

Republic of the Sudan

PCR, June 2018

Project completion report

Main report and appendices



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Currency equivalents

Currency Unit	=	SDG
US\$1.0	=	SDG 10.33

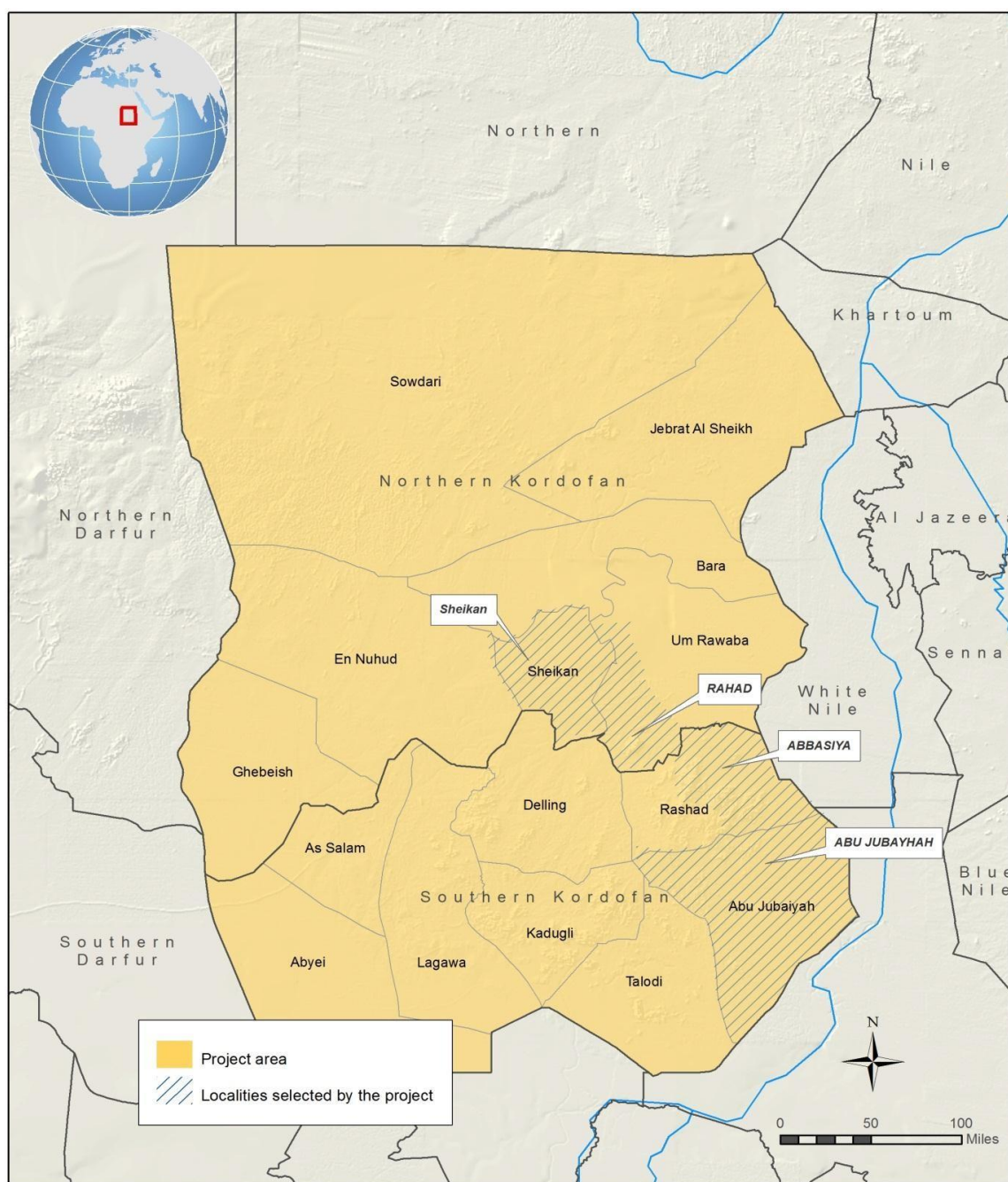
Weights and measures

1 kilogram	=	1000 g
1 000 kg	=	2.204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres
<i>1 feddan</i>	=	0.42 hectare
<i>1 hectare</i>	=	2.380 feddan

Map of the project area

Seeds Development Project

Design report



2-8-2011



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

List of acronyms

ABSUMI	Agricultural Bank of Sudan Microfinance Initiative
ARC	Agricultural Research Corporation
CDCs	Community Development Committees
CFM	Connecting Farmers to Market
CIC	community investment committee
CTCs	Central Trading Companies
FFS	Farmer Field Schools
FSA	Federal Seed Administration
GPGs	Grain Producer Groups
ISECs	Input Supply and Equipment Companies
ITC	Interstate Technical Committee
MDETs	Extension sub-teams and the Multidisciplinary Extension Teams
MoAF	Federal Ministry of Agriculture and Forestry
MoFEP	Federal Ministry of Finance and Economic Planning
NSC	National Seed Council
NSPP	National Seed Policy and Plan
PCU	Project Coordination Unit
PPP	Public Private Partnership
PSC	private seed company
PSES	Private Sector Engagement Strategy
PVP	Plant Variety Protection
SCUs	State Coordination Units
SGGs	Seed Grower Groups
SMDC	Sudanese Microfinance Development Company
UPOV	International Union for the Protection of New Plant Varieties
VDC	Village Development Committee

Project at a glance

Country	Republic of the Sudan				
Project Name	Seed Development Project				
Key Dates					
IFAD Approval	Signing	Effectiveness	Mid-Term Review	Original Completion	Actual Completion
13 Dec 2011	24 Feb 2012	24 Feb 2012	29 Sep 2014	31 March 2018	Same date
Mid-term Review	Interim Evaluation	Original Loan Closing	Actual Loan Closing		
		30 Sep 2018	Same date		
IFAD Financing					
Loan	SDR million		% disbursed		
DSF Grant	SDR million	6.35	% disbursed	99.50	
Actual Costs and Financing (USD ‘000)					
Component	IFAD	Cofinancing	Beneficiaries	GOVT	Total
Institutional and Regulatory Environment	1 098 472		In kind contribution was not quantified	66 520	1 164 992
Improvement of the Seed Production System	1 325 423			86 754	1 412 177
Seed Market Development	3 218 693			101 328	3 320 021
Project Coordination and Management	2 927 166			251 943	3 179 109
Remarks					
Indicate cofinancing partners, actual amounts, and amount committed for each as at appraisal.					
Number of Beneficiaries					
Total	Direct	Indirect	Women	Other	Other
120 400	52 494	67 906	15 748		
Project Objective					
Increased crop productivity for 69,000 smallholders using certified and improved seeds in North and South Kordofan.					
Country Partners					
Executing Agency	Federal Ministry of Agriculture				
NGOs/civil society					
Other					

Executive Summary¹

A joint IFAD-GOS Project Completion mission of the Seed Development Project (SDP) took place in Sudan from 18 of April to 3 May 2018. The Mission held consultations in Khartoum with Senior Officials of the Government in the Federal Ministry of Agriculture and Forestry (MoAF), the Federal Ministry of Finance and Economic Planning (MoFEP) and the Federal Seed Administration (FSA). Field visits took place in the Project area from 20 to 2 April. During these visits, the Mission met with smallholder farmers (seed growers and grain producers), Private Seed Companies (PSCs), service providers (MSPs, SSPs, Agro dealers), the Agricultural Research Corporation (ARC), the extension sub-teams and the Local Extension Teams (LETs) in North and South Kordofan states. The Mission findings and recommendations were validated at a stakeholders workshop held at the PMU HQs in El-Obeid on 26 April 2018.

The SDP was approved in 2011, became effective in 2012, and completed on time in March 2018. The goal of SDP was to improve food security, incomes and resilience to shocks of the smallholder producers. Its development objective was to increase crop productivity of smallholder farmers who adopt certified seeds for crop production under rainfed conditions in North Kordofan (NK) and South Kordofan (SK) states. The project area is composed of seven Localities: Rahad, Sheikan and Omrouaba in NK; Abbassiya, Abu Gubeiha, Atadhamoun, and Rashad, in SK.

Project original design estimated an outreach of 108,000 smallholder farmers and 32 Seed Growers Groups (SGGs). Two years after project initiation, the project target was adjusted at MTR to read 69,000 smallholder farmers and 17 SGGs. The primary target group consists of smallholder farmers who generally grow less than 15 feddan (6.3 ha) of land, engaging in traditional rainfed agriculture as their main source of livelihood, cultivating mainly sorghum, groundnuts, and sesame, and having limited access to inputs, technical knowledge, assets and services. About one third of them would be women. The target group consists of two categories, seed growers and grain producers and potential users of certified seeds. Within these groups and as part of project gender and youth mainstreaming strategy, the SDP aimed at ensuring equitable access of women and youth to more remunerative opportunities in seed production, as well as to access certified seeds and agricultural services to improve the productivity of cultivated land and to increase their incomes.

The Project has four complementary and reinforcing components. **Component 1** focuses primarily on the regulatory environment of the seed industry and on the institutional strengthening of the FSA. The aim of **Component 2** is to provide necessary support for enhancing the performance of the seed production system. **Component 3** is intended at supporting seed and market development, including support to farmers' groups and associations and the private sector providing relevant technologies, goods and services. The **component 4** is concerned with project management.

Three major outcomes were to be achieved by the project: (i) a conducive policy and institutional environment for the seed industry, under Component 1; (ii) an economically viable seed production system that meets farmers' demands and expectations, under Component 2; and (iii) a certified and improved seed market delivery mechanisms in place, under Component 3.

The mission consisted of Mr. Abdelhamid Abdouli (Economist, Mission Leader); Ms. Dajana (Economic and Financial Analyst); Mr. Mikael Kauttu, IFAD Programme Officer; Mr. Ahmed Subahi, Country Programme Officer, IFAD ICO, Khartoum; Mr. El Fadul Ahmed Ishag Procurement Specialist ICO, Khartoum; Mr. Adel, CCU Coordinator; Ms. Oaima Abulgadir, Head of Seeds Production Department, Federal Seed Administration; Ms. Jawaher Mohamed, SDP Focal Point at Federal Ministry of Agriculture; Ms. Fawziya Bushara, Federal Ministry of Finance, Mr. Salah Ankoosh, Federal Ministry of Finance; Mr. Mohammed Yousif Elnour (PCU – Project Coordinator); and all PCU staff at El Obeid); Mr. El Shafie Ahmed (South Kordofan State Focal Point – SDP State Coordinator); Mr. Eltag Mohammed Hussein (North Kordofan State Focal Point - SDP State Coordinator). The IFAD Country Programme Manager for Sudan, Mr. Tarek Ahmed, supervised the mission work and led meetings with the Government authorities.

The SDP was designed to address the main contextual constraints faced by smallholder farmers through testing IFAD 4Ps model on seeds business. The model consisted of private-public-producers-partnership between the private seed companies, private service providers, the farmers, the public extension services and agricultural research corporation. As such, the SDP relevance was considered by the completion mission as **satisfactory**.

Overall, and despite large discrepancies between implementation progress and achievements of Component 1 versus Component 2 and Component 3, the physical targets and output delivery are rated as **satisfactory**. The rating takes into consideration the magnitude of each component, whereby Component 1 is only 12% only of total project cost, while Components 2 and 3, which are of direct development impact on the target group, absorb 14% and 32%, respectively. The cumulative overall output achievements are 50% for Component 1, 90% for Component 2 and 95% for Component 3. At this stage, besides the limited progress on Component 1, the completion mission was pleased to see SDP continuing the promotion of seeds production/supply and seeds demand/use through farmer groups on a commercial basis. Certified and improved seeds are increasingly being adopted among crop producers within and even outside the project area in collaboration with private sector companies as well as the continuation of the participatory research approach. Certified/improved seeds use increased from 5% at pre-project to 45% with project. In some villages, members of the SGGs have been engaging, on a commercial basis, in selling certified and improved seeds to neighbours and other farmers outside the project area, such as West Kordofan and Darfur states. Their expansion plans are however constrained by the limited storage facility at the village level.

With regards to Component 1, the new Plant Variety Protection Law and a Seeds Law have been prepared by the National Seed Committee of the Ministry of Agriculture and submitted to the Ministry of Justice. Their review and approval at the Ministry of Justice has been delayed for at least two years. Since a full-fledged private sector-driven seed industry cannot be achieved without the necessary legal framework, it is of utmost importance that the Federal Minister of Agriculture approaches the Minister of Justice for the approval of the two laws.

Moreover, the compliance (with International Seed Testing Association (ISTA)) technical requirements) of the central lab equipment, provided by the project to the Federal Seed Administration (FSA), is yet to be officially confirmed through rigorous proficiency testing by ISTA. The test is a pre-requisite for a full accreditation of FSA.

However, despite the limited progress on component 1, the project managed to empower under Component 2, 17 SGGs (100% of MTR target) and their 853 members, of which 37% were women (124% of target). The project managed also under Component 3 to reach 52,494 smallholder farmers (76% of MTR target) through empowerment of 83 Grain Producers Groups (GPGs) and their members for a total area under certified and improved seeds of 453,912 feddan (94% of MTR target of 483,000 feddan). About 32% (110% of MTR target) of the grain producers are rural women.

The project has succeeded in establishing in rainfed environments a business oriented private sector driven seed production and marketing system that revolves around sustainable partnership arrangements between the producers (smallholder seed growers and grain producers and their associations) and private sector (private seed companies, services providers, input suppliers, Micro Finance Institutions (MFIs)), facilitated by public support (Agricultural Research Corporation (ARC), Extension team). The project succeeded in bringing together under the 4Ps approach, 59 Mechanised Service Providers (MSPs) for the provision of heavy/light chisel land preparation; disc harrowing; planting; and weeding); 98 Spray Service Providers (SSPs); 30 Agro dealers (input supplies); and two MFIs -ABSUMI and Bara'ah for the provision of rural finance.

With regards to project impact on rural poverty, project yearly assessments, which were confirmed by the mission through interviews of a sample of beneficiaries, clearly indicate a large reduction of

poverty perception from 51% before project to 32% with project. Project impact on rural poverty is rated **satisfactory**.

Moreover, the project impact on food security is rated as **satisfactory**. The project aimed at reducing food insecurity from 55% to 40%. In the absence of a full-fledged impact assessment, two proxy indicators were used by the mission to assess project impact on food security. Rural women met by the mission in several villages have all confirmed that: (i) Household (HH) food items availability increased from 8 months (pre project) to 12 months (with project); and (ii) HHs have reached zero indebtedness at local food shops with project against average 3-month indebtedness period before project.

Related to the above, project impact on agricultural productivity is rated as **satisfactory**. The Project Development Objective was to achieve 98% average increase in crop productivity for sesame, groundnuts, sorghum cultivated by smallholder farmers in North Kordofan and South Kordofan. Project interventions have succeeded in combatting adverse effects on yields of more erratic rain patterns through technologies that improve water retention and adoption of certified and improved seeds and more resilient varieties. Project assessments, confirmed by smallholders, indicate an average yield increase of 100% for groundnuts, Sesame and Sorghum.

The project impact on Climate Change Adaptation is rated as **satisfactory**. SDP design proposed two main climate change adaptation measures: (i) drought resistant varieties; and (ii) dissemination of soil and water conservations techniques. Mission's observations indicate that communities' resilience to environmental variability increased with the adoption of SDP promoted technologies, more specifically the improved high yielding drought tolerant varieties released by ARC for sesame, groundnuts and sorghum, and timely utilisation of agricultural machineries and recommended technical packages across the seasons. Promotion included mainly techniques of seed bed preparation and water harvest. The adoption rates of improved varieties and good agriculture practices by smallholders ranged from 41% for Sorghum to 53% for Sesame to 87% for groundnuts. These rates compare well with the design expected adoption rate of certified seeds by GPGs of at least 33%.

With regards to overall economic profitability of the project to the society at large, mission estimates the EIRR of SDP at 14.9% and the Net Present Value (NPV) at approx. SDG 417 million. The EIRR is relatively high given the unfavourable conditions in project area. It also indicates that the 26% EIRR estimation at design was based on unrealistic assumptions. With an estimated cost per beneficiary of USD 152 at completion, the project efficiency is satisfactory.

The most challenging aspect of SDP was to change the mentality of the smallholder to accept the financial merit of investing on certified and improved seeds instead of relying on traditional low yielding seeds that are usually kept from previous year harvest. The 4Ps model has helped reverse the trend of decreasing farming areas, and combat adverse effects on yields of more erratic rain patterns by improved water retention and more resilient varieties. The partnership has taken root. This is attested by the increased adoption rates of improved packages on a sustainable basis, and the private sector's plans to expand operations in the rainfed project areas that previously were deemed commercially uninteresting.

The implementation of SDP has generated a series of lessons that could guide ongoing and future project design and implementation in Sudan and elsewhere. The key lessons are focused on the 4Ps concept within a value chain approach. SDP implementation suggests that value chain approach is the most appropriate approach for sustainable development of the seeds industry. Seed production by isolated farmer groups in rainfed areas, with sale of the certified seeds restricted to project designated users is not of commercial interest to private seed companies. Instead, a flexible demand-driven comprehensive partnership between seed growers (smallholder farmers), private seed companies and input and service suppliers proved more feasible and sustainable. Seed promotion in isolation

from other necessary inputs and services is not enough to convince and induce smallholder farmers. There is need to include it in a package consisting of seeds, mechanisation, rural finance, other inputs supply through agro dealers, etc. Private companies would invest in marketing inputs and services targeted for smallholders, when convinced that these farmers are a significant market. Private companies do not find it cost-effective to invest into structures to directly provide inputs/services to smallholders; but they are more interested in building the capability of local or village based input/service providers and commercial agents.

Project success in the difficult socio-economic and climatic conditions suggests that the project concept of 4Ps-based seed industry is worthy for scaling up to other parts of Sudan. The scaling up is very timely now that (i) the Government of Sudan is no longer in charge of producing and distributing certified seeds; and (ii) the recently-approved Producers Act allows farmers associations to engage in profit-earning activities in favour of their members.

The recently approved Integrated Agricultural and Marketing Development Propjet (IAMDP) is itself a scaling up of the SDP 4Ps model. The project, which is planned to start during first half of 2018, covers similar rainfed environments in West Kordofan (WK), Sennar and new villages within NK, SK states. IAMDP implementation initiation is very timely because the lack of village storage facilities, which is strongly expressed by SDP beneficiaries (seed growers and grain producers alike), is addressed by IAMDP under Component 2: Market linkage and value addition (development of village-based post-harvest crop storage facilities).

Related to the above, the National Variety Release Committee decided to scale up the participatory research to all ARC stations in Sudan. Such approach was introduced by SDP for the first time in Sudan.

A. Introduction

1. A Project Completion mission of the Seed Development Project took place in Sudan from 18 of April to 3 May 2018. The Mission held consultations in Khartoum with Senior Officials of the Government in the Federal Ministry of Agriculture and Forestry (MoAF), the Federal Ministry of Finance and Economic Planning (MoFEP) and the Federal Seed Administration (FSA). Field visits took place in the Project area from 20 to 2 April. During these visits, the Mission met with smallholder farmers (seed growers and grain producers), Private Seed Companies (PSCs), service providers (MSPs, SSPs, Agro dealers), the Agricultural Research Corporation (ARC), the extension sub-teams and the Local Extension Teams (LETs) in North and South Kordofan states. The Mission findings and recommendations were validated at a stakeholders workshop held at the PMU HQs in El-Obeid on 26 April 2018.

2. The Mission wishes to express its appreciation to the representatives of the MoAF and MoFEP and other partners who participated in the completion mission and contributed to discussions during the field visits and in meetings. The Mission also thanks the coordinator and staff of the CCU for their excellent coordination of mission work, and SDP coordination team – Project Coordination Unit (PCU) at El-Obeid and State Coordination Units (SCUs) of North Kordofan (NK) and South Kordofan (SK) – and the extension teams and the communities met for their availability and for the quality of the exchanges.

B. Project description

B1 Project Context

3. The Project which was designed in 2011 was fully in line with GOS rural and agricultural development strategies, particularly the Agriculture Revival Programme (ARP). The latter aimed at achieving the following objectives: (i) increased agricultural exports and decreased reliance on volatile oil exports; (ii) increased agricultural productivity; (iii) improved food security and agricultural incomes; (iv) reduced rural poverty; and (v) redressed regional imbalances. Rainfed agriculture has been a major focus of the ARP, of which traditional rainfed farming covers about 18 million feddan, growing about 95 percent of the country's millet, 38 percent of sorghum, 67 percent of groundnut and 38 percent of sesame. The subsector also grows gum Arabic, rosella and melon seeds for export. Several studies have confirmed that the lack of quality seeds is one of the main productivity-lowering factors in rainfed cropping systems, in addition to land degradation, reduced soil fertility, and traditional tillage practices.

4. In the decade prior to project design, the supply of seed to the smallholder-farming sector in the Sudan was largely driven by the free distribution of seeds financed by the Government of Sudan and various national and international NGOs. The most pertinent government initiative during that period was the Small-scale Farmer Seed Programme that was stopped in 2008, after six years of implementation because of its high inefficiency. The distributed seeds were of variable quality as the seeds were not systematically certified and were delivered in insufficient quantities and late in the planting season. Furthermore, farmers' indigenous knowledge, while widely recognized, was not fully exploited by research and its potential impact in improving production, productivity and food security for the intended beneficiaries of the project was therefore not explored. In 2010, the Ministry of Finance decided to phase out free seed distribution by the government and supported instead the development of a viable private sector-led seed industry. The SDP was designed to help meet this objective.

B2 Project Objectives

5. The goal of SDP is to improve food security, incomes and resilience to shocks of the smallholder producers (including youth and women) and its development objective is to increase crop productivity for about 69,000 smallholder farmers who adopt certified seeds in NK and SK. The project

area is composed of 7 Localities: Rahad, Sheikan and Omrouaba in NK; Abbassiya, Abu Gubeiha Atadhamoun, and Rashad, in SK.

B3 Implementation Modalities

6. The project approach is characterized by: (i) promoting a producer-private-public partnership model for the supply and use of seeds and other inputs and services between the following players: private sector (seed companies, agrodealers, mechanised service providers, rural finance suppliers, insurance companies, etc.), the community organizations (CDCs, SGGs, GPGs), and the extension and research teams; (ii) promoting cost recovery of services; and (iii) a phased approach that allows to test the production and marketing model and adjust it to the changes in the regulatory environment.

7. The Federal Ministry of Agriculture is the lead agency. It chairs the Inter-Ministerial Steering Committee of the IFAD cofinanced projects. Through these organs, it is responsible for project oversight, strategic guidance and facilitation of the implementation of necessary strategic and policy decisions to enable the development of the seed sector. The management structure of the project is composed of the Project Coordination Unit and two State Coordination Units.

8. The Implementation of SDP was integrated within the Project Coordination Unit of the IFAD cofinanced WSRMP. This allowed SDP to take full advantage of the existing assets and management and coordination hierarchy of the project, particularly the established fiduciary system, effective field presence and extension support and functional M&E system. The project was implemented in two inter-linked phases: (i) a calibration phase during 2012-2014; and (ii) an intensification/scaling up and consolidation phase during 2015-2018.

9. During calibration phase, emphasis was planned to be primarily on (i) setting up the regulatory framework and the upgrading of technical and administrative capacity of FSA; (ii) production of quality breeder and foundation seeds; (iii) the setting up of the Participatory Research structure; (iv) forming and training of a small number of Seed Grower Groups; and (v) conclusion of seed multiplication contracts between the Seed Grower Groups and participating private seed companies to start seed multiplication on a limited scale. On the demand side, emphasis was to be put on capacity building and empowerment of Grain Producer Groups and on promoting the use of certified seeds, and selection of a suitable retail marketing channel for certified seeds.

10. During intensification/scaling up phase, both supply and demand related interventions were to be intensified. This phase was to be based on the profitability of the seed multiplication business model, the effectiveness of the legal and regulatory framework, the accreditation of the seed laboratory of FSA, the effectiveness of the production of breeder and registered seeds by ARC, and the adoption rate of certified seeds by the traditional rainfed smallholder farmers.

B4 Target Groups

11. The primary target group consists of smallholder, farmers who generally grow less than 15 feddan (6.3 ha) of land, engaging in traditional rainfed agriculture as their main source of livelihood, cultivating mainly sorghum, groundnuts, and sesame, and having limited access to inputs, technical knowledge, assets and services. The target group consists of two categories, Grain Producers and potential users of certified seeds, and Seed Growers, who are business minded young farmers interested in seed multiplication as an income generating activity. Within these groups and as part of project gender and youth mainstreaming strategy, the SDP aimed at ensuring equitable access of women (30% of target group) and youth (20% of target group) to more remunerative opportunities in seed production, as well as to access certified seeds and agricultural services to improve the productivity of cultivated land and to increase their incomes.

12. A minimum of approximately 69,000 traditional rainfed smallholder farmers, of which at least 30% are women, were expected to benefit from the Project through increased returns from the use of quality certified seed and other services. Within this target, 17 SGGs including 853 farmers (30% women) were expected to benefit from the Project directly whereby preference would be given to experienced and dynamic young farmers.

C. Assessment of project relevance

C1 Relevance vis-à-vis Project context

13. Relevance is rated **satisfactory**. The SDP was designed in line with GOS rural and agricultural development strategies, particularly the Agricultural Revival Programme and in line with IFAD COSOP for that period. In support of the Government intention to develop the seed sector, IFAD approved the SDP for the Republic of the Sudan. According to the COSOP Results Review of October 2016, the SDP contributed to maintaining IFAD on track to meet the core strategy objectives of improving productivity, protecting natural resources (and reducing conflicts around them) and increasing access to rural finance.

14. The seed industry in Sudan was characterised by: (i) subsistence agriculture; (ii) varietal improvement of indigenous material is mostly in the hands of farmers; (iii) inadequate quality control standards resulting from the limited human, technical and financial resources of the Federal Seed Administration (FSA); and (iv) a novice seed legislation in the form of the Seed Law of 2010. The Government has been fully aware of: (i) the importance of and need for a dynamic seed industry endowed with an appropriate legal basis and regulatory framework through the application and enforcement of the Seed Law of 2010; (ii) the need for building the capacity of the Federal Seed Administration to effectively and efficiently monitor the production, release and utilisation of all seed classes; (iii) the necessity to modernise and liberalise seed production and marketing through the promotion and the development of the nascent private sector and institutionalization of Public Private Partnerships.

15. As a result of these considerations, the SDP was designed to address these contextual constraints through testing a 4Ps model. Such model is a framework for private public partnership between the private seed companies and private service providers, the farmers, the public extension services and agricultural research corporation. This model was believed to be the most appropriate mechanism to produce and market certified seeds for the smallholder farmers thereby expanding the retail market for certified seeds.

C2 Internal logic

16. The project design was fully in line with the RB- COSOP 2009-2012, which highlighted IFAD's aim of building the technical, financial and social asset base of poor rural people, and supporting their capacities to adapt and their ability to influence policy decisions that affect their livelihoods. Moreover, SDP was designed to capitalize on the achievements of the two IFAD cofinanced projects in same project area as SDP -SKRDP and WSRMP. The main achievements of the SKRDP and WSRMP that were relevant to the SDP included: (i) the organization of the target group into community development committees (CDCs); (ii) the establishment of multi-disciplinary extension teams; and (iii) the establishment of microfinance initiatives that facilitate the access of the poor and smallholders to credit. These arrangements have been instrumental in meeting SDP project objectives.

17. The SDP was designed with three complementary and reinforcing technical components and a project management component. Such project structure was aimed at addressing main problems identified at the design including (i) smallholders limited access to inputs (particularly high yielding seeds), assets and services and (ii) agro-dealers/traders limited access to credit, low margins in the seed trade, unreliable seed market, lack of storage facilities, and poorly developed business skills.

18. At project design the theory of change was based on the fact that a sustainable increase in improved and certified seeds and an enabling environment for better access of smallholder farmers to them through 4Ps approach would help poor HHs improve income and food security. However, along the course of project implementation, the project design showed some weaknesses such as limiting the purchase and selling of seeds through contracting a seed company. This arrangement was too restrictive on the source of registered seed provided to farmers, or the marketing of seed purchased from the farmers by the PSCs. Consequently, and thanks to MTR's recommendations (see C3 below),

the project made some adjustment to improve its internal logic and proceed on a more sustainable path.

C3 Adequacy of design changes

19. After two years of implementation, the original design structure was found inadequate. The project missed out on its first two seasons seeking to implement the original project design's private sector partnership, which the private sector decisively kept refusing. The original SDP design for private sector partnership focused on identifying a PSC to buy SGG-produced seed (produced from ARC registered seed), process it, and then market it to the GPGs. As per project design, a seed company's assessment was done by SDP, which identified the private company ASSCO as the most appropriate partner. Although an MoU, acceptable to IFAD, was concluded between SDP and ASSCO, the latter did not pursue the partnership for seed production and marketing because: (i) it was very challenging to work with a large number of smallholder farmers unaware of the importance of improved seeds, and (ii) the restriction for ASSCO to use ARC-registered seeds while it has its own registered seeds. Moreover, earlier the demand for seeds was limited for some crops identified at design stage. Technically, two of the four crops chosen – groundnut, and sesame – are normally of limited interest to PSCs for commercial sales. These crops are self-pollinating, and with reasonable care, farmers may retain harvested grain to use as seed for many seasons without noticeable loss in desired characteristics, making the on-going demand for their improved seed limited and unpredictable. Contrary to these crops, Sorghum, with higher levels of cross pollination and therefore greater risks from farmer saved seed, has stronger commercial interest from the PSCs. In addition, the PSC rightly saw SDP guaranteeing the purchase of seeds from the producers as a disincentive for the establishment of a sustainable private sector-led seeds industry.

20. This design arrangement was improved at SDP MTR in 2014. IFAD and the GOS agreed at MTR to introduce the following changes: (i) reduce the project target outreach from 108,000 to 69,000 smallholders and the SGGs from 32 to 17 groups, (ii) develop effective demand for a wider range of certified seeds, as well as other key agricultural inputs such as agrochemicals and mechanized services with involvement of the private sector; (ii) improve farmer access (supply) to seed and other agricultural inputs, services, and finances; and (iii) continue to encourage PSCs to contract for seed production from SGGs, but remove restrictions on the source (ARC) of registered seed provided to farmers, or the marketing of seed purchased from the farmers by the PSCs only. The MTR revisions of 2014 turned the situation around. The following key revisions to the Project approach were deemed adequate and put the project on a sustainable development path:

- (a) Private sector engagement: (i) abandon the initial restrictive project design approach which required contracting a seed company which will both purchase and sell seed locally only to project-designed seed users; No limitations will be placed on the PSCs concerning the source of certified seed demonstrated, nor how it is eventually produced or marketed. ARCs may supply higher classes of seed to the PSCs, but it will not be a requirement by the Project, and (ii) inform seed growers that the Project will no longer guarantee purchase of their seeds, but will only facilitate their linkage to private companies through partnerships between SGGs, GPGs, private seed companies and input suppliers within and outside the project area.
- (b) Seed growers: (i) undertake a comprehensive survey to identify sites conducive to successful seed production and not susceptible to adverse weather events for establishment of future SGGs; and (ii) include medium size farmers with suitable land and skills for seed growing;
- (c) Expand the project area to the localities of Um Ruwaba in North Kordofan, and Rashad in South Kordofan. Such expansion was necessary in order to achieve the maximum outreach and impact under the project.

- (d) Rural finance: support ABSUMI and Bara'ah to expand their operations in the Project Area by revising the SGG and GPG group structure, develop outreach plans and provide relevant equipment.
- (e) Log frame: Revision of the project Log Frame to reflect these changes. In particular, remove the reference that the Project has a total outreach of 108,000 beneficiaries. This was necessary for the following reason: the calculations underlying said target in the design foresee an annual increase in the outreach numbers by the end of each growing season. A growing season starts in June and ends in October. With completion in March 2018, the last effective growing season is 2017. However, the design outreach estimate of 108,000 includes also 39,000 beneficiaries of the 2018 season; an impossibility as completion occurs before start of season. Therefore, the correct outreach estimate should be that ending in 2017 i.e. 69,000 beneficiaries. The new outreach and output targets are presented in the Log Frame (Appendix 4) targets.

21. As a result, farmers increasingly adopted a more modern farming approach that revolves around sustainable supply of farm inputs to smallholders (services, seed, agrochemicals, rural finance) from the private sector and MFIs. The project was put on a sound development path for phasing out successfully.

D. Assessment of project effectiveness

D1 Physical targets and output delivery

22. The Project has three complementary and reinforcing technical components. Component 1 (Institutional and Regulatory Environment Strengthening and Development) focuses primarily on the regulatory environment of the seed industry and on the institutional strengthening of the FSA. The aim of Component 2 (Improvement of the Seed Production System) is to provide necessary support for enhancing the performance of the seed production system. Component 3 (Seed market development support) is intended at supporting seed and market development, including support to farmers' groups and associations and the private sector providing relevant technologies, goods and services. The fourth component is concerned with project management.

23. Overall, and despite large discrepancies between implementation progress and achievements of Component 1 versus Component 2 and Component 3, the project physical targets and output delivery are rated as **satisfactory**. According to project progress reports, the cumulative overall output achievements are 50% for Component 1, 90% Component 2 and 95% for Component 3. At this stage, despite the limited progress on Component 1, the completion mission was pleased to see SDP continuing the promotion of seed production (supply) and use (demand) through farmer groups on a commercial basis. Certified and improved seeds are increasingly being adopted among crop producers within and even outside the project area in collaboration with private sector companies as well as the continuation of the participatory research approach. In some villages, members of the SGGs have been engaging, on a commercial basis, in selling certified and improved seeds to neighbours and other farmers outside the project area, such as West Kordofan and Darfur states.

Component 1 - Institutional and regulatory environment strengthening and development

24. Progress in the implementation of this component is rated **moderately Satisfactory**. The component aimed at: (i) introducing legislation for the seed industry focusing on development of the Seed Policy and related laws; (ii) improving the capacity of the Federal Seed Administration (FSA) to carry out its legal mandate of seed quality assurance at Federal and State levels; and (iii) establishing and supporting a multi-stakeholder forum of government, private sector, NGOs and farmers to discuss issues around seed and the seed industry.

25. **Output 1.1: Plant Variety Protection and Seed Laws drafted and enforced**. As rightly flagged at design stage, the Seed Act of 2010 covers the conventional marketing aspects of seeds and plant variety protection but does not comply with requirements of the International Union for the Protection

of New Plant Varieties (UPOV), therefore barring Sudan from UPOV membership and exchange of protected varieties with other UPOV members. The Policy, which is a milestone in the introduction of seed legislation, would encourage private sector investment in plant breeding, seed production and other agricultural activities. As per project design, a seed policy has been developed and approved to lay the ground for the development and approval of plant variety protection and seed laws. A new Plant Variety Protection Law and a Seeds Law have been prepared by the National Seed Committee of the Ministry of Agriculture and submitted together with 11 other draft laws for review by the Ministry of Justice. The National Seed Committee has confirmed to the completion mission the technical soundness and suitability of the two laws. However, their review at the Ministry of Justice has been delayed for at least two years, presumably for the heavy workload and high turnover of the competent legal committee at the Ministry of Justice.

26. **Output 1.2: FSA is capacitated to effectively monitor the multiplication and certification standards**. FSA is the principal Government institution with the responsibility of managing the national seed supply system. Consequently, the quality of seed produced and marketed depends to a large extent, on the effectiveness of FSA's monitoring functions. Therefore, to improve the effectiveness of FSA in carrying out its mandate, the Project was planned to carry out the following activities:

- (a) Providing the FSA with the appropriate equipment to conduct their quality control, regulatory and enforcement functions.
- (b) Accreditation of FSA by the International Seed Testing Association (ISTA) and ensure that the central testing laboratory meets ISTA accreditation standards. The project will cover the costs related to the accreditation process, staff laboratory testing proficiency, and visits by ISTA experts.
- (c) Drafting of standard operating manuals for the laboratory, accreditation fees, payment for seals and orange international certificates.

27. Project support to the FSA aimed at improving its capacity to carry out its legal mandate of monitoring the national seed system by providing resources for human capacity development, mobility, out posting of staff and upgrading of laboratories. Although the project managed to deliver the necessary lab equipment, the FSA has earlier rejected some equipment for non-compliance with technical requirements as per bidding documents. The project managed after one year delay, to secure the full compliance of all equipment from the suppliers. FSA central lab in Khartoum and the two local labs in North Kordofan and South Kordofan are now fully equipped and staff members properly trained to conduct quality control and seed certification. Following successful delivery of lab equipment, handbooks and publication of seed science and technology were procured from ISTA and the lab manual developed.

28. As a consequence to the delays in the procurement and establishment of the lab, at this stage, it is not possible for FSA labs to be ISTA accredited within the project closing period. Technically, the Proficiency test, which is a pre-requisite for the accreditation, is yet to be completed. It is still pending arrival of ISTA mission to inspect and check standardisation of FSA central lab and state labs.

29. **Output 1.3: Support to Policy Dialogue**. The FMoA, through FSA, was to convene at the federal level bi-annual forums involving the main seed industry stakeholders. The purpose of these forums was to discuss policy issues required to improve national seed supply. Two multi-stakeholder workshops were conducted with 102 participants from various stakeholders, including Government officials, ARC, FSA, Extension teams, Farmer Unions, seed companies, agro dealer representatives and agrochemical/fertilizer companies. These forums were a unique opportunity to advocate for continuous government regulatory support without crowding out the private sector in the production and marketing of certified seeds.

Component 2: Improvement of the seed production system

30. Progress in the implementation of this component is rated **Satisfactory**. The component aims at capacitating the Agricultural Research Corporation (ARC) to carry out demand-driven participatory research to ensure that sufficient quantities of high quality breeder, foundation and registered seeds are produced. The registered seeds were to be made available to the private companies who would contract small scale Seed Growers Groups (SGGs) operating at the grassroots level to multiply registered seeds and produce seeds which would be certified by FSA before commercialisation by private companies to final users. The extension services of the State Ministries of Agriculture in NK and SK were to be provided with additional training on certified seeds-related aspects, as well as with necessary logistic and mobility to enable and empower them to provide the necessary and timely extension services to seed growers. Seed growers would be organised into registered groups to facilitate linkages between seed growers, private seed companies, rural finance services and crop insurance services.

31. **Output 2.1: Participatory research for identification of suitable cultivars implemented.**

32. Participatory research approach where farmers are engaged in the management of experiments side by side with researchers and extension agents was initiated as a new research protocol supported by SDP in selected villages in Sheikhan and El Rahad localities since season 2013/2014. Seven (out of 8 planned) participatory research committees were established and included 72 members (farmers, extension agents and researchers from El Obeid and Kadugli research stations). As a national recognition to the great efforts and the introduction of the innovative participatory research approach, for the first time in Sudan, the National Variety Release Committee, held two meetings in El Obeid and approved the validation of release of the following varieties developed by ARC:

- (a) Two sorghum varieties WadAlnur and Alnfir, based on comparing performance of selected sorghum genotypes under drought prone areas of North and South Kordofan.
- (b) Sorghum variety yarwasha, being suitable for use of urea micro-dose fertilizer under different water harvesting techniques in gardud soils of North Kordofan
- (c) Cowpea Einelgazal variety with optimum 50 cm inter row spacing under rain fed conditions of North Kordofan.
- (d) Groundnut Tafra-1 variety produced under marginal drought tolerance rain fed conditions on sandy soils of North Kordofan.
- (e) Madibo pigeon pea variety, as a determinate extra-short duration variety for the rain fed areas of North and South Kordofan.
- (f) Almadih, a large seeded early maturing cowpea variety for the rain fed areas of North Kordofan. Due to its high seed productivity, this variety is expected to have high survival opportunities in the marginal rain fed dry lands, a characteristic that could also render it suitable for grain production for securing high protein grains for humans.
- (g) Evaluation of some genotypes of Roselle (Hibiscus, an important poor HH source of income) for yield and its component under rainfed condition in Western Sudan. Three varieties were released: Tadamon, Bayudah, and IFAD variety. The latter is named as recognition to IFAD support to ARC participatory research programme.
- (h) Other participatory research activities included: effect of intra-row spacing on yield of sesame varieties under rainfed conditions of North Kordofan; and New narrow inter row spacing for maximizing groundnut yield under the rain fed conditions of NK.

33. Moreover, and on the basis of observed results and lessons learned from ARC-SDP partnership in project area, the National Variety Release Committee decided to scale up the participatory research to all ARC stations in Sudan.

34. **Output 2.2:** Sufficient quantity of breeder/foundation/registered seeds produced by ARC in collaboration with PSCs.

35. Production of registered seed by the ARC was disturbed by the early reluctance of the PSCs to engage with contracted seed production with farmers early in the beginning of project implementation. At MTR, project design was adjusted for ARC and PSCs to produce the registered seed, under control and approval by the FSA. Following such adjustment, the partnership between three PSCs (ASSCO, Nile Sun and NECTAR), ARC and SDP was a successful endeavor in producing 489 MT of certified seeds of main crops, representing 125% of design target (400 MT). Despite slow start up of participatory research by ARC before project MTR, the ARC consulted heavily during the last four years with PSCs and extension department in both states on the varieties for which registered seeds should be produced. The partners maintained that only varieties in high demand by farmers should be produced. The weak capacity of ARC has been enhanced through Project support for the production of the required registered seeds, consisting of the following: (a) renovation of the breeder/ foundation seed store at El Obeid to ensure that such seed can be stored for long periods with minimum deterioration in quality; and (b) provision of necessary logistic support and inputs. Seeds were entirely produced on farmer's field. Mission observation confirms strong farmers' interest in these new varieties, as well as PSCs interest in the rainfed sector.

36. **Output 2.3:** The extension system is capacitated to support target seed producer enterprises. The Project was to work with two sub-teams of the existing locality extension teams in Abbassiya and Rahad to extend advisory services to the SGGs. The SDP support to these extension sub-teams was instrumental for them to interact more intensively with research in the participatory breeding programme, and SGGs. All design planned 30 men and 15 women extension agents received intensive training on seed production and marketing. At least 79 women and 190 men seed growers were accessing advisory services for seed production (against design estimation of 100 women and 220 men). The extension teams used six FFS to train the seed growers on seed crop production and supported linkages to the PSCs and the certification process by FSA.

37. **Output 2.4:** Community-based Seed Growers Groups (SGGs) are enabled to produce certified seeds of improved and traditional varieties. The cumulative number of SGGs reached 17 groups (against 12 groups planned at project design) including 853 farmers (530 men and 323 women). These groups were provided technical training by the extension teams and the PSCs technicians to multiply certified seeds using registered seeds produced by the ARC. Project records show a total area of 4,451 feddan is under seed production by the SGGs members. Mission discussion with SGGs members and PSCs clearly confirm the success of the project-supported business model in which private seed companies contract seed growers for the multiplication of registered seeds to produce fully certified seeds. Such success was very instrumental in changing an old pattern of smallholders relying solely on low-yielding seeds retained from their previous season harvest. Consequently, project and PSCs estimate a 45% increase in the demand for certified and improved seeds against 5% demand before project. Such demand goes way beyond project area. In some villages, members of the SGGs managed to establish business deals for seeds supply on a commercial basis to neighbours and other farmers outside the project area, such as West Kordofan and Darfur states. However, the high enthusiasm and ambitious expansion plans of the seed growers were constrained by the lack of appropriate storage facilities at the village level. The groups were willing to share the cost of investment of the storage facilities.

Component 3: Seed market development support

38. Progress in the implementation of this component is rated **Satisfactory**. This component aims at developing effective demand for certified seed; and linking Grain Producer Groups (GPG) to financial institutions and input suppliers; thus, enabling the private sector to select the best option for marketing certified seeds at the retail level to producers in the project area; empowerment of existing Grain Producer Groups (GPGs) by acting on raising their awareness to adopt certified seeds and correct seed practices through extension services. Furthermore, the project was to

support the establishment of a Seed Market Database and assist microfinance institutions in improving their outreach in terms of logistic support and branch network.

39. **Output 3.1: Creation of a marketing channel of certified seeds.** Project design stipulates that PSCs would specify in their business plans the model they plan to adopt for marketing seeds to smallholders in the project area. The most effective model adopted by the PSCs for its high effectiveness is local agents-based marketing system. Agents have been indeed selected among existing dynamic traders with good access to shops, good experience, and strong interest in the business. Project reports and mission observations indicate that around 45% of these agents are young entrepreneurs. The main marketing agents for the PSCs are 30 agro-dealers and 27 Business Development Agents in the targeted localities in NK and SK. The BDAs were selected and trained by the project in full collaboration with the PSCs. The typical profile of a marketing agent would be a young highly active, loan broker from ABSUMI, supplying seed from ASSCO company, providing MSP services and earning commercial fees for these services, with good connections to negotiate with service providers, suppliers, or financial institutions outside the community. The cumulative number of farmers covered by PSCs marketing, be it through these agents or extension teams, reached 52,494 (out of 69,000 planned).

40. **Output 3.2: Empowerment of the existing producers (Grain Producers Groups: GPG).** The project aimed at establishing GPGs as models for how communities can plan their farming business, and avail inputs including seeds, machinery hire, credit and insurance to their members. These GPGs were to be selected in communities where there are established Community Development Committees and farming interest groups. As per project design, target communities were regrouped into three categories, graduated, full intervention and exposure communities based on previous experiences with previous projects among other criteria.

41. Graduated communities are defined as communities, in which the project is indirectly involved through the implementation of integrated technical packages, identifying local agricultural engineering service providers (MSPs), crop spraying services (SSPs), agro-dealers, PSCs, restructuring of savings and credit groups and linking them to MFIs. These communities are expected to continue to adopt and apply the project-supported interventions through community development agents without direct intervention by the project or extension teams.

42. Full intervention communities are communities in which the project is involved in facilitation of implementing demonstration fields to illustrate different technical packages in farmers' fields, as well as to illustrate the inputs of some private companies supplying agricultural inputs (seeds and chemicals) and agricultural machinery. These are meant to solve specific problems and increase productivity and raise awareness for adoption and application of new technologies, and keep up with proper and safe application of agro-chemicals. The full intervention group were expected to implement the different agricultural technical packages at their farm level using a 2:1 feddan model. The project finances 2 feddan and at least additional one feddan would be financed by the farmer. The funding arrangement is left through the MFIs to select the farms.

43. Exposure communities are communities targeted by the project and some non-target communities but with proximity to full intervention communities/villages. These communities have not been able to apply any agricultural technologies by the project on their land/fields, nor have they been able to observe the experience of the communities targeted by project interventions in previous years.

44. The cumulative number of communities has reached 136 (out of planned 200 communities), distributed as follows:

Table 1: Number of communities covered (Exposure, Full intervention, graduated)

Type of community	NK	SK	Total
Exposure	21	14	65
Full intervention	25	27	52
Graduated	30	19	19
Total	76	60	136

45. Within these communities, the cumulative number GPGs has reached 83 Grain producers groups covering 52, 494 farmers (out of MTR estimated 69,000 farmers), including 32% women. Mission field visits and discussions with the GPGs (men and women) confirmed their satisfaction with project support and the partnership with the private seed companies and service providers. They indicated plans to expand business beyond SDP, but were constrained by the lack of appropriate storage facilities at the village level. The groups were willing to share the cost of the investment of the storage facilities.

46. The 6 extension teams who are already in the project area provided the following support to the GPGs:

- (a) Intensive extension support of similar to what was provided to the SGGs. This includes training on group management, on business planning for agriculture activities, and on financing of agriculture operations (access to credit and insurance).
- (b) Demonstration on the full technological package composed of certified seeds, soil and water conservation techniques and micro-fertilization (as described below).
- (c) Facilitation of access of the GPGs to agricultural machinery services, working capital to pay for the labour, weeding and harvesting costs. These inputs have been provided through credit from Bara'ah or from ABSUMI, operating in the project area.

47. The partnership between SDP and service providers was a marked success in terms of magnitude and smallholders degree of satisfaction. The number of service providers in the project area reached 219, distributed as follows:

Table 2: Number of service providers in the project area

Agent	NK	SK	Total
Mechanized service providers	21	38	59
Spray Service Provider	35	63	98
Agro-dealers	17	13	30
Business development Agent (BDA)	12	15	27
ABSUMI branch	1	2	3
Bara'ah branch	1	1	2

48. **Access to Mechanized Service Providers (MSPs).** The SDP experience with mobilizing, training, and ensuring that MSPs are equipped was a successful endeavor. The MSPs provided the following services: (i) heavy/light chisel land preparation; (ii) disc harrowing; (iii) planting; and (iv) weeding (inter-row cultivation and herbicide application from tractor-mounted boom-sprayers). MSPs and farmers alike were highly positive about their experience, and outlined plans for continuing with service provision/purchase independent of SDP in season 2018 and beyond.

49. **Access to Spray Service Providers (SSPs).** As with the MSPs, the SDP experience with mobilizing, training, and ensuring that SSPs were equipped was a marked success. SDP trained SSPs in each community and equipped the most qualified with sprayers. Farmers appreciate the cost savings. Mission findings in graduated village testify that SSPs continue providing the service independent of SDP.

50. **Access to Agro-dealers.** The project organized exposure visits for the 30 agro-input suppliers to Khartoum, with business deals struck by both parties. During field visits agro-dealers reported at least a 50% increase in their business over the last few years, and had a plan to expand the number of villages they covered by attending local market days and by going directly to communities.

51. **Access to Business Development Agents (BDAs) services.** The project successfully identified, trained, and facilitated 27 BDAs to bridge the gap between smallholders, SSPs, MSPs, agro-dealers, and micro-finance institutions. Mission discussions with smallholder farmers and rural women and some BDAs confirmed a high degree of satisfaction with service delivery by the BDAs. BDAs are now well established at the village level and very likely to continue way beyond project completion.

52. **Access to credit.** SDP successfully partnered with the two MFIs in project area, i.e. ABSUMI (in 3 localities: Sheikan, Al Rahad and Abu Juibeha) and Bara'ah (in Abbassiya locality) to support sustainable access of the target group to finance, using ABSUMI and Bara'ah own funds. SDP assisted ABUSMI and Bara'ah to design a special seasonal loan product specifically to facilitate the adoption the project promoted agricultural packages by smallholders in the project area. The features of the seasonal loan product included (i) different types of contractual arrangements according to Islamic banking guidelines to support the adoption of mechanised services, seeds and agrochemicals; (ii) one-time repayment by the farmer at harvest in contrast to monthly repayment; and (iii) access by men's groups in contrast to the women only approach followed for other loans. The cumulative seasonal loans reached 22,542 loans (against design estimates of 7,200 loans) in the amount of USD 1.4 million. It is important to mention that the introduction of the above mentioned BDA reduced the dependence of the credit officers on extension officers almost by half. This is due to the fact that the BDAs, in their task of loan mobilisation, operated on commercial basis and made profits by adding markups to the costs of mechanised services, seeds and other agro inputs delivered through them to the seasonal loan clients. Consequently, the cost of these services to the final borrower was slightly higher compared to their prices in the open market. Nevertheless, with the growth in business volumes and competition amongst BDAs in the future these margins are expected to decrease. The introduction of the BDAs has also reduced the transaction cost of the credit officers.

Table 3: Number of beneficiaries and loans of the micro-financed institutions

Item	ABSUMI	Bara'ah	Total
Number of villages covered	51	63	114
Number of loans	9 690	12 852	22 542
Number of borrowers	4 845	6 426	11 271
Total loans size (USD)	865 178	573 550	1 438 728

53. **Access to crop insurance.** As part of the project support for the empowerment of the SGGs and GPGs, the extension teams were planning to facilitate the access of GPG to crop insurance. The insurance policy is a production cost based insurance. It covers 75% of the total direct cost of production. The insurance premium is set at 10% of the total direct production cost per feddan which is to be shared between GOS (as part of counterpart funding of SDP), and the beneficiaries. The members of the SGGs and GPGs would be encouraged to ensure their crops at 50% of the insurance cost as the other 50% is subsidized by the Government. Such arrangement would serve to smoothen shocks to farm income and facilitate access of smallholder farmers to credit. The project concluded a Memorandum of Understanding with Sheikhan insurance company but with limited progress. Only 415 farmers got insured during project life. The insurance company, as expected, was reluctant to insure crops in risky rain fed environment. And the farmers preferred insuring their crops production rather than their cost of production.

54. **Farming business analysis through participatory on-farm demonstrations.** SDP was to test and scale up a seeds industry business model based on the 4Ps approach. Smallholder farmers needed on-farm convincing evidence of its profitability within their risky eco-systems environment. The business analysis was important for enhancing the business decision-making skills and knowledge base of farmers to sustainably engage and partner with private seed players. A total of 88 on-farm participatory demonstrations (out of 90 planned at design stage) were established (38 in NK and 50 demonstrations in SK) in collaboration with all players. Demonstrations covered the full technological package composed of certified seeds, soil and water conservation techniques and micro-fertilization. Seven private companies signed memos of understanding with the project to participate in the demonstrations with the provision of inputs suitable for the different locations, and technical support, while the project assisted in land preparation and agricultural operations and supervision for the demos through extension teams and contact farmers conducted field days. These PSCs are:

- (a) ASSCO and Nile Sun provided seeds for crop varieties.
- (b) NECTAR provided crop varieties and herbicides.

- (c) Nour Agro-science, CTC and Agromatco provided agro-chemicals.
- (d) Katbase provided agricultural machinery.

55. The main objective of PSCs demos was to introduce new innovations of applications of seeds, chemicals and machinery. For this season, it was planned to have one demonstration plot per locality to be implemented in full intervention communities. However, two localities (El Rahad in North Kordofan and Rashad in South Kordofan) were excluded during the selection process because locality extension teams didn't conduct community mobilization, the selection and land clearance properly.

56. All demonstrations results were regularly analyzed in relation to technico-economic aspects, including yield, cost of production and net profit. In general, the quality of the PSCs demonstrations was of a high standard. Demo plots were planted on time, field visits were held at land preparation, planting, mid-season, and at harvest. Results show a much higher profitability in SK because of the higher rainfall and better soil quality. Demos were implemented for the main crops including; groundnut, sesame, and sorghum. A sample of the demo results is presented below.

Table 4: Analysis of Groundnut demos in Sheikan, NK

PSC	CTC	ASSCO	Nectar
Groundnut variety	<i>Ghibeish</i>	<i>Soudari</i>	<i>Ghibeish</i>
Harvested area (fed)	1.0	1.0	1.0
Yield (kg/fed)	355.5	405.0	177.8
Gross revenue/fed (SDG)	6,517.9	7,425.0	3,258.9
Gross margin/fed (SDG)	6,517.9	7,425.0	3,258.9
Net profit/fed (SDG)	5,269.9	6,231.0	1,983.9

Table 5: Analysis of Sesame demos in Sheikan, NK

PSC	ASSCO	CTC	Nectar	Nour Agro
Sesame variety	<i>Promo</i>	<i>Promo</i>	<i>Promo</i>	<i>Promo</i>
Harvested area (fed)	1.0	1.0	1.0	1.0
Yield (kg/fed)	140.0	100.0	66.7	209.8
Gross revenue/fed (SDG)	5,270.0	3,800.0	2,549.8	7,791.4
Gross margin/fed (SDG)	5,270.0	3,800.0	2,549.8	7,791.4
Net profit/fed (SDG)	4,501.0	3,014.0	1,772.8	7,004.4

Table 6: Analysis of Sorghum demos in Sheikan, NK

PSC	ASSCO	Nectar	Nile Sun			CTC	Nour Agro
Sorghum Variety	Butana	Dindir	Arfa Gadamak	Butana	Shams El Nile	Arfa Gadamak	Arfa Gadamak
Harvested area (fed)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Yield (kg/fed)	360.0	180.0	270.0	315.0	315.0	180.0	270.0
Gross revenue/fed (SDG)	3,130.0	1,740.0	2,540.0	2,840.0	2,940.0	1,740.0	2,610.0
Gross margin/fed (SDG)	3,130.0	1,740.0	2,540.0	2,840.0	2,940.0	1,740.0	2,610.0
Net profit/fed (SDG)	2,374.5	986.0	1,726.0	2,087.0	2,167.0	996.0	1,860.0

Table 7: Analysis of Sorghum Demos in El Abbassiya, SK

PSC	Agromatco	ASSCO	CTC	Nectar	Nile Sun			Nour Agro
Variety	<i>A. Gadamak</i>	<i>Butana</i>	<i>A. Gadamak</i>	<i>Dindir</i>	<i>A. Gadamak</i>	<i>Butana</i>	<i>Shams El Nile11</i>	<i>A. Gadamak</i>
Harvested area (fed)	0.8	0.5	0.8	0.3	0.8	0.5	0.5	0.8
Yield (kg/fed)	540.0	720.0	720.0	720.0	600.0	720.0	720.0	720.0
Gross revenue/fed (SDG)	4,164.0	5,232.0	5,178.7	5,952.0	4,280.0	5,592.0	5,312.0	5,258.7
Gross margin/fed (SDG)	3,209.2	3,262.8	4,310.9	2,211.2	2,831.1	3,440.8	3,166.8	3,996.3
Net profit/fed (SDG)	3,102.5	3,102.8	4,204.3	2,051	2,724.4	3,280.8	3,006.8	3,889.6

Table 8: Analysis of Sesame Demos in Abu Gubeiha, SK

PSC	Agromatco	CTC	Nour Agrosience
<i>Variety</i>	<i>Promo</i>	<i>Promo</i>	<i>Promo</i>
Harvested area (fed)	1.0	1.0	1.0
Yield (kg/fed)	179.0	156.8	156.8
Gross revenue/fed (SDG)	6,444.0	5,644.8	5,644.8
Gross margin/fed (SDG)	4,828.0	4,043.8	3,843.8
Net profit/fed (SDG)	4,728.0	3,943.8	3,743.8

D2 Project outcomes and impacts

57. Three major outcomes were to be achieved by the project: (i) a conducive policy and institutional environment for the Seed industry, under component 1; (ii) an economically viable seed production system that meets farmers' demands and expectations, under component 2; and (iii) a certified and improved seed market delivery mechanisms in place, under component 3.

58. The Project was expected to increase agricultural productivity, production and farm incomes through the use of improved varieties and quality certified seeds. As mentioned earlier, the original project design estimated at least 108,000 traditional rainfed smallholder farmers, of which at least 30,000 women, to benefit from the Project through increased returns from the use of quality certified seed and technologies more appropriate to rainfed farming. Furthermore, around 1,280 seed growers in approximately 32 SGGs were expected to benefit from the Project directly whereby preference is given to experienced and dynamic young farmers. These targets were found too ambitious and were revised at MTR to read 69,000 traditional smallholder farmers of which 30% were women and 17 SGGs covering 853 seed growers of which 30% were women.

59. With regards to the first project outcome, at this stage, unfortunately and after six years, the draft law is still pending Ministry's approval. As for FSA operational self-sufficiency, which was to be achieved by 2014, the mission assessment clearly indicates a limited progress towards such self-sufficiency, which was contingent on FSA labs accreditation. As mentioned above, the compliance of the lab equipment is yet to be officially confirmed through rigorous proficiency testing by ISTA, leading to full accreditation of FSA.

60. However, despite the limited progress on first outcome, the project managed to reach 52, 494 smallholder farmers (76% of MTR target) under Component 3 through empowerment of 83 grain producers groups and their members for a total area under certified and improved seeds of 453,912 feddan (94% of MTR target 483,000 feddan). About 32% (110% of MTR target) of the grain producers were rural women. In addition, the project empowered 17 SGGs (100% of MTR target) and their 853 members, of which 37% were women (124% of target).

61. The project has succeeded in establishing in rain fed environments a business oriented private sector driven farming approach that revolves around sustainable partnership arrangements between the producers (smallholder seed growers and grain producers) and private sector (private seed companies, services providers, input suppliers, MFIs), initially facilitated by public support (ARC, Extension team).

62. **Reduction of rural poverty.** The rating is **satisfactory**. The project conducted yearly impact assessments over its implementation period. Four field teams were formed to cover 31 communities with 7 - 8 communities per team. The team consisted of 3 members (team leader + 2 data collectors). Based on this plan a team of 7 monitoring and evaluation officers from the locality extension teams, a monitoring and evaluation officer at extension department and the two M&E officers at state coordination units were deployed for the survey. These yearly surveys clearly indicate a large reduction of poverty perception from 51% before project to 32% with project. The reduction is even stronger for the category of very poor target group (from 20 to 2%). These results were confirmed by the completion mission through interviews of a sample of 46 beneficiaries (35% women) in NK and SK.

Table 9: % of perceived poverty profile in the targeted communities after the SDP project

Category	N K		SK		Average (Project)	
	Before	After	Before	Before	Before	After
Very poor	19.8	1.3	21.7	2.8	20.75	2.05
Poor	59.5	30.9	42.5	33.3	51	32.1
Sustained	18.1	63.0	32.5	55.6	25.3	59.3
Rich	2.6	4.8	3.3	8.3	2.95	6.55
Total	100.0	100.0	100.0	100.0	100.0	100.0

63. **Increase in HH asset index.** The rating is **satisfactory**. In the absence of a full-fledged impact assessment, and as a proxy to measuring project impact on the household asset ownership index, the project compared the change in durable good ownership without and with project. From the project yearly assessments, it is learned that the project contribution has been remarkable. The following table shows a clear evidence of the positive impact on the livelihoods of the target group. Such trend was confirmed by mission field observation and discussions with project beneficiaries in NK and SK. They were explicit in stating the positive changes and improvements in their household asset ownership index. Cropped farm area is another proxy indicator that could be added to the HH index ownership composite. Project assessment indicates a 45% increase in farmed area over project life in the graduated project villages, as opposed to 5% reduction in control villages.

Table 10: % ownership of durable goods before and after the SDP project

Assets	Before SDP	With SDP
Gas Stove	6.1	17.0
Refrigerator	2.4	5.4
T.V	7.2	9.2
Mobile phone	45.0	82.8
Bicycle	20.8	28.4
Radio	46.0	68.8
Solar unit	6.2	20.5

64. **Human and social capital and empowerment** is rated as **satisfactory**. The project design created opportunities for the poor households to participate in different community-based groups. Of particular relevance are 17 SGGs and 83 GPGs. These were empowering models for how communities can plan their farming business, and avail inputs including seeds, machinery hire, credit to their members to sustainably engage in profitable farming and contractual arrangement with private sector players. All households, including smallholders, women and youth, received various forms of project support, including training, increased accessibility to agricultural extension services, certified and improved high yielding seeds, production tools and inputs, production and business planning, rural finance, and markets.

65. **Food security** is rated as **satisfactory**. The project aimed at reducing food insecurity from 55% to 40%. In absence of a full-fledged impact assessment, 2 proxy indicators were used by the mission to assess project impact on food security. Rural women met by the mission in several villages have all confirmed that: (i) HH food items availability increased from 8 months (Pre-project) to 12 months (with project); and (ii) HH have reached zero indebtedness at local food shops with project against average 3 month indebtedness period before project. Improvements in the food security indicators in the project area are attributed greatly to activity implementation under Component 2 and Component 3, such as technical training, awareness, increase in production, diversification of income sources, input support for production development, and better business linkage for output market. In addition the relatively high percentage of women beneficiaries would lead to higher food security as is well known that women spending priority is on purchasing food items for family members.

66. **Agricultural productivity** is rated as **satisfactory**. The Project development objective was to achieve 98% average increase in crop productivity for sesame, groundnuts, sorghum cultivated by 69,000 smallholders in North and South Kordofan. Project interventions have succeeded in combatting adverse effects on yields of more erratic rain patterns through technologies that improve

water retention and adoption of certified seeds and more resilient varieties. Project assessments indicate an average yield increase of 100% for groundnuts, Sesame and Sorghum. Smallholder farmers (men and women) confirmed to mission members at least an average yield increase 50% for same crops under most unfavourable conditions.

Table 11: Field crops yield (kg /fed), as per project assessment

Crop	NK		SK		Average (project)	
	Before	with	Before	with	Before	With
Sorghum	155	234	313	535	234	385
Groundnuts	171	315	188	540	180	428
Sesame	204	252	349	432	277	342

67. **Institutions and policies** is rated **moderately satisfactory**. The project was expected to support the development of a nation-wide enabling institutional and policy environment for the seed sector and to strengthen relevant seed sector authorities, such as FSA, NSC and ARC. The project aimed at introducing appropriate legislation for the seed industry particularly in relation to plant variety protection; improving the Federal Seed Administration's capacity to carry out its legal mandate of monitoring the national seed system; and establishing a multi-stakeholder dialogue forum that brings together Government, the private sector, NGOs and farmers to discuss seed policy issues on a regular basis. Although these relevant authorities (FSA, NSC and ARC) have been strengthened through training, capacity building and equipment, they fell short of delivering on policy issues (Plant Variety Protection and Seed Laws), and on securing ISTA accreditation of FSA.

68. **Natural resource and the environment** is rated as **satisfactory**. In general, project activities made no negative impacts on environment and natural resources. To the contrary, the project has contributed to environment improvement by supporting households in applying good agricultural practices (use of certified seeds with soil and water harvesting techniques and chisel ploughing). The extension team, ARC agents and private seed companies have been active in demonstrating and facilitating the adoption of the appropriate cropping patterns within the farmers' context with the appropriate crop husbandry practices and inputs. As much as 88 demonstrations on soil and water conservation were conducted. The mission observed that smallholders applying the recommended technical packages were performing better, demonstrating greater coping characteristics.

69. **Climate Change Adaptation** is rated as **satisfactory**. The SDP proposes two main climate change adaptation measures: (i) drought resistant varieties; and (ii) dissemination of soil and water conservations techniques. Mission's observations indicate that communities' resilience to environmental variability increased with the adoption of SDP promoted technologies, consisting of improved high yielding drought tolerant varieties released by ARC for sesame, groundnuts and sorghum, and timely utilisation of agricultural machineries and recommended technical packages across the seasons. Promotion included mainly techniques of seed bed preparation and water harvest (chisel and disc harrow, techniques of crop planting using mechanical/pneumatic planter vs sowing (using traditional tools – sallouka- and seed broadcasting. As mentioned earlier, the adoption rates of improved varieties and good agriculture practices by smallholders ranged from 41% for Sorghum to 53% for Sesame to 87% for groundnuts. These rates compare well with the design expected adoption rate of certified seeds by GPGs of at least 33%.

70. **Gender equity and women empowerment**. The rating is **satisfactory**. The project made considerable efforts to empower women and strengthen their position in community organisations by surpassing the 30% women quota specified at design for the various activities and ensuring that the relevant extension teams would be gender sensitive. All nine extension teams include women extension agents which facilitated the mobilization and organization of women and their involvement in agricultural production activities at the village level. Thus, the participation of women in all community structures contributed to greater community awareness about the importance of women's participation. Women also became motivated to play an active role in several community groups and

committees. Thanks to the improved participation, women could raise their voice during decision-making process at localities and had better access to services and support from the project for production and business development. Women are active participants in SGGs and GPGs at all levels.

D3 Targeting and outreach

71. **Effectiveness of targeting approach is Satisfactory.** To provide the best support to the target groups, the project management applied the three pronged targeting strategy selected at design stage: geographical targeting based on the poverty lines and income levels, self-targeting based on project activities that primarily interest poor households and direct targeting. For greater impact, the project has refined its targeting by tailoring its support based on communities' maturity and experience, categorised into (i) exposure; (ii) full intervention; and (iii) graduation villages. Although project design recommended at MTR for the supply of seeds that only 40% of seed growers could be from the poorer households, project records show that only 10 % of seed growers are medium size farmers. The other 90% are smallholder producers. The same applies to the grain producers. The relative small magnitude of the less performing component 1 as compared to the much larger magnitude of the well performing components 2 and 3 is also worth mentioning.

72. **Gender and Youth focus is rated as Satisfactory.** The project gender and youth mainstreaming strategy aimed at ensuring equitable access of women and youth to more remunerative opportunities in seed production, as well as to access certified seeds and agricultural services to improve the productivity of cultivated land and to increase their incomes. The project sets: (i) a quota for the participation of women and youth in various project activities; (ii) periodic monitoring of the profile of participants to ensure that women and youth are equitably benefiting from the project; and (iii) training on gender mainstreaming in agriculture targeting producer groups and extension staff. The PCU, through its existing women and community development officer, has been responsible for the implementation of the gender and youth mainstreaming strategy. Women and youth participation in SDP activities has been successful with 37% of the farmers participating in full intervention activities being women and 75% of the contact farmers are youth. Finally, access to rural finance through ABSUMI and Bara'ah has had a positive effect on women empowerment.

73. The project intensive training and identification of employment opportunities for rural young men and women was another indicator of the satisfactory youth focus. The Project did specifically target young people to enable them to take up the various employment opportunities that would arise from the various activities, in particular: (i) seed production whereas during the selection of members of seed producer enterprises, priority was given to interested and capable young farmers with a quota set at least 20%; (ii) entrepreneurship opportunities for young people whereby youth were encouraged to become small traders/agro-dealers/entrepreneurs and to be involved in seed marketing activities at the village or locality level. The involvement of youth was confirmed by the mission through the profile of selected number of farmers and local service providers met in many villages in NK and SK.

D4 Innovation, replication and scaling-up: overall project performance is rated satisfactory

74. The most challenging aspect of SDP was the change in smallholder mentality to accept the financial merit of investing on certified and improved seeds instead of relying on traditional low yielding seeds, usually kept from previous year harvest. For this, the project has introduced, within the local context, a more modern business oriented farming approach that relies on partnerships between farmers and their associations and the private sector (mechanised service providers, small-scale retailers of agrochemicals and large-scale companies in Khartoum and NK and SK) with enabling support from public institutions (ARC, extension, MFIs). This has helped reverse the trend of decreasing farming areas, and combat adverse effects on yields of more erratic rain patterns by improved water retention and more resilient varieties. The partnership has taken root. This is attested by the increased adoption rates of improved packages on a sustainable basis, and the private sector's plans to expand operations in the rainfed project areas that previously were deemed commercially

uninteresting. Such success in the difficult conditions of the project area suggests strongly that the project concept of 4Ps-based seed industry is worthy for scaling up to other parts of Sudan. The scaling up is very timely now that (i) the Government of Sudan is no longer in charge of producing and distributing certified seeds; and (ii) the recently-approved Producers Act allows farmers associations to engage in profit-earning activities in favour of their members.

75. Related to the above, and as stated earlier, the National Variety Release Committee decided to scale up the participatory research to all ARC stations in Sudan. Such approach was introduced by SDP for the first time in Sudan.

76. The recently approved Integrated Agricultural and Marketing Development Propjet (IAMDP) is itself a scaling up of SDP 4Ps model. The project, which is planned to start during second half of 2018, covers similar rainfed environments in WK, Sennar and new villages within NK, SK states, in addition to villages covered by SDP.

E. Assessment of project efficiency

E1 Project costs and financing

77. Total direct Project cost is estimated at SDG 75.825 million (USD 9.076 million) over a 7-year period. Total costs, when non-collected duties/customs and taxes are considered, are reaching amount of USD 10.594 million. Project financing plan is presented in Appendix 7, showing an IFAD financing of USD 8,569,638 and GOS financing of USD 506,660. Beneficiaries' contribution, largely in-kind was not quantified. Private companies' contribution foreseen at project design was abandoned as these companies provided direct support (input and extension services) to the seed growers and demonstrations plots.

78. Component 3 - Seed Market Development Support and Component 4 - Project Coordination and Management Support' are the biggest component representing SDG 60.966 million (USD 6.499 million) of total project costs. Component 2 covers the costs for Improvement of the Seed Production; represent SDG 8.293 million (USD 1.412 million) of the total project costs. Component 1 - Institution and Regulatory Environment Strengthening and Development, represents SDG 6.566 million (USD 1.165 million).

E2 Quality of project management is rated satisfactory

79. The Federal Ministry of Agriculture is the project lead agency. It chairs the Inter- Ministerial Steering Committee of the IFAD cofinanced projects. The membership in this committee includes the representatives of the Ministry of Finance and Economic Planning, Ministry of Irrigation and Water Resources, Ministry of Animal Resources and Fisheries, the State Ministries of Agriculture where IFAD cofinanced projects are on-going, the Central Coordination Unit for IFAD cofinanced projects. For the purpose of the SDP, the Seed Council was added to the membership by a decree from the Federal Minister of Agriculture. The committee is responsible for project oversight, strategic guidance and facilitation of the implementation of necessary strategic and policy decisions to enable the development of the seed sector. The committee met 12 times during the 7 year implementation period.

80. At the state level, the two State Coordination Committees (SCC) in North and South Kordofan are chaired by the State Ministers of Agriculture and composed of the director general of the state ministry of agriculture, one representative from the state ministry of finance, the state ministry of physical planning and public utilities, the state manager of Forest National Corporation, the manager of the range and pasture department and soil and water conservation of the state ministry of agriculture, representatives of the Farmers' Union, Pastoral Union, Women Union and the native administration and directors of ARC research stations in El Obeid and Kadugli. The SCCs have been consistently meeting twice a year to provide guidance and review AWPBs and progress reports submitted by the two SCUs for approval and submission to the PCU for consolidation.

81. The management structure of the Project comprises the PCU, and two State Coordination Units (SCUs) embedded in the State Ministries of Agriculture, one in NK and one in SK that report directly to the PCU coordinator. The PMU performance is satisfactory given its earlier involvement and experience with implementation of WSRMP. The M&E specialist and team successfully conducted the annual assessments, seed tracking and adoption surveys. The Community and Gender Development specialist documented and published success stories on project achievements (contact farmers, seed growers, grain producers, rural women, etc.).

82. The Financial management and the quality of the internal control system in place are rated **moderately satisfactory**. The organization and staffing arrangements for the financial unit were adequate and distribution of roles and responsibilities is clearly identified. Auditing and reporting were done in accordance with IFAD regulation and international standards. However, the accounting software is a customized database from MS Access which allows only single entry accounting and its maintenance is highly dependent on the consultant, who designed the system.

E3 Partners' performance

83. **Borrower.** The FMOAF and the Federal Ministry of Finance and Economic Planning constantly participated in projects supervision and implementation support missions. They ensured compliance with the covenants of the Financing Agreement and due follow-up on the recommendations of the supervision, MTR and implementation support missions annually.

84. **Financially,** the total contribution received from the government (including forgone duties and taxes) is of USD 986,000 equivalent, which represents approximately 10% of total project cost. However this data reflects a high underestimation of the contribution from the Government. As part of its contribution the Government is also paying for the operating costs for the activities implemented by the FSA and ARC but it is not providing the project with the concerning information and as a result the project is not able to account the actual contribution that the Government is providing.

85. The State Ministries of Agriculture in North and South Kordofan lead the state coordination unit of SDP. They carried out the following: (i) facilitate project implementation at state level through the deployment of staff for this purpose and through coordination/management and technical backstopping of the extension teams; and (ii) provision of offices and residential facilities to the FSA out posted staff.

86. Unlike the supportive attitude of the FMOAF and the Ministry of Finance, and the two state Ministries of Agriculture, the CBoS was slow and reluctant in systematically applying the commercial/incentive rate to the transfers made from the DA to project account. Since December 2016 the CBoS has been applying only the official rate to the transfers made from the DA to the operating account, in contradiction with the new policy of applying the official rate increased by the incentive rate. Unlike other IFAD projects in Sudan, SDP has been receiving transfers converted at the increased rate from April 2017 onward but for the period November 2016 – March 2017, the transfers have been made only at the official rate. This has been the cause of delays in disbursement since the last two WAs submitted have been kept on hold at IFAD pending the resolution of the matter. A recent agreement has been reached in September 2017 with the approval of the MoFEP to exchange the transfers retroactively with the additional incentive rate and the CBoS to transfer the money shortly.

87. **Implementing partners.** In addition to the successful partnership with ARC (on participatory research on seeds development), and to a less extent FSA (on seeds inspection and certification), and Locality Extension Teams (on community mobilisation and training), the project made substantial progress in developing and formalising its relationship with the private sector entities involved in project implementation, including PSCs, MSPs, SSP. The private partners continued their support to the target group despite the discontinuation of SDP-funded grants in their favour.

88. As mentioned earlier, the PSCs have developed new varieties that were evaluated on the SDP/PSC demonstration plots. Farmers are quite interested in these new varieties, and encouraged

that the PSCs are interested in the rainfed sector. The PSCs are actively involved in contractual arrangements with seed growers and seeds business to smallholders at large.

89. The performance of the other private service providers is equally successful. Services highly demanded by the smallholders who are willing to cover the cost of operations include heavy/light chisel land preparation; disc harrowing; planting; and weeding (inter-row cultivation and herbicide application from tractor-mounted boom-sprayers). Mission observations confirmed that smallholder farmers were highly positive about their experience, and outlined plans for continuing with service provision independent of SDP.

90. The performance of two financial institutions, ABSUMI and Bara'ah, is satisfactory. They have timely responded to the requirements of financing investment and seasonal production costs for the smallholder farmers and investment and operating costs for village service providers.

91. Unlike the performance of ARC and private sector entities and the two financial institutions, the partnership with the insurance companies fell short of design expectations. At early stages of implementation, the project supported the linkage of the producers with Sheikhan insurance company in year 2014 by paying the interim 50% for the project and 50% from the Government local contribution. The year after, the producers were expected to cover 25% of the cost of the insurance fees, while the project and government were to cover the remaining 75%. This cost sharing arrangement did not materialise because the farmers wanted compensation for the production itself and not for the cost of production as the practice in Sudan. Moreover the insurance companies were reluctant because of the risky nature of the rainfed agriculture.

E4 Quality of supervision and implementation support

92. The five supervision missions, six implementation support missions and MTR mission were timely, planned and adequately staffed. Procurement and AWPB reviews and WAs processing were timely conducted. IFAD management and relevant services at headquarters, and the ICO were pro-actively engaged in accommodating in-country circumstances, such as SDG continuous depreciation and related adjustments. Of particular importance was the interaction and proactive role of IFAD in addressing the design flaws and correcting them at project MTR in 2014.

E5 Project internal rate of return

93. On the basis of mission data analysis, the EIRR of SDP is estimated at 14.9% and the Net Present Value (NPV) is approximately SDG 417 million. This rate is relatively high given the unfavourable conditions in project area. It also indicates that the 26% EIRR estimation at design was based on unrealistic assumptions. The details of the analysis are presented in Appendix 10. With an estimated cost per beneficiary of USD 152 at completion, the project efficiency is satisfactory.

94. In order to test the robustness of the above results, a sensitivity analysis has been carried out. The sensitivity analysis shows the project to be sensitive to exchange rate shocks and in the worst-case scenario (costs higher by 50% and the EIRR drops to 7% resulting with negative NPV or where project benefits drops by 50%, the EIRR drops to only 2%.

F. Assessment of sustainability

95. **Target group empowerment.** The project succeeded in empowering smallholder farmers to access better services and secure market outputs for their products. Smallholder farmers are not only empowered to successfully engage with private seed companies on a win-win contractual basis for the supply of certified seeds (SGGs) but also for the demand of production factors (inputs, services, microfinance, etc.). A farmer-to-farmer seed market is developing, albeit slowly, as a sustainable source of income at the village level or even out of project area. Another key factor in ensuring the sustainability of the project is the change of mindset of beneficiaries.

96. **Service Providers (MSPs, SSPs and Agro-dealers).** Project interventions enabled the MSPs, SSPs and agro-dealers to establish local business arrangement for the provision of the following

services: (i) heavy/light chisel land preparation; (ii) disc harrowing; (iii) planting; and (iv) weeding (inter-row cultivation and herbicide application from tractor-mounted boom-sprayers), sales of various production inputs and tools. MSPs, SSPs and Agro-dealers and farmers alike were highly positive about their experience, and outlined plans for continuing with service provision/purchase independent of SDP, and even when the original grants in their favour were discontinued. The farmers appreciate the cost savings and quality of services. Mission findings in graduated village testify that these partners continue providing the service independent of SDP and service providers had plans to expand the number of villages they covered by attending local market days and by going directly to communities.

97. **Rural finance - replication without project support.** Some of the ABSUMI units have started replicating the seasonal loans without project support. The seasonal loans in the non-SDP villages have supported the same improved technology packages as promoted in the SDP villages. This is a positive change compared to previous seasons when ABSUMI credit officers were sceptical about the benefits of the improved technologies and were unwilling to push their adoption through the seasonal loans. Overall loan recovery rate stands at 98%.

98. **Resilience to climate change through good agricultural practices.** Technically, the communities' resilience to environmental variability increased with the adoption of SDP promoted technologies. The latter includes improved high yielding drought tolerant varieties, timely utilisation of agricultural machineries across the season, and water conservation through chisel plough.

G. Lessons learned

99. The implementation of SDP has generated a series of lessons that could guide ongoing and future project design and implementation in Sudan and elsewhere. The key lessons are focused on the **4Ps concept within a value chain approach through privatisation and decentralisation of the seed industry** with government role confined to regulatory aspects. The main lessons include:

- (a) **Private sector partnership and market dynamics.** Value chain approach is the most appropriate approach for sustainable development of the seeds industry. Seed production by isolated farmer groups in rainfed areas, with sale of the certified seeds restricted to project designated users is not of commercial interest to private seed companies. Instead, a flexible demand-driven comprehensive partnership between seed growers (smallholder farmers), private seed companies and input and service suppliers proved more feasible and sustainable.
- (b) **Technical considerations are crucial for sustainability of seed value chain selection.** Self-pollinating crops are not of very high interest to private seed companies for commercial sales. Only crops with higher levels of cross pollination, and therefore greater risks from farmer saved seeds, have high commercial interest from the private companies.
- (c) **Creation of economies of scale.** Private companies would invest in marketing inputs and services targeted for smallholders, when convinced that these farmers are a significant market. Private companies do not find it cost-effective to invest into structures to directly provide inputs/services to smallholders; but they are more interested in building the capability of local or village based input/service providers and commercial agents.
- (d) **Participatory applied research and demand creation.** On farm demonstrations are key means through which demand creation will occur. For this, research on demonstration and evaluation of seed varieties for their adaptability and suitability to local conditions must be fully participatory, involving all seed value chain actors. In addition to involving research institutions (ARC), extension agents and farmers, project design and implementation should envisage the involvement of private seed companies and service

providers in the design, management, and dissemination of the results of the demonstration plots. The cost of participatory research should be shared by all partners.

- (e) **Smallholders' empowerment.** Smallholders need technical knowledge and business skills to organize themselves, individually and through their community-based organisations. This would enable them to be more attractive and profitable customers for local service providers (mechanisation) and input suppliers (seed, agrochemicals), and to negotiate better prices and business terms for a win-win partnership between the smallholders and private actors.

100. IFAD-supported projects in Sudan, including the SDP, have during the past few years built up a Community of Practice (CoP) in knowledge sharing at country level involving project staff, the CCU, key line ministries and beneficiaries. The establishment of this CoP has strengthened KM at country level which can be seen through increased interactions between projects, ministries, donors, and beneficiaries. Key outputs include a joint Knowledge Management (KM) strategy for IFAD-funded projects, the establishment of a coordinating body for KM at the CCU, exchange visits between IFAD projects, international exchange visits, joint capacity building trainings and a peer to peer knowledge sharing event on Natural Resources Management and Agricultural Productivity (Learning Route). In the future the CoP can be used as a channel to replicate and scale up IFAD piloted approaches (such as the 4P approach in SDP) both at country and regional level, which would contribute to increasing the sustainability of the SDP project.

H. Conclusions and recommendations

Conclusion

101. Based on the above analysis, the overall project performance is rated as **satisfactory**. Such rating takes into consideration the country and local context, and the strong challenges facing the smallholder producers in rainfed area. The project was successfully implemented. On the qualitative aspect, the project succeeded in changing the mentality of the smallholder traditional rain fed farmers from using low yielding seeds to increasingly using certified high yielding varieties. On the quantitative aspect, key achievements include: (i) the EIRR of the whole project is estimated at an acceptable level of 14.9%; (ii) increased productivity of main crops, e.g. sesame, sorghum, and groundnuts by an average of 90%; (iii) reduction of rural poverty perception from 51% before project to 32% with project; and (iv) increase in HH food items availability from 8 months (Pre-project) to 12 months (with project). In addition, the project also contributed to improving women empowerment, environment and climate change adaptation.

Key drivers of success

102. The above successes are attributable to some key drivers, including (i) timely intervention of the federal and state authorities and the inter-ministerial and two state PSCs in providing an enabling implementation environment as much as possible; (ii) dedication and commitment of Project management at all levels from PCU to LETs; (iii) SDP integration within the Project Coordination Unit of the IFAD cofinanced WSRMP. Thus, taking advantage of the existing management and coordination hierarchy of the project, particularly the well-established fiduciary system, effective field presence and extension support and functional M&E system; (iv) Post-MTR increased interest of project target groups and private players in undertaking participatory market-based approaches of mutual interest to both parties; and (v) good implementation support and intensive supervision by IFAD.

Challenges

103. The project would have achieved much more than the above if it did not face some significant shortfalls such as: (i) poor design of the 4P structure, which led to MTR change in design; (ii) very slow progress at the Ministry of Justice (beyond project control) on review for approval of draft Plant Variety Protection and Seed Laws; (iii) earlier reluctance of Central Bank of Sudan to apply

commercial/incentive exchange rates to project expenditures; and (iii) delay in procurement of equipment because for FSA Central Lab in Khartoum and two provincial labs in NK and SK.

Recommendations

104. As mentioned earlier the new Plant Variety Protection Law and a Seeds Law have been prepared by the National Seed Committee of the Ministry of Agriculture and submitted to the Ministry of Justice. Their review and approval at the Ministry of Justice has been delayed for at least two years. Since a full-fledged private sector-driven seed industry cannot be achieved without the necessary legal framework, it is of utmost importance that the Federal Minister of Agriculture approaches the Federal Minister of Justice for the approval of the two laws.

- (a) The Integrated Agricultural Market Development Programme (IAMDP) was approved by IFAD EB in December 2017 and planned implementation start up in Mid-2018. It is partially a continuation and scaling up of SDP activities, but going beyond seed development, with main focus on the 4Ps approach. IAMDP central Coordination Unit and state coordination units will be the same as SDP's in El Obeid and NK and SK. The mission was pleased to hear that all performing staff of SDP are confirmed by the Ministry of Finance and Economic Planning to continue with IAMDP. It would be most opportune to ensure as soon as possible the transfer of all SDP assets at central and state level, most notably vehicles, equipment and agricultural machinery, to the IAMDP.
- (b) In order to keep and enhance momentum during the bridging period between SDP and IAMDP, and to avoid farmers losing an entire agricultural season, there is urgent need for SDP to coordinate with ongoing Integrated Solutions Programme. For this, the Ministry of Finance and Economic Planning is urged to release SDG 2.7 million as part of the AWPB for the Integrated Solutions Programme in NK and SK.
- (c) **Complete the accreditation of FSA by the International Seed Testing Association (ISTA).** Such accreditation is contingent on the satisfactory conclusion of FSA lab proficiency test. It is still pending arrival of ISTA mission to inspect and check standardization of FSA central lab.
- (d) Scaling up to all ARC stations in Sudan of the participatory research, which SDP has successfully promoted in Kordofan states. The National Variety Release Committee is fully supportive of its scaling up in Sudan.
- (e) **Scaling up of SDP to other parts of Sudan.** Project success in the difficult socio-economic and climatic conditions area suggests strongly that the project concept of 4Ps-based seed industry is worthy for scaling up to other parts of Sudan. The scaling up is very timely now that (i) the Government of Sudan is no longer in charge of producing and distributing certified seeds; and (ii) the recently-approved Producers Act allows farmers associations to engage in profit-earning activities in favour of their members. The recently approved Integrated Agricultural and Marketing Development Propjet (IAMDP) is itself a scaling up of SDP, as the GOS increased its counterpart contribution to IAMDP project cost by approximately 50% (in comparison to SDP) . The project, which is planned to start during first half of 2018, covers similar rainfed environments in West Kordofan, Sennar and new villages within NK, SK states, in addition to current SDP coverage. The start of IAMDP implementation is very timely because the lack of village storage facilities, which is strongly expressed by SDP beneficiaries (seed growers and grain producers), is addressed by IAMDP under Component 2: Market linkage and value addition (development of village-based post-harvest crop storage facilities).

Appendix 1: TOR of the completion review mission

TERMS OF REFERENCE FOR CONSULTANTS AND OTHER PERSONS HIRED BY IFAD TO PARTICIPATE IN MISSIONS UNDER A NON-STAFF CONTRACT

COUNTRY OF ASSIGNMENT/LOCATION: Sudan

MISSION NAME: Sudan: Seeds Development Project - PCR mission

MISSION START AND END DATES: 18 April – 6 May 2018

REPORT TO: Tarek Ahmed, CPM, NEN/PMD

MISSION COMPOSITION: Mr. Abdelhamid Abdouli, Team Leader

Ms. Dajana Grandic, Economic and Financial Analyst

I. INTRODUCTION:

1. You will proceed to Sudan (see Section IV. Tentative Itinerary) to carry out the Project Completion Mission for the Seeds Development Project (“SDP” or “Project”). The objective of your assignment will be to produce a Project Completion Report (PCR) in consultation with project stakeholders and in line with IFAD guidelines.

II. BACKGROUND:

2. As of 2010, the Ministry of Finance and National Economy decided to phase out free seed distribution by the government and support instead the development of a viable seed industry by allocating annually around SDG 8 million from its development budget for seed production. In support of the Government intention to develop the seed sector, IFAD approved the entry of the Seed Development Programme (SDP) into the 2011 pipeline for the Republic of the Sudan.

3. The grant agreement for SDP was signed on 24 February 2012. It completes in March 2018, and comprises four components: Component 1: Strengthening and Development of the Institutional and Regulatory Environment; Component 2: Improvement of the Seed Production System; Component 3: Support Seed Market Development; and Component 4: Project Coordination and Management. The primary target group is smallholder farmers who engage in traditional rainfed agriculture as their main source of livelihood, cultivate mainly sorghum, groundnuts and sesame and have limited access to inputs, assets and services.

4. In its objective to address the main constraints hindering the development of an open market for the seed industry in the Sudan, the project intervenes at three interrelated levels of the seed production and marketing chain by: (i) improving the regulatory framework through stronger implementation of the Seed Act, promulgation of Plant Variety Protection; and capacitating and empowering the Federal Seed Administration to carry out its inspection and control functions effectively and efficiently; (ii) increase the supply of good quality seed and appropriate varieties to smallholder farmers by linking farmers with Private Seed Companies (PSCs) along with other farm inputs; and (iii) enhance the effective demand for improved seeds by smallholder farmers.

5. The project revolves around a partnership between farmers and private seed companies (PSCs), the public sector research and extension services, which up till the 2014 MTR had failed to take off, but is now on track. The original SDP design for private sector partnership focused on identifying a PSC to buy SGG-produced seed from ARC registered seed, process it, and then market to the GPGs. This original partnership arrangement was not acceptable to the PSCs, and no progress had been made. During the MTR it was agreed that it be expanded and re-designed to: (i) develop effective demand for a wider range of certified seeds, as well as other key agricultural inputs such as agrochemicals and mechanized services; (ii) improve farmer access to seed and other agricultural inputs, services, and finances; (iii) improve markets for farmers for grain and seeds; and (iv) continue to encourage PSCs to contract for seed production from SGGs, but remove restrictions on the source of registered seed provided to farmers, or the marketing of seed purchased from the farmers by the PSCs.

III. MISSION TASKS

6. The mission shall produce the project completion report for the SDP drawing on all preceding preparatory surveys commissioned by the project and IFAD, observations in the field, and discussions with stakeholders. The mission shall assess and document overall project implementation performance and the results achieved. This process calls for an informed reflection on the relevance, effectiveness, efficiency and sustainability of project interventions covering all aspects of project management, community mobilization, natural resource management, rural finance and rural marketing. Attachment 1 includes a more detailed outline of the methodology and evaluation criteria to be applied.

7. **Mr. Abdelhamid Abdouli, Mission Leader**, will be responsible for the following tasks:

- Assess the relevance of project interventions at the time of project design and in today's context.
- Assess the effectiveness of project implementation, or the extent to which project objectives were met, and to document the immediate results and impacts of project interventions.
- Review the project costs and benefits and the efficiency of the overall project implementation process, including IFAD's and partners' performance
- Assess the prospects of sustainability of project benefits beyond project completion
- Generate and document useful lessons from implementation that will help improve IFAD's or Borrower's future programming and designs.
- Identify any potential for the replication or up-scaling of best project practices
- Draft a project completion report in line with IFAD guidelines.
- Undertake any other relevant task as agreed with the CPM.

8. **Ms. Dajana Grandic, Economic and Financial Analyst**, will be responsible for the following tasks: (24 April – 10 May 2018)

- Review the SDP costs and benefits and the efficiency of the overall SDP implementation process, including IFAD's and partners.
- Analyse the Project costs for the various activities and achievements.
- Identify the benefits generated by the Project for the direct and indirect targeted populations.
- Conduct the analysis of various data needed for the ex-post economic and financial analysis of the Project.
- Conduct the ex-post economic and financial analysis of the Project.
- Write an EFA annex of the Project
- Review the final PCR from the EFA perspective.

IV. DOCUMENTATION

9. The following documentation will be made available to consultants prior to commencing the assignment:

Supervision mission and follow up mission reports, reports on disbursement and status of funds, PCR sample report, and other relevant reports and materials.

V. IMPORTANT NOTE

10. IFAD will accept only reports that have been properly formatted by using the template, which will be provided separately. The team leader is responsible for preparing the main report and annexes in the required format, and ensuring that the working papers submitted by the individual team members are consolidated in one single document and in the correct format. She will compile the full report, including his own contributions and those of all the mission members into one consistent final and complete Report and submit it to IFAD on or before the agreed deadline.

Attachment 1 – Main performance assessment questions for SDP PCR

1. The project completion review team will seek to answer each of the following detailed questions, grouped according to the criteria to be used in the assessment. Obviously, the scope of coverage will depend upon the nature of the project and areas of performance assessment covered. So most project completion exercise will cover only a selected set of questions.

Project Performance

Project relevance

2. Broadly speaking, the mission will assess the extent to which project objectives were consistent with the priorities of the rural poor and their perception of their needs and potential; with the priorities and poverty alleviation policies and strategies of the country; and with IFAD's mandate and policies. More precisely, the mission will answer each of the following detailed questions:

- Did the project design focus on, and were its objectives consistent with, the needs and priorities of the rural poor? Was the design process participatory and did it take into account the needs, potential, livelihoods, asset bases and development opportunities of the rural poor at the time of project design? Are these characteristics, constraints and opportunities still the same today?
- Were the approaches promoted consistent vis-à-vis the socio-politico-economic conditions at the time of project design and vis-à-vis prevailing environmental and climate conditions? Were project objectives, approaches and activities consistent with IFAD's objectives of increasing the assets and incomes of poor rural households, and improving their food security?
- Were project objectives realistic and consistent with national development plans, poverty reduction strategies, agriculture and rural development strategies and other sectoral priorities? In particular, was the project design aligned with relevant policies? Are these documents still relevant today or were there important changes in the policy context?
- Were the project objectives consistent with IFAD's mandate, its *Strategic Framework* and with IFAD's country strategy as reflected in the COSOP? Were IFAD policy concerns (existing at the time of project's design or developed later during implementation) (as reflected in policies and strategies on targeting, innovation, rural finance, private sector etc.) adequately incorporated into project design?
- Did the Project Design Document include a well-defined, clearly articulated Log frame or Results' Framework? Were all identified activities and outputs consistent, and commensurate, for the attainment of proposed goal and objectives? Were external risks (or assumptions) clearly identified? Were the proposed indicators relevant and adequate to monitor project implementation and results?
- Were the initial implementation arrangements well defined and adequate to ensure a smooth, cost-efficient project implementation? Were there any major changes in these arrangements, and if so, were these changes appropriate and timely?
- Were there major changes in the external project environment (e.g. policies, socio-economic conditions, political changes, crisis, etc.) since the project was designed and implementation started? Were project objectives adjusted to reflect changing circumstances during implementation? Are initial (or revised) project objectives still valid?
- What were the main factors that contributed to a positive, or less positive, assessment of project relevance?

Project effectiveness

3. The mission will assess the extent to which the project's specific objectives were achieved in both quantitative and qualitative terms. This will involve the careful description of the main activities undertaken by the project since its start, as well as a thorough analysis of the results achieved at the

output, outcome and impact levels. Variations between initial and actual targets will be highlighted and the external factors that had a bearing on project effectiveness will be explained. More precisely, the mission will answer the following questions:

- Were all activities implemented as planned? If not, what were the reasons? Were all expected outputs achieved in quantitative and qualitative terms? Did they lead to the intended outcomes and were those properly measured and documented? Are there significant discrepancies between original targets and actual achievements, and if so, what are the reasons?
- Did the project achieve its objectives?
- Was project implementation well monitored? Are all results at all levels properly measured, quantified and documented? Is this information reliable?
- Did all results meet expected quality standards? If not, what were the problems?
- Were all results achieved within the original timeframe and budget?
- Did the project provide all expected benefits to all intended target groups? Do results and achievements adequately fulfil the needs of these intended target groups?
- What are the external factors that facilitated, or constrained, output delivery and the achievement of project objective?
- What factors in project design and implementation account the most for the estimated results in terms of effectiveness?

Project efficiency

4. The mission will assess how economically project inputs and resources (funds, expertise, time, etc.) were converted into results. This analysis will involve a review of the following aspects:

Resources' use:

- What were the main expenditure patterns? Were financial and budgetary resources spent as initially anticipated? Were there deviations from original cost estimates and, if so, what were the reasons? Was the budget significantly amended in the course of implementation?
- Were there timely and adequate financing contributions from all project financiers, including in-kind contributions from beneficiaries?
- For the resources spent, was the number (and quality) of outputs optimal? Could the project have produced more with the same resources, or the same results with less money? Could other approaches have produced results more efficiently in terms of costs, time and resources?

Quality of project management:

- How well did the PCU coordinate and manage project activities? Were implementation timetables adequately met? Was project management responsive to changes in the environment or the recommendations made during supervision missions of by the Project Steering Committee? Was the PCU adequately staffed with motivated staff members? How useful were the various project management tools (AWPB, Procurement Plan, M&E Plan) and the Management Information System (MIS) developed during implementation? Were these tools properly used by project management?
- Were there appropriate arrangements in place for sound financial management, flow of funds, financial record keeping and the timely preparation of financial reports? Were there any issues?
- How efficient was the project M&E or MIS systems in providing reliable, timely information on output delivery, outcomes and impact? Was M&E information adequately analysed and used by project management for planning and decision-making purposes?
- Was the Project Steering Committee useful and proactive to help resolve problems and guide project implementation?

Quality of IFAD supervision and implementation support (same guiding questions to be used for a cooperating institution if not supervised by IFAD):

- To what extent did the services and support provided by IFAD ensure a sound project design and an efficient project implementation? Did IFAD mobilize the adequate technical expertise and resources in project design and implementation?
- Did IFAD provide adequate support through direct supervision and/or country presence? Were supervision missions useful and timely? Did IFAD ensure pro-active problem identification, follow-up and resolution?
- How efficient was IFAD in handling loan administration, procurement reviews and AWPB reviews? Were there any delays in funds' transfers?
- Was IFAD proactively engaged in policy dialogue activities at different levels in order to ensure, inter alia, the replication and scaling-up of pro-poor innovations? Was IFAD active in creating effective partnerships?

Cost-benefits analysis:

- For each of the main project investments, what were: (a) the actual costs and value of inputs mobilized (*including capital costs, operation and maintenance costs, labor costs, taxes*); (b) the estimated economic benefits (*including revenues from sales, incomes, value of self-consumed production*); and (c) the estimated social benefits?
- What is the cost ratio of inputs to outputs and is it comparable to local, national or regional benchmarks? What are the loan costs per beneficiary? What are the mission's conclusions with regard to this costs-benefits analysis? What are the main internal or external factors that may have had a negative or positive impact on costs or benefits?
- Where available, how does the actual project internal rate of return (EIRR) compare with the estimated EIRR calculated during project design?

Sustainability

5. The mission will assess the likelihood that the benefits from project intervention will continue after project completion. It will also assess the likelihood that actual and anticipated results will be resilient to risks, including climate-related risks, beyond project life. The adequacy of the post-project strategy, as designed and/or implemented, will also be examined. More precisely, the mission will examine the following questions:

- Was an appropriate post-project strategy developed and implemented since project start-up?
- **Social sustainability (Empowerment):** Do project beneficiaries have the necessary capacities and skills, individually or collectively, to continue the approaches or manage the investments promoted by the project? Are these socially acceptable? Is there sufficient local ownership for these approaches or investments? Was there adequate beneficiary participation during project implementation? Is there interest and willingness, among concerned communities, to continue with promoted approaches or investments after project completion?
- **Economic and financial sustainability:** Do project investments generate sufficient cash flow and income to offset future investment and O&M costs? Are project investments economically and financially viable? If not, what are the constraints?
- **Technical sustainability:** Are the approaches promoted by the project viable from a technical point of view? Are spare parts for acquired or promoted machineries and equipment locally available? Do beneficiaries have the necessary technical capacities to operate and maintain the investments promoted by the project? Do they have access to adequate funds for operation and maintenance?
- **Institutional sustainability:** Are the institutions supported by the project self-sufficient and viable? Have operating capacities been created and/or reinforced in national and local partners? Are the new approaches or practices promoted by the project mainstreamed?

within normal government operations? Is there a clear indication of government commitment after the loan closing date in terms of follow-up actions, provision of O&M funds, etc.?

- **Environmental sustainability:** Are the approaches and investments promoted by the project environmental-friendly? Are they helping reduce the pressure on the natural resource base? Are they having any negative impact on the environment or the natural resource base? Did promoted techniques and approaches take into account climate change issues? Are they promoting adaptations to climate change? Can recurrent natural hazards endanger prospects of sustainability?
- **Climate change:** Are the agricultural approaches promoted by the project suitable in a context of a rapidly changing climate? How many changes in climatic conditions affect the sustainability of interventions in the long run? Which precursors are critical to achieve long-term impact?

Rural Poverty Impact

6. The impact of project interventions should be presented in quantitative and qualitative terms, using the standard IFAD's impact domain classification. The mission will examine in particular the following questions:

7. **Households' incomes and assets:** Did the project contribute to positive changes in households' assets? Did the composition of incomes change or was there a diversification in means of livelihood. Did the project improve ownership, or security of access, to land, water or productive resources? Were there positive changes in households' assets, and if so, what were the main changes? Was there an increase in households' financial assets?

8. **Human and social capital and empowerment:** Did the project influence the knowledge and skills of the rural poor? Did the rural communities gain access to better health, education facilities, safe water sources and other social facilities? Did the project enhance social capital and cohesion in the communities? Did rural people's organisations and grassroots institutions change? Did the project affect the capacity of the rural poor to influence decision making and access to institutions (social services, local development actors, national authorities) either on an individual or collective basis? Did the project affect social capital, social cohesion and the self-help capacity of rural communities?

9. **Food security:** Did the project improve food availability, whether self-produced or purchased, to ensure a minimum necessary intake for all households members? Do project beneficiaries have an improved and more regular access to enough or more nutritious food? Is there a reduction in the occurrence, or duration, of lean periods? Did children's nutritional status change (stunting, wasting and underweight status)? To what extent did the rural poor improve their access to input and output markets that could help them enhance their productivity and access to food? To what extent were the rural poor able to overcome market volatility or climate changes to ensure year-round food security?

10. **Agricultural productivity:** Did the project contribute to increase agricultural, livestock and fish productivity, as measured in terms of cropping intensity, yields and land productivity? Are there changes in the levels of local production and crop diversification? Are farmers applying improved or more sustainable farming practices? Did the project ensure that smallholders benefited from increased agricultural production and were enabled to manage market fluctuations and changes in climatic or natural resources conditions?

11. **Institutions and policies:** Are there changes in the capacities of the various grassroots organizations supported during project implementation (such as Rural Producers' Groups, Interest Groups or Users' Associations)? Are there changes in the institutional capacities of the main institutions involved in project implementation? Are there changes in the quality or range of services delivered for the rural poor? Are there changes in local governance or in the behaviours of local institutions? Are there changes in the policy or institutional framework as a result of project-led policy dialogue activities (e.g. changes in the laws, statutes, rules, regulations, procedures, national quality standards or norms)?

Additional Evaluation Criteria

12. **Gender equity and women empowerment:** Did the project generate changes in gender roles or gender relations? Are there changes in women status at the community level (participation

in local elections or decision-making processes, representation in rural producers' groups), at the household level (workload, nutrition status, women influence on decision-making) or the community level)? What is the impact of capacity-building activities on individual women or on Women Groups? Are there changes in the institutional or legal framework that were made in favour of women as a result of project policy dialogue activities?

13. **Access to markets:** Are there changes in farmers' physical access to markets (e.g. availability of roads and marketing outlets), in their access to market prices and information or in their bargaining power with traders? Did the project have an impact on the timely access to quality agricultural inputs (fertilizers, vaccines, seeds) and on the capacities of Producers/Marketing Groups?

14. **Innovation.** The mission will assess the extent to which project interventions have introduced and tested innovative approaches to rural poverty reduction. These are any processes, tools or practices that add value or solve a problem in new ways. More precisely, the mission will answer the following questions:

- Was the project designed specifically to test or lead to innovation, for example by piloting new concepts or technologies? Did the project test and introduce innovative ideas in the project target area? What are the characteristics of these innovations? Are these consistent with the IFAD definition of the concept? How did the innovation originate and was it adapted in any particular way during project design? Are these approaches truly innovative with regard to the local or national contexts?
- Were these innovative approaches carefully monitored and documented? Were these innovations discussed with the Government or other actors? Were these innovative approaches successful? Did these innovations address relevant needs of the rural poor and are these viable?
- Were these innovations adopted by the rural poor, local implementation partners, government entities or any other actors?

15. **Potential for Scaling up:** The mission will assess the extent to which some approaches, technologies or innovative features pilot-tested or successfully implemented by the project are likely to be up-scaled. It will also assess the likelihood that some project approaches may be replicated in other geographical areas. More precisely, the mission will examine the following aspects:

- How likely is it that the project - or some of its activities, approaches or innovative technologies - may be replicated in other localities or at the national level by the Government or other donors? Has any component or activity of the project already been replicated beyond the target area or target group?
- How proactive was project management, or other stakeholders, in discussing future up-scaling with the Government or other development partners? What are the prospects or obstacles?

16. **Environment and natural resource management:** Were the approaches to environment preservation and natural resources management appropriate to local circumstances and were they effective in addressing local problems? Are there positive or negative changes in the natural resources base (forests, marine/fisheries resources, pastureland, water resources) that may be attributable to project interventions? Did the project have positive or negative changes – intended or unintended - on the environment? Did it contribute to the protection or rehabilitation of natural and common property resources (land, water, forests and pastures)? Has the degree of environmental vulnerability changed?

17. **Adaptation to climate change:** Were the approaches for climate change adaptation promoted by the project appropriate to local circumstances and were they effective? Did the project manage to empower rural communities to cope with, mitigate or prevent the effects of climate change and natural disasters? Are farming communities more resilient to such disasters and are farming practices better adapted to climate change? Were the coping capacities of vulnerable natural systems restored?

18. Targeting and outreach: The mission will assess the extent to which project interventions have reached the intended target groups, that is the specific individuals or organizations for whose benefit specific interventions were initially designed and implemented. The mission will also assess the effectiveness of the project targeting strategy. More precisely, the mission will examine the following aspects:

- Did the project reach out to the expected number of beneficiaries in the manner intended? Did the project provide all anticipated benefits to the specific socio-economic groups identified in the Project Design Document? Were there deviations from initial outreach targets and if so, what were the reasons?
- Was outreach properly monitored in both quantitative (e.g. number of direct and indirect beneficiaries) and qualitative terms (e.g. beneficiaries' socio-economic profile)?
- Did the project implement a sound targeting strategy? Did the project regularly analyze the needs, potentials and priorities of intended target groups and the poverty dynamics in the project target area and developed specific outreach strategies accordingly?
- Were there measures taken to ensure that the poor and vulnerable groups would not be excluded from project implementation and would benefit from it; and that the non-poor would not capture project benefits?
- Did the project implement gender-sensitive implementation approaches? Did the project ensure equal participation of men and women in implementation? Were there specific measures undertaken in order to promote women participation in project activities? Did the project's M&E system track gender-disaggregated data?

Partners Performance

Performance of implementation partners

19. The mission will assess the performance of IFAD and the government. These are the organizations or entities directly responsible for project implementation, for providing strategic guidance and oversight. More precisely, and in addition to determining if all implementation partners have adequately fulfilled their respective roles and responsibilities, the mission will examine the following points:

- Central Government agencies: Did the Executing Agency and Implementing Agency comply with the covenants of the loan agreement and the provisions of the Project Design Document? Were they proactive in supporting project implementation and identifying solutions to problems? Was the Project Steering Committee fulfilling its role adequately?
- IFAD: The rating measures the overall IFAD's performance while designing the project, supervising project implementation and providing implementation support. It also examines IFAD's performance for loan administration, procurement reviews, administering the project Grant/Loan Agreement or managing the MTR and/or PCR processes. It assesses the extent to which IFAD has mobilized adequate technical expertise and resources to support implementation effectively and if it has ensured pro-active problem identification and resolution.

Lessons learned

20. The mission will present the main lessons learned from project implementation, based on the analysis of what learning from experience may be applicable to a more generic situation. In so doing, the mission will refrain from exposing platitudes, keeping in mind the following definition of a lesson learned: *"knowledge or understandings gained by experience which may be positive, as in a successful experiment, or negative, as in a mishap or failure"*.

21. All lessons learnt presented should be significant in that they have a real or assumed impact on operations; valid in that they are factually and technically correct; and applicable in that they identify a specific design, process, or decision that reduces or eliminates the potential for failures and mishaps, or reinforces a positive result.

22. In order to identify these lessons learned, the mission may examine the following questions:

- What specific knowledge or lessons can we derive from project implementation that may be used in the future in similar, or different, contexts?
- What were the project strengths and its main weaknesses? What were the main opportunities, or threats, in the environment that have facilitated, or constrained, project implementation?
- With the benefits of hindsight, what are the things that should have been done differently? What are the specific dimensions of the project design that one should never repeat again in similar contexts or circumstances?
- What are the specific aspects of project implementation that will be worthwhile replicating in future interventions in the country, or elsewhere, because they were particularly interesting or successful? In the external context, what will be the important conditions required for similar interventions to lead to similar results elsewhere or in the future?

Appendix 2: List of persons met and mission's programme

1. Khartoum level

- Dr Omer Hajjam, Director of International Cooperation, Ministry of Finance and Economic Planning,
- Mr. Salah Ankoush, Finance Officer, Ministry of Finance and Economic Planning,
- Mrs Fawzia Beshara, Senior Officer, International Cooperation Department, Ministry of Finance and Economic Planning
- Mr. Youssef Abdelghani, External Financing Division, Ministry of Finance and Economic Planning
- Dr Nabil Ahmed Saad, Deputy Minister a.i. Ministry of Agriculture and Forestry
- Dr Ikbal Hassan, Director International Relations Department, Ministry of Agriculture and Forestry
- Mrs Dawaher Ibrahim Ahmed, Focal Point of SDP Project, Ministry of Agriculture and Forestry
- Mr. Alaa Hussein, Project Officer, Ministry of Agriculture and Forestry
- Dr Omaira Mohamed Abdelgadir, FSA, Ministry of Agriculture and Forestry
- Dr Adel Abdelwahab Tahar, Director, Legal Department, Ministry of Agriculture and Forestry
- Ms Rachida Al Mirghani, Legal Officer, Ministry of Agriculture and Forestry

2. PCU, NK, SK level

Name	Title / post
Tarig Amin Abulbasher	Senior M&E at PCU
Nawal Adam Bakhiet	M&E Officer SK
Attika Mohammed Elamin	Women Development Officer at PCU
Mohammed Yousif	Principal Programme Coordinator PCU
Eltag Mohamed Hussein	Project State coordinator NK
Ahmed Chafi Mohamed Salem Musa Eldaw	Project State coordinator SK
Mubark Ahmed Musa	Extension Team leader, Sheikhan, NK
Thani Mohammed Hasan	Extension Team member, Sheikhan, NK
Batool Abdelbagi	Extension Team member, Sheikhan, NK
Osama Abdalla	Extension Team member, Sheikhan, NK
Safa Mansour Elnour	Extension Team member, Abbasiya, SK
Alsanousi Hussein	Extension Team leader, Abbasiya, SK
Nassereldien Mohammed Dafalla	Extension member, NK
Mayassa Hassan Eisa	Extension member, NK
Hawida Mohammed Gabralla	Extension member NK
Alhadi Altahier Gamaleldeen	Extension member, SK
Hamida Khater Daloom	Extension member, SK
Ishag Alnour Moh	Extension member, SK
Dr Al Gailani Adam Abdallah	Director, ARC El Obeid Office
Dr Tarig E. Ahmed	Senior Research Officer , ARC El Obeid Office
Dr. Hayat Abdolrahman	Senior Research Officer, ARC El Obeid Office
Mr. Ibrahim Ahmed	Director, ASSCO El Obeid

Mission Programme:

Mission members except Financial Analyst

Date	Agenda	From	To	Venue
Wed 18 th Apr	Arrival to Khartoum			
Thu 19 th Apr	Meeting with Federal Ministry of Agriculture and Forestry	11:00 am	11:45 am	Office of Directorate of International Cooperation, FMoAF
	Meeting with Federal Ministry of Finance and National Planning	12:00 pm	12:45 pm	Office of Directorate of Foreign Finance, FMoFNP
Fri 20 th Apr	Travel to El Obeid			
Sat 21 st Apr	Orientation meeting with the PCU, NK and SK SCUs	9:00 am	1:00 pm	PCU meeting room at El Obeid
Sun 22 nd Apr	Visit Abu Umsaadain (Seed Grower Group) NK	7:00 am	10:00 am	Abu Umsaadain community
	Visit to Elnabagaya cluster of villages (Grain producers) NK	1:00 pm	4:30 pm	Sheikan communities
Mon 23 rd Apr	Visit to Gumboraya (Grain producer group) SK	6:00 am	12:00 pm	El Abbassiya communities
	Visit Tofein Seed growers group SK	1:00 pm	3:00 pm	El Abbassiya
Tue 24 th Apr	Meeting with ASSCO NK	9:00 am	10:00 am	ASSCO Office
	Meeting with ARC NK	11:00 am	12: pm	ARC Office
	Wrap up meeting at field level with the PCU and SCUs	1:30 pm	3:30 pm	PCU meeting room at El Obeid
Wed 25 th Apr	Travel back to Khartoum	1:00 pm	4:00 pm	
Thu 26 th Apr	Meetings with FMoAF and FMoFEP and CCU			
Fri 27 th Apr	Travel back home			

Financial Analyst

24 April	Travel from home base to Khartoum
25 April	Debriefing meeting with Team Leader in Khartoum
26 April morning	Travel to El Obeid
26 April afternoon	Meeting with PCU and relevant counterparts
27 April-1 May	Field work and stakeholder workshop
2 May	Travel to Khartoum
3 May	Departure to home base and report writing

Appendix 3: PCR rating matrix

PROJECT NAME: Seed Development Project	
PROJECT ID: 1100001612	
BOARD APPROVAL DATE: 13 Dec 2011	
ENTRY INTO FORCE: 24 Feb 2012	
PROJECT COMPLETION DATE: 31 March 2018	
LOAN CLOSING DATE: 30 Sep 2018	
IFAD DSF GRANT (USD MILLION): 10.07	
TOTAL PROJECT FINANCING: 17.46	
IMPLEMENTING AGENCY: Ministry of Agriculture	
Criterion	PCR Rating
Project Performance	
– Relevance	4
– Effectiveness	5
– Efficiency	5
– Sustainability	5
Rural poverty impact	
– Households' incomes and assets	5
– Human and social capital and empowerment	5
– Food security	5
– Agricultural productivity	5
– Institutions and policies	4
– Overall rural poverty impact	5
Additional evaluation criteria	
– Gender equity and women's empowerment	4
– Access to markets	5
– Innovation	4
– Potential for scaling up	5
– Environment and natural resource management	5
– Adaptation to climate change	5
– Targeting and outreach	5
Partners performance	
– IFAD's performance	5
– Government performance	5
Overall project achievement:	5

Appendix 4: Project logical framework

Narrative Summary	Verifiable Indicators	Means of Verification	Assumptions
COSOP Goal			
Food security, incomes and resilience to shocks of the smallholder producers (including youth and women) in rainfed areas of North and South Kordofan improved.	<ul style="list-style-type: none"> Prevalence of malnutrition in children under age of five years reduced: rate reduced from 3% to 2% (RIMS) 	<ul style="list-style-type: none"> RIMS baseline survey and impact survey 	<ul style="list-style-type: none"> Macro-economic stability
	<ul style="list-style-type: none"> Improved food security: food insecurity reduced from 55% to 40%.(RIMS) 	<ul style="list-style-type: none"> Anthropometric and UNICEF periodic surveys 	<ul style="list-style-type: none"> Contained insecurity events
	<ul style="list-style-type: none"> Increase in HH asset index: production 5 fed in qoz soils, 3 fed in gardud soils and 10 fed in clay soils doubles. 	<ul style="list-style-type: none"> Official government statistical yearbooks; censuses 	
		<ul style="list-style-type: none"> HH income and expenditure surveys 	
Development Objective			
Increased crop productivity for 69,000 smallholders using certified and improved seeds in North and South Kordofan	<ul style="list-style-type: none"> 100% increase in the yields for 75% of GPG members applying the full package of agricultural practices recommended by project, as compared to the baseline: NK: Sorghum 155 kg/fd Millet 125 kg/fd Sesame 204 kg/fd Groundnut 171 kg/fd SK: Sorghum 313 kg/fd Millet 147 kg/fd Sesame 349 kg/fd Groundnut 188 kg/fd 	<ul style="list-style-type: none"> Baseline survey, Mid Term Review (MTR) and completion assessments 	<ul style="list-style-type: none"> Expanding access to input suppliers, extension advisory services, credit and insurance
	<ul style="list-style-type: none"> 45,000 smallholder men and 19,000 smallholder women reporting increase in yields for all crops disaggregated by gender (RIMS) 	<ul style="list-style-type: none"> Ministry of Agriculture crop cutting surveys and annual crop assessment Agricultural Research Corporation (ARC) and National Seed Administration (NSA) reports 	
Component 1 – Strengthening and Development of Institutional and Regulatory Environment			
Outcome: Conducive policy and institutional environment for the seed	<ul style="list-style-type: none"> By laws of Seed Act 2010 in place by mid-2012 and fully enforced by 2012 	<ul style="list-style-type: none"> Client survey 	<ul style="list-style-type: none"> NSA operates in an autonomous way

Narrative Summary	Verifiable Indicators	Means of Verification	Assumptions
industry in place			
	<ul style="list-style-type: none"> Operational self-sufficiency for FSA by 2014 (RIMS) 	<ul style="list-style-type: none"> Institutional performance assessment Record on law enforcement 	<ul style="list-style-type: none"> Gvt phases out distribution of free or subsidized seeds Seed policy for the UN agencies operating in Sudan is harmonized
Outputs			
1.1 Plant variety protection legislation drafted, approved and enforced.	<ul style="list-style-type: none"> PVP legislation promulgated by end 2012. 	<ul style="list-style-type: none"> Legislation document 	<ul style="list-style-type: none"> Seed Council is timely appointed by the Government (target date: end 2011).
1.2 Federal Seed Administration (FSA) is capacitated to effectively monitor the multiplication and certification standards.	<ul style="list-style-type: none"> 70 FSA staff and extension agents trained (RIMS), 30% women 1 central laboratory at the Federal level accredited to the International Seed Testing Association (ISTA) standards by 2014 2 laboratories established and equipped in North and South Kordofan States. 	<ul style="list-style-type: none"> National Seed Administration activity report on number of seed crop fields certified per year, number of seed samples tested per year, no. staff trained per year 	
1.3 Multi-stakeholder policy dialogue, with participation from youth and women in seed sector is established.	<ul style="list-style-type: none"> Bi-annual forums convened regularly from 2012 at National and State levels. At least 50 persons attend each multi-stakeholder forum 	<ul style="list-style-type: none"> National seed policy document Proceedings of bi-annual meetings 	
Component 2 -Improvement of the Seed Production System			
Outcome: An economically viable seed production system that meets farmers' expectations and demands in place	<ul style="list-style-type: none"> 8 SGG operational in 2014; 12 SGGs operational in 2017 4 medium-sized farmers operational in 2017 Cash returns per seed growing HH reach SDG1700/HH/yr in 2014 and SDG 2800/HH/yr in 2017 	<ul style="list-style-type: none"> Surveys at MTR and completion 	
Outputs			

Narrative Summary	Verifiable Indicators	Means of Verification	Assumptions
2.1 ARC capacitated for implementation of participatory breeding research	<ul style="list-style-type: none"> Appropriate sorghum seed variety and cultivation practices for gardud soils tested and ready for dissemination by 2014 At least 1 new variety of millet in NK, and sesame for NK and SK Number of participatory research committees in place for ARC stations in El Obeid and Kadugli 	<ul style="list-style-type: none"> ARC reports on number of varieties released per year and maintenance record of released varieties 	<ul style="list-style-type: none"> Procedures for ARC-ASARECA collaboration timely implemented
2.2 High quality and sufficient quantity of breeder / foundation/registered seeds produced by Agricultural Research Corporation (ARC).	<ul style="list-style-type: none"> Production of 23 MT of registered seeds in 2012, 90 MT of registered seeds produced for 2013 and 2014 	<ul style="list-style-type: none"> ARC activity report on breeder/foundation/registered seed production statistics for the two States; frequency of varietal replacement in the national varietal catalogue; record of national seed standards in project years 	<ul style="list-style-type: none"> ARC adequately equipped to produce sufficient quantities of breeder & foundation/registered seed
2.3 The extension system is strengthened to support target seed producer enterprises.	<ul style="list-style-type: none"> 30 men and 15 women extension agents trained on seed production and marketing one operational/field manual developed and distributed to 12 seed grower groups 	<ul style="list-style-type: none"> Project monitoring reports 	<ul style="list-style-type: none"> Sufficient human resources for two 4 member team mobilized
2.4 Seed growers are enabled to produce certified seeds of improved and traditional varieties.	<ul style="list-style-type: none"> 400 MT of certified seeds produced by 2017 100 women and 220 men accessing advisory services for seed production by 2017 (RIMS) 	<ul style="list-style-type: none"> Baseline survey, MTR and completion assessments Project monitoring reports on quantity and quality of seed produced by groups in project years 	<ul style="list-style-type: none"> SGG and seed companies adhere to respective contractual obligations
Component 3 -Support Seed Market Development			
Outcome: Improved seed supply system with improved market delivery mechanisms in place.	<ul style="list-style-type: none"> 483,000 feddan cultivated with certified and/or improved seeds in the project area in 2017 (RIMS) 15,000 farmers use certified and/or improved seeds and SWC by 2017; 30% women (RIMS) 	<ul style="list-style-type: none"> Baseline survey, MTR and completion assessments 	<ul style="list-style-type: none"> Seed companies able to mobilize SDG 6 million for scaling up phase

Narrative Summary	Verifiable Indicators	Means of Verification	Assumptions
Outputs			
3.1 Marketing of certified seeds to smallholder producers established	<ul style="list-style-type: none"> Number of farmers reached through the PSC marketing: 10,500 in 2014 and 69,000 in 2017; with 30% women 	<ul style="list-style-type: none"> Client survey for farmers 	
3.2 Farmers empowered to use certified and improved seeds and improved techniques.	<ul style="list-style-type: none"> Demand for certified and improved seeds reaches at least 483,000 feddan at the end of 2017 	<ul style="list-style-type: none"> Baseline survey, MTR and completion assessments 	<ul style="list-style-type: none"> Farmers access to credit and insurance facilitate purchase of certified seeds
3.3 Increased access of farmers/ grain producers to credit and microfinance	<ul style="list-style-type: none"> ABSUMI branch operational in Sheikan in 2012; and ABSUMI branches operational in Abu Gibeiha and El Rahad by 2017) 	<ul style="list-style-type: none"> Records from Bara'ah, ABSUMI, ABS and other banks 	<ul style="list-style-type: none"> MoU signed between PCU and banks/ MFI to facilitate access of farmers/grain producers to micro-credit SDG 500-600/ loan
	<ul style="list-style-type: none"> At least 7,200 production loans disbursed in 2017 	<ul style="list-style-type: none"> Records from Sheikan Insurance Co. ABSUMI records 	

Appendix 5: Dates of supervision and follow-up missions

Activity name	Actual start	Actual end
Impl. Sup/Follow Up Mission	03-Oct-12	20-Oct-12
Supervision Mission	01-Sep-13	20-Sep-13
Impl. Sup/Follow Up Mission	15-Feb-14	01-Mar-14
Mid-Term Review	18-Sep-14	29-Sep-14
Impl. Sup/Follow Up Mission	15-Feb-15	03-Mar-15
Impl. Sup/Follow Up Mission	27-Jul-15	14-Aug-15
Supervision Mission	06-Dec-15	22-Dec-15
Impl. Sup/Follow Up Mission	16-Apr-16	27-Apr-16
Supervision Mission	19-Sep-16	11-Oct-16
Impl. Sup/Follow Up Mission	18-Feb-17	03-Mar-17
Supervision Mission	25-Sep-17	11-Oct-17

Appendix 6: Summary of amendments to the loan agreement

1. Following MTR recommendations and supervision confirmation, the Financing Agreement was amended in February 2017.
2. Among the adjustments to the IFAD grant proceeds:
 - (a) The budget category "Fund" was reduced by 78% due to the discontinuation of the grant programme to private sector companies.
 - (b) The Contractual services category was increased by 56% to cover increases in knowledge management Category VIII: Recurrent Costs: At the time of entry into force of the Financing Agreement, the cost of staff salaries in the amount of SDR 820 000 had by design been allocated to the category V (b) National Technical Assistance, so that the total amount of this category amounted to SDR 1,100,000. For the sake of clarity and pursuant to an IFAD/FMD recommendation, such amount should be reallocated to category VIII Recurrent cost. Accordingly, the category Recurrent Cost was increased from SDR 630,000 to SDR 1,450,000 due to moving the salary of the PCU from the NTA category to this category pursuant to FMD's recommendation not to include salary under any other category but recurrent cost.
 - (c) In addition, the project area was expanded to the localities of Um Ruwaba in North Kordofan, and Rashad in South Kordofan. Such expansion is necessary in order to achieve the maximum outreach and impact under the project.
 - (d) The project outreach was corrected to read 69,000 instead of 108,000 farmers.

Appendix 7: Actual Project costs

Description	IFAD	GoS	IFAD	GoS
	SDG		USD	
Investment Cost				
Civil Works	1 620 431	1 979	248 649	1 183
Fund	606 519	-	97 361	-
Vehicles	4 109 685	-	1 626 968	-
Equipment	13 480 791	450	1 244 376	27
Technical Assistance (International)	1 435 751	-	163 196	-
Technical Assistance (National)	4 958 076	-	568 615	-
Training	18 797 838	107 558	1 925 993	2 076
Contracted Services	3 521 531	66 899	366 176	2 519
Growers/producer Group	-	-		-
Government Contribution	-	31 101		2 299
Total Investment Cost	48 530 623	207 986	6 241 334	8 105
Recurrent Cost	-	-		
Direct Project Recurrent Costs	18 677 839	734 389	1 714 288	87 676
Salaries and Allowances	3 220 102	2 692 814	522 706	275 824
Operations and Maintenance	71 840	1 448 379	8 973	125 308
Vehicle O&M	137 714	103 535	82 337	9 747
Total Recurrent Cost	22 107 495	4 979 117	2 328 304	498 555
Total costs	70 638 117	5 187 104	8 569 638	506 660
Grand Total	75 825 221		9 076 298	

Appendix 8: Physical progress table

Activity	Unit	Project Target	Cumulative achievement	Achievement %
Component I: Institutional and Regulatory Environment Strengthening and Development				
A. Federal Level				
1. Infrastructure				
Refurbishment of Central Laboratory	No	1	1	100
2. Technical Assistance				
Plant variety protection legal expert (IC)	Person/month	2	-	
Plant breeding strategy developed (IC)	Person/month	2	-	-
Seed Policy Consultant (IC)	Person/month	2	2	100
Support Annual Forum (International Consultant)	Person/month	1	-	-
Plant breeding strategy developed (National Consultant)	Person/month	3	-	-
Seed Policy Development (National Consultant)	Person/month	3	3	100
Development of FSA lab manual (national Consultant)	Person/month	4	1	25
3. Training				
Crop seed technology course for developing countries	Trainee	2	2	100
Protection of new plant varieties, breeders' rights	Trainee	2	-	-
PVP Legislation Consultative Workshop	Workshop	1	1	100
PVP training for breeders and NSA staff	Workshop	1	1	100
Seed Health Testing Course	Trainee	2	1	50
ISTA laboratory quality assurance	Trainee	2	3	150
Train SA staff - inspectors and seed analysts	Workshop	6	3	50
Training of Trainers on Seed Technology	Trainee	2	2	100
Computer training & specialized software	Course	1	1	100
Facilitate the convening of a national bi-annual forum	Forum	12	2	17

Activity	Unit	Project Target	Cumulative achievement	Achievement %
PVP Legislation Consultative Workshop	Workshop	1	1	100
Annual subscription – ISTA	Per annum	6	4	67
Participation in international Fora and ISTA workshops	Participant	6	8	133
National Forum	Forum	5	3	60
Training on seed diseases for 3 seed administration staff-Internal	Course	1	1	100
Training on seed laboratory test for FSA and SSA in Egypt-External	Course	1	1	100
Training on fields inspection in Egypt for FSA and SSA-External	course	1	1	100
Workshop on seed sampling -External	Workshop	1	1	100
Workshop on seed health -External	Workshop	1	1	100
Workshop on variety verification -External	Workshop	1	1	100
Workshop on seed vigour -External	Workshop	1	1	100
Training on variety verification -External	Course	1	1	100
Training on Field inspection -ICARDA-External	Course	1	1	100
Training on Laboratory tests-ICARDA-External	course	1	1	100
Thematic seminars, and workshops	per annum	24	14	58
B. State Level (North and South Kordofan)				
1. Infrastructure				
Rehabilitate offices and staff accommodation	No.	3	3	100
2. Training				
Seed health testing	course	3	3	100
Tetrazolium test	course	2	1	50
Seed pathology	Course	3	3	100
Seed processing	Course	2	2	100
Seed Technology	Course	3	3	100
Traditional seed testing	Course	2	2	100
Training of NSA staff out posted to state level - laboratory staff	Course	2	2	100
Training of State Seed Unit staff – Internal	Course	2	3	150

Activity	Unit	Project Target	Cumulative achievement	Achievement %
Facilitate the convening of a state forum	Forum	6	1	17
Training in Laboratory Test-External	Course	1	1	100
Training in field inspection-External	Course	1	1	100
Component one average achievement				
Component II: Improvement of the Seed Production System				
A. State Level (North and South Kordofan)				
1. Infrastructure				
Renovate breeders' seed storage at ARC	No.	2	2	100
2. Training & Capacity Building				
2.1 Capacity building of ARC staff				
Crop Breeding - External (ARC)	Course	1	1	100
Water harvesting techniques - External (ARC)	Course	1	1	100
Participatory research - External (ARC)	Course	1	3	300
Participatory research committees formed	No.	16	40	250
Participatory research on-farms implemented	No.	60	104	173
2.2 Capacity building of Extension Teams staff				
Extension Staff - External training	Trainee	45	45	100
Gender mainstreaming in agriculture	Course	2	2	100
Seed production and marketing practices – Internal	Course	2	2	100
Best practices in M&E and impact assessment - Internal	Course	2	2	100
Farming as a business – Internal	Course	2	2	100
2.3 Capacity building of farmers groups				
Farming as a business – Internal	course	4	4	100
Training of village-based extension staff – Internal	course	6	6	100
Information campaigns, awareness raising, media campaign, Gender sensitization	per annum	12	6	50
National Exchange visits on successful experiences	tour	3	2	67
Training Women farmers in decision making and leadership	workshop	2	2	100

Activity	Unit	Project Target	Cumulative achievement	Achievement %
Workshop for leaders of seed producer groups	Workshop	2	2	100
Number of SGGs formed	No.	17	17	100
Farmers accessing advisory services for seed production (Men)	No.	900	862	97
Farmers accessing advisory services for seed production (Women)	No.	380	369	110
Quantity of certified seeds produced by SGGs	MT	2 500	412	16
No. of farmers received insurance services	No.	1 280	415	32
Total funds disbursed by IFAD for crop insurance	SDG '000	529	62	12
Total funds disbursed by GoS for crop insurance	SDG '000	694	62	9
Total funds disbursed by Farmers for crop insurance	SDG '000	165	-	-
C. Project Facilitation				
1. Technical Assistance				
Participatory Research expert (IC)	Person month	2	2	100
Training need assessment for extension (NC)	Person/month	5	5	100
Quantity of registered seed produced by ARC	MT	134	9	6
Component III: Seed Market Development Support				
A. Project Facilitation				
1. Technical Assistance				
Crop Value chain study and PPP (IC)	lump sum	2	2	100
Rural Finance Expert (IC)	lump sum	2	2	100
Crop Value chain study (NCT)	lump sum	1	1	100
PPP Consultant (NC)	Person/month	7	7	100
Seed information system/database established (PCU level)	lump sum	1	-	-
Maintenance and updating of MIS (ABSUMI)	lump sum	1	-	-
2. Training		-	-	
Seed marketing network training	Course	2	-	-
B. State Level (NK and SK)		-	-	
1. Training & capacity building		-	-	

Activity	Unit	Project Target	Cumulative achievement	Achievement %
Training of grain producers in agricultural planning by extension teams	campaigns	6	6	100
Harvest day	number	8	8	100
Training of extension officers in Microfinance – Internal	course	4	4	100
Formation of Grain Producers Groups (GPGs)	No.	83	83	100
farmers in GPGs provided with certified seeds (men)	No.	14 000	8 503	60
Farmers in GPGs provided with certified seeds (women)	No.	6 000	2 487	41
Area cultivated with certified/improved seeds	000' fed	483 000	453 000	94
Farmers in GPGs accessing Micro-finance services (men)	No.	14 000	6 240	45
Farmers in GPGs accessing Micro-finance services (women)	No.	6 000	3 000	50
Training of contact farmers	Trainee	400	456	114
Field demonstration plots	No.	90	90	100
Field days	No.	1 200	317	26
Formation and development of savings and credit groups	group	600	395	66
Formation and development of Community investment committee	association	200	5	3
Internal exchange visits (VSCGs)	Visit	6	-	-
Documentation of success stories and best practice (VSCGs)	practice	6	6	100
Training of community trainers	person	600	-	0.33
Training of farmers on FAAB	Person	-	1 413	
Training on agric. Machinery operation	Person	-	99	
Training of BDA	Person	-	-	
Training of agents on SSP	Person	-	90	
Assessment for selection of full intervention communities	Assessment	-	2	
Assessment of VSCG	assessment	3	2	67
Exposure visit to SCG experience outside Sudan (ABSUMI & Bara'ah)	person	16	24	150
Component IV: Project Coordination and Management				
1. Technical Assistance				

Activity	Unit	Project Target	Cumulative achievement	Achievement %
Develop KM Strategy	Person/month	2	-	
Update Project M&E System Design	Person/month	2	-	
Development of computerized accounting system	Person/month	15	10	67
Technical and thematic studies	Person/month	10	9	90
2. Contracted services		-	-	
Baseline study	Survey	1	1	100
RIMS Baseline Survey	Study	1	1	100
Mid-term Review	Mission	1	1	100
Annual Audit	Annual	6	4	67
3. Training		-	-	
Training for PCU & FP staff (External)	Person	15	11	73
Training for PCU staff (Internal)	Person	10	10	100
Annual Project Assessment	Per annum	6	5	83
Conduct Annual Review and Planning Workshops	Per annum	6	3	50

Appendix 9: RIMS Data

Indicators				Project Yr 6 (2017)			
Name	Baseline	Mid-Term	End Target	Year Targets	Year Results	Cumulative	Cumulative Results % (2017)
Communities receiving project services							
Community - Number			200			105	52.5
1.b Estimated corresponding total number of households members							
Household members - Number of people			140 000	49 000	46 900	120 400	86
1.a Corresponding number of households reached							
Non-women-headed households - Number							
Women-headed households - Number							
Households - Number			20 000	7 000	6 700	17 200	86
1 Persons receiving services promoted or supported by the project							
Males - Number			36 000	20 000	12 295	36 746	102
Females - Number			33 000	25 000	2 618	15 748	48
Young - Number							
Total number of persons receiving services - Number of people			69 000	45 000	14 913	52 494	76
Smallholder farmers reporting increase in yields for all crops							
Males - Number			48 300	25 000	36 746	36 746	76
Females - Number			20 700	10 000	15 748	15 748	76
Government Officials and staff trained - FSA							
Males - Number			45	4	4	33	73
Females - Number			25	5	5	20	80
Other productive infrastructure constructed/rehabilitated - seed lab							
lab - Number			3	0	0	3	100
Multi-stakeholder forums organized at national & state levels							
Forum - Number			10	2	1	3	30
Persons attended multi-stakeholder forums organized at national & state levels							
Males - Number			260	30	40	102	39
Females - Number			240	20	10	45	19
Tonnes of registered seeds produced							
MT - Number		23	90	2	1	8	9
Certified seeds produced							
Seeds - Weight (t)			400	400	152	727	182
Hectares of land - Area (ha)				3 500	4 721	7 551	
1.1.4 Persons trained in production practices and/or technologies							
Men trained in crop - Number			220	100	89	563	256
Women trained in crop - Number			100	50	51	337	337
Total persons trained in crop - Number of people			320	150	140	900	281
People accessing facilitated advisory services							
Males - Number			48 300	25 000	18 370	32 967	68
Females - Number			20 700	8 000	7 450	14 979	72
People in agricultural/ livestock production groups formed/ strengthened							
Males - Number			336	150	134	511	152
Females - Number			144	100	89	310	215
Extension agents trained on seed production & marketing							
Males - Number			30	25	19	19	63
Females - Number			15	15	13	13	87
Operational/field manual developed and distributed							
Manual - Number			1	1	1	1	100
Staff of service providers trained - research							
Males - Number			100	0	0	168	168
Females - Number			50	0	0	77	154
Farmers using certified and/or improved seeds							
Males - Number			15 000	15 000	13 745	13 746	92
Females - Number			4 500	10 000	7 080	7 080	157
Farmers reached through PSC marketing							
Males - Number		10 500	69 000	25 000	19 716	19 716	29
Females - Number		3 150	20 700	15 000	10 891	10 891	53
Marketing groups formed/strengthened- crops (GPGs)							
Group - Number			200	105	85	327	164
People in marketing groups formed/strengthened- crops							
Males - Number			12 000	3 360	2 975	10 626	89
Females - Number			8 000	1 470	1 275	4 599	57

Indicators				Project Yr 6 (2017)			Cumulative Results % (2017)
Name	Baseline	Mid-Term	End Target	Year Targets	Year Results	Cumulative	
Marketing groups with women in leadership positions							
Females - Number			100	30	25	76	76
People trained in post-production, processing and marketing							
Males - Number			5 000	1 000	977	4 468	89
Females - Number			3 000	2 000	1 679	3 417	114
Land under improved management practices							
Hectares of land - Area (ha)			202 860	20 500	23 460	644 710	318
Demand for certified and improved seeds							
Tonne - Weight (t)		300	2 200				0
Saving and credit groups formed/strengthened							
Group - Number			200	100	67	206	103
People in saving and credit groups formed/strengthened							
Males - Number			1 000	400	131	985	99
Females - Number			3 000	1 600	1 015	2 569	86
1.1.6 Financial service providers supported in delivering outreach strategies, financial products and services to rural areas							
Service providers - Number			2	0	0	2	100
Staff of financial institutions trained							
Males - Number			20	30	27	48	240
Females - Number			10	40	34	40	400
ABSUMI branches operational							
Branch - Number			2	0	0	3	150
Loans disbursed for production purposes							
Loans - Number			7 200				0
1.1.5 Persons in rural areas accessing financial services							
Women in rural areas accessing financial services - savings			1 000	150	101	517	52
Men in rural areas accessing financial services - savings			3 000	150	140	917	31
Men in rural areas accessing financial services - credit				3 000	3 101	7 101	
Women in rural areas accessing financial services - credit				1 500	1 990	4 170	
Total persons accessing financial services - savings			4 000	300	241	1 434	36
Total persons accessing financial services - credit				4 500	5 091	11 271	
Value of voluntary savings mobilized							
Savings - Money (USD' 000)			950	70	66		
Value of gross loan portfolio							
Amount - Money (USD' 000)							
services							
Males - Number			1 000	500	412	1 831	183
Females - Number			3 000	1 000	827	2 097	70
Persons in rural areas trained in FL and/or use of FProd and			4 000	1 500	1 239	3 928	98

Appendix 10: Project internal rate of return (detailed analysis)

I. INTRODUCTION

1. **Incremental Production.** The main quantifiable benefits are incremental crop yields that have been obtained by smallholders through the use of certified seed and improved varieties.
2. For the year 2012-2015, yield increase by 65% while for the period 2016-2017 improved technical package was introduced to the farmers and yield increase reached up to 150%, which is due to the usage of technical package. Those technical packages consisted of water harvesting techniques, improved seeds, efficiency and usage of herbicides and use of pneumatic planter (saving time, increasing soil moisture by making use of effective rains).
3. Certified seed production does not occur in the without project situation as it will be a new enterprise for the seed growers. Furthermore, the average net income within without of project for each of grain producers has been estimated, and used as without project scenario for seed growers.
4. During design phase the analyst assumed non-workforce active without project scenario for seed growers.
5. In 2016 and 2017 MSPs were introduced to 1456 beneficiaries, where SDP fully covered costs for 2 feddan per farmer (i.e. on farm demonstration), such as seeds, land preparation (light/heavy Chesil and harrowing), seed dressing, herbicides and pneumatic planter.
6. It is worth to mention that on the top of SDP support of 2 feddan per farmer on farm demonstration, each farmer contributed for additional 3 feddan in 2016 and 1 feddan in 2017. In 2012-2015 year the project fully financed 1 feddan per community.
7. Tables 12 and 14 provides Financial Analysis of the crop budget for two beneficiaries categories: GPG and SGG where reflected average yields per feddan, production and investment costs including labour for 1st year, average production and investment costs, including labour, average revenue per year, average net income before labour costs, average net income after labour costs and average incremental income.
8. GPG highest average yield of 741 kg/fed has been reached in South Kordofan for sorghum, variety Wadahmad in Abu Jebelha locality, following by locality Abbassiya and Rashad where reached 731kg/fed. The average revenue per year was higher for groundnuts across all localities (8,608 SDG/fed), similarly incremental income is higher for the same crop. Average net income (after labour costs) is higher for groundnuts compared to the other two crops. The lowest net income of 544 SDG/fed has been noticed for sorghum, variety Arfa Gadamak in North Kordofan State.
9. SGG's highest average yield of 488kg/fed has been reached in South Kordofan, variety Gubeish for Groundnuts. The average net income (after labour costs), the incremental revenue is also higher for the region and crop variety.
10. Table 13 and 15 provides Financial Profitability Indicators for GPG and SGG crop type, variety, state, net income in 2017 year, net present value/feddan, B/C ratio, return to family labour, average incremental income and incremental income for 2017 year.
11. GPG highest profitability is for Groundnuts NPV of 30,408 SDG/fed for locality Abbassiya/Tadamon, variety Gubeish. The sesame is the second highest profitable crop, with average NPV of 12,182 SDG/fed in South Kordofan and slightly lower NPV 11,924 SDG/fed in the North Kordofan. Average NPV for sorghum is 8,334 SDG/fed in South Kordofan, and 4,010 SDG/fed in North Kordofan. According to B/C ratio sesame variety Bromo in the locality Sheikan pops out as most profitable crop.

12. SGG highest profitability is for Groundnuts, variety Gubeish in Abbassiya/Tofein locality up to NPV 39,389 SDG/fed assuming project period of 20 years. The B/C ratio of 2,77 is highest for Sorghum, variety Arfa Gadamak in Abbassiya locality, South Kordofan. The slightly higher returns in South Kordofan reflect the higher rainfall pattern and fertile soils.

Table 12: GPG Financial analysis of crop budget

Model	Variety	Locality	State	Average Yield kg/feddan	Production & investment cost, including labour (year 1) SDG/fed	Average Production & investment cost, including labour SDG/feddan	Average Revenue per year SDG/feddan	Average Net Income (before labour cost) per year SDG/feddan	Average Net income (after labour costs)	Average Incremental income SDG/feddan
Sesame	Bromo	AbuJebeiha	SK	360	808	904	3 450	3 092	2 546	2 305
Sesame	Bromo	Abbassiya/Tadamon	SK	298	1 078	1 078	2 484	2 255	1 716	1 886
G.N.	Gubiesh	Abbassiya/Tadamon	SK	444	2 214	3 222	7 974	6 180	5 782	5 071
Sorghum	Butana	Tadamon	SK	555	1 568	1 763	2 805	1 767	1 043	1 188
Sorghum	Tabat	Tadamon	SK	618	1 539	1 656	2 933	2 011	1 277	1 351
Sorghum	Wadahmad	AbuJebeiha	SK	741	1 675	1 559	3 831	3 031	2 272	1 952
Sorghum	Tabat	Abbassiya	SK	609	1 862	1 135	2 409	1 841	1 274	1 174
Sorghum	Wadahmad	Abbassiya/Rashad	SK	731	1 376	1 576	2 996	2 196	1 420	1 543
Sorghum	Arfa Gadamk/Butana	Er Rahad, Sheikan, Um-Ruwaba	NK	221	856	1 081	1 625	1 269	544	683
G.N.	Gubeish	Sheikan	NK	416	2 214	2 965	7 990	5 527	5 025	4 451
G.N.	Gubeish	Er Rahad	NK	433	2 526	3 082	8 608	6 036	5 526	4 952
Sesame	Bromo	Er Rahad, Um-Ruwaba	NK	249	782	857	2 329	2 008	1 472	1 486
Sesame	Bromo	Sheikan	NK	344	500	588	3 395	3 299	2 807	2 597

Table 13: GPG Financial profitability indicators

Model	Variety	Locality	State	Net income (2017) SDG/fed	Net present value SDG/fed	B/C Ratio	Return to family labour (SDG/day)	Average Incremental Income SDG/fed	Incremental income, (2017) SDG/fed
Sesame	Bromo	AbuJebeiha	SK	3 372	13 240	3.64	102	2 305	2 585
Sesame	Bromo	Abbassiya/Tadamon	SK	2 462	11 124	2.48	174	1 886	2 094
G.N.	Gubiesh	Abbassiya/Tadamon	SK	6 625	30 418	2.79	174	5 071	5 555
Sorghum	Butana	Tadamon	SK	1 883	6 801	1.54	35	1 188	1 313
Sorghum	Tabat	Tadamon	SK	2 201	7 604	1.70	36	1 351	1 552
Sorghum	Wadahmad	AbuJebeiha	SK	3 062	11 605	2.40	96	1 952	2 007
Sorghum	Tabat	Abbassiya	SK	1 950	6 640	1.95	52	1 174	1 313
Sorghum	Wadahmad	Abbassiya/Rashad	SK	2 156	9 021	1.86	52	1 543	1 526
Sorghum	Arfa Gadamk/Butana	Er Rahad, Sheikan, Um-Ruwaba	NK	1 352	4 010	1.48	46	683	746
G.N.	Gubeish	Sheikan	NK	6 985	26 096	3	183	4 451	5 924
G.N.	Gubeish	Er Rahad	NK	6 306	29 994	3	257	4 952	5 256
Sesame	Bromo	Er Rahad, Um-Ruwaba	NK	2 164	8 847	2.64	64	1 486	1 643
Sesame	Bromo	Sheikan	NK	3 630	15 001	5.55	107	2 597	2 930

Table 14: SGG Financial analysis of crop budget

Model	Variety	Locality	State	Average Yield kg/feddan*	Production & investment cost, including labour (year 1) SDG/fed	Average Production & investment cost, including labour SDG/feddan	Average Revenue per year SDG/feddan	Average Net Income (before labour cost) per year SDG/feddan	Average Net income (after labour costs)	Average Incremental income SDG/feddan
G.N.	Gubeish	Abbassya/Tofein	SK	488	4 521	4 792	10 025	6 781	5 233	4 375
G.N.	Sodari/Gubeish	Sheikan	NK	258	1 784	2 331	4 710	3 166	2 379	1 521
Sesame	Bromo	Abbassya	SK	254	3 017	3 225	6 576	4 851	3 351	3 066
Sorghum	Arfa Gadamk	Abbassya	SK	347	1 568	1 713	4 732	3 859	3 019	2 651

Table 15: SGG Financial profitability indicators

Model	Variety	Locality	State	Net income (2017) SDG/fed	Net present value SDG/fed	B/C Ratio	Return to family labour (SDG/day)	Average Incremental Income SDG/fed	Incremental income, (2017) SDG/fed
G.N.	Gubeish	Abbassya/Tofein	SK	5 559	39 389	2.10	256	2 305	3 141
G.N.	Sodari/Gubeish	Sheikan	NK	3 032	18 610	1.91	93	1 521	1 460
Sesame	Bromo	Abbassya	SK	5 047	28 947	1.98	142	3 066	3 262
Sorghum	Arfa Gadamk	Abbassya	SK	3 902	17 619	2.77	216	2 651	2 694

13. On average for GPGs net income per feddan for groundnuts is SDG 5,444 and sesame is SDG 2,135 followed by sorghum 1,305. On average for SGGs net income per feddan for groundnuts is SDG 3,806; sesame is SDG 3,351 followed by sorghum 3,019.

14. On average groundnuts selling price increased over years for 22%, sorghum for 25% and sesame for 37%. Fluctuations in inflation rate influenced prices oscillations.

15. At full development, smallholders investing in the purchase of certified and improved varieties and an improved technological package benefited double their gross margins for the crops.

16. Agricultural machinery has been introduced in 2016 where in North Kordofan has been estimated that farmers targeted group usage of heavy Chesil comes to 3%, the light Chesil reached 51% and herbicides 2%, while in 2017 year heavy Chesil is adopted by 4%, light Chesil adopted by 56%, herbicides 4%. In South Kordofan, project farmers' usage of heavy chisel is 3%, herbicides 31%, while in 2017 only 3% used heavy chisel, and 34% used herbicides.

17. **Benefits.** The Project benefits included the contribution of the quality control of certified seed and improved varieties in North and South Kordofan with the resulting favourable impact on crop productivity and production. The smallholder farmer produces the certified seed and improved varieties in the communities under rainfed conditions.

18. Participatory research approach was initiated by SDP and now it is acknowledged and adopted by ARC (Agricultural Research Corporation). The achievement of the approach is visible through release of 8 new crop varieties and 7 new technologies in order to continuously improve the resilience and applicability of seed varieties.

19. The Project has demonstrated the viability of financially and economically sustainable seed production. In so doing, it paved the way for increased private sector and smallholder cooperation in seed production, marketing, distribution and trade and a corresponding freeing of Government resources, as well as promoting domestic investment in the establishment of a modern and sustainable seed production mechanism.

II. FINANCIAL ANALYSIS

20. Total direct project cost is estimated at SDG 75.825 million (USD 9.076 million) over a 7-year period. Total costs, when non-collected duties/customs and taxes are considered, are reaching amount of USD 10.594 million.

21. Component 3 on 'Seed Market Development Support' and Component 4 'Project Coordination and Management Support' are the biggest component representing SDG 60.966 million (USD 6.499 million) of total project costs. Component 2 covers the costs for 'Improvement of the Seed Production'; represent SDG 8.293 million (USD 1.412 million) of the total project costs. Component 1 on 'Institution and Regulatory Environment Strengthening and Development' represents SDG 6.566 million (USD 1.165 million). PCUs provided total project costs per year in SDG currency. Thereafter, those amounts are compared with US dollar denominated amounts per year, which are calculated based on XDRs amount and exchange rate on transaction date.

Table 16: Project Costs per components and years

Component	2012		2013		2014		2015		2016		2017		2018		Total	
	SDG	USD	SDG	USD	SDG	USD	SDG	USD	SDG	USD	SDG	USD	SDG	USD	SDG	USD
Institution and Regulatory Environment Strengthening and Development	712 350	432 164	854 946	168 464	856 662	29 053	1 013 728	161 541	2 593 065	340 671	534 937	33 099	-	-	6 565 688	1 164 992
Improvement of the Seed Production	941 652	571 275	1 015 545	200 110	1 630 837	55 308	1 947 769	310 383	1 567 715	205 963	1 083 843	67 062	106 000	2 076	8 293 361	1 412 177
Seed Market Development Support	1 195 602	725 340	1 041 742	205 272	1 399 669	47 469	4 668 738	743 978	6 565 731	862 591	10 650 073	658 965	3 901 500	76 406	29 423 055	3 320 021
Project Coordination and Management	283 507	171 996	1 441 396	284 022	3 625 966	122 971	5 884 907	937 778	6 865 633	901 992	11 754 663	727 311	1 687 045	33 039	31 543 117	3 179 109
Total	3 133 111	1 900 776	4 353 629	857 867	7 513 134	254 801	13 515 142	2 153 679	17 592 144	2 311 217	24 023 516	1 486 436	5 694 545	111 521	75 825 221	9 076 299

Table 17: Project costs per Component and Financier (for the period 1/1/2017 to 31/03/2018)

Total in USD			
Component	IFAD	GOS	IFAD & GOS
Institutional and Regulatory Environment	1 098 472	66 520	1 164 992
Improvement of the Seed Production System	1 325 423	86 754	1 412 177
Seed Market Development Support	3 218 693	101 328	3 320 021
Project Coordination and Management	2 927 166	251 943	3 179 109
Grand Total	8 571 447	504 852	9 076 299

Table 18: Table 14. Expenditure Summary by Category Financier in SDG & USD from 2012 to April 2018

Years	IFAD	GoS	IFAD	GoS
	SDG		USD	
IFAD				
Investment Cost				
Civil Works	1 620 431	1 979	248 649	1 183
Fund	606 519	-	97 361	-
Vehicles	4 109 685	-	1 626 968	-
Equipment	13 480 791	450	1 244 376	27
Technical Assistance (International)	1 435 751	-	163 196	-
Technical Assistance (National)	4 958 076	-	568 615	-
Training	18 797 838	107 558	1 925 993	2 076
Contracted Services	3 521 531	66 899	366 176	2 519
Growers/producer Group	-	-		-
Government Contribution	-	31 101		2 299
Total Investment Cost	48 530 623	207 986	6 241 334	8 105
Recurrent Cost	-	-		
Direct Project Recurrent Costs	18 677 839	734 389	1 714 288	87 676
Salaries and Allowances	3 220 102	2 692 814	522 706	275 824
Operations and Maintenance	71 840	1 448 379	8 973	125 308
Vehicle O&M	137 714	103 535	82 337	9 747
Total Recurrent Cost	22 107 495	4 979 117	2 328 304	498 555
Total costs	70 638 117	5 187 104	8 569 638	506 660
Grand Total	75 825 221		9 076 298	

22. Government of Sudan contribution due to the non-collection of custom duties of imported vehicles and equipment has been estimated in the amount of USD 484,070, equivalent to 30% of equipment/vehicles procurement value.

Table 19: Government non-collected Customs & Duties for SDP Vehicles Motorbikes and Agricultural Equipment

YR	Amount in USD
2013	192.728,46
2015	35.052,63
2016	191.264,13
2018	65.025,00
Total	484.070,22

Table 20: Provides information on total project costs (divided by component) and beneficiaries (divided by category)

PROJECT COSTS AND INDICATORS FOR LOGFRAME							
TOTAL PROJECT COSTS (in million USD)				9 076 298.51			
Beneficiaries	52 494 people		7	Households			
Cost per beneficiary	173 USD x person			1 245 USD x HH		Adoption rates	76%
Components and Cost (USD million)			Outcomes and Indicators				
COMP 1: Institutional and Regulatory Environment Strengthening and Development	1 165 000	13%	Increase income for smallholder farmers		Increase farmers accessibility to Service Providers		
COMP 2: Improvement of the Seed Production System	1 412 000	16%	Increased quantity and quality products (i.e. certified seeds and improved varieties)		Yield & production increased between 72 % and 146%		
COMP 3: Seed Market Development Support	3 320 000	37%			51 360 smallholder farmers reached due to the project intervention		
COMP 4: Project Coordination and Management	3 179 000	35%	Created sustainable business environment		Setting up of 7 SGG Groups with 1134 smallholder farmers		

23. **Methodology and Data:** As part of the financial analysis of the Project seed and grain production crop budgets were prepared for three main crops namely sorghum, sesame, and groundnuts. These indicative budgets are based on the following data:

- Smallholder farmers have been provided with strong vertically integrated extension and contract farming support ensuring financing and technically sound development of seeds resulting in high quality seed production.
- All benefiting smallholder farmers received access on the full technical package
- The major climatic risk is poor rainfall, which resulted to lower yield in North Kordofan and South Kordofan through each few-year cycle drought.

24. The grain production models and budgets take into account yield increases for grain production that can be anticipated as a result of utilising certified an improved seeds, improved crop husbandry practices, access to the technical packages, SPs, processing and marketing. The models were developed based on primary and secondary data, interviews with farmers and other informed sources. The models/budgets are utilised to assess production costs for seed production under the Project. They also reflect increased yield as a result of using certified seed and improved varieties with lower seeding rates. All prices are expressed as average for the period of 2012-2018 year in Sudanese Pounds (SDG). The cost of labour used in project completion report is SDG 36 per person day and is higher compared to design phase where it was estimated to be SDG 10 per person day. Increased costs are caused by inflation.

25. The profitability farm models have been developed over 20-year period. The budgets are broken down to production costs, labour costs and revenue/sales for the eight years of their operations, starting with 2012 when the initial investments are made. For the purpose of the analysis, PY7 and beyond are taken as having the same revenue and cost structure as in PY6.

Table 21: Farm Model Financial Analysis

F I N A N C I A L A N A L Y S I S		PRODUCTION																
		GPG Farm model's incremental benefits in South Kordofan (in '000 of SDG)								GPG Farm model's incremental benefits in North Kordofan (in '000 of SDG)					SGG Farm model's incremental benefits in South Kordofan (in '000 of SDG)		SGG Farm model's incremental benefits in North Kordofan (in '000 of SDG)	
		Sesame (Bromo) AbWebeiha	Sesame Abassya/ Tadamon/ Bromo	G.N. Gubeish, Abassya/ Tadamon	Sorghum, Tadamon, Butana	Sorghum, Tabat, Tadamon	Sorghum, Wadahmad, AbWebeiha	Sorghum, Tabat, Abassya	Sorghum, Wadahmad, Abassya/ Rashad	Sorghum, Arfa Gadam/Butana, Er Rahad/ Sheikan/ Um-Ruwaba	G.N. Gubeish, Sheikan	G.N. Gubeish, Er Rahad	Sesame, Bromo, Er Rahad/ Um-Ruwaba	Sesame, Bromo, Sheikan	Sorghum, Arfa Gadamk, Abbassya	Sesame, Bromo, Abbassya	G.N. Sodari/ Gubeish/ Sheikan	G.N. Gubeish, Abbassya-Tofein
PY1	826	592	1 919	41	(15)	1 219	162	452	323	2 154	3 490	482	790	1 621	1 418	208	3 141	
PY2	826	963	3 223	403	219	1 305	385	731	323	3 490	3 490	882	1 290	1 822	1 754	357	3 642	
PY3	1 186	1 333	3 875	800	729	1 410	541	969	323	3 490	4 826	1 202	1 690	2 694	3 262	445	4 527	
PY4	1 905	1 333	4 478	1 346	1 230	1 732	913	1 516	744	2 810	4 814	882	1 290	4 436	2 508	722	4 527	
PY5	2 585	2 094	4 591	377	1 069	1 865	1 124	1 505	746	5 596	3 592	1 643	2 930	1 822	1 452	943	4 527	
PY6	2 585	2 094	5 555	1 313	1 552	2 007	1 313	1 526	746	5 924	5 256	1 643	2 930	2 694	3 262	1 460	4 527	
PY7	2 585	2 094	5 555	1 392	1 588	2 093	1 360	1 562	746	5 924	5 256	1 643	2 930	2 781	3 304	1 736	4 527	
PY8	2 585	2 094	5 555	1 392	1 588	2 108	1 360	1 738	746	4 588	5 256	1 643	2 930	2 704	3 413	1 888	4 527	
PY9	2 585	2 094	5 555	1 392	1 588	2 108	1 360	1 738	746	4 588	5 256	1 643	2 930	2 704	3 413	1 888	4 527	
PY10	2 585	2 094	5 555	1 392	1 588	2 108	1 360	1 738	746	4 588	5 256	1 643	2 930	2 704	3 413	1 888	4 527	
NPV (SDG)	13 240	11 124	30 418	6 801	7 604	11 605	6 640	9 021	4 010	26 096	29 994	8 847	15 001	17 619	28 947	18 610	39 389	
NPV (USD)	1 281.5	1 076.6	2 944.1	658.2	736.0	1 123.2	642.6	873.2	388.1	2 525.8	2 903.0	856.2	1 451.9	1 705.3	2 801.7	1 801.3	3 812.4	

26. **Grain production using certified seeds.** A total number of 52,494 smallholders including 37% women smallholder farmers adopted certified seeds and improved varieties to produce grains of staple and cash crops. The average cultivated area varies based on soil type and rainfall. The modelling for the crop and farm budget has relied on differentiated cultivated areas depending on the soil type, locality and crop. Furthermore, the farm modelling involves the typical crop mix of food and cash crops for the average household, thus the analysis includes sorghum as a food crop and sesame and groundnuts as a cash crops.

27. Table 22 shows the total number of targeted project's beneficiaries, subdivided into activities and phased following the inclusion pattern envisaged by the project

Table 22: Beneficiaries, adoption rates and phasing

BENEFICIARIES, ADOPTION RATES AND PHASING								Adoption rates
	PY1	PY2	PY3	PY4	PY5	PY6	Total	76%
GPG	1.316	1.655	7.245	11.299	19.924	26.071	67.509	
<i>Adjusted (adoption rate)</i>	1.001	1.259	5.512	8.596	15.158	19.834	51.360	
SGG	131	216	314	298	323	208	1.491	
<i>Adjusted (adoption rate)</i>	100	164	239	227	246	158	1.134	
Nr of Targeted HH							69.000	
Adopting HH							52.494	

III. ECONOMIC ANALYSIS

28. **Objective.** The objectives of the economic analysis are: (i) to examine the overall Programme viability, and (ii) to assess the Project's impact and the overall economic rate of return; and (iii) to perform sensitivity analyses to assess the benefits from a broad welfare perspective.

29. **Key Data.** The physical inputs and productions established in the financial analysis provided the basis to determine the viability of the programme investment in terms of opportunity costs and quantifiable benefits to the economy as a whole. The estimate of the likely economic returns from project interventions are based on the following assumptions: (i) Project life has been assumed at 20 years; (ii) Project inputs and outputs traded are valued at their respective market prices, and goods are expected to move freely within the Project area in response to market demand; (iii) an economic discount rate of 14,7% has been used due to the relatively high inflation and volatility on financial market; (iv) The economic analysis is based on direct costs and benefits.

30. **Project Economic Costs and Benefits.** The economic analyses include the investment and incremental recurrent costs of Project components. The Project financial costs have been converted to economic values by removal of price contingencies, taxes and duties. In order to avoid double counting, the final aggregation considered only those costs that were not included in the financial models. Furthermore, it has been assumed that after the 7th year, the incremental net benefits of each model will be the same as for the incremental net benefits obtained after the seventh year of the Project.

31. **Economic Parameters.** The analysis is in average prices of the project period taking into consideration constant prices in SDG. The discount rate is 14.7% compared to the design phase where estimated 25% based on local inflation and the project life is 20 years. The shadow exchange rate (SER) used is SDG 11.536 to USD 1.

32. The economic analysis of the project compares all project investments with the measurable benefits generated by certified and improved seed varieties produced in the project area based on the following assumptions:

- (a) An overall adoption rate of 76% by both seed growers and grain producers.
- (b) A drought cycle every few years reduces revenues in North Kordofan and South Kordofan for both seed growers and grain producers.

33. **Economic Pricing.** Economic pricing was undertaken using the following assumptions: (a) the opportunity cost of labour is SDG 30.6 /day, or 85% of financial cost of labour, which is justified given high rural unemployment; (b) the shadow exchange rate (SER) has been calculated at 1 USD=11.536 SDG; (c) the standard conversion factor for the exchange rate has been calculated at 1.12; and (d) the conversion factors for outputs and inputs have been calculated starting from FOB and CIF prices when data were available; when data were not available CFs were calculated starting from the financial price, deducting any duty or tax and multiplying it by the SCF; overall all CF vary between 1.23 (for imported inputs) and 1.16.

Table 23: Conversion Factors

Standard Conversion Factor (SCF) for imported agricultural/products	1,23	SCF
Standard Conversion Factor (SCF) for exported agricultural/ products	1,16	SCF
Shadow Wage Rate Factor (SWRF)	0,85	SWRF

Table 24: Main Assumptions and Shadow Prices

MAIN ASSUMPTIONS & SHADOW PRICES ¹						
	State	Output	Av. Incremental Yields (%)	Price (in LC)/kg	Input prices	Price (LC)
FINANCIAL	NK	Sorghum	146%	4.80	Fertilizer/kg	5.00
		Groundnuts	85%	7.07	Herbicides/lit	130.00
		Sesame	145%	13.01	Seeds, Sorghum	5.04
	SK	Sorghum	128%	2.80	Seeds, Sesame	17.33
		Groundnuts	72%	7.00	Seeds, G.N.	7.82
		Sesame	100%	11.14	Rural wage	36.00
ECONOMIC	Official Exchange rate (OER)		10.33	Discount rate (opportunity cost of cap		0.15
	Shadow Exchange rate (SER)		11.54	Social Discount rate		0.15
	Standard Conversion Factor		1.12	Output conversion factor		1.16
	Labour Conversion factor		0.85	Input Conversion factor		1.23

¹ All prices expressed in Local Currency (SDG). See definition and formulas in the INSTRUCTIONS

34. **Economic Rate of Return:** On the basis of the above data, the EIRR of SDP is 14,9% and the Net Present Value (NPV) is approx. SDG 417 million. The high EIRR reflects the ambition and potential leverage of SDP, with an approach focused on clear comparative advantages and existing economic dynamics in The Sudan.

35. Table 25 on Economic Analysis represents the overall project aggregation. It includes the net incremental benefits of each financial model in economic terms, converted with shadow prices (table 19), and multiplied by the number of beneficiaries of each category that received direct financial support from the project. In 2012-2015 year the project fully financed 1 feddan per community and per year, reaching 105 feddan or farmers each year for educational demonstration plot purposes. In 2016 and 2017 MSPs were introduced to 1456 beneficiaries, where project fully covered costs for 2 feddan per farmer (i.e. on farm demonstration).

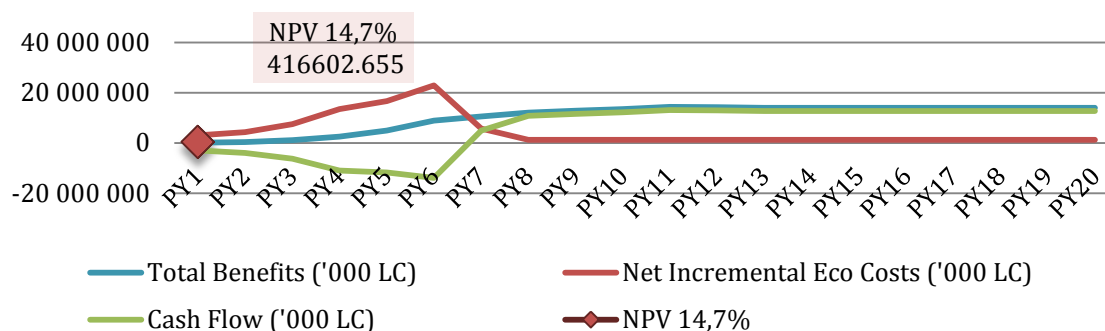
36. Last column shows the net cash flow of the project, which is obtained deducting net incremental costs from net incremental benefits. Project profitability indicators such as NPV and Economic IRR (EIRR) are calculated below.

Table 25: Economic Analysis

		NET INCREMENTAL BENEFITS																		Net Incremental Eco Costs (‘000 LC)	Cash Flow (‘000 LC)
		Sesame (Bromo) AbuJebelha	Sesame Abassya/ Tadamon/ Bromo	G.N. Gubeish, Abassya/T adamon	Sorghum, Tadamon, Butana	Sorghum, Tabat, Tadamon	Sorghum, Wadahmad, AbuJebelha	Sorghum, Tabat, Abassya	Sorghum, Wadahmad, Abassya/ Rashad	Sorghum, Arfa Gadam/Butana, Er Rahad/ Sheikan/Um- Ruwaba	G.N.Gubeish, Sheikan	G.N. Gubeish, Er Rahad	Sesame, Bromo, Er Rahad/ Um-Ruwaba	Sesame, Bromo, Sheikan	Sorghum, Arfa Gadamk, Abbassya	Sesame, Bromo, Abbassya	G.N.Sodari/ Gubeish/ Sheikan	G.N., Gubeish, Abbasyia- Tofein	Total Benefits (‘000 LC)		
E C O N O M I C A N A L Y S I S	PY1	4 912	4 231	21 886	368	278	4 704	953	778	814	20 382	35 880	1 026	4 813	21 579	12 132	504	0	135 241	3 061 346	(2 926 105)
	PY2	11 260	11 761	64 496	1 467	1 020	10 978	2 491	2 194	1 866	58 962	82 254	3 093	13 808	51 706	30 047	1 293	0	348 697	4 281 864	(3 933 167)
	PY3	38 913	38 588	204 491	4 923	3 881	36 094	8 082	7 148	6 118	181 242	283 131	10 003	44 753	176 956	106 368	4 180	0	1 154 873	7 441 369	(6 286 497)
	PY4	84 848	85 929	470 277	13 056	10 198	76 213	18 218	16 827	13 414	402 038	587 687	22 266	98 463	393 318	223 241	9 289	0	2 525 282	13 443 377	(10 918 096)
	PY5	172 897	176 626	937 660	26 382	22 698	146 797	36 260	33 777	25 846	802 121	1 146 795	46 278	205 798	759 523	449 905	18 368	0	5 007 729	16 729 602	(11 721 873)
	PY6	303 772	304 263	1 637 258	52 051	45 542	243 532	63 511	60 691	44 723	1 345 050	1 904 309	78 722	349 884	1 332 931	758 801	32 028	384 094	8 941 162	22 895 787	(13 954 625)
	PY7	383 227	392 530	2 065 790	73 924	71 649	262 048	79 152	79 009	51 152	1 650 741	2 044 570	102 980	460 748	1 525 347	878 957	39 424	432 767	10 594 014	5 694 545	4 899 469
	PY8	505 298	463 679	2 344 706	94 955	102 441	287 185	95 815	96 284	62 328	1 764 659	2 268 127	116 624	542 451	1 789 102	998 989	48 490	533 345	12 114 479	1 295 831	10 818 648
	PY9	630 102	522 521	2 553 569	100 897	120 686	315 612	113 979	109 805	76 991	2 006 492	2 215 800	125 393	628 654	1 815 597	908 252	60 586	533 345	12 838 280	1 295 831	11 542 449
	PY10	697 983	598 889	2 712 539	91 675	126 277	330 181	124 088	108 807	77 799	2 439 041	2 215 904	150 722	792 831	1 427 770	955 325	72 563	533 345	13 455 739	1 295 831	12 159 908
	PY11	697 983	598 889	2 899 743	124 789	143 274	341 781	129 879	112 299	77 799	2 391 355	2 515 710	150 722	792 831	1 608 486	1 184 306	84 424	533 345	14 387 614	1 295 831	13 091 783
	PY12	697 983	598 889	2 899 743	127 117	144 155	347 236	130 818	117 008	77 799	2 220 162	2 515 710	150 722	792 831	1 612 224	1 199 548	91 002	533 345	14 256 291	1 295 831	12 960 460
	PY13	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
	PY14	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
	PY15	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
	PY16	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
	PY17	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
	PY18	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
	PY19	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
	PY20	697 983	598 889	2 899 743	127 117	144 155	348 169	130 818	121 978	77 799	1 997 980	2 515 710	150 722	792 831	1 594 347	1 212 744	93 582	533 345	14 037 910	1 295 831	12 742 079
NPV@ 14,7% ('000 SDG)		416 603																			
NPV@ 14,7% ('000 USD)		36 113																			
EIRR		14.9%																			

37. Chart below depicts and compares over time project's net benefits and incremental costs alongside project cash flow. The data is based on total flows (benefit, cost and cash flow) from table 20. Economic Analysis

Figure 1: Time dynamics for total net's benefits, incremental costs and cash flow



38. **Results and sensitivity analysis.** In order to test the robustness of the above results, a sensitivity analysis has been carried out, the outcomes of which are presented in Table 26 below. The sensitivity analysis investigates the effect of fluctuations in Project costs, benefits and delays in implementation on the NPV and EIRR. The findings show that the project is economically rewarding, with an EIRR for the base case estimated at 15%; similarly as estimated during project design phase. The sensitivity analysis shows the project to be sensitive to exchange rate shocks and in the worst-case scenario (costs higher by 50% and the EIRR drops to 7% resulting with negative NPV or where project benefits drops by 50%, the EIRR drops to only 2%.

Table 26: Sensitivity Analysis

SENSITIVITY ANALYSIS (SA)					
		Δ%	Link with the risk matrix	IRR	NPV (000 LC)
Base scenario				15%	416.603
Project benefits		-10%	Combination of risks affecting output prices, yields and adoption rates	13%	-3.834.223
Project benefits		-20%		10%	-8.085.049
Project benefits		-50%		2%	-20.837.528
Project costs		10%	Increase of labour costs and input non labour costs (i.e. fertilizer, seeds)	13%	-3.792.563
Project costs		20%		11%	-8.001.729
Project costs		50%		7%	-20.629.226
1 year lag in ben.			Risks affecting adoption rates and low implementation capacity	12%	-5.819.173
2 years lag in ben.				10%	-11.255.769
Production costs		10%	Low management & negotiating capacity of farmers groups	24%	10.609.519
Production costs		20%		21%	7.651.610
Investment prices		10%	Market price fluctuations	25%	12.388.516
Investment prices		20%		24%	11.189.632

Appendix 11: Environmental assessment (detailed analysis)

Major site characteristics

1. **Land use in the Project area.** Traditional rainfed agriculture is the main form of agriculture in the target areas. The land area for the majority of the smallholder traditional farmers ranges from 3 feddan to 30 feddan. The farmers practice shifting cultivation with an average of one third of the land fallow. A piece of land is cultivated continuously for three years then left for vegetation to grow and replenish the soil for at least two years. The addition of inorganic fertilizers is not practiced though continuously declining crop yields have been blamed on depleted soils that are not getting enough mineral replenishment. Recent research by the Agricultural Research Corporation (ARC) at El Obeid Research Station shows that farmers cultivating in sandy soils must start applying inorganic fertilizers if their yields are to improve significantly.

2. The practice of renting out land by poor farmers to better off farmers is common especially in South Kordofan as source of extra income. However, this results in shorter fallow periods of one season. Women have areas of about 0.5 to 2 feddan set aside for gardening (*jubraka*) to produce vegetables, cowpeas, okra, spices and maize. This provides extra family nutrition and is a main source of income for the women. Livestock is grazed in communal pastures which are sometimes invaded by migrating pastoralists during the dry season.

3. **Rainfall.** The average rainfall in the Project area varies from 350 mm in Sheikan and Rahad localities of North Kordofan to about 400 mm in Abbassiya and 600 mm in Abu Gubeiha in South Kordofan. The rainfall season starts in June and ends in October. The season starts a bit earlier and lasts longer in the South. Due to climate change the seasons are becoming more unreliable with uneven rainfall distribution and the effects of these changes are more pronounced in the North. Farmers have adopted coping strategies that allow them to plant crops and varieties of different maturities depending on the onset of the rains. Reduced soil cover due to overgrazing in the North increases rain runoff thereby reducing effective rainfall in an area already suffering from low precipitation.

4. **Main livelihoods.** The rural economy in the four localities is mainly driven by traditional rainfed agriculture which is the mainstay for the majority of the rural population

Issues in sustainable traditional rainfed agricultural productivity

5. The design mission identified the following issues as critical for sustainable traditional rainfed agricultural productivity:

6. **Soil degradation.** Cutting down of trees, overgrazing, inadequate rotation/fallowing and lack of soil and water conservation practices has exposed the soil to serious wind and soil erosion. The practice of shifting cultivation with reduced fallowing and no supplementary inorganic fertilizer application has resulted in declining soil fertility. The effect of this soil degradation is evident in declining crop yields and an upsurge in parasitic weeds such as striga in sorghum. Soil degradation is also affecting rangelands with non-nutritive invasive plant species replacing pastures grasses. This is more evident in North Kordofan.

7. **Vulnerability to drought.** Drought in Sudan is a common occurrence such that on average with crop failure is recorded in one out of three years. The situation is being worsened by the increased frequency of late and poorly distributed rains in the supposedly good years. According to the Federal Ministry of Environment and Physical Development (2003) temperatures and precipitations are going to change significantly by 2030 and 2060 for the States of North and South Kordofan. The average temperatures are expected to rise significantly relative to the baseline (1961-1990). By 2060, average temperatures are expected to rise by between 1.5°C and 3.1°C above the baseline during August (rainy season), and by between 1.1°C to 2.1°C during January

(beginning of dry season). Average rainfall is also expected to reduce by about 6 mm per month during the rainy season. The impact of such changes on agriculture is: (i) reduction of the area available for crop production due to a Southward shift in moist agro climatic zones; and (ii) decrease in the food crop yield between 13% and 82% for sorghum and between 20% and 76% for millet, and in the production of the gum Arabic between 25% and 30%.

8. **Land scarcity.** The current land use is leading to competing claims on the land resulting in disputes that can escalate into violent confrontations between pastoralists and crop farmers especially in North Kordofan. The pastoralists stray into fields where their animals sometimes destroy unharvested crops. Their animals also compete for pastures and water with local livestock during the dry season on migration to the South. Southward migration may be reduced by the changes in the political situation after the secession of South Sudan from the North.

Project Social and environmental impacts

9. Project design identified some environmental risks and proposed many mitigation measures for each component and its activities. Project contribution towards introducing and promoting these mitigation measures at the smallholders level are presented in Table 27.

Environmental category

10. The project design proposed a B category classification given the nature of Project interventions and their positive impact on the environment. On the basis of field observations, the completion mission confirms the project B classification. The project interventions improved smallholder farmers' access to certified seed of improved varieties which have helped them cope with climatic variability and enhanced their adaptation to climate change.

Table 27: Project's Social and Environmental Impact

Component/ activities	Environmental and Social Impacts/ risks	Mitigation measures	Project Contribution
Component 1: Institutional and Regulatory Environment Strengthening and Development			
Enactment and enforcement of PVP legislation	<ul style="list-style-type: none"> Increased number of crop varieties and introduction of new types of crops. increased area under seed production Improved food security from better varieties Improved household incomes from wider choice of cash crops 	<ul style="list-style-type: none"> Monitoring of environmental, production and economic aspects of the new varieties and new crop types 	<ul style="list-style-type: none"> ARC in collaboration with SDP and PSCs released 8 new varieties with high yielding and drought resistant characteristics. Area under certified and improved seeds increased by 45% in project area. HH assets index increased on average 50%
Training of seed administration and extension staff	<ul style="list-style-type: none"> Monitoring seed production and marketing 	Not applicable	<ul style="list-style-type: none"> FSA staff at federal and local levels and extension staff trained on seeds development and inspection and monitoring.
Multi-stakeholder policy dialogue	<ul style="list-style-type: none"> Development of sustainable seed industry responsive to environmental challenges 	Not applicable	<ul style="list-style-type: none"> Two multi stakeholders' forums conducted with wide participation (102 members) from public, private and producers' actors in seeds production and marketing.
Component 2: Improvement of the Seed Production System			
ARC capacitated for implementation of participatory breeding research	<ul style="list-style-type: none"> Seed varieties and technologies that fit with farmers' situations are developed together with farmers Improved farmer confidence from the acknowledgement of their knowledge systems. 	<ul style="list-style-type: none"> Farmer involvement in technology development 	<ul style="list-style-type: none"> ARC released through participatory research 8 varieties. Demonstrations were carried out on farm with active involvement of smallholders farmers.
High quality and sufficient quantity of breeder/foundation/registered seeds produced by Agricultural Research Corporation (ARC)	<ul style="list-style-type: none"> registered seeds key input in seed value chain 	<ul style="list-style-type: none"> Two year requirements produced in any given year to have a buffer against calamities 	<ul style="list-style-type: none"> ARC with SDP support produced sufficient quantities of required registered seeds
Community-based Seed Grower Groups enterprises are enabled to produce certified seeds of improved and traditional varieties	<ul style="list-style-type: none"> Diversification of production system of smallholders Increase supply of certified seed at local level 	<ul style="list-style-type: none"> Monitoring of environmental, production and economic aspects of the new varieties and new crop types 	<ul style="list-style-type: none"> 17 SGGs produced certified seeds sold to 3 PSCs at commercial prices plus 10% incentive. Total area using certified and improved seeds reached 453,912 feddan
The extension system is strengthened to support target seed producer enterprises	<ul style="list-style-type: none"> Improved advice to farmers to improve productivity and environmental management 	<ul style="list-style-type: none"> Annual seed production figures 	<ul style="list-style-type: none"> 714 and 369 women accessing advisory services for seed production

Component/ activities	Environmental and Social Impacts/ risks	Mitigation measures	Project Contribution
Component 3: Support Seed Market Development			
Licensed seed agents established	<ul style="list-style-type: none"> Better supply of quality seeds at local level (timeliness, reliability). 	<ul style="list-style-type: none"> Individual farmer and group seed demand and grain production figures 	<ul style="list-style-type: none"> Unlike pre-project situation, Smallholder farmers confirmed availability of improved seeds before season started.
Farmers empowered to use certified seeds and improved techniques	<ul style="list-style-type: none"> Increased resilience of farmers to climatic shocks 	<ul style="list-style-type: none"> Household survey 	<ul style="list-style-type: none"> Smallholders adoption rate of improved seeds and good agricultural practices reached average 76%.
Seed Market Database in place	<ul style="list-style-type: none"> Information on market for drought and pest resistant seed varieties 	<ul style="list-style-type: none"> Monitoring of seed market (supply and demand) 	<ul style="list-style-type: none"> Continuous contacts established between smallholder farmers and companies agents and extension staff on seed market.
Increased access of farmers/ grain producers to credit and microfinance	<ul style="list-style-type: none"> Adoption of drought resilient production practices 	<ul style="list-style-type: none"> Monitoring of land under improved crop practices 	<ul style="list-style-type: none"> Area under improved seeds reached 453,912 feddan Adoption of following resilient practices by 52,000 smallholder farmers. Improved high yielding drought tolerant varieties, timely utilisation of agricultural machineries across the season, and water conservation through chisel plough. Number of loans provided to smallholders: 22,542.
Component 4: Project Management and Coordination			
Establishment of the Project management and coordination structure	<ul style="list-style-type: none"> Monitoring and management of project implementation 	Not applicable	<ul style="list-style-type: none"> Project management was adequately staffed and empowered at central level, state level and village level.

Appendix 12: Stakeholder workshop findings 12 September 2018



A. INTRODUCTION

1. To conclude the Project Completion Review (PCR) a one-day stakeholder workshop was organised on Wednesday the 12 September 2018 at the venue of the Agricultural Research Corporation, el Obeid. Detailed proceedings of the workshop are drafted in arabic which includes all presentations, details of the group work guidelines and outcomes, pictures of the workshop, names and position of all participants, etc. and shall be disseminated among all participants and relevant authorities. The underlying appendix presents the set-up of the workshop, the major findings, lessons learnt and recommendations.

B. SET-UP OF THE WORKSHOP

2. A detailed proposal on the set-up of the workshop was prepared and circulated among the officials, resources persons and facilitators of the workshop, and accordingly tasks were divided, and preparations made. The timely preparations contributed to the success of the workshop; among others, the time slots were respected, the participants made active use of the folder with background information and guidelines for group work, etc. The set objectives and expected outcomes are presented in table 1 below.

Table 28: Objectives and expected outcomes of the stakeholder workshop

Workshop objectives:	Workshop outcomes:
<ul style="list-style-type: none"> To identify/validate the impacts (benefits and costs) of the project, To validate key lessons identified during project implementation (and identify any additional lessons), To consider the sustainability of project benefits, outputs and outcomes, and propose/agree the requirements to maximize SDP sustainability. 	<ul style="list-style-type: none"> Project impacts will have been identified/validated and documented, to augment evaluation information collected through the SDP M&E system and the PCR report, Key lessons will have been agreed and validated by the appropriate stakeholders, The key elements of a sustainability strategy will have been determined, The findings and information arising out of the workshop will be part of the PCR.

3. Table 2 presented below provides an overview of the actual fe/male participants to category. In total 93 persons of whom 67 males (72%) and 26 (28%) females participated the full day.

Table 29: List of actual number of fe/male participants of the SDP stakeholders' workshop to category

Categories		Male	Female	Total
1	Federal Ministries of Finance and Agriculture	1	3	4
2	IFAD Office in Sudan (ICO)	1	0	1
3	CCU and IFAD funded projects in Sudan	5	0	5
4	State ministers of Agriculture	2	0	2
6	General managers of agriculture (localities)	2	0	2
7	Line ministries departments at state level (PIAs)	5	3	8
8	Repr. of Universities and Research	9	0	9
9	Repr. of Agriculture Bank of Sudan, ABSUMI, partners of similar projects	8	2	10
10	Repr. of Project localities (TLs & Executive Managers)	8	7	15
11	Repr. of private sector companies	5	1	6
12	Repr. of communities	12	8	20
13	Resource persons and facilitators	3	2	5
14	Key staff of the PCU and SCUs	6	0	6
Total		67	26	93

4. The agenda of the workshop (table 3, below) reflects the set-up of the stakeholder workshop which allowed that researchers could interact with farmers, private actors with extension leaders and so on; it reflected the 4Ps (public, private, producer partnership) concept promoted. The fact that there were various short presentations of the private actors and farmers might have had a positive effect in this regard; they spoke from their heart.

Table 30: Actual Agenda of the Workshop

	Topics	Session	Time slot
1	REGISTRATION of participants, distribution of the folder	Plenary	08:00-08.30
2	WELCOMING SESSION by two Ministers (South and North Kordofan), Senior Coordinator of Central Coordination Unit (CCU), IFAD Country Director, Principal Coordinator of PCU	Plenary	08:30-09.00
3. PROJECT COMPLETE REVIEW REPORT			
	Description of SDP, main achievements and findings as per PCR report, by PCU principal coordinator	Plenary	09.00-09.30
4. EXPERIENCES SHARING – LESSONS LEARNT			
4.1	Repr. Agricultural Research Corporation (ARC)	Plenary	09:30-09.45
4.2	Repr. Spraying Service Providers (SSPs)	Plenary	
4.3	Repr. Seed Growers Groups (SGGs)	Plenary	10.00-10.10
4.4	Repr. Machinery Service Providers (MSP)	Plenary	10.10-10.20
4.5	Repr. Agro-dealers	Plenary	10.20-10.30
	BREAKFAST BREAK		10.30-11.30
4.6	OPEN DISCUSSION	Plenary	11.30-13.00
	Break for PRAYERS		13.00-13.30
5. WORKING GROUPS			
5.1	Group A: Assessment of project output and impact Group B: Assessment of project sustainability and replicability Group C: Identification of key lessons learned and innovations	Working groups	13.30-14.30
5.2	Presenting working groups findings and recommendations	Plenary	14.30-15.45
6. AWARD GIVING			
	Honoring successful project partners	Plenary	15.45-16.15
7. CLOSING			
	Minister of Agriculture, South Kordofan	Plenary	16.15-16.30

C. FINDINGS²

5. The various findings generated are presented below.

The key innovation is '**Farming as a Business**'; '*in our locality 'farming as a business' is novel and liked*'. In general, there is a lot of appreciation for what SDP post mid-term developed but

² During the workshop, the findings were not analysed in detail but for this report they were summarised and presented. As a result, some remarks might touch issues beyond the design and objectives of the programme. For instance, the programme was about testing certain mechanisation modalities but not to arrive at full mechanisation package for different type of farmers.

much more time is needed to shape the models and fine tune the packages; then, the outcomes observed can lead to more sustained impacts.

6. The main findings shared through group work are:

Group A:

- Incomes from farming increased and it improved the livelihoods. Households (HHs) made investments in animal rising.
- The development of relationships in the groups created bonds among the group members.
- New relationships are development with private actors and micro finance institutions (MFIs), etc.
- Contribution to community stabilization, especially the youth.
- Packages promoted can contribute to mitigating climate change.
- Women increased their income, improved their participation in groups and SDP activities. Capacities in trading, getting access to micro finance, and being commercial oriented.
- Associations formed and registered (production, financing and trading).

Group B:

- Seed Growers Groups (SDGs) are registered and linked to private sector actors while having basic capital.
- Service Providers and Business development agents managed to sell their services, but:
 - communities need more awareness and more hand spraying equipment is needed; and
 - MFIs not interested in business development agents and don't provide incentives; MFI and HHs might be able to jointly develop incentives.
- Village Saving and Credit Groups (VSCGs) do lack attention of the extension teams (follow-up & coordination); they could make use of the law on animal and agriculture entrepreneurship and seek more training opportunities.
- For MFIs the costs of operation are very high, prices keep fluctuating and inflation is huge. Number of MFIs could be reduced, while operational costs could be minimised by applying 'Farming as a Business' concept.
- Package promoted has positive impact on production and other farming communities might adopt.
- Agricultural Research Corporation (ARC) and Locality Extension Teams (LET) lack funds and activities such as participatory research shall not be able to continue.
 - Specialised State Units might provide opportunities; and
 - State Governments might allocate funds to up-scale the models.
- Machinery Service Providers (MSPs) do lack medium and long-term capital loans, need more training, should have access to appropriate equipment and deserve guidance in provision of services.

Group C:

- Participatory Research, working with private service providers, application of 'Farming as a Business' concept, facilitating development of SGGs and Grain Producer Groups (GPGs) are perceived as innovations.
- Being involved and hence having access to the basics of conservation agriculture and new crop varieties from planting to harvesting has been a learning trajectory.
- Linking farming HHs to service providers, private sector companies, MFIs, MSPs and Spraying Service Providers (SSPs) turned reality.

- Through provision of capacity building of local extension agents and farmers the application of packages through a business mode could be promoted.
 - At all levels and concerning all activities, gender mainstreaming was taken seriously.
 - Certain things could have been done better such as: - linking farmers to the market, - training on value chain, - working through Agriculture Service Centres, - post-harvest activities, - cleaning of seed at HH level, - attention for climate change, - support for business development agents, - timely addressing of contractual problems (MSPs in particular).
 - Serious weaknesses were as follows: - complete lack of attention for natural resources (NRs)³, - not using land use maps to control unregulated agriculture expansion, - weak linkage between female farmers and the private companies, - lack of timely delivering of goods and services.
7. The lab established at central level is not yet functioning, lab staff not yet trained and manuals not yet available, while labs (State Seed Units) established at State level are poorly equipped.
 8. The two laws (Seed Law & New Plant Variety Protection Law) developed are not yet approved and thus no conducive environment yet for seed multiplication and marketing.
 9. SDP has taken too much time to release new varieties and developing new packages; henceforth there has been insufficient time for fully testing the models.
 10. Dissemination of research and extension findings not enough shared with farming communities neither with all extension team members.
 11. SSPs, MSPs, etc. are not sufficiently provided by Government services (training, guidance, maintenance equipment, etc.).
 12. Sustainability issues received late attention in SDP, while nothing on Exit Strategy (ES) was mentioned in presentations. However, this issue including the main aspects of the ES were clearly explained and clarified to the participants in the discussion. As the set of recommendations show, various pending issues need to be addressed by the new Integrated Agriculture and Marketing Development Project (IAMDP) which has just started.
 13. With the current set of farm implements, full mechanisation with small farmers doesn't work. Full mechanisation is currently not done in the appropriate manner (pneumatic planter can't be adjusted easily; titan planter is for irrigated fields; type of farmer, soil etc to be considered too). Specific and environmentally adaptive farm implements for smallholders would be needed.
 14. Not any reference is made to knowledge products while various Good Practices & Models have been developed.
 15. Cooperation with service providers started mainly after MTR; thus, more rigorous and substantial impact is anticipated to come. PCR has no RIMS level three data (impact), for instance.
 16. Micro finance is not enough to assist the MSPs; they need access to Agriculture Bank of Sudan for obtaining capital loans.
 17. Use insurance for the crop production process is not yet sufficiently developed. It deserves more attention as it is normally a prerequisite from the micro finance institutions.

³ This NR related observation was much linked to the PCR report, page 21, item '**Output 2.1: Participatory research for identification of suitable cultivars implemented**', validation of 'b.) Sorghum variety Yarwasha, being suitable for use of urea micro-dose fertilizer under different water harvesting techniques in Gardud soils of North Kordofan'. Gardud soils are rangeland areas and concern grazing areas for mobile livestock keepers. The participants of group C critically questioned this farming on pasture land.

D. LESSONS LEARNT

18. High probability that model with private actors can be sustained post project; community associations need more technical support however.
19. Gender mainstreaming when working with private actors requires extra efforts otherwise female farmers are easily left out.
20. Micro financing is not equipped for providing infrastructural services (tractor & implements, storage facilities), compared to seasonal operating costs.
21. Sustainability issues are often considered at the end of the project, but should be given attention from the onset.
22. Promoting links with private owners of machinery is appreciated and welcomed but it needs to be done in an equitable manner so that the right farm implements are used in the correct manner; implements for smallholders are, for instance, not yet enough at hand.
23. When approval of Policies & Laws at Federal level is at stake, the IFAD Country Office (ICO) and Central Coordination Unit (CCU) need to play a prominent role as project managers are far from the centre and might not have enough clout.
24. Private actors can set out demo's and these could be co-financed where relevant while also providing farming plots; sign boards to be used to explain variety and key plant husbandry practices.
25. Using the indigenous knowledge of the farming communities and the accumulated experience of Farming as a Business is important; together they can actively share and present.

E. RECOMMENDATIONS⁴

Important exit issues to be taken up by IAMDP

- Arriving at a fully functioning Central Lab: - Capacities & Manuals, - Accreditation by ISTA.
- Importance of upgrading State Labs (Seed Units).
- Two Laws (Seed Law & New Plant Variety Protection Law) to be approved, adhered to and monitored. It is urgent as without it the seed production by communities is hindered.
- Attention needed for relationship between Federal Seed Administration (FSA) and State Seed Unit (SSU) whereby arriving at a functional and effective relationship.
- Participatory research still needs more attention to further shape and fine tune packages and models.
- SGGs should continue under Relevant Ministries and with Private Seed companies; i.e. consider forms of competition.
- Storage facilities for storing seed are needed at community and/or locality level; to be managed by the communities. In addition, seed cleaning equipment is highly needed as it is frequently requested by communities.
- Produce relevant knowledge products (different models, SGGs, SSPs, MSPs, Agro-dealers, on-farm research – extension – private actor participatory work; role micro financing, 4Ps, etc.).

⁴ The State Ministries which are involved in SDP are responsible for implementing the recommendations except for those under C1 i-xv, which should be followed up by Integrated Agriculture and Marketing Development Project (IAMDP).

- Reviewing 'mechanisation experiences under SDP' and arrive at a set of activities and recommendations accordingly.
- Fine tune existing (SDP) packages including provision of appropriate loans and machinery services.
- Develop strategies which facilitate access to markets by farmers and their groups and associations; remained underdeveloped under SDP.
- Ensure mapping of communities which participated in SDP; to performance level.
- Develop relevant Knowledge Products ('farming as a business').
- Look into findings of 'access to loans' and act; - Capital loans needed for MSPs and storage facilities, - Specific loans for service providers sector.
- Communities must be encouraged to participate in activities intended to support them.

PACKAGES – OPTIONS

- It is important to work with the concept of vertical expansion instead of increased yields only; - more income from piece of land, - use economics, - consider investments, etc..
- The triangle 'Research – Private Actors (incl. financing institutions) – Extension' and in the centre the farming communities is to be acknowledged and respected. A researcher can show that one simple message can make a difference; e.g. correct spacing of groundnut can increase production substantially, and private actor can be motivated to test it in a demo plot, etc..

Agriculture Services Centres (ASCs)

- Institutional support to Agricultural Services Centres for farmers' capacity building and proper linkages with the markets and funding institutions.
- Institutional support to limited number of officers at locality level not efficient and effective; all agriculture related staff need to be capacitated.
- Research -, Private Sector Actors (incl. Banks) and Extension Teams should work hand in hand; i.e. have a network group to produce appropriate packages for different agro ecological zones, to type of farmers, to context (access to loans, markets, etc.).
- Focusing on safe application of agro-chemical and correct use of farm machinery is important whereby respecting the State Policies.
- ASCs should play a key role in strengthening the linkage between service providers and farmers.
- MSP should be advised on using suitable equipment for each agriculture operation namely as per advice of the agriculture engineering department; it is important to acknowledge the experiences of the MSP as not all advice might be applicable.
- ASCs need more facilities such as guest houses, stores, offices, etc. In many places there aren't yet proper ASCs.
- Services providers need to be linked to relevant technical departments and vice versa so that they can share experiences.
- Producers need to be linked to local, national and international markets.
- More good practices are needed to mitigate climate change.
- Attention is needed for adding value prior to marketing.

Mechanization

- Review with the relevant professionals, document the positive and less positive experiences & draft lessons learnt,
- Distinguish small -, medium and large farms; needs for mechanisation is different,
- Look into specific female farmers needs and interests including gender sensitive technology;

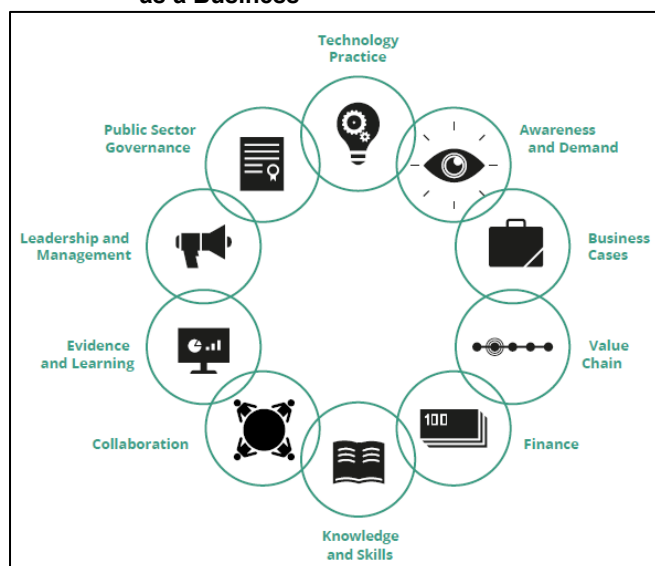
Policies and strategies

- Land use and natural resource policies and strategies to be respected: where to farm, where to graze & browse, by whom, and preventing encroachment,
- Zero chemical policy of South Kordofan needs to be known to all practitioners,
- Relevant policies and strategies should be available with extension teams and at Agriculture Services Centres (ASC), Integrated Community Development Centres (ICDC), Community Development Centres (CDCs), etc.

Project governance

- SDP lacked a technical committee at State Level while such a committee was very constructive during WSRMP period. To be considered for IAMDP, LMRP and other new IFAD Programmes,
- Importance of respecting and recognising the Agriculture Directors at locality level; they need to play a coordinating and lobbying role,
- Timely delivery of goods and services is a must; too often extension services arrive too late for the inputs cum service providers (SSPs; MSPs, etc.),
- Selection of Communities to be done in early stage of project as well as related activities,
- Mapping of communities and the status of agricultural development (new model of 'farming as a business') is important as it is an input for AWPBs,
- Successful scaling is not only about scaling a specific technical solution, but all kind of non-technical requirements are important as shown in the figure 1 below.

Figure 2: Ten 'scaling ingredients' for scaling up 'Private Public Producer Partnerships' and 'Farming as a Business'⁵



⁵ Source: [Launching the Scaling Scan: a tool to determine the potential to scale](#)

Appendix 13: Final wrap-up meeting minutes

1. A final wrap up meeting took place on 26 April 2018 in Khartoum at the General Directorate of International Cooperation of the Ministry of Finance and Economic Planning. The meeting was chaired by the DG of the Department and attended by staff from Ministry of Finance, Ministry of Agriculture, CCU, and SDP.
2. Following presentation of main findings and PCR ratings by mission members (local and international), the meeting discussed mission recommendations and the way forward. All recommendations mentioned in the section on conclusions were endorsed by the chairman of the wrap up meeting.

Annex 1: Success stories from the field

1. Success story of woman seeds grower farmer

Hawa Albalah Abdullah Hamed, married and mother of six, is a sorghum farmer from the village of Umm al-Khayrat in South Kordofan. She has been involved in the SDP project since 2014 when she joined a seed production group. Through the group she has received training on the use of improved seeds and other crop production technologies. In 2017 she was able to expand her farm through a loan (45,000 SDG) from the Agricultural Bank of Sudan. The loan helped her to increase her farm output, and she was also able to create job opportunities for 35 young men and women. 44-year old Hawa Albalah is known in the community as a woman who is highly successful in her business. She has managed to store 30 percent of her total sorghum production, and sold it later at a higher price. She has also managed to gain better access to markets by learning how to compare prices and negotiate better deals with traders through her mobile phone. Now she sells her produce both at the local market in the village and to traders from outside the state. More

recently Hawa Albalah has now bought a tractor from the Agricultural Bank of Sudan through a 394,000 SDG loan. She feels economically empowered and proud to be setting a good example for her children.

I am happy to be able to send my children to school and pay their school fees and clothes. I am especially proud of sending one of my children to study in a private school in the capital of Sudan and that I can help my husband with money. Today I have a good source of income and a return that has enabled me to improve my family's nutrition and status, says Hawa Albalah



2. Success story of a woman contact farmer

Haja Hamouda Hussain is a 55-year old female farmer living in the village of Jabal al-Ahmar in South Kordofan. She is the head of a household and responsible for eight children. Haja Hamouda joined the SDP project in 2013 as a contact farmer. With support from the SDP extension team she applied new agricultural technologies on a one feddan demonstration plot and every year neighboring farmers came to her plot to learn about her experiences. During these field days Haja Hamouda explained the technologies (seeds, tillage methods and chemicals) she had applied and showcased the results to other farmers. After serving as a contact farmer in the demonstration field for three consecutive years, she decided to apply her new skills and experience and expand her sesame and sorghum fields to cover 3 feddans. She received a 2,000 SDG loan from the Baraa Microfinance institution to cover tillage and harvesting costs. Her increased income enabled her to build her family assets. She for example bought a motorcycle which her son could use to offer transportation services at the village level. She was also able to educate one of her sons at a university and provide food and drink for her family all year around.

Although I am illiterate, I have gained self-confidence which has enabled me to stand in front people during the field day. I have never imagined before that a farmer could be an important and respected person among people. I have been empowered to talk and discuss farming issues. I now speak courageously, and have become a respected figure in the village, says Haja Hamouda.



3. Success story of an agrodealer (agricultural input) dealer

38-year old Abdullah Bashir al-Tayeb lives with his wife and three sons in Umm al-Khairat village in South Kordofan. He has three shops (one owned by himself and two rented) where he sells agricultural inputs such as chemicals, seeds, and agricultural equipment. He joined the SDP project in 2014 through an agro dealers group organized to provide input supply to the farmers. In 2017 Abdullah expanded his business and was able to sell seeds to about 2,000 farmers in neighboring villages. This was a breakthrough for him and his business because in the past his new clients used to travel outside South Kordofan to purchase seeds. Through his agents Abdullah also managed sell 4,000 liters of chemicals to 500 farmers, and packing sacks and sieves to 1,000 farmers. Abdullah claims that the SDP changed his behavior, attitude, and perception of what how-to-do-business means. He was also able to buy additional agricultural land (38 feddans), pay education fees for his sons and improve the nutritional status of his family. Through his business he created strong social relations with farmers, private seeds companies and other agro dealers in the neighboring states. Thanks to the project I am now better linked to my suppliers and my clients through a sustainable business arrangement. I am now capable of continuing and even expanding my business without project support, says Abudallah.



4. Success story of seed production farmer

Mastora Mohammed Ahmed is a 45-year old female farmer from the village of Abu Um Saadin in Shikan locality in North Kordofan. She is the head of her household and has one son. Mastora has participated in the SDP project since 2014 as a member of a seeds grower group.

Together with other women I have benefited from the farmer field schools provided by the project. I learned about technical packages for seed production, which as instrumental in increasing my production and income, says Mastora.

She sells her production to a private seeds company at a profit, which has enabled her to increase her household assets. She has for example bought three additional sheep and three more goats, managed to improve her house structure and bought additional beds and bed linen for the house. She has also paid her son's university fees and is happy about this this great achievement in a rural area where many people are illiterate.



5. Success story of contact farmer

Ismail Mohammed Osman is a 41-year old farmer, married with five children, from the village of Jabal Al Ahmar in South Kordofan. He participated in the SDP project as a contact farmer for a period of three years from 2013 to 2015. During this period he planted sorghum in his demonstration field, applied agricultural technologies and plowed the land using the chisel plow. At each stage during the cultivation process he explained to other farmers what he had done and what results he had achieved. In 2015 and 2016 he was also employed as a contact farmer at a private seeds company's demonstration field. Before the project I practiced traditional agriculture and had no knowledge of the use of agricultural technologies (improved seeds and chisel plows), until I was chosen as contact farmer. Now I regularly receive farmers during the field days. In 2017 I supervised a group of 100 farmers who applied agricultural technologies. My increased income enabled me to build assets, such as building an extra room with bricks, purchasing of cupboard, two beds, and pay school fees for my children and provide them with good food, Ahmed says with pride.

