigated area was cultivated, although it varied from as low as 53% in 1993 to as high as 98% in 2011. The main reasons for not cultivating about 20% of the irrigated area are (i) insufficient irrigation of the land, partly due to lack of proper land levelling; and (ii) mesquite infestation of farmland. Between 2004 and 2010, the average irrigated/cultivated ratio for the first four irrigation blocks ranged between 79 and 89 percent, whereas it was only 68 and 64 per cent for Metateib and Hadaliya blocks, which did not (fully) benefited from irrigation rehabilitation works (see figure 3).

Figure 3
Average irrigated/cultivated ratio for irrigation blocks (2004 - 2010)



Source: Anderson 2011.

Scheme management

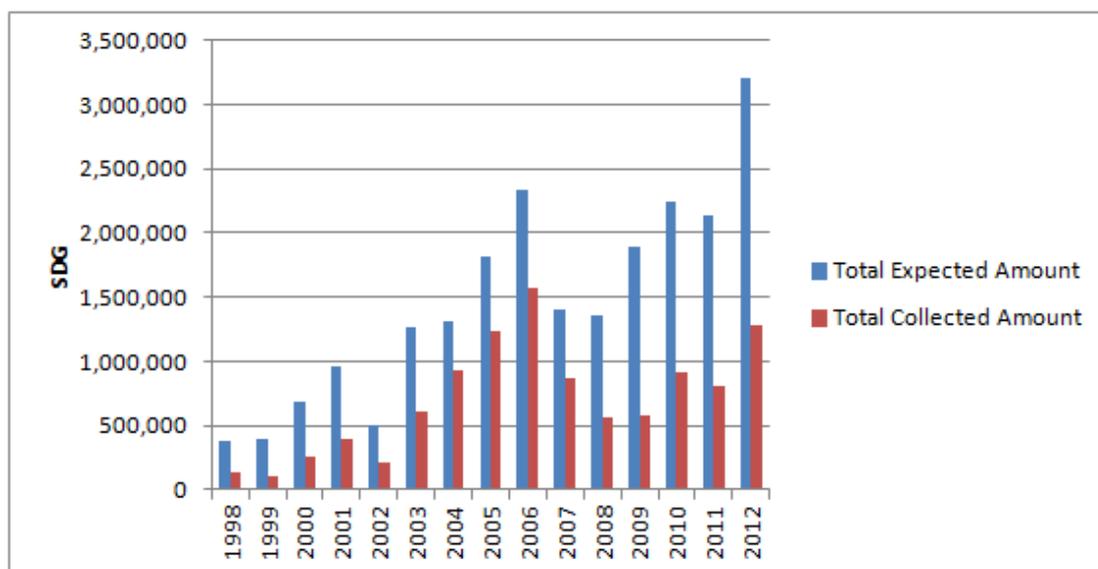
30. Until the independence of The Sudan, the Gash spate irrigation scheme was managed by a private company named Kassala Cotton Company, which also played a primary role in the development of the Gezira Scheme. After independence, the scheme was transformed into a public entity until 1980 when it was replaced by a public corporation. In 1993, this corporation was dissolved and its responsibilities

were divided between the Gash Development Authority (GDA), under the auspices of the Federal Minister of Irrigation and Water Resources, and the State Ministry of Agriculture, Irrigation and Animal Wealth. In 2002, the Government decided to return the responsibility for scheme management responsibility to the federal administration of MOIWR by decree following a successful lobby of the Farmers, who had organized themselves under the "Hadendowa Farmers' Union". In 2004, the GDA was modified and renamed Gash Delta Agricultural Corporation (GDAC), which was subsequently renamed Gash Agricultural Scheme (GAS). In 2003, GOS passed the Public Corporation Act in an attempt to give MOFNE a wide range of controls over corporations, especially with regard to financial and employment issues. Under this Act, each corporation should submit an establishment order to be approved by the Council of Ministers. As the establishment order for GAS, which was submitted in 2003, has not been approved by the Council of Ministers, GAS does not have a legal status and it operates in accordance with known civil service regulations and ad-hoc decisions taken by concerned government authorities as deemed necessary. In 2006, a new draft GAS Charter providing for the transfer of O&M responsibilities to WUAs, including the roles and responsibilities of WUAs at *masga* and block level regarding O&M, water fee collection and delivery of rural finance, was elaborated, but it has not been approved by the Council of Ministers until today.

Water fee collection

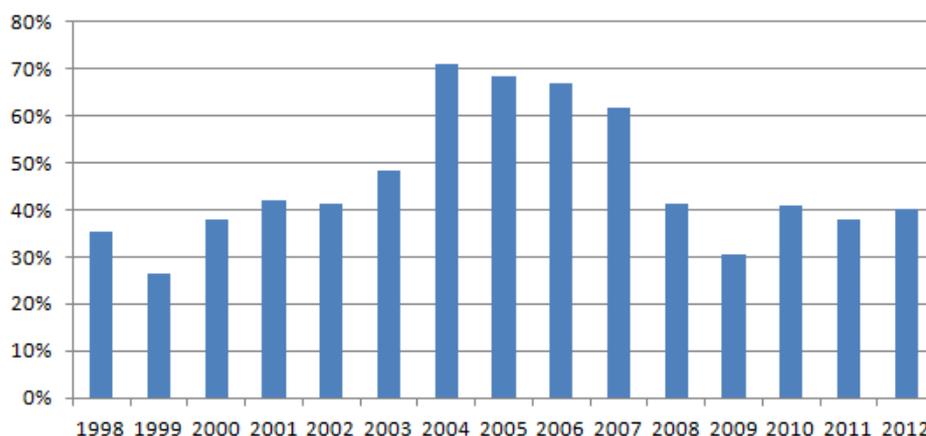
31. As the actually cultivated area is different from year to year, the expected annual revenue from the collection of water fees also varies. The total expected amount of water fees and the actual collected amount of water fees for the period 1998 to 2012 are presented in figure 4 together with the water fee recovery rate in figure 5.

Figure 4
Total expected and actually collected amount of water fees



Source: Egemi 2007, Pre-PCR 2011, GAS.

Figure 5
Water fee recovery rate



Source: Egemi 2007, Pre-PCR 2011, GAS.

32. At the start of the project, the water fee collection rate increased sharply from 48% in 2003 to 71% in 2004 and it remained relatively high until 2007. From 2008 onwards, however, the water fee recovery rate dropped to around 40%.³ One of the possible explanations for the recent decline in the recovery of water fees may be the fixation of land plots removing the incentive for farmers to pay their water fees.

Mesquite infestation

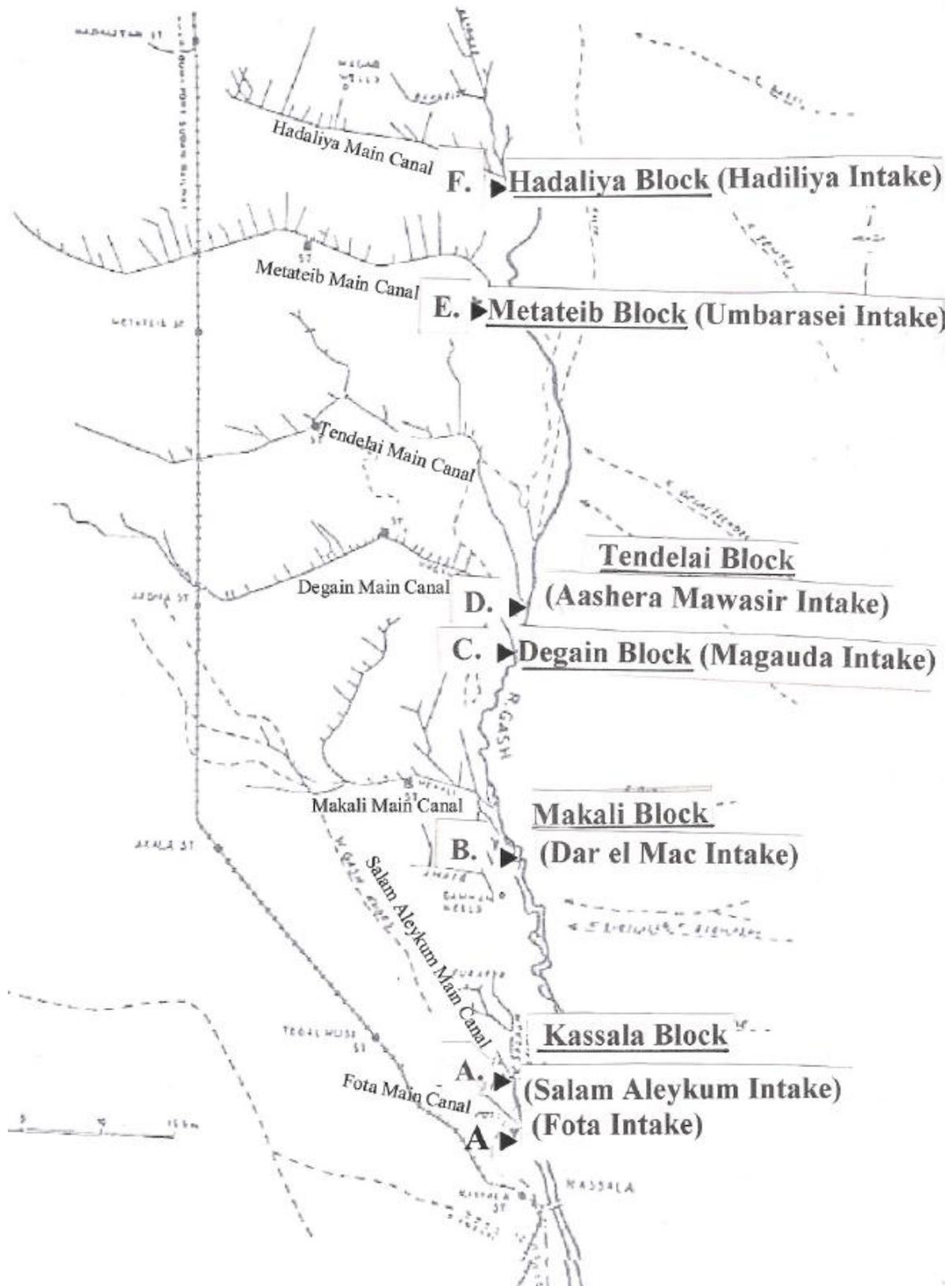
33. Mesquite (*Prosopis chilensis*) was introduced to stabilize sand dunes, but it has become an aggressive invasive shrub along the banks of the Gash river and canal systems as well as on irrigated farmland and the flood plain, especially on well drained soils where its root system can reach the water table.
34. Although it is the major weed pest on the irrigated lands, mesquite has become the economic base of the charcoal industry due to the loss of native trees (e.g. Tamarix tree) and provides one of the few sources of cash income for the local population, particularly for the landless. Mesquite also provides a degree of stabilisation where it has colonized the riverbanks and the main canals due to its extensive root system. Without effective mesquite control, however, the negative aspects of mesquite infestation outweigh potential and actual benefits of the plant, especially in terms of reducing the areas that can be cultivated in the scheme command area.



One-year old mesquite in Degain block (left) and mesquite seeds (right) © IFAD/Olaf Verheijen

³ GAS General Manager claims that the water fee collection rate is about 80%.

Appendix 1. Map with location of off-take structures and layout of main canals



Land tenancy reform at Gash spate irrigation scheme

1. The land tenancy reform with the aim of more equitable access to irrigated land on the Gash spate irrigation scheme was at the core of the project but it presented significant challenges. This annex describes the land allocation mechanism before the formation of WUAs and changes initiated in the project. It also analyses available data with regard to access to land (before and after the project) and provide comments thereon.

Allocation of irrigated plot of land

2. All land within the command area of the Gash spate irrigation scheme is State property. The names of all tenants having land tenancy rights within one of the six irrigation blocks are listed in a register book. In principle, actually irrigated land is allocated annually to each tenant in accordance with his entitlement (i.e. a number of feddan) stipulated in the register book.
3. Before the establishment of WUAs, a tenant did not have a land tenancy right on a permanent portion of land in one specific *masga*. He would be allocated a plot of irrigated land within the irrigation block for which his name was listed on the register, using a lottery system as a fair system for equitable access to irrigated land. The location of the land allocated to an individual changes each year according to the amount of water and the area irrigated. In order to have relatives and friends as neighbours, lottery groups were formed. The use of a lottery system reflects the variability of water availability in spate irrigation system: some areas may be better irrigated than other areas in a given year, or less area may be irrigated due to less floodwater in a given year. The system functioned reasonably well earlier when the number of tenant farmers registered was about 10,000 with an entitlement of 11 feddan (10 feddan for cotton and 1 feddan for sorghum).¹ With a growing population and increasing pressure on the land from late 1980s, however, land tenancy entitlement for each farmer reduced considerably. This was also exacerbated by a sharp reduction in the irrigated area due to deterioration of the irrigation infrastructure. As a result, tenants were allocated far less actually irrigated land than their "entitlements" written in the register book.² Increasing pressure on reducing resources led to the situation where land allocation was largely influenced by favouritism and corruption.
4. When Masga WUAs were established, each of them was allocated two "paired" *masgas* within the same irrigation block, whereby one *masga* is located in the upper reach of the main canal having a higher probability of irrigation, and the other in the lower reach of the main canal with less probability of irrigation. These two "paired *masgas*" are irrigated alternatively from year to another. Consequently, each tenant as a member of a Masga WUA knows in which *masga* he will be allocated a plot of actually irrigated land in a given year, in accordance with his land tenancy right using the lottery system on the condition that the first water fee instalment is paid. However, there is a risk that access to irrigated land becomes less secure and fair than before since not all *masgas* always receive water. Another risk is that in unsuccessful attempt to irrigate as much land as possible, water is spread too widely resulting in under-irrigation of farmland and negatively affecting production levels in all "irrigated" areas in the end.
5. One step further after allocating two paired *masgas* to WUAs is the allocation of fixed plot of land to each individual tenant within a *masga*. This increases the sense of ownership and improves land management by respective farmers, including

¹ This information (10,000 tenants with 11 feddan each average) was provided in the appraisal report. However, if "land entitlements" on the register books were annual figure, it does not add up, since it will come to 110,000 feddan against less than 80,000 feddan available for irrigation.

² "...with the reduction in size of irrigated areas, farmers only receiving at best 10% of their entitlement. The Authority decided that the minimum annual allocation would be 1 feddan, and that is what all those registered for 5 or 10 feddan get while those registered for more receive 10% of their allocation" (appraisal report, working paper 1).

improved land levelling and mesquite control. At the same time, it could again increase insecurity in access to irrigated land since the whole *masga* is not always entirely and/or sufficiently irrigated. One possible option to address variability of water availability and irrigation level could be the allocation of two separate land plots to each farmer within a *masga*, one in an area with high probability of irrigation and the other one in an area with lower probability. Such system is practiced in other countries (e.g. Pakistan). Another downside of land fixation is that farmers have now less incentive to pay water fees, which was a precondition before to be included in the lottery-based land allocation system. This is where the roles of WUAs become important in terms of rules and regulations and their enforcement.

Salient reform features in land allocation mechanism

<i>Before reform</i>	<i>First stage reform</i>	<i>Second stage reform</i>
<ul style="list-style-type: none"> Land entitlements of tenants recorded in the register books for each irrigation block including the names of tenants and the size of land to be allocated (number of feddan). The location of land within a block is not known. Allocation of specific land portion is annually done using a lottery system when it is known which part of the block is irrigated. With the population pressure and the scheme degradation, tenants were allocated far less actually irrigated land than their "entitlements" written in the register book. 	<ul style="list-style-type: none"> Masga WUAs are established and each of them is allocated two "paired" <i>masgas</i> within the same irrigation block. These two "paired <i>masgas</i>" are irrigated alternatively from year to another. Tenants know in which <i>masga</i> he will be allocated a plot of actually irrigated land in a given year 	<ul style="list-style-type: none"> A fixed land plot is allocated to each individual tenant within a certain <i>masga</i>.

6. The above discussion reflects variability and unpredictability of water availability in spate irrigation system and such risk would increase even more with deterioration of irrigation infrastructure and reduction of canal capacity.

Land tenancy reform initiative

7. Historically, tenants were registered by having their names included in the register of the block concerned, with their entitlement (i.e. a number of feddan). According to the appraisal report, there were apparently no selection criteria defining entitlement for registration: anyone could be registered regardless of age, ethnic origin, residence, or occupation, although no women had been registered then. New registration books were reportedly created every few years. No registration documents were given to the farmers, with the only evidence of registration being the annual receipt for payment of water fees. As the vast majority of the people concerned did not (and still do not) have identity cards, there was also no mechanism to prevent the same person from registering more than once. Indeed many farmers were said to be registered on more than one block, while others moved their registrations from one block to another.
8. The appraisal report (working paper 1: socio-economic characteristics and targeting) described the accounts and complaints by farmers regarding lack of transparency, favouritism and corruption in land allocation, e.g. the same farmers tended to receive land every year, while others were getting land only every 3-5 years.
9. The intention under the project was to clean up and update the land registers (list of registered farmers) to retain only those eligible and legitimate. Although the credibility of the historical land registers were questionable, it was thought that the 1992-93 registers could serve as the best starting point, based on the fact that the 1992-93 registers were drafted after the inclusion of the influx of displaced people from the East Bank and that they were also drafted before the recent potential

rehabilitation schemes, which have been a major incentive to include additional 'ghost' people on the books. The 1992-93 registers included about 32,000 people. "Once the registers have been 'cleaned', removing ghosts and non-poor individuals, reducing to the agreed size those who currently have much larger allocations, institutions and others, it [was] expected that those already registered and fitting the criteria will number about 30 000".³ Based on the planned yearly allocation of 3 feddan for each tenant and the assumption that with change from 3-year rotation to 2-year rotation 120,000 feddan would be available for irrigation annually, the project design envisaged that 10,000 landless could be brought to the irrigation scheme. The assumption that 120,000 feddan would be available for irrigation annually based on 2-year rotation turned out to be not realistic, as commented by some IFAD supervision and implementation support missions.

10. In order to undertake screening and cleaning of the land register books, the Legal Committee for Land Reform (LCLR) was established by a decree in September 2003. A set of eligibility criteria for tenant selection and registration was adopted by stakeholders.⁴ The LCLR completed the screening and cleaning of the 1992/93 register books in all six irrigation blocks before MTR with a total number of 56,600 claimants – substantially more than what was envisaged (30,000-32,000). The screened and cleaned register books that were approved by GAS Board of Directors (BOD) included 46,273 eligible tenants, whereas about 10,000 remaining claimants were put on a waiting list. However, the validity and credibility of the updated register books has been questioned to a great extent. In order to validate the identity of registered farmers, the issuance of identification cards was repeatedly recommended, but it was never implemented mainly due to strong resistance from influential farmers.

Comments on available data on access to land

11. Data related to access to land before and after the project were found in the appraisal report (which draws on the land register books) and the AIA 2011. Unfortunately, it is difficult to make sense out of these due to the following.
12. First, most likely, the data and figures drawn from the old land register books were already not reliable. For example, during the project design process, 11 per cent of the registered 6,953 tenants in the Kassala block register (i.e. 762 tenants) was sampled and their land entitlements recorded, which showed that the total area owned by the sampled tenants were 9,350 feddan, which is almost 85 per cent of the total annual (maximum) command area for the Kassala block at the time (11,000 feddan). This – 11 per cent of the registered tenants owning 85 per cent of the command area in the block – does not add up. This indicates that "land entitlements" recorded and updated in the land registers may not have been based on the available command area, let alone irrigated area. In other words, if land entitlements of all registered tenants were added up, it could have been much more than maximum designated command areas for irrigation. Indeed, the appraisal report also mentioned that with the reduction in size of irrigated areas, farmers were "only receiving at best 10 per cent of their entitlements". It is impossible to verify this figure, but if access to a tiny fraction of so-called "entitlement" was indeed the situation, this could explain the sampled record in the Kassala block described above. This confusion may have happened in the process of "updating" the register blocks at certain intervals, with population pressure, favouritism and increasing use of "fictitious" names.
13. Secondly, AIA 2011 had questions regarding "land ownership" before and after rehabilitation but the reliability of data is again questionable. This survey sampled 970 farmers from WUA members and reported as follows:

³ GSLRP appraisal report, working paper 1.

⁴ The criteria suggested in the appraisal report included points such as: only one beneficiary per nuclear household; farmers who was farming land on the scheme for the past 10 years or longer and included in the 1992-93 registers; and poverty level.

Land entitlement before and after rehabilitation presented in Annual Impact Assessment 2011

Feddan	Before rehabilitation "owned"				After rehabilitation "owned"			
	% farmers	No. farmers	Average area (fed)	Total areas owned by respondents (fed)*	% farmers	No. farmers	Average area (fed)	Total areas owned by respondents (fed)*
<3	19.9%	190	1.1	209	3%	29	1.8	52
>3>5	39.5%	376	4.6	1 730	73.2%	710	3.2	2 272
5 to 10	15.7%	150	9.6	1 440	13.4%	130	7.9	1 027
10 to 20	11.8%	112	16.2	1 814	5.8%	56	14.8	833
>20	13.1%	125	50.2	6 275	4.6%	45	35.7	1 593
TOTAL	100%	953		11 468	100%	970		5 777
		Average "owned"		12.03		Average "owned"		5.96

Source: AIA 2011. Note that the figures for "before rehabilitation" are different from the draft report obtained from NEN/PMD since it was established later on, through direct contact by the PPA team with the consultant who conducted the survey, that there were errors in the table in the draft report.

14. At first sight, the above figures seem to indicate that the land ownership has become less skewed and become more equitable. However, there are a number of issues:
- There is a question on the "after rehabilitation" data. If the "land ownership" was still the area of entitlement in one of the two paired *masgas* (i.e. annual entitlement), the data indicates that about 2 per cent of the tenants owned 4.8 per cent of the annually available command area (120,000 feddan). The average figure of 5.96 feddan is not line with the indicated allocation of 3 feddan through the tenancy reform.
 - For "after rehabilitation", if the respondents gave the total area of entitlement in two paired *masgas* (i.e. entitlement over 2 years) as was explained by the AIA consultant to the PPA team, it would not make sense to compare the area size before and after the rehabilitation. At best, the figures "before rehabilitation" would have had to be multiplied by three (to provide the total figures for 3-year rotation), and this would indicate that 953 respondents who owned land before rehabilitation had a total of some 34,000 feddan, compared to 5,777 feddan after rehabilitation by 970 respondents. This does not tally with the information that no landless was accommodated. Even if there were a small number of landless people accommodated, this substantial reduction does not make sense.
 - In relation to the issue of "ghost" farmers, it is very likely that the survey respondents would not give true pictures anyway.
 - Since respondents were sampled from the list of WUA members (presumably linked to the land register books and including fictitious names), it is not surprising if the AIA consultant's team was not able to find some of them when conducting the survey. In any case, it would have been impossible to verify the identities of respondents reconciling with the register books.
15. All of the above indicates that unfortunately, there is no or little credible data to show the situation before and after the project regarding access to irrigated land.

Legal framework for water users' associations and other community-based organizations

1. The Gash Delta Agricultural Corporation¹ Water Users' Act (hereinafter called "WUA Act") was approved by the Governor of the Kassala State and issued by the Kassala State Council in June 2004. As the submission of the draft legislation for the WUAs to IFAD by the Government was one of the conditions for loan effectiveness, it had to be prepared quickly - and this is reflected in its quality.
2. There were a number of elements in the WUA Act that did not seem sensible, including the following:
 - The Act defines the term "project" as "the Gash Sustainable Livelihoods Regeneration Project financed by the Sudanese Government and IFAD" and refers to "the project community based organizations registrar" and "the project documents". It is anomalous to have a reference to one specific project in the state legislation.
 - The Act covers the formation of WUAs in the command area of the Gash Irrigation Scheme only and not for the entire Kassala State.
3. As a framework governing WUAs, the Act was found inadequate, lacking provisions related to the following topics/items:
 - Purpose of WUA
 - Qualification of membership
 - Rights and responsibilities of members
 - Organizational structure of WUA, including a General Assembly and Executive Committee
 - Powers, responsibilities and tasks of General Assembly
 - Powers, responsibilities and tasks of Executive Committee
 - Minimum frequency of meetings and required quorum for General Assembly and Executive Committee
 - Powers, functions
 - Formation of sub-committees, including Audit Committee
 - Powers, responsibilities and tasks of office bearers (e.g. Chairman, Secretary and Treasurer)
 - Employment of O&M staff, such as Farasheen
 - Only the financial resources for the Apex Organization for WUAs are specified but not for the Masga WUAs and WUA Block Committees
 - Assessment, billing and collection of water fees, including effective sanctions/penalties for late and non-payment
 - Preparation of annual O&M work plan and budget
 - Minimum requirements with regard to recording and bookkeeping
4. Furthermore, the application/implementation of this Act is also worth commenting. Despite the limited scope (i.e. limited to WUAs on the Gash Irrigation Scheme), it is understood that this Act has been used also as a basis for registering other community-based organizations (e.g. women's savings and lending groups, range users associations), which was again found anomalous.

¹ This was one time the name of the institution / organization mandated to manage the Gash spate irrigation scheme. Elsewhere in the report, it is called "Gash Agricultural Scheme" (GAS).



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