

**Republic of Sudan
State Government of Kassala**

**Capacity Development Project
for the Provision of Services
for Basic Human Needs in Kassala,
the Republic of Sudan**

**Final Report
Volume 3: Agriculture and
Livelihood Cluster**

April 2015

Japan International Cooperation Agency (JICA)

**International Development Center of Japan Inc.
Earth System Science Co., Ltd.
System Science Consultants Inc.**

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**Capacity Development Project for the Provision of Services for Basic Human Needs
in Kassala, the Republic of Sudan**

Final Report
Agriculture and Livelihood Cluster

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Map of the Project Area

List of Abbreviations

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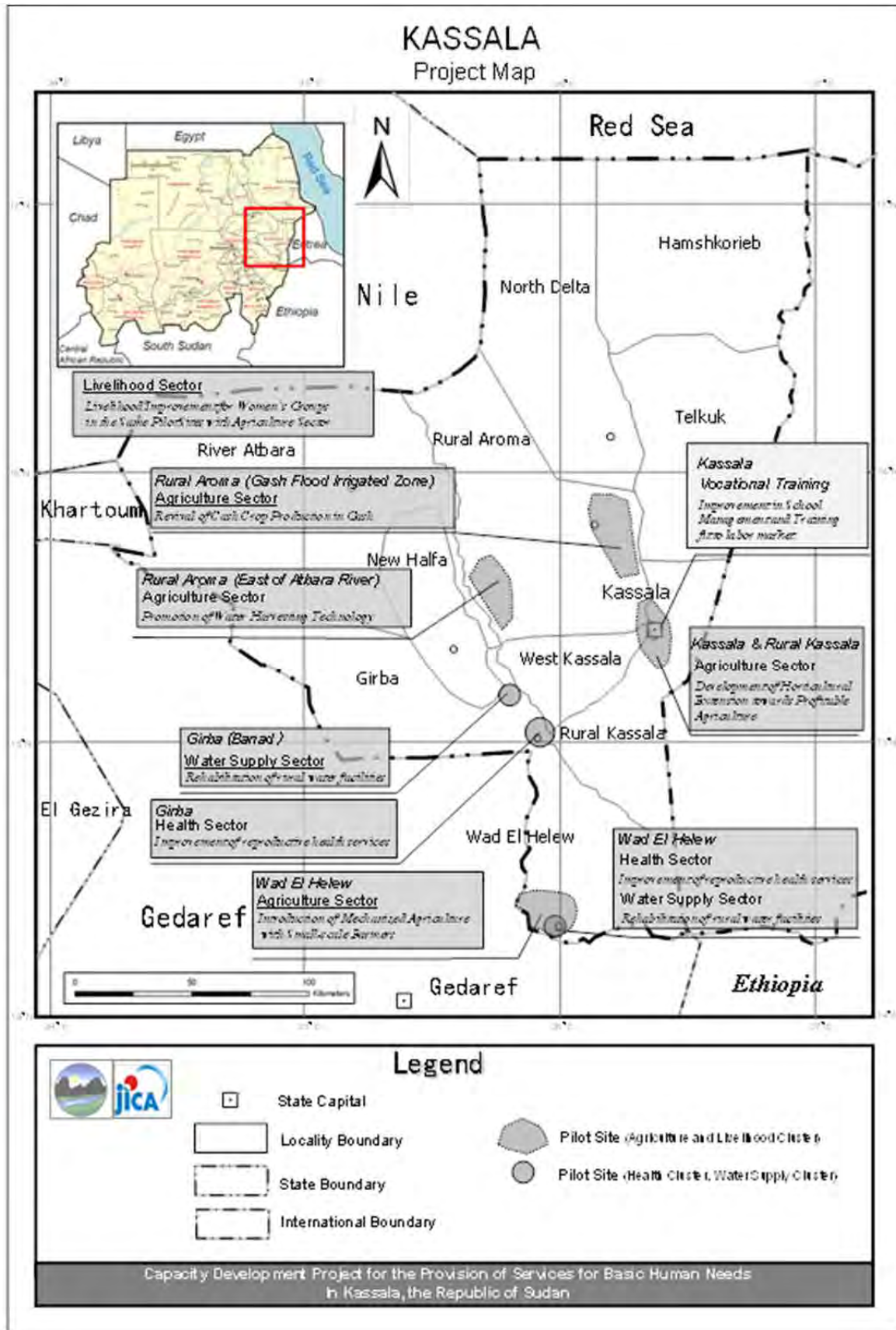
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Appendix 1. Project Design Matrix ver. 4.0

Appendix 2. CUDBAS Ability Map

**Map of the Project Area
(Location of State of Kassala)**



List of Abbreviations

AM	Agricultural Mechanization (Section of TTEA)
AMSA	Agricultural Machinery Service Association
ARC	Agriculture Research Cooperation
BOQ	Bill of Quantity
C/P	Counterpart
CUDBAS	Curriculum Development Based on Vocational Ability Structure
DG	Director General
DPD	Directorate of Economic Planning and Development
FE	Field Extension (Section of TTEA)
FIZ	Flood Irrigation Zone
FRC	Food Research Corporation
GPS	Global Positioning System
HCDG	Higher Council for Decentralized Governance
HZ	Horticulture Zone
IGA	Income Generation Activities
JCC	Joint Coordination Committee
JOCV	Japan Overseas Cooperation Volunteers
KVTC	Kassala Vocational Training Center
MIC	Ministry of International Cooperation
M&E	Monitoring and Evaluation
MoFNE	Ministry of Finance and National Economy
MZ	Mechanized Rain-fed Zone
NGO	Non-Governmental Organization
PO	Plan of Operation
O&M	Operation and Maintenance
OJT	On-the-Job Training
QC	Quality Control
PDM	Project Design Matrix
PME	Directorate of Planning, Monitoring and Evaluation
PR	Public Relations
R/D	Record of Discussion
RD	Rural Development (Section of TTEA)
RRA	Rapid Rural Appraisal
SMoA or SMoAFIAF	State Ministry of Agriculture, Forestry, Irrigation, Animal Resources and Fishery
SMoE	State Ministry of Education
SMoF	State Ministry of Finance, Economy and Labor Force
SMoH	State Ministry of Health
SPC	Strategic Planning Council
SPLM	Sudan People's Liberation Movement
SUST	Sudan University of Science and Technology
TOT	Training of Trainers
TRZ	Traditional Rain-fed Zone
TTEA	Technology Transfer and Extension Administration
WEH	Wad el Helew (Locality)
WH	Water Harvesting
WS	Workshop (the use of this abbreviation is limited in the tables)

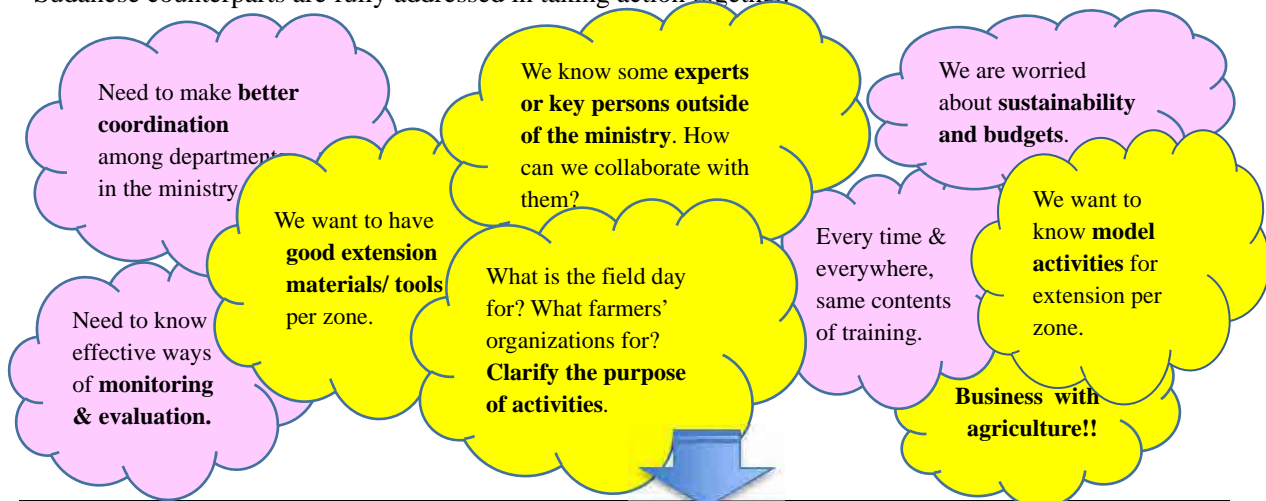
Agriculture & Livelihood Improvement Cluster

Highlights

Cluster Purpose

The capacity of Kassala State Government for providing agricultural and rural development services to small scale farmers and women is strengthened.

Kassala State Ministry of Agriculture, Forestry, Irrigation, Animal Resources and Fishery (SMoA) has been making various endeavors to eradicate poverty and hunger caused by natural disasters and to mitigate economic gaps among communities. While pursuing this policy, it aims at transforming agriculture from subsistence production to a modern sector responsive to market signals. Given these institutional directions, Agriculture & Livelihood Improvement Cluster has conducted pilot activities for 5 agro-ecological zones/ issue and developed capacity of the ministry for sustaining extension services. The needs and wishes of our Sudanese counterparts are fully addressed in taking action together.



Zone/ Issue	Major Activities and Outputs
Horticulture Zone How to increase profit of agriculture?	Knowledge to verify profitability of horticultural crops through : <ul style="list-style-type: none"> ● Onion off-season production (early cropping and storage); ● New crop production e.g. cabbage, melons and potatoes; and ● Co-purchasing inputs and direct sale by farmers group.
Flood Irrigation Zone People focus on sorghum production despite the potential in Gash area	Knowledge to introduce new cash crops <ul style="list-style-type: none"> ● Identifying promising crops (sunflowers and pigeons identified) ● Involving farmers in demo (cost-sharing/ payback introduced) ● New extension activities (e.g. match with buyers and book-keeping by farmers) ● How to review and evaluate the profits of new crops
Traditional Rain-fed Zone Production of sorghum is not stable due to unreliability of rainfall.	Knowledge to stabilize production of sorghum production, including <ul style="list-style-type: none"> ● Improved techniques for water harvesting ● Effective ways of demonstration/extension for terrace making ● Introduction of cost-sharing with farmers ● Dissemination of services through cost-sharing
Mechanized Rain-fed Zone Small-scale farmers cannot receive machinery services in time.	Knowledge to provide machinery services to small-scale farmers <ul style="list-style-type: none"> ● Formulating accessions of small-scale farmers ● Providing training on machinery to the associations ● Making the associations provide services to others ● Maintenance & operation by the department of the ministry
Rural Development Extension services to women depends on budget availability and are not sustainable	Knowledge to sustain extension services to women and their groups <ul style="list-style-type: none"> ● Mobilization of women and formulating groups ● Creating income-generation activities (e.g. restaurant and biscuit making) ● Establishment of K-TOP funds with user fees from beneficiaries
Institutional capacity of SMoA No mid-term action plans to solve the issues per zone/ theme	Capacity for sustaining extension services <ul style="list-style-type: none"> ● Holding technical/ budgetary coordination meeting in SMoA ● Improving reporting and reviewing systems of activities ● Formulating 5-year action plan per zone and theme

Agriculture & Livelihood Improvement Cluster Highlight 1
Extension services through cost-sharing with beneficiaries have been embarked on.

(1) Background

Extension services provided by SMoA tend to rely on budgets offered by external donors such as UN agencies and NGOs. Beneficiaries are also likely to see the financial supports as grants or gifts to them. In order to change this attitude/mindset and make the best use of limited resources, SMoA / K-TOP has embarked on cost-sharing system for extension.

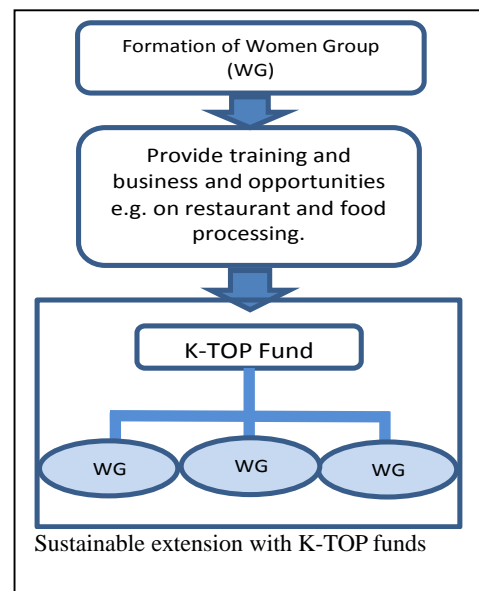


(2) Activities

- In Horticulture Zone (HZ) and Flood Irrigation Zones (FIZ): SMoA / K-TOP introduced payback system to encourage farmers to produce promising crops, while transferring technologies for cultivation and marketing to them. Upon successful results, the initial costs rendered by K-TOP are to be paid-back by the farmers to SMoA: they can be used for further extension.
- In Traditional Rain-fed Zone (TRZ) where there had been no extension services prior to K-TOP, SMoA launched machinery services for terrace making for water harvesting. It is the first time to systemize the concept of subsidy by SMoA for economic-poor area. The service is provided at affordable prices with cost-sharing between SMoA/K-TOP and farmers.
- In Rural Development (RD), SMoA/K-TOP provides women with training and business opportunities for income generation. Once their business turns to be profitable, they collecting commission or user fees from them.

(3) Outputs

- HZ and TRZ: High-level management in SMoA has adopted cost-sharing system as basic principle of extension to promote new potential crops and coordinates with other donors for the alignment of this policy.
- TRZ: The number of farmers who receive the services from SMoA has increased from 0 (2011) to 123 households (2013) and 165 households (2014).
- RD: SMoA has established the K-TOP fund with commissions collected from female participants (about 1,000 SDG / month). This fund enables SMoA to provide services to other women.



(4) Approaches adopted

- Beneficiaries-to-Beneficiaries Approach: SMoA/K-TOP regard them not merely as “beneficiaries” but also as “service providers” to others. They conduct demo or business with their own costs, which enhance their undertaking of services and techniques. SMoA, on the other hand, increase their awareness over responsibilities for service delivery.

(5) Way forwards and recommendations to the counterparts

- SMoA should continue coordination with other donors on cost-sharing system, so as to unify extension services to communities in a same zone, regardless of “provided by whom”
- There is substantial need to reinforce coordination among departments in SMoA in order to meet the demand of increased farmers for terrace making.
- It is necessary to keep good running the restaurant business as it is, in order to enrich the K-TOP fund. In addition, it is of crucial importance for SMoA to establish management system of the fund in a transparent way.

Agriculture & Livelihood Improvement Cluster Highlight 2
Machinery service association of the small-scale farmers for other small-scale farmers

(1) Background

In general, agricultural activities in Wad El Helew (WEH) is semi-mechanized. There, small-scale farmers receive machinery service from large-scale farmers who own machineries as their properties. Since the large-scale farmers provides machinery services to the small-scale after their use, it is difficult for them to do farming practice in time. This delay of practice then bring negative impacts on their productions.



Machinery maintenance training

(2) Activities

Against this background, SMOA/K-TOP organized Agricultural Machinery Service Association (AMSA) by small-scale farmers and established extension system to provide machinery service to the members as well as to other small farmers in WEH. The activities implemented for this system establishment include the following;

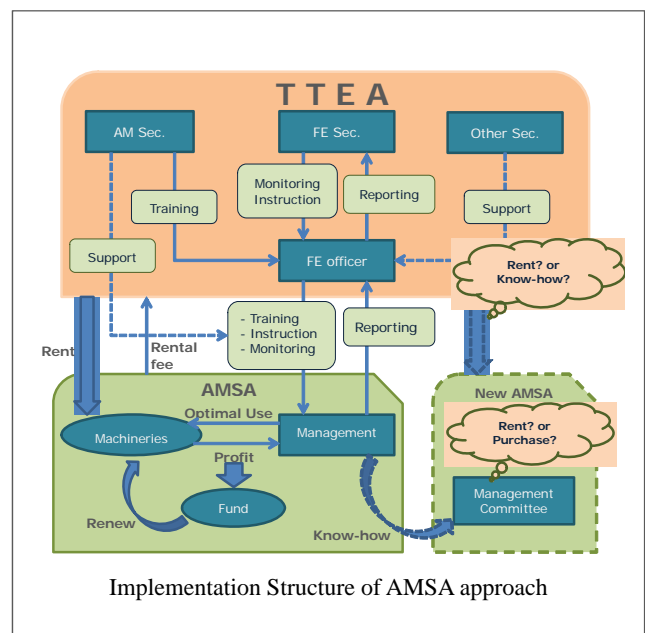
- 1st Year: Formation of AMSA; training on machinery use and maintenance;
- 2nd Year: Training on financial management; establishment of monitoring and evaluation system in SMOA;
- 3rd Year: Training on improvement of monitoring system; and evaluation of performance of AMSAs.

(3) Achievements

- AMSAs can manage and operate machineries appropriately, and provide machinery services to small-scale farmers more than the case in which SMOA directly serves.
- Extension officers have been capacitated. They can now formulate mechanization plans and manage and maintain machineries, and monitor the activities of AMSAs and give instructions to them.
- AMSAs are able to make profits from machinery services and pay rental fee to SMOA. AMSAs are sustainable in financial terms.

(4) Approach adapted

- **Farmer to Farmer Approach:** Small-scale farmers are recognized as not only recipients of machinery service but also service providers. Through AMSA, SMOA is able to provide the services to small-scale farmers in remote areas.
- **“Visualization” approach:** We visualized machinery performance numerically. With the assistance of the K-TOP expert, Extension Department (TTEA) of SMOA specified the roles of stakeholders in management of AMSAs. Field Extension officer (FE officers), Agricultural Mechanization Section (AM Sec.) and AMSAs are then made able to accumulate data. They are processed and visualized performance of AMSAs. It helps TTEA to make specific strategies and action plan to improve or expand their service through AMSAs.



(5) Way forwards and recommendations for counterparts

- Enhancing monitoring by high-level management of SMOA: Monitoring system on AMSAs has been established between FE officers and AM Sec. Yet the system still needs strong supports from high-level management (e.g. Director of TTEA, Planning Department and Director General). Sometimes FE officers were reshuffled all of sudden and decision making was in delay, both of which affect functionality of monitoring by AM Sec. High-level managers therefore should be involved in monitoring. It is necessary for AM Sec. to hold mid-term and evaluation workshop, so that they can recognize situation and provide advices in timely and appropriate manners.
- Collaboration with private sector: In implementing pilot activities, SMOA/ K-TOP collaborated with CTC Agrochemicals to disseminate crop management techniques by machineries. Through this

experience, it was found that the agricultural machinery dealer has strong interests in developing their business in Kassala state and introducing new machineries to farmers e.g. sesame harvesters, which meets needs of farmers in pilot villages. Therefore it is highly recommended that SMOA work with CTC in delivering extension services e.g. in conducting training on the new tractor attachments and introducing rental services from CTC.

1. Outline of the Agriculture and Livelihood Cluster

1.1 Background of the Agriculture and Livelihood Cluster

National Agricultural Development Strategies possess a vision, “a comprehensive national socio-economic development led by a dynamic agricultural sector capable of rapid and sustainable growth and biased towards the weak and vulnerable sectors of the population.” They also indicate the mission, which is “to transform agriculture from a sector dominated by subsistence production to a modern sector responsive to market signals with substantial contributions to poverty reduction, growth, foreign exchange earnings and sustainable management of natural resources.” In accordance with the national strategy, the state agricultural development strategy aims at transforming subsistence-level agriculture to market-oriented one. During this transition, however, it is significant to take balancing approach between to poverty reduction and to economic growth, which could prevent civil wars and starvation caused by natural disasters. With this consideration in mind, Kassala state put priorities for development on a) supporting subsistence-level agriculture for food security, b) promoting profitable agriculture, and c) strengthening income-generating activities for vulnerable people.

The State Ministry of Agriculture, Forestry, Irrigation, Animal Resources and Fishery (hereinafter SMOAFIAF) has the following five goals and strategies.

- Growth through agricultural and rural developments: increasing agricultural export, increasing productivity and food security, improving agricultural income, redressing economic imbalance
- Poverty reduction strategy: supporting the livelihood strategies of Traditional Rain-fed Zone.
- Empower both farmers and women to fully participate in development process: contributing to empower the rural poor to increase their food security, increasing capacity of producers, increasing access of poor rural people to agricultural services
- Increase in access of poor rural women and men to market and microfinance
- Conservation and management of the natural environment

Prior to this Project, extension officers and relevant officers were engaged in provision of various services to communities, such as demonstration farm and farmers field school, as far as they are accessible. They might have knowledge and experiences through their works. However, there was no effective mechanism to share such expertise among officers. This was applied not only to individual capacities of extension officers but also to the relation among different departments within SMOAFIAF. There was also no clear policy of extension system and technologies.

Given the capacity of SMOAFIAF in terms of human resources, facilities and budgets, it would be difficult to cover the whole area in the state. It is then of great importance to establish a mechanism to expand knowledge and information by formulating model activities and materials. In addition, the monitoring and evaluation (M&E) and follow-ups were also required after the implementation of activities. Based on this analysis, the following issues were identified for the development of extension services in Kassala.

- Making linkages of expertise among officers, departments and institutions
- Establishment of models for extension activities with extension materials
- Conducting extension services with clear objectives
- Inclusion of business skills (profit calculation, value addition and cost saving)
- Diversification of training packages
- Utilization of external resources in training
- Making a follow-up (i.e. M&E) after training and demo plots
- Formulating a rolling-out plan to be implemented by the counterparts (C/Ps) in this Project

1.2 Objectives of the Agriculture and Livelihood Cluster (Project Purpose and Outputs)

Against the background delineated above, the Agriculture and Livelihood Cluster has provided training or lectures to extension officers and relevant officers for their own capacity development. This has been accompanied with the implementation of pilot activities, through which they learn practical know-how, including how to formulate action plan and conduct M&E. As explained in the next section 1.3, the pilot activities are carried out in the four agricultural zones with a balancing view to poverty reduction in Horticulture Zone (HZ) and Flood Irrigation Zone (FIZ) and to economic growth in Traditional Rain-fed Zone (TRZ) and Mechanized Rain-fed Zone (MRZ). In addition to agricultural activities in the four zones, the Project conducts rural development activities that serve for livelihood improvement of women. The results of these pillar activities (4 zones + rural development) are regarded as Outputs from 1 to 5 in PDM. Moreover, the Project assists SMOAFIAF in developing institutional capacities for sustaining the Project efforts through information sharing and budget and personnel arrangements, which is designated as Output 6 of the PDM. Figure 1.1 below shows the relations of Objectives, Outputs and Activities for the Agriculture and Livelihood Cluster.

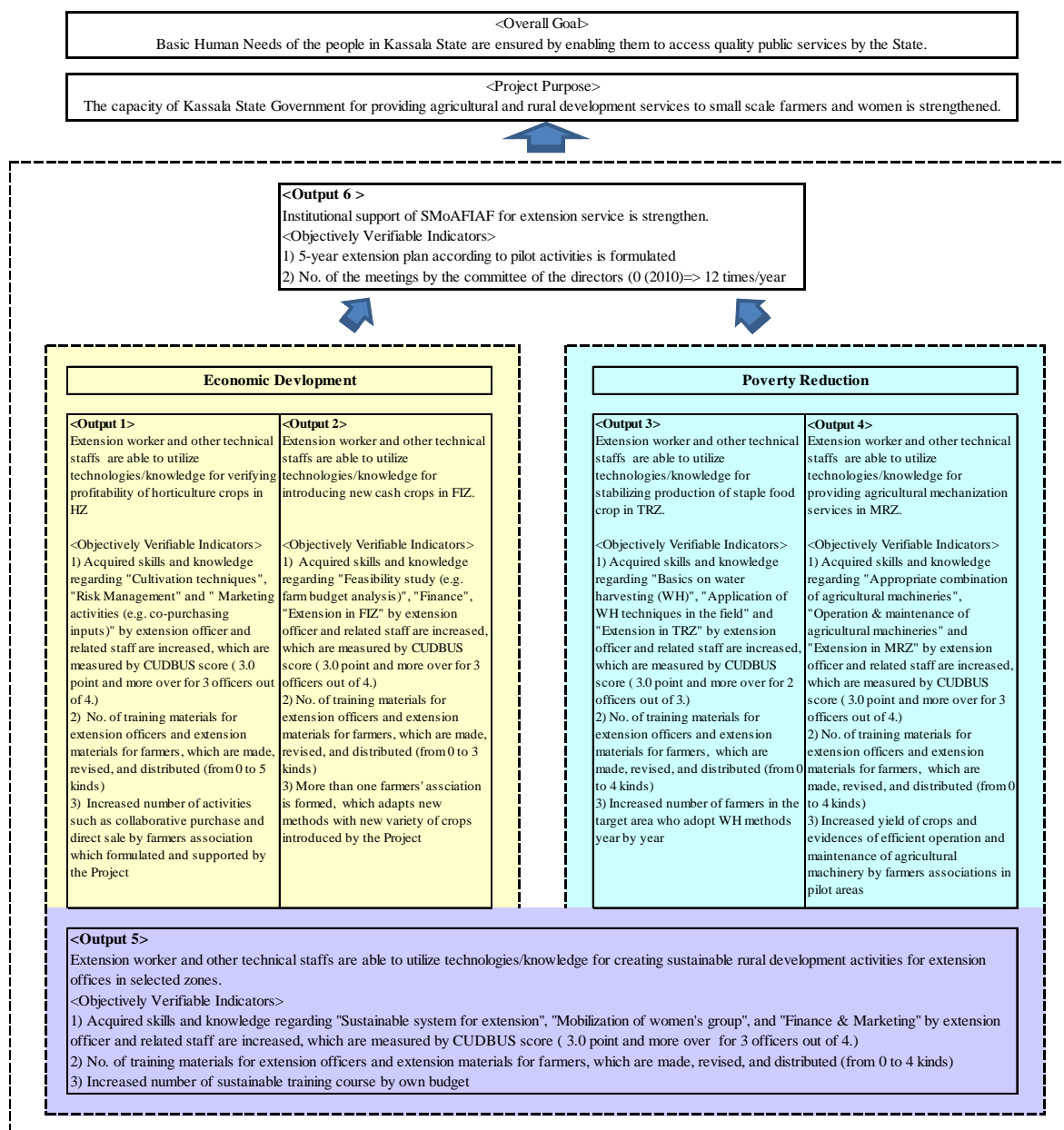


Figure 1.1: Objectives and Outputs of the Agriculture and Livelihood Cluster

1.3 Target People and Target Areas in the Agriculture and Livelihood Cluster

In general, the Project targets the whole areas and populations of about 1.8 million people in Kassala State. In particular, the Agriculture and Livelihood Cluster regards the extension officers (around 60) and relevant officers of SMOAFIAF as direct beneficiaries for capacity development. And to this end, it has conducted pilot activities in the four zones out of the five Kassala agro-ecological zones.

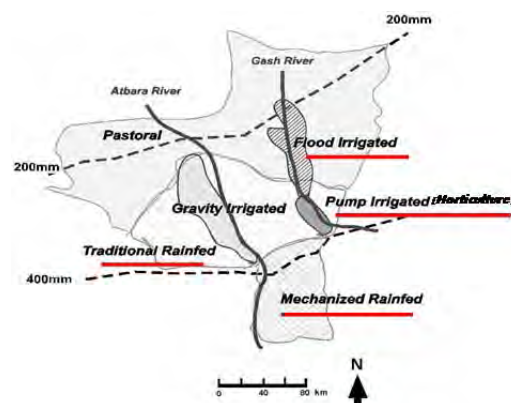


Fig.1.2: Targets of Kassala Agro-ecological Zones

Source: Final Report in the preparatory study of the Project

1.4 Sudanese Counterparts for the Agriculture and Livelihood Cluster

The Project is a multi-sectoral intervention, consisting of the five clusters as explained in the next sub-section. As far as the Agriculture and Livelihood Cluster is concerned, major Sudanese counterparts are SMOAFIAF, as shown in Figure 1.3 overleaf, while at federal level Ministry of Agriculture is involved as an advising agency of the Project.

1.5 Organization for Implementation of the Agriculture and Livelihood Cluster

This sub-section outlines organizational arrangements for the Project as a conglomeration of the five clusters.

(1) Joint Implementation Team

The C/Ps for the Project are State Ministry of Finance, Economy and Labor Force (SMoF), State Water Corporation, SMOAFIAF, State Ministry of Health, and Kassala Vocational Training Center (KVTC) in Kassala State Government. At federal level, Higher Council for Decentralized Governance (HCDG) is the coordinator for the Project, and other relevant ministries/organizations (Ministry of International Cooperation, Ministry of Finance, Ministry of Agriculture, Ministry of Health, Public Water Corporation, and Supreme Council for Vocational Training and Apprenticeship) provide technical supports to the state-level C/Ps.

In order to facilitate the capacity development of the C/Ps, the Project needs to be implemented jointly by the C/Ps and JICA experts. Figure 1.3 overleaf the Joint Implementation Team between the Sudanese C/Ps and JICA experts in the five clusters, who plans, implements, monitors and evaluates the Project, based on the C/Ps' initiative and ownership.

(2) Joint Coordinating Committee (JCC)

At state level, Joint Coordinating Committee (JCC) is organized to coordinate and make necessary decision on the Project. The major roles of JCC are as follow:

- 1) To discuss and approve the annual work plan and the report of the Project.
- 2) To understand the progress of the Project based on the Joint Implementation Team's reports, and make necessary actions to solve problems, if any. (JCC will also discuss the possible change of the work plan and revision of the PDM of the Project.)
- 3) To share the achievements of and lessons from the Project and arrange activities to disseminate them to the whole Kassala state.
- 4) To coordinate the Kassala State Government to secure the local component budget for the Project and arrange timely disbursement of it to the C/Ps

Members of JCC are shown in Table 1.1 overleaf while Table 1.2 reveals the record of JCC meetings.

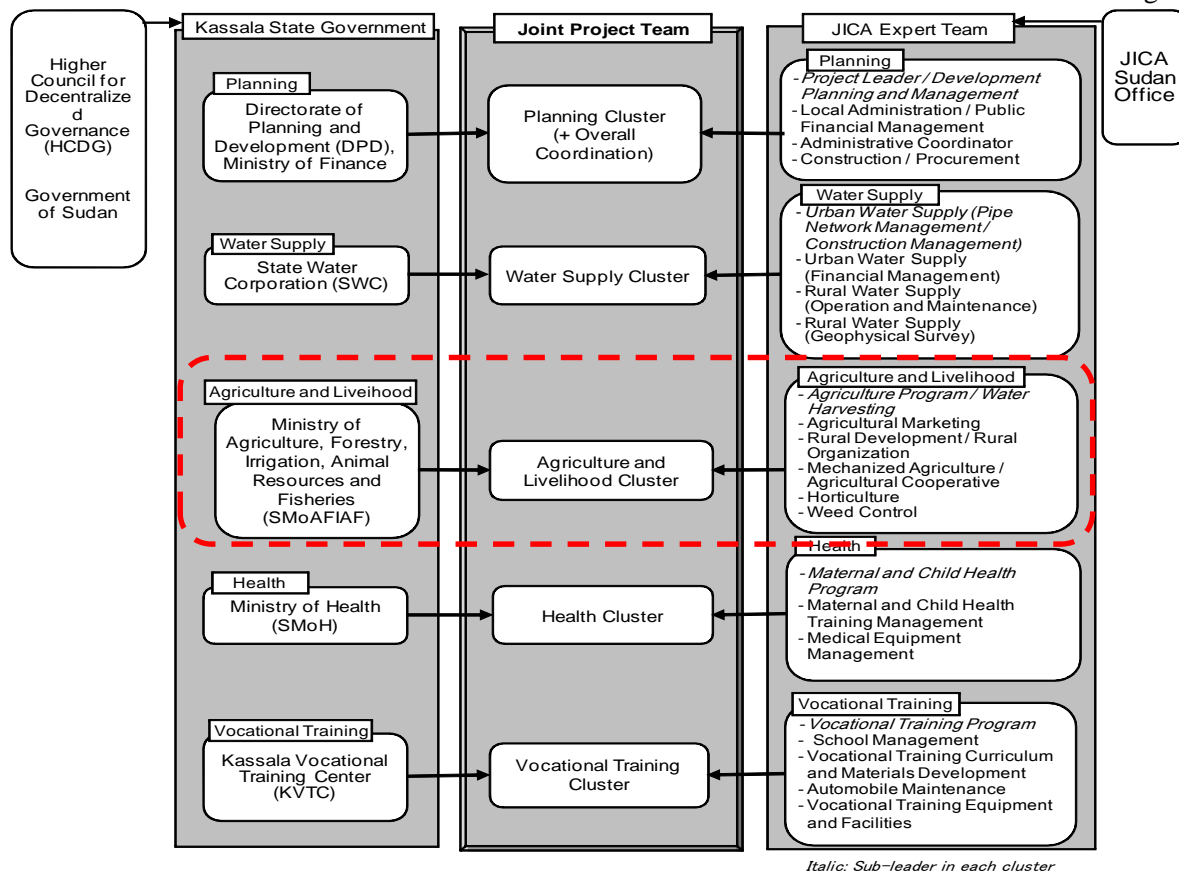


Figure 1.3 : Joint Implementation Team for the Project

Table 1.1: Members of Joint Coordinating Committee (JCC)

Chairperson of JCC	Director General (DG), State Ministry of Finance, Kassala	
Members of JCC	Kassala State Government	<ul style="list-style-type: none"> - Director of Planning and Development (DPD), SMoF - Representative(s) of State Ministry of Health - Representative(s) of SMoAFIAF - Representative(s) of KVTC - Representative(s) of State Water Corporation - Others appointed by SMoF
	Federal Government	<ul style="list-style-type: none"> - Representative(s) of Ministry of International Cooperation - Representative(s) of Ministry of Finance and National Economy - Representative(s) of HCDG
	Japanese Members	<ul style="list-style-type: none"> - JICA Experts of the Project - Representative(s) of JICA Sudan Office - Others appointed by JICA Sudan Office

Table 1.2: JCC meetings during the implementation phase of the Project

Project Year	JCC	Date	Main issues
First Project Year	1st JCC	June 5, 2011	Discussion of the work plan for the 1 st project year
	2nd JCC	November 3, 2011	Discussion on the progress of the Project based on the draft Progress Report No.1
	3rd JCC	March 6, 2012	Discussion of the progress in the 1 st project year based on the draft Progress Report No.2
2 nd Project Year	4th JCC	June 26, 2012	Discussion of the work plan for the 2 nd project year
	5th JCC	December 20, 2012	Discussion of the results of Mid-Term Review
	6th JCC	March 14, 2013	Discussion of the progress in the first half of the 2 nd

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			project year based on the draft Progress Report No.3, and report of Mid-Term Review to the Federal Government
	7th JCC	July 3, 2013	Discussion of the progress of in the second half of the 2 nd project year based on the draft Progress Report No.4
3 rd Project Year	8th JCC	September 29, 2013	Report of activities until 2 nd project year and discussion of the work plan for the 3 rd project year
	9th JCC	January 20, 2014	Discussion of the results of Terminal Evaluation
	10th JCC	April 28, 2014	Discussion of the outputs of K-TOP based on the draft Progress Report No.5

2. Basic Principles to Implement the Agriculture and Livelihood Cluster

2.1 Technical Principles to Implement the Agriculture and Livelihood Cluster

The Project adopts the following principles during the implementation of the Project.

- (1) Respect and foster Kassala State Government's ownership and initiatives for the Project
- (2) Bring visible impacts of the Project at the early stage of the Project, so that the local population can enjoy the "fruits of the peace"
- (3) Improve the C/Ps' primary works through the Project, so that they can use their improved capacity sustainably and self-reliantly in their work

In addition to these, the Agriculture and Livelihood Cluster employ the following principles to facilitate the implementation of the Project in technical aspects.

- (1) Conduct training to improve core capacity of extension officers and relevant officers
- (2) Strengthen their practical skills e.g. for marketing ,through pilot project activities
- (3) Strengthen information sharing among the officers and a linkage among relevant departments

2.2 Administrative Principles to Implement the Agriculture and Livelihood Cluster

The Project will follow the two principles in administration aspects.

- (1) Strengthen communication among the Project team members to generate a synergy effect among sectors
- (2) Implement the Project in cooperation with the JICA Headquarters and Sudan Office

2.3 Key Points for Implementation of the Agriculture and Livelihood Cluster

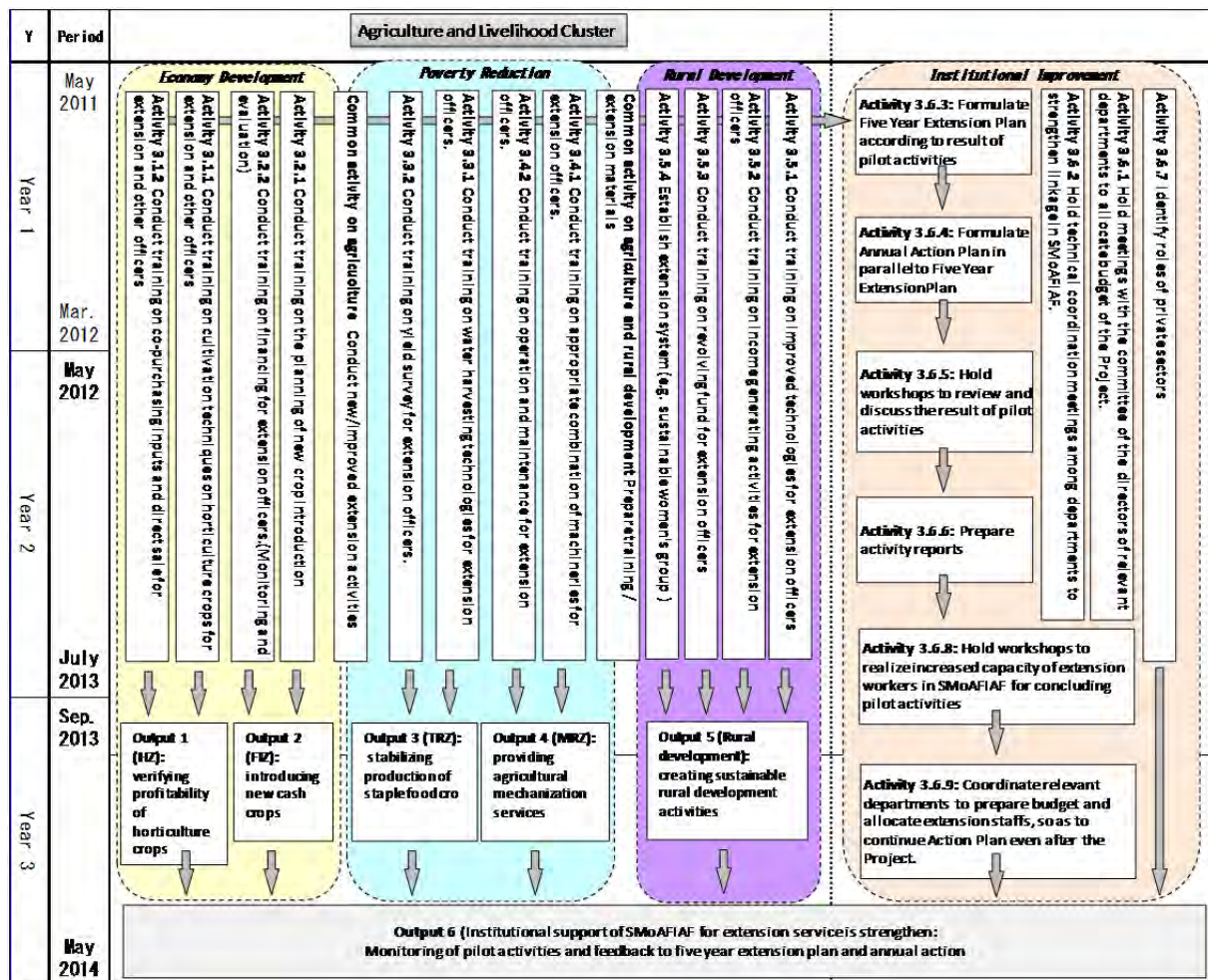
Throughout the implementation period, especially the latter half of it, the Project gives due consideration to the following.

- (1) Enhance the efficacy of the implementation by prioritizing activities in each zone and theme, so as to realize outputs (Output 1 to 5) specified in the PDM
- (2) Reinforce collaboration among departments in implementing activities (for Output 6)
- (3) Conduct monitoring and evaluation of the activities in each zone and theme through collaboration among the departments
- (4) Formulate the 5-year extension plan and annual plans through collaboration among the departments
- (5) Make necessary personnel and budgetary arrangements through collaboration among the departments for project implementation and sustainability

3. Progress of the Activities in the Agriculture and Livelihood Cluster

3.1 Flow of Activities in the Agriculture and Livelihood Cluster

The work flow of the Agriculture and Livelihood Cluster can be summarized in the figure below. Descriptions of activities in the PDM changed from the Work Plan originated at the beginning of this year (i.e. 2nd year). The Project has followed the activities in the PDM Ver. 4.1.



*In the extension period from May 2014 to March 2015, activities of Output 3&4 were implemented in addition to a part of Output 6.

Figure 3.1 : Flow of Activities in the Agriculture and Livelihood Cluster

3.2 Summary of Activities in PDM Ver. 4.1

The progresses and achievements of the activities indicated in PDM Ver. 4.1 can be summarized in the table below.

Table 3.1: Summary of the Activities

Outputs and activities	Summary of Status
HZ	
Output 3.1 Extension worker and other technical staffs are able to utilize	Done as planned. Capacity levels of the C/Ps were analyzed with CUDBAS. Training and activity plans were prepared based on the analysis.

Outputs and activities	Summary of Status
technologies/ knowledge for verifying profitability of horticulture crops in HZ.	Capacity development was monitored on the occasion of training. CUDBAS was reviewed according to the revised PDM. Capacities were evaluated at the end of the pilot activities.
Activity 3.1.1 Conduct training on cultivation techniques on horticulture crops for extension and other officers	Done as planned. <ul style="list-style-type: none"> • Basic knowledge on horticultural crop cultivation (crop management and fertilizer application, soil test, yield survey, etc.) • Onion cultivation (Early cultivation test, selection of suitable variety) • Tomato cultivation (Raising seedling on tray, technologies concerning with crop protection, review of field trials, etc.) • Potato cultivation (review of field trials) • Cabbage cultivation (Introduction test, review on the test) • Grafting of cucurbit crops (including practical training) • Exchange visits among demo farms on raising seedlings with cell tray
Activity 3.1.2 Conduct training on co-purchasing inputs and direct sale for extension and other officers	Done as planned <ul style="list-style-type: none"> • Co-purchasing (grouping and match with the bank and wholesalers) • Direct sale (grouping, preparing application to Kassala locality, determination of the price and pay-back period • Onion storage (for direct sale, experiments by groups)
Activity 3.1.3 Conduct new/improved extension activities (e.g. demonstration farm, study tours)	Done as planned. <ul style="list-style-type: none"> • On-farm demonstrations (tomato : control of insect vector for virus, onion: bulb set culture of onion, potato: modification of fertilizer application, new crops; cabbage, etc.) • Support farmers' groups for co-purchasing inputs, direct sale and onion storage
Activity 3.1.4 Prepare training / extension materials	Done as planned, including <ul style="list-style-type: none"> • Extension manual (functioning as handover notes for extension officers) • Cultivation manuals (soil analysis, diagnosis of nutrient deficiency, cell tray use, physiology and ecology of onion), cabbage) • Marketing manuals (co-purchasing input, direct sale, onion storage)
FIZ	
Output 3.2 Extension worker and other technical staffs are able to utilize technologies/knowledge for introducing new cash crops in FIZ.	Done as planned. Capacity levels of the C/Ps were analyzed with CUDBAS. Training and activity plans were prepared based on the analysis. Capacity development was monitored on the occasion of training. CUDBAS was reviewed according to the revised PDM. Follow-up was made especially for those who shifted to another position. Capacities were evaluated at the end of the pilot activities.
Activity 3.2.1 Conduct training on the planning of new crop introduction for extension officers	Done as planned. <ul style="list-style-type: none"> • Feasibility Study (incl. farm budget analysis, marketability analysis and technical/ institutional analysis) • Stakeholder workshop (WS), selecting sunflowers and pigeon peas. • General lecture on new crops • Planning extension plan (incl. cost-sharing with farmers)
Activity 3.2.2 Conduct training on financing for extension officers.	Done as planned. <ul style="list-style-type: none"> • Financial management training • Cash-book training through OJT • Evaluation (C/Ps prepared a report for technical review of sunflowers.) • Making recommendations for the next season
Activity 3.2.3 Conduct new/improved extension activities (e.g. study tours, public relations)	Done as planned. <ul style="list-style-type: none"> • Public relation (PR) activities with leaflets and radios • Demo with cost-sharing with farmers (pay-back system) • Match making between buyers and farmers • Cash-book training by the C/Ps for farmers • Evaluation/Technical review (incl. FAO and farmers)
Activity 3.2.4 Prepare training / extension materials	Done as planned, including <ul style="list-style-type: none"> • Extension manual (functioning as handover notes for extension officers) • PR Leaflets e.g., for demo site notification • Textbook on financial management and a format for cash book

Outputs and activities	Summary of Status
	<ul style="list-style-type: none"> • Sample formats of pay-back agreement with farmers
TRZ	
<p>Output 3.3 Extension worker and other technical staffs are able to utilize technologies/knowledge for stabilizing production of staple food crop in TRZ.</p>	<p>Done as planned. Capacity levels of the C/Ps were analyzed with CUDBAS. They were monitored through CUDBAS. Coordination meeting with FAO and Practical Action in December 2012. CUDBAS was reviewed according to the revised PDM. With change of an officer in charge (June 2013), OJT was re-conducted from preparatory stage to harvesting time during the season Capacities were evaluated at the end of the pilot activities.</p>
<p>Activity 3.3.1 Conduct training on water harvesting technologies for extension officers.</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Field Day for monitoring the production of sorghum using demo plots (with attendance of 50 farmers). • The C/Ps formulated annual plan, for 2013 establishing demo plots in 5 sites in 2 villages
<p>Activity 3.3.2 Conduct training on yield survey for extension officers.</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Confirmation on yield survey method with TTEA and Land Use Dept. • Yield Survey and WSs for result-feedback at pilot five villages
<p>Activity 3.3.3 Conduct new/improved extension activities (e.g. Farmer-to-farmer extension, public relations)</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Training 10 proactive farmers for farmer-to-farmer extension. • Technical coordination meeting between TTEA and Land Use Dept. to demarcate tasks for machinery services. • For demo plots established, Land Use Dept. started services. • Study to introduce cost sharing between SMoA and farmers. • Water harvesting (WH) terrace construction with cost sharing method was explained to farmers and implemented for 123 families.
<p>Activity 3.3.4 Prepare training / extension materials</p>	<p>Done as planned, including</p> <ul style="list-style-type: none"> • Extension manual (functioning as handover notes for extension officers) • Training on extension material making for Media Sec., TTEA. • Posters and leaflets to disseminate improved WH terrace • Video materials for farmers who could not join to field day.
MRZ	
<p>Output 3.4 Extension worker and other technical staffs are able to utilize technologies/knowledge for providing agricultural mechanization services in MRZ.</p>	<p>Done as planned. Capacity levels of the C/Ps were analyzed with CUDBAS. Training and activity plans were prepared based on the analysis. Capacity development was monitored on the occasion of training. CUDBAS was reviewed according to the revised PDM.</p>
<p>Activity 3.4.1 Conduct training on appropriate combination of machineries for extension officers.</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Training on data collection and analysis for mechanization plan • Field day to introduce new machineries • Selection of appropriate machinery for target areas by collecting data on machinery use, analysing efficiency
<p>Activity 3.4.2 Conduct training on operation and maintenance for extension officers.</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Training on maintenance and fault diagnosis of machinery for extension officers and operators of AMSA • Establishment of a garage for machineries in WEH office
<p>Activity 3.4.3 Establish extension system (e.g. association extension, public relations)</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Training on concept and relevant law of association • Enhancing machinery service operation capacity by training on finance management • Making rules and regulations for AMSA with reviews after each season • Training on record keeping, machinery management and operation • Allocating responsibilities to AM and FE Sections, and established management and monitoring system in TTEA • Analysing data on machinery service operation, and holding evaluation

Outputs and activities	Summary of Status
	workshop. Instructing AMSA and reviewing management system • <u>Making contract between TTEA and AMSA</u>
Activity 3.4.4 Prepare training / extension materials	Done as planned. Training for Media Section to prepare extension materials • Extension manual (functioning as handover notes for extension officers) • Preparing posters on new agricultural implements • Made pamphlets of new attachments, and its distribution • Made video training material on machinery maintenance
Rural Development	
Output 3.5 Extension worker and other technical staffs are able to utilize technologies/knowledge for creating sustainable rural development activities for extension	Done as planned. CUDBAS was reviewed to maintain consistency with the indicators of PDM in Mid-term Review. Capacity building of the C/Ps was monitored through CUDBAS.
Activity 3.5.1 Conduct training on improved technologies for extension officers	Done as planned. <u>HZ (income generation activities through small restaurant business and biscuit production)</u> • Organizing production groups as a business model • Marketing survey • Training on restaurant business and biscuit production and sales • Attending the cooking workshop organized by Sayga company • Training on food processing using sorghum flours by Food Research Cooperation (FRC) • Training on food processing by Sudan University of Science and Technology (SUST) • Training on sewing techniques for rural women by C/P who attended ToT by KVTC <u>MRZ (food processing, vegetable production using a water pump)</u> • Training of food processing • Training of vegetable cultivation method • Training on operation and maintenance of water pump including record keeping <u>FIZ, TRZ (utilization of mesquites, nutrition improvement)</u> • A series of lecture on mesquites (charcoal making, biological management, livestock feed, food processing, and prevention of occurrence) • Presentation of action plan after training in Japan
Activity 3.5.2 Conduct training on income generating activities for extension officers	Done as planned. <u>HZ, MRZ</u> • Needs survey and baseline survey • Financial management training and account book keeping • Sales analysis • Preparation of the next production and sales
Activity 3.5.3 Conduct training on revolving fund for extension officers	Done as planned <u>HZ</u> • Formulation of women group and division of works among group members • Training on account book keeping • Planning and monitoring for financial management of K-TOP fund <u>MRZ</u> • Preparation of proposal for water pump procurement • Formulation of women group and division of works between women group and water pump management committee including men members • Training on record keeping • Planning and monitoring for pay-back plan of initial investment cost for water pump
Activity 3.5.4 Establish extension system (e.g.	Done as planned. <u>HZ</u>

Outputs and activities	Summary of Status
sustainable women's group)	<ul style="list-style-type: none"> • Account book keeping and monitoring • Advertisement • Planning and monitoring for collection of user fee (commission) • Establishment of K-TOP fund (prepared as revolving fund for the next activities) • Enlargement of restaurant hall by using K-TOP fund • Conducting new trainings for rural women by using K-TOP fund <p><u>MRZ</u></p> <ul style="list-style-type: none"> • Introducing of revolving fund by collecting investment cost of water pump • Technical support for women group management (establishment of group regulation, registration of group, creation of water pump management committee, collection of member fees and financial management) <p><u>FIZ, TRZ</u></p> <ul style="list-style-type: none"> • Support for C/Ps to implement action plans of training in Japan • Preparation of proposal for extension activity by using K-TOP fund (improved stove, charcoal making, home garden and clean-up campaign)
Activity 3.5.5 Prepare training / extension materials	<p>Done as planned, including</p> <ul style="list-style-type: none"> • Extension manual (functioning as handover notes for extension officers) • Introduction of RRA • Manual for use of new energy as alternative to firewood • Text on basic sanitation control (translation into Arabic) • JOCV textbook on livelihood improvement (translation into Arabic) • Cooking recipes
Institutional support of SMoAFIAF for extension service	
Output 3.6 Institutional support of SMoAFIAF for extension service is strengthen	<p>Done as planned.</p> <p>Enhancement of collaboration and commitments of relevant departments of SMoAFIAF through the achievement of Outputs 1 to 5</p> <p>Establishment of collaboration patterns for pilot activities</p> <p>Improvement of meeting methods</p> <p>Improvement of reporting methods and system</p>
Activity 3.6.1 Hold meetings with the committee of the directors of relevant departments to allocate budget after the project	<p>Done as planned.</p> <ul style="list-style-type: none"> • Weekly meetings among the relevant departments from April to Oct. 2012 with the newly-appointed Director General (DG) • Morning meetings with the DG from Aug. to Feb., 2013 • Coordination meeting between TTEA and Planning Monitoring and Evaluation Dept. (PME) for reporting improvement • Coordination among DG, TTEA, and PME for budgetary arrangements for 5-year plan • Field monitoring with PME
Activity 3.6.2 Hold coordination meetings among departments to strengthen technical linkage in SMoAFIAF.	<p>Done as planned.</p> <p><u>Overall</u>: Self-evaluation conducted by PME</p> <p><u>HZ</u>:</p> <ul style="list-style-type: none"> • Visits to the existing direct shop by Horticulture Dept. and TTEA • Training on direct sale by Horticulture Dept. and TTEA • Verification of integrated cultivation technologies to be disseminated <p><u>FIZ</u>:</p> <ul style="list-style-type: none"> • Stakeholders WS with Plant Protection Dept, Agricultural Research Cooperation (ARC) and Agri. Bank • Lectures on cotton in collaboration with ARC <p><u>TIZ</u>:</p> <ul style="list-style-type: none"> • Joint evaluation by Land Use Dept. and TTEA on applied techniques in different soil condition • Joint preparation of an annual plan with demarcation of tasks <p><u>MRZ</u>: Meeting on machinery operation and management bet. DG/ TTEA</p>
Activity 3.6.3 Formulate Five Year Action Plan according to result of pilot activities	<p>Done as planned.</p> <p>The 5-year extension plan was drafted. The Project makes budgetary arrangements for activities for Output 1-5 with PME. The 5-year plan was developed on the basis of annual plans for 2014.</p>

Outputs and activities	Summary of Status
Activity 3.6.4 Formulate Annual Action Plan in parallel to Five Year Action Plan	Done as planned. The Project drafted the annual plans, which were refined by the C/Ps. They submitted the plans to PME and finalized them.
Activity 3.6.5 Hold workshops to review and discuss the result of pilot activities	Done as planned. <ul style="list-style-type: none"> • Self-evaluation for C/Ps to review and report the activities. • WS for reviewing activities and preparing action plans • Seminar to share findings of training in Japan to the staff
Activity 3.6.6 Prepare activity reports	Done as planned. <ul style="list-style-type: none"> • Collecting and analysing existing weekly/monthly reports • Report-KAIZEN committee organized by PME with TTEA • Designing a standard format for reporting
Activity 3.6.7 Identify roles of private sectors	Done as planned, including <u>HZ:</u> <ul style="list-style-type: none"> • AKMAM for potato experiment and introduction of quality seeds • CTC as a business partner with farmers group doing co-purchasing • East African Seeds Co for finding new channel for seeds procurement • Sayga of the DAL group for mobile training of cooking <u>FIZ:</u> <ul style="list-style-type: none"> • CTC: supplier for sunflower seeds • Making buyer lists of sunflower <u>MRZ:</u> <ul style="list-style-type: none"> • CTC as a partner holding Field Days on uses of planters and sprayers • Conducting study tour to look for opportunities to use CTC as an external trainer • DAL group for examining contract production of sorghum
Activity 3.6.8 Hold workshops to realize increased capacity of extension workers in SMoAFIAF for concluding pilot activities	Done as planned. <ul style="list-style-type: none"> • Self-evaluation (September 2012) • Evaluation of C/P's capacities by CUDBAS for Mid-term Review and Terminal Evaluation
Activity 3.6.9 Coordinate relevant departments to prepare budget and allocate extension staffs, so as to continue action plan even after the Project.	Done as planned. <ul style="list-style-type: none"> • Discussion with PME to make budgetary arrangements and formulation of 5-year plan • Discussion with DG and TTEA on staff arrangement

The progresses and achievements of the activities during the extension period from May 2014 to March 2015 in FIZ and TRZ can be summarized in the table below.

Table 3.2: Summary of the Activities

Outputs and activities	Summary of Status
FIZ	
Output 3.2 Extension worker and other technical staffs are able to utilize technologies/knowledge for introducing new cash crops in FIZ.	Done as planned. Implement pilot activities by the line budget of SMoAFIAF Fix ideas of cost sharing and pay back system Coordination meeting with other organization Monitoring and evaluation of activities
Activity 3.2.5 Monitoring on Flood Irrigation Zone Activities	Done as planned. <ul style="list-style-type: none"> • Monitoring was on the demonstration activities implemented by the line budget of SMoAFIAF • Study whether to implement the own demonstration activities and its size and contents etc. according to other donors and organizations • Coordination meeting with FAO • Conduct demonstration activities on pigeon pea (<i>Cajanus cajan</i>) by cost sharing or pay-back system.
Activity 3.2.6 Establish budget implementation	Done as planned. <ul style="list-style-type: none"> • Monitoring on budget implementation system of State Government.

system for pilot activities	<ul style="list-style-type: none"> • Advices for appropriate budget disburse • Request to Minister of Finance and DPD together with SMOAFIAF • Joint seminar with SMOAFIAF and SMOF
Activity 3.2.7 Explanation to farmers and call for participation	<p>Done as planned.</p> <ul style="list-style-type: none"> • Make explanation to two farmers groups in Digein Block WUAs No.37 and Tidili Block WUAs No.17 (6 and 25 members each) to call for participation. • Select farming farmer groups in 2015 for easy demonstration farm facilitation. • Raise cost sharing or pay back system as a condition for the participation.
Activity 3.2.8 Selection of the cultivating land and profit prediction	<p>Done as planned.</p> <ul style="list-style-type: none"> • Discussion with two farmers groups in Digein Block WUAs No.37 and Tidili Block WUAs No.17 (6 and 25 members each) • Select cultivating land for chick pea • Estimate production cost based on the real cultivation condition • Predict the gross income for chick pea in 2014-2015
Activity 3.2.9 Reaching agreement on payback or cost sharing methods	<p>Done as planned.</p> <ul style="list-style-type: none"> • Promote cost sharing of more than 75% or complete pay back of production cost for capacity development of farmers • Explain ideas of payback or cost sharing to two farmers groups in Digein Block WUA No.37 and Tidili Block WUA No.17 to call for participation when to make contract of demonstration farm. • Propose cost sharing to farmers • Adopt pay back system finally.
Activity 3.2.10 Conduct training on book management	<p>Done as planned.</p> <ul style="list-style-type: none"> • Visit regularly to train book management by on the job training, since selected farmers groups had sufficient basic knowledge on book keeping.
Activity 3.2.11 Monitoring on harvest of newly introduced crop	<p>Done as planned.</p> <ul style="list-style-type: none"> • Harvest chick pea at Digein Block WUA No.37 on 17-18th February y in 2015. • Harvest chick pea at Tidili Block WUA No.17 on 17-18th February and at the end of February in 2015. • Monitor harvesting by extension officers and ARC staffs at both sites • Expected to be 6-7 sacs per feddan, and become more than two times of yield compare to the average.
Activity 3.2.12 Support matching with buyers	<p>Done as planned.</p> <ul style="list-style-type: none"> • Provide information such as price, period and chickpea buyers at the Kassala Gash West market to both farmers groups in Digein Block WUA No.37 and Tidili Block WUA No.17.
Activity 3.2.13 Conduct farmer's satisfactory survey	<p>Done as planned</p> <ul style="list-style-type: none"> • Hold Field Day at Tindili Block WUA No.17, collecting farmers from surrounding villages and Digein Block WUA No.37 on 5 February. • Made interview to farmers on this occasion. • Headquarters of WUAs participated in the Final Seminar in 5 March. • Headquarters of WUAs expressed new action to increase planting area of chickpea by their own budget, since they are quite satisfied by this season's yield.
Activity 3.2.14 Support formulating Annual Plan and budgeting	<p>Done as planned.</p> <ul style="list-style-type: none"> • Support the extension officers to submit Annual Budget Plan, based on Year 2 of 5 Year Plan to PME in November 2014. • Considering high profitability and marketing access and so on, SMOAFIAF decide to continue extension activities on chick pea with contract-based demonstration farm.
TRZ	

<p>Output 3.3 Extension worker and other technical staffs are able to utilize technologies/knowledge for stabilizing production of staple food crop in TRZ.</p>	<p>Done as planned. Implement pilot activities by the line budget of SMoAFIAF Fix ideas of cost sharing system Coordination meeting with other organization With change of an officer in charge (June 2013), OJT was re-conducted from preparatory stage to harvesting time during two seasons. Monitoring and evaluation of activities</p>
<p>Activity 3.3.5 Establish budget implementation system for pilot activities</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Meeting with SMoAFIAF on the delay of budget disburse in 2014 • To maintain sustainability after the project, the Project and SMoAFIAF made request for appropriate budget disburse to SMoF. • In the Final Seminar in March 2015, main discussion made on sustainability and importance for establishing budget implementation system to continue pilot activities was emphasized.
<p>Activity 3.3.6 Support linkage between TTEA and Land Use Administration</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • To make use of lessons learned, collaboration between TTEA and Land Use was initiated from April in 2014. • The respective roles of TTEA and Land use became more clearly Main collaboration between TTEA and Land Use can be described as follows. • Prepares and submits farmer's application list by TTEA • Establish providing terrace construction services by Land Use • Make monitoring on growth of sorghum in the improved terraces. • Report 2015 Year Plan for budget to Land Use by TTEA. • One project vehicle was lent to SMoAFIAF and entrusted to self-management in 2014.
<p>Activity 3.3.7 Conduct training for farmers.</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Share the idea of cost sharing the Local Extensionist collected from targeting five villages in April and May 2014, • Confirm with the Local Extensionist some basic issues on WH terrace construction and requested to inform other farmers. • Provide on the job training on WH. In the field.
<p>Activity 3.3.8 Monitoring on agricultural machinery services, meetings to exchange opinions and reporting within SMoA</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Start agricultural machinery services on constructing WH terraces in May 2014 • 165 terraces totally were completed as forecasted, which were 34 % increases from the previous year. • Land Use took part in monitoring of construction • Moreover requests for terrace construction. In SMoAFIAF, TTEA together with DG and Land Use held internal meeting to seek possibility to add budget to answer the requests. • 235 terraces were targeted in 2015, which were 42% increases from the previous year
<p>Activity 3.3.9 Monitoring on harvest of sorghum</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • TTEA in collaboration with Land Use made joint crop assessment • Yield, height, weight of seed, stem and leave. And soil water content was measured in and out of the improved terrace.
<p>Activity 3.3.10 Conduct farmer's satisfactory survey</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Use extension materials i.e. leaflet, poster and video, which were prepared together with Media Section in TTEA and distribute to each village for extension. • Conduct public relation activities on WH terrace. • During the process of making extension materials, extension officers made interview to farmers on their satisfaction to services.
<p>Activity 3.3.11 Support formulating Annual Plan and budgeting</p>	<p>Done as planned.</p> <ul style="list-style-type: none"> • Support the extension officers to submit Annual Budget Plan, based on Year 2 of 5 Year Plan to PME in November 2014. • In 2015, TTEA is planning to extend services horizontally to two villages in addition to five villages.

	<ul style="list-style-type: none"> Study the policy to increase farmer's contribution on cast sharing, considering the yield of the previous season.
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3.3 Activities Implemented in the Agriculture and Livelihood Cluster

Horticulture Zone

(Activity 1.1) Conduct training on cultivation techniques on horticulture crops for extension and other officers

Technical training has been provided not only to extension officers but also to agronomists of Horticultural Department with consideration to the importance of collaboration. Capacity development was done by the mean of OJT at the nursery of Horticulture Department and demo farms. The Project assisted the C/Ps of TTEA and Horticulture Department in reviewing the results of the experiments and demos and sharing knowledge. The table below shows technologies transferred to the C/Ps.

Table 3.3: Technologies transferred per crop

Theme	Cultivation test	Contents and results of technology transfer	Major findings and lessons learnt
Onion			
Take off from mono harvesting system (Establishment of early shipping technology)	Onion set culture	The experiment attempts to produce onion set by sowing seeds late in April. However, bulb formation was not enough.	Despite the theory verifying that it would be possible toward the longest photoperiod in June, bulb formation has not been making smooth progress due to extremely high temperature.
	Early sowing cultivation (Sowing in June)	Onion seeds were sown to in early June, one month earlier than the usual sowing time. It is expected to lead to harvesting by the beginning of October.	Baftim was specified to be a potential variety as early sowing cultivation.
	Seed production trail	Bulb, which was broken dormancy in September was cut into half to plant.	It was observed that onion bulb could bolt up for flowering by planting sprouts growing from the bottom side of bulb cut into halves.
Tomato			
Establishment of summer cultivation	Shade management trial (Two varieties)	Trails on intensive nursery management with cell tray and transplanting bed using shading net. Growth condition was observed and recorded.	Methods for summer cultivation were studied but pest control was focused.
Pest control	Comparative trial between tolerant and susceptible varieties in appearance of symptom of TYLCV	Based on skill and capacity of diagnosis, adaptation and implementation, symptoms of pest in the pilot activities were observed and reviewed.	The recent production is at standstill due to severe occurrence of pest in Kassala. Moreover Tuta Absoluta has been occurring since the last year, damaging production; however there is no practical control method so far. Further study is required.
Potato			
Newly introduced cultivation	Comparative trials on varieties	Technology transfer on basic cultivation techniques	In the last two trial, yields did not exceed break-even point. It was recognized that the age of seed tuber

techniques in Kassala	Trails on suitable cultivation season	Varieties, age of tuber, planting season and dose of fertilizer were investigated.	and soil productivity had significant effects on the growth and yield. Not merely the results of pilot activity but even in several trials in the past in Kassala show poor productivity. Further study is required.
Cabbage			
Newly introduced summer cultivation techniques in Kassala	Comparative trials on introduced varieties	It was verified through two years trials that cabbage could grow even under severe condition in summer in Kassala if appropriate technologies were applied. This year, the practice is enlarged in order to investigate the profitability.	SMoA has decided to continue the study to introduce cabbage with farmers at south Sawagi area. Regarding cell tray techniques, which were introduced and adopted by several farmers for tomato nursery are also essential to be disseminated for summer cabbage production. Further study is required to expand production and reach profitability.
Melon			
Newly introduced cultivation techniques in Kassala	Comparative trials on introduced varieties	-Cultivation techniques at greenhouse and open field -Pest control -Grafting	It was found that they could grow in normal in greenhouses but were seriously attacked by disease Stem Gummy in open field. In fact, there are a lot of constrains that must be overcome for full scale of production in open field. Some seedlings were studied to graft on local pumpkin to prevent disease infection.

(Activity 1.2) Conduct training on co-purchasing inputs and direct sale for extension and other officers

This activity has been fully launched since Year 2 of the Project. Given the fact that there had been almost no activities on marketing e.g. co-purchasing and direct sale in Kassala, the Project has adopted OJT for capacity development with the aim of identifying possible marketing activities through learning-by-doing approach. The table below indicates the outline of pilot activities in marketing aspect.

Table 3.4: Technologies transferred for co-purchasing inputs and direct sale

Theme	Date	Contents	Participants	Major findings and lessons learnt
Co-purchasing				
Formation of a group	June 2012	How to make a group (targeting farmers who have already mutual trust each other)	3	Functionality of a group increase by involving not only-small-scale but also mid-scale farmers
Identification of inputs for co-purchasing	June 2012	To identify which inputs are common for group members	3	Seeds of onions were not appropriate for co-purchasing, as farmers have their own preferences. Fertilizers and chemicals are suitable items.
Match making with input dealers	Aug 2012	To facilitate negotiation between the group and CTC	2	Need to prove the social status and reliability of the group, including advance payment
Match making with Agri. Bank	Sep 2012	To know conditions for loan and procurement	1	The price of Urea at the bank was cheaper than the market, especially with cash payment
Review of the activity	Oct 2012	Review of the results of the pilot activity	10	Farmers' interests increased given the good result of the pilot activity
Expansion of	June	Mobilization of new	3	Many farmers intended to join but the

Theme	Date	Contents	Participants	Major findings and lessons learnt
the group	2013	farmers, based on the first pilot experience		activities have suspended due to the high price of Agri. Bank's inputs.
Direct sale				
Coordination with market office	Aug-Sept 2012	Obtaining a site for sale, designing the shop, confirming rules for selling	3	Farmers can update the shop structure by themselves, showing their strong interests.
Application to the locality	Set 2012-Jan 2013	Obtaining approval from locality for direct sale	2	Great roles of extension officers in justifying groups for direct sale, taking a lot of time for approval
Price setting and financial management	Jan 2013	How to set prices for direct sale and do financial management	5	Could not set realistic sale targets and business plan due to no experience of direct sale. Need to give advice based on the pilot conducted
Trial sale	Feb-July	Trial sale with promotion	2	Trial could be done while waiting for approval by the locality. Good opportunities for farmers to gain practical skill
Sale and follow-up	Sept	Launching the sale with promotion and monitoring by the C/Ps	2	At initial stage, very important to inform many people on direct sale. Media/ Microphone performance and small gifts such as balloons could be effective for promotion.
Onion storage				
Experiment	Feb- July 2013	To identify possible methods for storage	3	On-bed and hanging methods were identified with identification of dis/advantages of each.
On-farm trial	Feb 2013	To do experiment at farm level by the group	2	Need to give guidance to farmers before harvesting

(Activity 1.3) Conduct new/improved extension activities (e.g. Demonstration farm, study tours)

Cultivation activities

3.1) Activities at demo farms and the nursery of Horticulture Department

The Project has demonstrated various kinds of technologies at farm and nursery levels. The extension officers, horticulture officers and farmers selected promising techniques among others through consultation with the Japanese experts. During implementation, the pilot experience revealed that some of the techniques required in-depth experiments rather than filed application. In such cases, the Project shifted the work station from the demo farms to the nursery of Horticulture Department.

3.2) Extension of effective techniques

While doing demonstrations, the Project has found that farmers increased their interests in use of cell trays and in improved application of fertilizers (lower amounts of N). Although the introduction of cell trays requires some initial costs for investment, several framers procured them with their own resources. Having noted this, the Project held a field day for effective use of cell trays.

3.3) Examination of potential crops for extension

Throughout the three-year implementation, the Project examined the potential of new crops for cultivation, including potatoes, melons and cabbages by doing experiments. It was then found out that summer production of cabbage was most promising, thus requiring further examination to identify appropriate production volumes for marketing. Given this finding, the Project assisted pro-active farmers in producing cabbage through a pay-back system, in which we provided some initial inputs to them and they will return costs to SMOAFIAF after harvesting and selling the produce.

Marketing activities

3.4) Co-purchasing inputs

For co-purchasing inputs, the Project started organizing 5 farmers as one group, who knew each other and had mutual trusts. This was followed by the identification of inputs common to all members and matching of the group with an input dealer (CTC). This process revealed some lessons to the extension officers, e.g. onion seeds were not appropriate for co-purchasing due to individual preferences; and the private sector required social endorsement of the group by the government and advance payments from the group. In addition it was found that farmers recognized inputs by brand name rather than by function. In such cases, extension officers have to explain farmers the function of respective inputs and help them in identifying a particular good for co-purchasing. Moreover the experiences show that the price of Urea at Agri. Bank, when it becomes lower than market, provides good impetus for farmers to proceed co-purchasing. Therefore extension officers have to obtain price information and conditions for business in advance of taking action with farmers' groups. The project has developed capacity of the C/Ps for facilitation and coordination. They must play a vital role for further extension of co-purchasing.

Table 3.5: Reduction of production costs by co-purchasing (2012)

Items	1) Market / Shop price	2) Price paid by Group	3) Price Difference =1)-2)	4) Q'ty procured	5) Total Difference =3) x 4)	Purchased from
A. Urea	220	185	35	150	5,250	Agri. Bank*
B. Goal	175	148	27	15	405	CTC
C. Insecticide	45	41.25	3.75	15	56	CTC
Total Cost reduced(Benefit) for 30 feddan: A + B + C=					5,711.25	
Total Cost reduced(Benefit) per feddan=					190	SDG/feddan

3.5) Direct sale

As for direct sale, the extension officers assisted farmers groups in making an application to locality offices to obtain approval for selling. They also provided training to the groups on how to set prices for direct sale and prepare a business plan, after receiving TOT from the Japanese expert. The lessons learnt from the pilot experiences includes i) the need of appointing one or two members as sellers rather than all members attending the shop, taking into account opportunity costs of them; ii) the need for PR activities to inform many people of the direct sale; and iii) the need for good microphone performers for marking promotion especially during the initial stage of business.

The Project estimated that the net profits (difference from selling to middlemen) could be 70 SDG/day¹, based on the size of the group and shop. The pilot activity, in practice, gained 20-30 SDG/day according to monitoring records. Hence there must be further efforts to be made by the group for developing business e.g. selling various kinds of vegetables and fruits all the time. This should be realized with the follow-up by the extension officers, who have been capacitated by this Project.

3.6) Onion storage

Onion storage was attempted to sell onions in scarce season with higher prices, even at the direct sale shop. The first pilot season (2012) utilized facilities of a cooperative and TTEA. The storage methods adopted are on-bed and hanging type. It is estimated that if the rotten proportion of onions kept in

¹ Major products e.g. onions and tomatoes could yield the net profit of 1 SDG/ Kg as compared to selling to middlemen. The sale volume could reach 50 kg/ day, bringing the profit of 50 SDG/ day to the group. Other goods such as leaf vegetables, hot peppers and limes may contribute 20 SDG/ day.

storage is less than 30% until September when the price gets high, the activity would be profitable. Given the fact that the first season recorded less than 10% until July, there are some farmers attempting onion storage at farm level.

For the purpose of extension, the Project assured the minimum prices for farmers by buying the produce at market price when harvested. Extension officers have been made able to provide technical advice to farmers e.g. fully-mature harvesting and harvesting onion with neck. Recognizing that farmers show strong interests in this activity, they should provide more services and advice e.g. lower application of Urea in cultivation to produce storage-durable onions.

(Activity 1.4) Prepare training / extension materials

The Project has produced the extension manual for HZ, which delineates how to conduct the pilot activities and use training materials with reflection of lessons learned from the practice. The following is a list of training/ extension materials. The extension manual is expected to function as handover notes for extension officers.

Table 3.6: Extension and training materials (HZ)

Name of material	Type	Major Usage
Extension Manual for HZ	Manual	Guidance to new officers and practical notes to existing ones
Soil analysis	Leaflet	Training material to extension officers
Raising seedling on cell tray	Leaflet	Training material to farmers
Fertilizer application	Manual	Training material to extension officers
Yield Survey	Manual	Training material to extension officers
Physiological characteristic of onion	Manual	Training material to extension officers
Tomato yellow leaf curl virus	Manual	Training material to extension officers
Cabbage cultivation manual	Manual	Training material to farmers
Results of potato cultivation trial	Report	Record of the pilot activity
Results tomato cultivation trial	Report	Record of the pilot activity
Results of cabbage cultivation trial	Report	Record of the pilot activity
Results of Trial on early planting of onion	Report	Record of the pilot activity
Soil nutrient value	Report	Record of the pilot activity
Role and Importance of Agri. associations based on the pilot activity of co-purchasing	Presentation material	Training material to farmers' groups
Effectiveness of onion storage	Leaflet	Training material to farmers' groups
Key points of Direct sale	Presentation material	Training material to farmers' groups



Field day on cell tray with Horticulture Department



Visit to farmers who adopted cell tray with his own resources

<p>Explain the benefits of a group for co-purchasing</p>	<p>Urea co-purchased by the group</p>
<p>Direct sale at West Gash Market</p>	<p>Guidance on how to keep sale records</p>
<p>Onion storage</p>	<p>Onion storage practiced by a farmer himself</p>

Flood irrigation Zone

(Activity 2.1) Conduct training on the planning of new crop introduction for extension officers

This activity was conducted in Year 1 of the Project. Since then, the extension officers have reviewed the results of the last season and formulated an annual plan for the next. The technology-transfer process undertaken by this Project are shown in the table below. The extension officers are now capable of producing action plans by themselves almost all, with, if any, little advice by the Japanese experts.

Table 3.7: Training and technology-transfer process for new crop introduction

Theme	Date	Contents	Partici- pants	Major findings and lessons leaned
Feasibility Study	Sep – Oct 2011	Farm budget (profitability analysis) Marketability analysis Institutional/ technical readiness	10	Need to consider not only profitability but also marketability and technical/institutional readiness Avid over-estimation of profitability, taking safety factor.
General lecture	July 2012	General knowledge on cotton, sunflowers and pigeon peas	7	Availability of trainers at universities and ARC
Extension plan	July 2012	Designing demo plots Selecting technologies	3	Started with 5 feddan to see validity of production package and marketing
Review and plan for the next	Feb-Mar 2013 月	Review of 2012/13 season and making extension plan for 2013/14	3	Difficult for TTEA to manage the demo plots. Change extension approach from TTEA demo to direct support to farmers willing to cultivate new crops. Select cottons and pigeon peas while discarding cottons which were not sold
Review and plan for the next	Feb-Nar 2014	Review of 2013/14 season and making extension plan for 2014/15	2	(Extension officers are able to do almost all by themselves)

(Activity 2.2) Conduct training on financing for extension officers

Under this activity, the Project has transferred extension officers the knowledge for monitoring the implementation of the plan that they have made. The table below summarizes its process. In Year 2, the C/Ps applied the knowledge of cash book, which was obtained from this Project, to other donors' activities by providing training to their beneficiaries. While some farmers practiced what they have learned, others are yet to adopt it. There is thus need for extension officers to keep facilitating farmers in practice.

Table 3.8: Training and technology-transfer process for financial monitoring

Theme	Date	Contents	Partici- pants	Major findings and lessons leaned
Financial management	May - Jun 2012	Production cost Break-even point Cash book	12 (3 from FIZ)	The C/Ps developed format of cash book for farmers
Cash book and evaluation	Sept 2012- Mar 2013	Record of production costs in a cash book	3	The C/Ps could differentiate training costs from production costs Need to keep original evidence with cash book Found that production was lower than planned.
Monitoring farmers' cash book	Sept2012-Mar.2013	Checking data in cash book recorded by farmers	3	Need to check data in terms of items, timing and amounts. Need to combine cash book monitoring with field monitoring especially for high-cost items such weeding
Technical review of sunflowers	Feb. 2014	Prepare review reports and make presentation	2 人	Need to compare plan and the actual Also important to visit other areas for technical and economic comparisons

(Activity 2.3) Conduct new/improved extension activities (e.g. Study tours, public relations)

FIZ has a nature of un-predictability: no one knows when flood comes. Due to this characteristic, it

was difficult to make a plan of training or field days in advance and thus invite farmers and other stakeholders. In order to make the people aware of our pilot activity in a daily life, hence, the Project initiated PR activities as a new extension e.g. by distributing leaflets widely and announcing demo locations through a radio. It also engaged in match making between farmers and buyers. Moreover cost-sharing (pay-back) system was employed with the aim of assisting farmers in cultivating new crops while discarding conventional demonstration by TTEA, as found that it was not effective in Year 1.

Through the implementation of the pilot activities, extension officers came to play a significant role e.g. by developing a cash book format for farmers and making agreement of pay-back system with them. While there is no denying of capacity development of the C/Ps, there is a significant challenge for new crop introduction. The production of sunflowers have been lower than planned, failing to get pay-back. It is of critical importance for the C/Ps to find effective technical package for production increase and realize the potential of production with farmers. Cost-sharing approach is being adopted by other donors: this should be maintained for the future extension.

Table 3.9: Extension activities undertaken in FIZ

Theme	Date	Contents	Partici-pants	Major findings and lessons leaned
Cost-sharing	June 2013	Agreement with farmers Demarcation of responsibilities with farmers	2 rep. of farmers groups	Need to address how to deal with the case in which revenue exceeds farmers portion but not overall costs
Monitoring production cost	June 2013	Cash book monitoring	3 farmers	Need to make in-depth follow-up
Training on cultivation	Several times in 2012/13 season	Chisel, riders and planters for new crops	Around 100	Need to decide which technology we use, by machine or labor
PR for demo on new crops	Aug – Oct 2012 Dec 2013	Leaflet distribution PR through a radio	Around 500 pieces	Better to request Agri. Bank to put leaflet at their office for distribution No need to prepare high-quality one rather use A4 paper for making leaflets
Field day for PR	Several times in every season	PR by the minister and other key players	30-50/ each	No need to do framing practice at FD, just show some sample works at FD
Yield survey	Feb 2014	Measuring yield	Several farmers	Need to do calibration or bring several weight scales for accurate measurement
Match making with buyers and marketing	June 2013 Feb 2014 (for marketing)	Making buyers list Assist farmers in selling their produce	2 buyers and 50 farmers	Need to confirm sale conditions e.g. where to sell and how to do with the volume of sacks
Technical review of sunflowers	Feb 2014	Review, evaluation and recommendations	20 incl. donors and farmers	Need to clarify the role of each stakeholder for collaboration

(Activity 3.4) Prepare training / extension materials

The Project has produced the extension manual for FIZ by improving and utilizing the training materials and review reports which had been made during implementation of the pilot activities. The following table shows the list of training/ extension materials. The extension manual is expected to function as handover notes for extension officers.

Table 3.10: Extension and training materials (FIZ)

Name of material	Type	Major Usage
Extension Manual for Flood Irrigation Zone	Manual	Guidance to new officers and practical notes to existing ones
Report of Feasibility Study	Report	Training material to extension officers
Proposal from Task Force	Presentation material	Training material to farmers
Contract format	Format	A tool for extension
General texts on new crops	Textbook	Training material to extension officers
Leaflets for PR (new crops and demo)	Leaflet	Training material to farmers
Financial Management	Textbook	Training material to extension officers
Gash book format	Format	A tool for extension
Match making	Outline	Training material to extension officers
Evaluation / technical review of sunflowers	Presentation material	Report to stakeholders of sunflowers



Presenting the feasibility study results and proposing new crops at a stakeholder workshop



PR activities (leaflet distribution) for demo



Matching between the farmers' group and buyers



Cash book monitoring by extension officers

	
Selling of sunflowers by farmers to a buyer with witness of an extension officer	Technical review of sunflower production 2013/14 (Compare the plan and the actual)

Traditional Rain-fed Zone

(Activity 3.1) Conduct training on water harvesting technologies for extension officers.

The introduction of WH in TRZ required special knowledge and techniques that were not observed in TTEA. Therefore the Project facilitated collaboration with Land Use Department that possesses such expertise, establishing one team for WH extension with the officers from the two departments. The Project identified useful knowledge and techniques for improving WH terrace and provided training to TTEA officers on those issues. In fact the process of capacity development was repeated two times due to the reshuffling of the officers in charge. While engaged in building capacity of TTEA, we also organized training on land survey and topographic map making for Land Use Department, inviting trainers from outside of the ministry. In Year 2, collaboration was made with ARC for field experiments on the use of the chisel with WH terraces and for the survey on the water-holding capacity of soil.

Table 3.11: Technical training conducted for TRZ

Theme	Date	Contents	Participants	Main findings and lessons learned
WH techniques	June, 2012	Combination with improved terrace methods and chisel plough	50	Introducing improving water harvesting techniques to farmers
Review on activity	Sep., 2012	Field day on WH (Growth of the season)	5	Confirmation of the growth of sorghum and applied techniques
Construction of demonstration farm	June, 2013	Construction of WH terrace at 5 sites in two villages	6 (incl. 5 farmers)	Learned improved WH terrace as demonstration

(Activity 3.2) Conduct training on yield survey for extension officers.

Under facilitation of the Project, the WH extension team established the methodologies of yield survey, which combines interviews with sample measuring. The demonstrations on WH techniques were carried out in two seasons in 2012 and 2013. And in the second one, the team held night-time video shows for farmers in target villages. They explained benefits of introducing WH terraces with the results of the yield survey, which succeeded in convincing them to apply the techniques.

(Activity 3.3) Conduct new/improved extension activities (e.g. Farmer-to-farmer extension, public relations)

The extension of WH techniques started in Year 2(2012). First, the Project held a series of field days at

demonstration farms with the aim of raising awareness of many farmers over the new techniques. Following this, in 2013, we were engaged in establishing an extension system, in which SMOAFIAF shared cost with beneficiaries, so as to provide services for a large area of 5 villages, in addition to the demonstration farms. To realize this, the Project facilitated discussion among PME, TTEA and Land Use Department while having night-time video shows in the villages. The following table indicates the outline of the extension services carried out in 2013, through cost-sharing with farmers.

Table 3.12: WH Terrace construction service implemented in 2013



Service	WH Terrace construction
Method	Implementation in collaboration with TTEA and Land Use
Season	During June
Prices (per a terrace)	440SDG
Cost sharing (per a terrace)	Farmers 110SDG (25%), SMOAFIAF 165SDG (37.5%), The Project 165SDG (37.5%)

(Activity 3.4) Prepare training / extension materials

In order to enhance quality of training/extension materials, the Project conducted training on material making to Media Section of TTEA with external experts. This was followed by development of posters, leaflets and video programs through collaboration between TTEA and Land Use Department. It also prepared the extension manual for TRZ, addressing the steps for extension with lessons learned from the pilot activities. The extension manual is expected to function as handover notes for extension officers.

Table 3.13: Training and extension materials (TRZ)

Name of material	Type	Major usage
Extension Manual for TRZ	Extension Manual	Guidance to new officers and practical notes to existing ones
Introduction for Improved WH Terrace Construction	Leaflet	Extension material to farmers
Advantages of introducing Improved WH Terrace	Poster	Extension material to farmers
Making improved WH terrace	Video program	Extension and training material for farmers and extension officers
Voices from Beneficiary Farmers	Video program	Extension and training material for farmers and extension officers

	
Field day on improved WH terraces (Swel village)	Survey on water-holding capacity of soil with ARC

	
<p>Training for pro-active farmers on WH terraces</p>	<p>Sorghum grown with improved WH terraces</p>
	
<p>Explaining the cost-sharing machinery service to farmers</p>	<p>Confirmation of location for the demo by Land Use Dept. and local extensionist</p>
	
<p>Technical coordination meeting between TTEA and Land Use Dept</p>	<p>Night-time video show on improved WH terrace</p>

Mechanized Rain-fed Zone

(Activity 4.1) Conduct training on appropriate combination of machineries for extension officers

Objectives of the pilot activity in MRZ are to establish a system to provide machinery service to small-scale farmers in remote areas and introduce new machineries. In this pilot activity, the Project conducted training on the general procedure of mechanization plan to identify appropriate combination of machinery implements. In Year 1, we collected necessary data for machinery selection such as speed of operation, specifications of attachment, and duration of operation and effective working days. This was followed by evaluation on the efficiency of machinery service in pilot villages by comparing theoretical field coverage calculated by the mechanization plan with the actual coverage of each village. Comparing costs and profits between the theoretical and the actual, the Project also assessed

efficiency of machinery service in terms of finance.

Through the process above, extension officers gained capacity for assessing efficiency of machinery use and advantage/ disadvantage of each implement and for making appropriate decision on machinery selection. Table 3.13 shows the items that extension officers learned through the pilot activity. In general, the needs for machineries that stabilize production of sorghum are higher than those that make farming practices efficient and more profitable. Behind this is tendency of farmers in WEH locality to minimize risks of production failures against drought.

Table 3.14: Advantages and disadvantages of each implement

Implements	Advantages and Disadvantages
Wide-level Disc Harrow with seeder	It is commonly used by farmers in the target area. Width is large and speed is high in operation. It can harrow effectively and coverage of service is large in area. It cannot plow deep thus soil moisture is lower compare to the soil plowed by chisel.
Chisel Plow	It is new implement for the target area. Width of operation is smaller than wide level disc, but it can increase soil moisture. The needs of chisel have been dramatically increased from second year of pilot activity.
Disc Plow	It is applied horticultural crops in the riparian zone due to soil feature.
Front loader	It is effective in making terraces for rainwater harvesting. Terrace making is high profitable service for AMSA.
Planter and Sprayer	Input of planter and sprayer will be loss if rainfall is small. Due to lack of predictability in profit against input, farmers still hesitate to apply them.
Mower	It helps to optimize harvesting work, but the demand is still low in WEH. Since casual labors are available during harvesting season, it does not reduce cost a lot..
Baler	It is a machine to pack residues of grains in square block to store as feed. Demonstration of baler attracted members of livestock union as profitable business more than farmers.

(Activity 4.2) Conduct training on operation and maintenance for extension officers.

The Project has provided extension officers with training on machinery maintenance and management from the beginning of pilot activity. In Year 1, AMSAs failed to conduct periodical maintenance. This was because the responsibilities of concerned officers in FE Section and AM section were ambiguous and there is no systematic arrangement to monitor operations and maintenance of AMSAs. Therefore, the Project assisted TTEA in demarcating the responsibilities for operation and maintenance among AM Section, FE Section and AMSAs. It also conducted training on operation and maintenance for the machinery operators of TTEA and AMSAs and then developed operation plan and tools of monitoring and evaluation for collaboration of TTEA with AMSA.

The officers of AM section prepared the inventory of agricultural machineries and update it on a regular basis. At TTEA office, they also, as a part of Kaizen activity, cleaned a garage and yard and stored agricultural machineries in TTEA in well-organized way. For the WEH extension center, on the other hand, a garage was constructed by this Project in order to keep machineries during off season.

Through activities in Year 3, extension officers learned how to make operation plan and use monitoring and evaluation tools that were established by the Project. Based on the weekly report produced by extension workers in WEH, AM section keeps records of machineries' performances and those of income and expenditure of operations. It now can prepare summary reports, when it is needed.

(Activity 4.3) Establish extension system (e.g. Association extension, public relations)

The Project organized small-scale farmers as AMSA to provide machinery service to other small-scale farmers in remote area in appropriate time. First of all, the Project conducted training on machinery maintenance and operation for extension officers. The extension offices provided the same training to

the members of AMSAs. After they started providing machinery services, the extension officer assisted AMSA in making rules and regulations and instructed them to keep cash book and log book to enhance AMSA's capacity of machinery service operation.

In Year 1, on account of occurrence of severe drought, the performance of machinery service operation was low and record keeping was not well done. In addition, most of the machines rented for AMSA were new, while a wide-level disc which was the most popular attachment in WEH, was not provided. Regardless of these, it was proved that chisel plow, a new implement for the farmers, could sustain the moisture of soil. At farms that were plowed by chisel, the production of sorghum was relatively higher than others where wide-level discs were used.

TTEA rented wide-level discs with seeders to AMSA in Year 2, which could expand coverage of machinery service. On the other hand, the Project promoted the use of other new attachments through demonstrations and field days, which resulted in boosting up demand for chisel plow. Consequently, AMSAs achieved coverage of 616 ha by machinery service with chisel plow. While AMSAs could improve the coverage of service delivery, their capacities for repair and maintenance were still low, thus worsening the performances of the services after all. Although AMSA in Abuda could make profit from the service by the end of season, there was no benefit for that in El Karda.

The experience of Year 2 was reflected to Year 3. The Project strengthened capacity of AMSA for keeping log book and cash book. Training on maintenance and repair was also given to extension officers and operators of AMSA. The Project also established a system in TTEA to monitor status of operation and maintenance and provide AMSA with necessary guidance. By introducing new report formats, AM section has been able to collect and accumulate data and assess the performance of machinery service. The achievements of AMSAs in Year 3 are summarized in the table below.

Table 3.15: Achievements of Abuda and El Karda AMSA

AMSA Code** (target village)	MF8 (Abuda)		MF9 (El Karda)		
	Year of Assessment	2012/13	2013/14	2012/13	2013/14
Total hours of operation (h)		325	503	129	446
Gross income (SDG)		19,250	60,581	8,570	69,039
Gross income per hour (SDG)		59	120	66	155
Expenditure (SDG)		12,730	30,238	9,173	35,134
Rate of expenditure against gross income (%)		66%	50%	107%	51%
Expenditure per hour (SDG)		39	60	71	79
Rental fee (25% of Gross income)		-	15,145	-	17,260
Actual payment (SDG)		1,220	9,182	0	14,150
Balance of payment (SDG)		-	5,963	-	3,110
Profit (SDG)		5,300	15,198	-603	16,645
Profit per hour (SDG)		16	30	0	37

*Rental fee of El Karda actually shows cost of tires which were supposed to be covered by TTEA. Balance of payment was paid in cash. **It shows code of tractor that given when inventory was made

As the table reveals, the achievements of AMSA has improved from 2012-13 season to 2013-14. The initial intention of AMSA approach had been to make small-scale farmers have and use machines in time. But the service had been limited only to the members of AMSA, without maximizing its function. Thus there had been no incentive to expand the services to other farmers. The Project then started renting high demanded machinery, disseminating new machinery and providing training on financial management, all of which contributed to expansion and improvement of performance of machinery service. AMSAs are now able to pay rental fee to TTEA though they were unable to do it in Year 1.

(Activity 4.4) Prepare training / extension materials

The Project made the manual for formation and operation of AMSA and compiled extension materials prepared for pilot activity with it. They are described in Table 3.16. The extension manual is expected to function as handover notes for extension officers.

Table 3.16: Training and extension materials (MRZ)

Name of Material	Type	Major usage
Extension manual for AMSA approach	Manual	Extension officers use it for formation of new AMSA as guideline
Cropping schedule and operation plan of machineries	Format	Form to be used for making schedule of machinery operation
Foundation of Organization Act	Law	Law to be used as reference for management of AMSA
Regulation of AMSA	Sample	Sample for making rules and regulations for AMSA
Equipment contract	Sample	Sample to be used for making contract with new AMSA
Cost analysis of machinery use	Format	Used for deciding rental fee
Estimation of field coverage	Format	Format to evaluate efficiency of newly introduced machineries
Procedure of mechanization plan	Manual	Used as reference for mechanization plan
Cash book	Format	Format for AMSA's Cash book
Log book	Format	Format for keeping record of machinery service
Record of machinery service	Report format	Format to be used for reporting for extension officers
Performance evaluation sheet	Evaluation format	Format to be used for evaluation of AMSA's performance
Summary report of AMSA's activity	Report format	Format to be used by AM section to report performance of AMSA
Machinery maintenance schedule	Manual	Manual for keeping maintenance machinery schedule
Basic maintenance of tractor	Video	Training material for extension officers and member of AMSA
Effect of chisel plow on sustainability of soil moisture	Poster	Extension material for chisel plow
Effectiveness of harvesting and post-harvesting machineries	Leaflet	Extension materials for harvesting and post harvesting machineries
Effectiveness of planter and sprayer	Leaflet	Extension materials for crop management machineries
Manual for financial management	Manual	Training manual on financial management for extension officers

Since it was proved that AMSA is able to sustain their service on their own, the SMOAFIAF has decided to expand AMSA gradually by adding two sets of machinery in Wad el Helew within five years, according to Five Year Action Plan.. Manuals mentioned above include procedures and formats for formation, instruction and monitoring. TTEA is expected to operate AMSA according to the manual. The Project also enhanced capacity of Media Section in TTEA to make extension materials. Thus, the materials for extensions are to be revised according to use and target areas.

	
<p>Assembly for Formation of AMSA</p>	<p>Training on Machinery Operation and Maintenance</p>
	
<p>Training on Sprayer by CTC (Collaboration with private sector)</p>	<p>Kaizen activity in agricultural machinery</p>
	
<p>Record keeping of pump operation (El Karda)</p>	<p>Observation of front loader</p>
	
<p>Training of use of front loader (Abuda)</p>	<p>Workshop on 5 Year Action Plan</p>

Rural Development

(Activity 5.1) Conduct training on improved technologies for extension officers

As for rural development activities, the Project implemented various activities through OJT for extension officers, taking into consideration the feature of each pilot zone. In HZ which locates in urban area, business model was created in food processing, while in FIZ and TRZ which are mainly rural areas, it aimed at livelihood improvement e.g. charcoal making etc. In MRZ, the Project introduced vegetable production by the provision of water pump and established revolving fund system for collecting initial investment cost.

Table 3.17: Trainings conducted to extension officers and rural women

Content of training	Major findings and lessons learnt
HZ (Jun 2012 – April 2014), Target 25 (16 extension officers and 9 rural women)	
<u>Small restaurant (wmen group)</u> <ul style="list-style-type: none"> • Discussion with women group and monitoring of the group activity • Market survey • Book keeping and financial management • Advertisement • Business management 	<u>Small restaurant</u> <ul style="list-style-type: none"> • Contents of business, division of works, collection of commission (user fee), and financial management • Review of business plan • Opening restaurant
<u>Biscuit production group</u> <ul style="list-style-type: none"> • Discussion with women group and monitoring of the group activity • Market survey, negotiation with customers • Book keeping and financial management • Advertisement • Business management • Attending the cooking workshop organized by Sayga company (DAL group) • Development of a new product • Attending the training on food processing using sorghum flours by Food Research Cooperation (FRC) • Implementation of campaign for TTEA products sales (every Wednesday) • Lectures on food processing (utilization of mesquite) by Sudan University of Science and Technology (SUST) • Business analysis, SWOT analysis 	<u>Biscuit production group</u> <ul style="list-style-type: none"> • Identifying what is produced and sold • Division of work among group members • Collection of commission (user fee) and financial management • Finding customers (shops) and cooperating with fruit processing factory in Kassala • Trial sales • Acquiring new recipes and new skills • Trial production of pumpkin cake and sponge cake • Applying sorghum flour in sweets • Sales promotion of biscuit and agricultural products in collaboration with small restaurant business • Establishment of sales campaign in TTEA • Applying mesquite powder in sweets • Finding a new market
<u>Sewing and tailoring</u> <ul style="list-style-type: none"> • Painting techniques 	<u>Sewing and tailoring</u> <ul style="list-style-type: none"> • Acquiring painting skills
MRZ (May 2011 – April 2014) Target 57 (2 extension officers, 47 rural women and 5 men)	
<u>Food Processing</u> <ul style="list-style-type: none"> • Basic training 	<u>Food processing</u> <ul style="list-style-type: none"> • A sampling party of products (biscuit, bread, juice, noodle, dried vegetables etc.)
<u>Vegetable production using water pump</u> <ul style="list-style-type: none"> • Discussion with women group and monitoring of the group activity • Preparation of proposal for water pump procurement • Vegetable cultivation (land preparation, seeding, fertilizer application, weeding) • Operation and maintenance of water pump • Financial management 	<u>Vegetable production using water pump</u> <ul style="list-style-type: none"> • Cultivation of okra, tomato and cucumber • Sales of vegetables • Introduction of revolving fund method • Introduction of water pump management book and book keeping • Collection of water pump user fees • Group management
FIZ, TRZ (Nov. 2012 – April 2014) Target 14	
<u>Utilization and prevention of mesquite</u> <ul style="list-style-type: none"> • Lectures on mesquites (charcoal making, 	<u>Utilization and prevention of mesquite</u> <ul style="list-style-type: none"> • Acquiring improved charcoal making skill

Content of training	Major findings and lessons learnt
biological management, livestock feed, food processing, and prevention of occurrence) by SUST <u>Action plan after training in Japan</u> <ul style="list-style-type: none"> Livelihood improvement, home garden, introduction of improved stove, clean-up campaign etc. 	<ul style="list-style-type: none"> Understanding utilization and prevention of mesquite Close cooperation with Department of Forest <u>Action plan after training in Japan</u> <ul style="list-style-type: none"> Cooperation with Ministry of Health Implemented by K-TOP fund Internal training for Ministry of Agriculture

(Activity 5.2) Conduct training on income generating activities (IGA) for extension officers

In Ramla extension center in HZ, the Project supported two food processing groups; biscuit production (5 women) and small restaurant (9 women) as income generation activities. In El Karada village in MRZ, the Project also supported two women groups; food processing (6 women) and vegetable production using water pump (22 women). Through supporting and monitoring activities of production groups, various skills and technical knowledge such as book keeping and marketing were transferred to the extension officers.

Table 3.18: Training conducted for IGAs

Zone	Theme	Date	Content	Participants	Major findings and lessons learnt
HZ (Ramla, Sabeel)	Food processing business (small restaurant and biscuit production)	Aug. 2012 – Jun. 2013	<ul style="list-style-type: none"> Baseline survey on food processing groups Business diagnosis Book keeping SWOT analysis Training for newly organized production group 	18 (incl. 12 women)	<ul style="list-style-type: none"> Improvement of food processing technique Selection of production group Initiate production and sales Payment of commission to RD section of TTEA
MRZ (El Karda village)	Food processing (bread production)	Dec. 2012 – Apr. 2014	<ul style="list-style-type: none"> Discussion with production group Business diagnosis Book keeping 	32 (incl. 28 women)	<ul style="list-style-type: none"> Selection of production group Initiate production and sales Payment of commission to RD section of TTEA

(Activity 5.3) Conduct training on revolving fund for extension officers

The project established a revolving fund system which reserved profit from income generation activities in order to finance extension services for other women. This fund is called K-TOP Fund. In HZ, the Project has collected commission from both biscuit production group and small restaurant since January 2013. In El Karda village in MRZ, the Project monitored vegetable production with a water pump and revised the pay back schedule to reflect actual performance. The following training programs were conducted through OJT.

Table 3.19: Training on revolving fund for extension officers and women

Zone	Theme	Date	Content	Participants	Major findings and lessons learnt
HZ	Food processing (restaurant and biscuit production)	Nov. 2012 - Apr. 2014	Management of women group through discussion, activity, monitoring and evaluation	25 (incl. 9women)	<ul style="list-style-type: none"> Establishment of K-TOP Fund Use of bank account of the Ministry of Agriculture
MRZ (El Karda)	Vegetable production	Nov. 2012 -	Management of women group through	86 (incl. 20men)	<ul style="list-style-type: none"> Payback plan and its revision

		Apr. 2014	discussion, activity, monitoring and evaluation		<ul style="list-style-type: none"> • Cultivation plan • Division of role among group members
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(Activity 5.4) Establish extension system (e.g. Sustainable women's group)

Rural Development Section of TTEA collected commission (user fee) on utilization of facilities and equipment from production group (users) and created "K-TOP Fund." As explained in the section 19) Activity 3.5.3 above, they conducted some training for other women by utilizing K-TOP Fund. In HZ, the Project held a marketing promotion campaign (every Wednesday in June 2013) and set up a place near the restaurant of TTEA, where both women groups and the direct-sale group sold their products. Incidentally collaboration was made between them in that the direct sale group sells the produce to the women group. In El Karada village in MRZ, the Project supported women group in vegetable cultivation and made a close follow-up on payback plan of the investment cost of water pump. Funding level of "K-TOP Fund." is approximately 10 times of usual annual budget (approximately 10,000SDG per year). With control under bank account in SMOAFIAF, it is expected to use "K-TOP Fund." as revolving fund stably and successively for rural development activities.

Table 3.20: Training conducted for establishment of sustainable extension system

Zone	Theme	Date	Content	Partici-Pants	Major findings and lessons learnt
HZ (Ramla)	Food processing business	Nov. 2012 – Mar. 2014	<ul style="list-style-type: none"> • Restaurant business training (OJT) • Biscuit production and sales training (OJT) • Sales promotion (every Wednesday in June 2013) • Implementation of action plan of training in Japan • Financial management training 	32 (incl. 18 women)	<ul style="list-style-type: none"> • Products were sold • Joint marketing centre was established for sales promotion • New products were developed and sold
MRZ (El Karda)	Vegetable production with revolving fund	Mar. 2013 - Mar. 2014	<ul style="list-style-type: none"> • Women group management training (OJT on group regulation, group registration, collection and management of group fee etc) • Water pump management training • Book keeping training (OJT) 	15	<ul style="list-style-type: none"> • Group regulation was developed • Group was registered • Water pump management system was established • Investment cost was partially returned • Book keeping and financial management
FIZ, TRZ	Livelihood improvement	Oct. 2012 – May 2014	Improved charcoal making, home garden, improved stove and clean-up campaign	327 (aggregate number)	<ul style="list-style-type: none"> • Utilization of K-TOP Fund • Implementation of action plan of training in Japan • Submission of proposal by extension officers

(Activity 5.5) Prepare training/ extension materials

The Project prepared extension manual for rural development activities which includes lessons learned through the pilot activities. In addition to the extension manual, two manuals were prepared for the activities in Year 1: one is introduction of RRA method and the other is environmental friendly energy

alternative to firewood. Moreover, in order to share the knowledge on training in Japan to other extension officers in TTEA, the Project translated two training textbooks into Arabic; one is hygienic on food processing and the other is livelihood improvement. They were distributed to all extension officers in TTEA as well as a recipe book developed. Furthermore, a set of training tools (book keeping format, advertisement of products etc.) was attached to the extension manual. The extension manual is expected to function as handover notes for extension officers.

Table 3.21: Training and extension materials (RD)

Name of Material	Type	Major usage
Extension Manual for Rural Development Activity	Extension manual	Guidance to new officers and practical notes to existing ones
Introduction to RRA method	Manual	Training material to extension officers
Environmental friendly alternative energy for firewood	Manual	Training material to extension officers
Hygienic on food processing	Textbook	Training material to extension officers and rural women
Livelihood Improvement	Textbook	Training material to extension officers and rural women
Recipe book	Textbook	Training material to extension officers and rural women



RRA workshop (Wad el Helew)



Harvesting rocket in El Karada village



Kick-off meeting with women group of restaurant (Ramla)



Kitchen and restaurant hall built with K-TOP funds

	
<p>Restaurant hall : chairs and tables purchased with K-TOP funds to accommodate more customers</p>	<p>Promotion campaign of pumpkin cakes and tomato jams</p>
	
<p>CUDBAS workshop on rural development</p>	<p>Financila training by Water Cluster Expert</p>
	
<p>Discussion on the possible linkage between women's group and male direct sale group (one of the action plan made by the C/P at training in Japan)</p>	<p>Participation in the mobile cooking workshop</p>

Institutional supports to the system of extension service

(Activity 6.1) Hold meetings with the committee of the directors of relevant departments to share progress of the Project

From April 2012, when the new DG was appointed, to October 2012, the weekly meetings had been organized by directors concerned, which helped to share the progress and issues of the activities among themselves. In parallel to this, the Japanese experts were engaged in early morning meeting with the DG in order to build common understanding about the Project through daily operation. For the rest of the implementation period, the Project put focus on the coordination with PME for the budgetary arrangement and preparation of the 5-year plan. First of all, it facilitated the improvement of reporting and information sharing among DG, PME and TTEA. The second step was to explain the

outlines of the activities to the newly-appointed director of PME and person-in-charge and conducted field monitoring together with them. Finally we facilitated extension officers in each zone/ theme in preparing budgets and extension plans, while enables PME to compile them as an “exit strategy” after this Project.

(Activity 6.2) Hold coordination meetings among departments to strengthen linkage in SMOAFIAF

The Project has held various opportunities for collaboration among the relevant departments, dealing with the technical issues of horticultural crops, upland crops, water harvesting, and mechanization. As a result, Information sharing and effective M&E were realized among different departments especially between TTEA and Horticulture / Land Use Departments.

(Activity 6.3) Formulate Five Year Action Plan according to result of pilot activities

TTEA formulated the 5-year extension plan (draft) for each zone/ theme in December 2011. Since then this plan underwent fundamental revision to meet the policy of the new DG, which was to develop the extension activities through inter-department initiatives (not by TTEA solely). Given this direction, the Project, in collaboration with PME, conducted M&E for Output 1-5 and make necessary adjustment in terms of budget and human resources, which results in formulation of the 5-year plan.

(Activity 6.4) Formulate Annual Action Plan in parallel to Five Year Action Plan

Since the field officials have no/little experience of formulating a plan, the Japanese experts prepared the draft plan to them, first. Based on the draft, the C/Ps could develop action plan and budgets. And they coordinated with PME to produce annual action plans for 2014.

(Activity 6.5) Hold workshops to review and discuss the result of pilot activities

The Project held a workshop to review pilot activities for all zones/ theme in December 2012. In addition, we assisted the C/Ps in presenting their findings from training in Japan to other colleagues and in making follow-up of each pilot activity. Through this process, 5-year / annual action plans were developed. Each of them was discussed and approved at stakeholder workshops initiated by TTEA director.

(Activity 6.6) Prepare activity reports

To the new PME director and officer, the Japanese experts explained the process of report improvement. The Project has assisted PME in improving reporting skills of the officers e.g., using the standardized format and improved contents with photos.

(Activity 6.7) Identify roles of private sectors

In Kassala sate, public-private partnerships had not received due consideration in implementing policy and activities. However, the involvement of the private sector in service delivery is essential especially where the function of the public sector is limited. SNOAFIAF is expected to develop and facilitate public-private partnerships, which has been trained through on-the-job training in the project. The Project has made collaboration with private sectors, as follows.

HZ:

- AKMAM for potato seed tuber procurement
- CTC Group as business partner of co-purchasing inputs
- East African Seeds Co. for cabbage seed procurement
- DAL Group (Syaga Company) provided mobile cooking training, in which TTEA participated.
- Fruits processing company in Kassala for marketing of biscuits

FIZ:

- CTC for sunflower seed procurement
- Through the preparation of the buyer list, potential buyers have been identified for sunflowers e.g. Alafial Company in Wad Medani and a trader in Khartoum. They participated in match making with farmers and bought sunflowers from them.

MRZ:

- CTC as a resource agency for training on agriculture machines e.g. sprayers and planters
- The Project conduct a study tour to CTC, inviting extension officers and the officials in KVTC.
- DAL group as potential buyers of sorghum.

(Activity 6.8) Hold workshops to realize increased capacity of extension workers in SMOAFIAF for concluding pilot activities

The Project evaluated the capacities of extension officers and relevant officers by using the Ability Map of CUDBAS through the self-evaluation in September 2012 and the Mid-term Review in December 2012 . We also held a workshop to confirm the attainment of capacity development in April 2014.

(Activity 6.9) Coordinate relevant departments to prepare budget and allocate extension staffs, so as to continue Action Plan even after the Project.

The Project carried out filed monitoring with PME. Following this, budgetary arrangements were made in collaboration with PME. The budget proposals were approved and incorporated in the 5-year action plan compiled by PME. Personnel arrangements were also discussed in line with the action plans among TTEA, PME and DG.

	
<p>Project presentation made by PME to the federal</p>	<p>Discussion on annual plans</p>
	
<p>Visit by the Japanese ambassador to a direct sale shop</p>	<p>New office of the ministry</p>

	
<p>PME-TTEA meeting on report improvement</p>	<p>Field Monitoring in TRZ with PME</p>
	
<p>Field Monitoring in FIZ with PME</p>	<p>Field Monitoring in TRZ with PME (discussion on project impacts)</p>

Activities implemented during the extension period from May 2014 to March 2015 in Flood Irrigation Zone and Traditional Rain-fed Zone were reported as follows.

Flood irrigation Zone

(Activity 2.5) Monitoring on Flood Irrigation Zone Activities

Monitoring was conducted on the demonstration activities implemented by the line budget of SMOAFIAF. In 2014, federal government, in addition to FAO and other donors was going to make huge inputs on demonstration of sunflower more than hundreds to ten thousands feddan. The Project and SMOAFIAF studied whether to implement the own demonstration activities and its size and contents etc. Finally, SMOAFIAF decided to conduct two demonstration activities in several feddan on pigeon pea (*Cajanus cajan*) by cost sharing or pay-back system.

(Activity 2.6) Establish budget implementation system for pilot activities

Since there was no appropriate budget disburse from DPD, SMOAFIAF made some efforts to prepare budget internally and paid in advance for the activities from January to September. In the meanwhile, it seem that State Government and Ministry of Finance in charge of dispersing budget still depend largely on financial support by donors and other aid organization. Through Final Seminar and other occasions, the Project and SMOAFIAF requested to State Government and SMOF for establishing clear budget implementation system to continue the pilot activities.

(Activity 2.7) Explanation to farmers and call for participation

As described in 31), as SMOAFIAF decided to conduct demonstration activities on chickpeas in 2014, the extension officer made explanation to two farmers groups in Digein Block WUAs No.37 and Tidili

Block WUAs No.17 to call for participation. Each group consists of 6 and 25 members respectively in each group. As experienced in the previous season, it was not easy for TTEA to establish reliable collaboration with pastoral farmers in the area, farming farmer groups were selected in 2015. Cost sharing or pay back system was raised as a condition for the participation.

(Activity 2.8) Selection of the cultivating land and profit prediction

Through discussion with the farmer groups described in 33), the extension officer selected suitable land for cultivating pigeon pea. Furthermore, the extension officer estimated production cost based on the real cultivation condition. And from the revenue forecast, the gross income was predicted for each farmer group. The predicted revenue, production cost and gross income are shown in the tables below.

Table 3.22: Prediction of revenue, production cost and gross income for chickpea in 2014-2015

Item	Degain (WUA No.37)	Tindili (WUA No.17)
Cleaning Mesquite	150	200
Irrigation	42	42
Plowing by Disk Harrow	0	80
Plowing by Disk Plow	80	80
Sowing by Hand	100	160
Seed	6	6
Weeding	100	280
Fencing	430	0
Guard	30	30
Total Production Cost (B)	938	848
Revenue (A) (Prediction by Yield)	7,500	7,500
Predicted Gross Income (A) -(B)	6,562	6,652

(Unit: SDG/Feddan)

Table 3.23 : Gross Income Prediction of Chickpea (Cajanus cajan) and other newly introduced crop

New Crop	Revenue	Production Cost	Gross Income
1) Sorghum (Ave.) (Including Stem and Leave))	1,000	562	438
2) Cotton (Ave.)	1,500	765	735
3) Sunflower (Ave.)	1,440	748	692
4) Chickpea (Ave.)	3,750	1,087	2,663
5) Chickpea (Ave. in two groups in 2014-2015)	6,607	893	5,714

(Unit: SDG/Feddan)

(Activity 2.9) Reaching agreement on payback or cost sharing methods

The project and SMOAFIAF promoted cost sharing of more than 75% or complete pay back of production cost, because the previous project with donation system make farmers in a passive manner. As described in 33), the extension officer explained ideas of payback or cost sharing to two farmers groups in Digein Block WUA No.37 and Tidili Block WUA No.17 to call for participation when to make contract of demonstration farm. In parallel, huge demonstration activity (800 feddan) with donation method by FAO was running, the project decided to propose cost sharing to farmers, which is easier for farmers to tackle. But farmers agreed to adopt pay back system finally.

(Activity 2.10) Conduct training on book management

Since selected farmers groups had sufficient basic knowledge on book keeping, the extension officer visited regularly to train book management by on the job training.

(Activity 2.11) Monitoring on harvest of newly introduced crops

Digein Block WUA No.37 and Tidili Block WUA No.17 harvested on 17-18th February, and at the end of February respectively in 2015. The extension officers and researchers in ARC made monitoring harvesting at both sites. It was expected to be 6-7 sacs per feddan, and become more than two times of yield compared to the average.

(Activity 2.12) Support matching with buyers

The extension officers provided information such as price, period and chickpea buyers at the Kassala West market to both farmers groups in Digein Block WUA No.37 and Tidili Block WUA No.17.

(Activity 2.13) Conduct farmer's satisfactory survey

The Project and SMOAFIAF held Field Day at Tindili Block WUA No.17, collecting farmers from surrounding villages and Digein Block WUA No.37 on 5 February. The extension officer made interview to farmers on this occasion. Furthermore, headquarters of WUAs expressed new action to increase planting area of chickpea by their own budget, since they are quite satisfied by this season's yield.

(Activity 2.14) Support formulating Annual Plan and budgeting

The Project supported the extension officers to submit Annual Budget Plan, based on Year 2 of 5 Year Plan to PME in November 2014. Considering high profitability and marketing access and so on, SMOAFIAF will continue extension activities on chick pea with contract-based demonstration farm.

	
<p>Selecting cultivated area in Digein Block</p>	<p>Land Preparation for planting chick pea. Removing Mesquite.</p>
	

<p>Explanation to farmers at Tidili Block in the Gash Irrigation Scheme</p>	<p>Sowing chick pea at Digein Block</p>
	
<p>Monitoring growth of chick pea</p>	<p>Field Day on harvesting chick pea at Tindili Block</p>
	
<p>Budget Request to PME for FIZ and TRZ</p>	<p>Meeting with Minister of Finance for requesting appropriate budget disburse</p>

Traditional Rain-fed Zone

(Activity 3.5) Establish budget implementation system for pilot activities

As described in 32), flow of line budget from DPD to SMOAFIAF was stagnated. It was disbursed partially in October 2014. Considering seasonality in agricultural activities such as timing of sowing, cultivation and harvesting, it is essential to provide services on appropriate timing for better productivity. Also, if the planned activities are not implemented on schedule, it will become treacherous deed against farmers who have agreed to cost-sharing; and farmers might lose their confidence on the State government as it was before. To maintain sustainability after the project, the Project and SMOAFIAF made request for appropriate budget disbursement to SMOF. In the Final Seminar in March 2015, main discussion was made on sustainability and importance for establishing budget implementation system to continue pilot activities was emphasized.

(Activity 3.6) Support linkages between TTEA and Land Use Administration

In 2013, providing terrace construction services became late just before entering rainy season in the mid to late of June due to unharmonious cooperation between TTEA and Land Use Department (hereinafter referred as Land Use). To make use of lessons learned, cooperation was initiated from April in 2014. The respective roles of TTEA and Land use became more clearly. First, TTEA prepared and submit farmer's application list to Land Use. The Land Use established providing terrace

construction services. Also, TTEA and Land Use made monitoring on growth of sorghum in the improved terraces. Furthermore, TTEA reported 2015 Year Plan for budget to Land Use.

From May to August in 2014, the Project managed one project vehicle together with TTEA. The project had a responsibility to basic management such as hiring driver and operation & maintenance. On the other hand, SMoAFIAF took responsibility to pay fuel cost from the line budget. SMoAFIAF was obliged to submit weekly and monthly plan for operation and to hold internal meetings. This rule was also applied to FIZ. After September 2014, the project vehicle was completely lent to SMoAFIAF and entrusted to self-management.

(Activity 3.7) Conduct training for farmers

In April and May 2014, Local Extensionists were collected from targeting five villages and SMiAFIAF shared the idea of cost sharing. SMoAFIAF confirmed some basic issues on WH terrace construction and requested to inform other farmers. After starting terrace construction, TTEA in collaboration with Land Use provided on the job training on WH.

(Activity 3.8) Monitoring on agricultural machinery services, meetings to exchange opinions and reporting within SMoA

Starting agricultural machinery services on constructing WH terraces in May 2014, 165 terraces totally was completed as forecasted, which were 34 % increase from the previous year. Land Use took part in monitoring of construction and TTEA was in charge of corresponding to farmers. Farmer's satisfaction on WH terrace construction was extremely high and there were moreover requests for construction. In SMoAFIAF, TTEA together with DG and Land Use held internal meeting to seek possibility to add budget to answer the requests.

(Activity 3.9) Monitoring on harvest of sorghum

TTEA in collaboration with Land Use made joint crop assessment, including yield, height, weight of seed, stem and leave. And soil water content was measured.

(Activity 3.10) Conduct farmer's satisfactory survey

The extension materials i.e. leaflet, poster and video, which were prepared together with Media Section in TTEA was distributed to each village for extension and public relation activities on WH terrace. During the process of making extension materials, extension officers made interview to farmers on their satisfaction to services. In 2014, preparation of terrace construction was good and also plenty of rain fall was received. Farmer's reaction to services was satisfactory.

(Activity 3.11) Support formulating Annual Plan and budgeting

The Project supported the extension officers to submit Annual Budget Plan, based on Year 2 of 5 Year Plan to PME in November 2014. In 2015, TTEA is planning to extend services horizontally to two villages in addition to five villages. Furthermore, TTEA is examining possibility to increase farmer's contribution on cost sharing, considering the yield of the previous season.



Meeting between TTEA and DG on budget flow of terrace construction services



Meeting on linkages between TTEA and land Use



Meeting with local extensionist confirming the messages to farmers



WH terrace construction services



Explanation to farmers in a new target village on terrace construction from the next season



Interview to a farmer

	
<p>Improved terrace with harvested water</p>	<p>Joint crop assessment on sorghum by TTEA and Land Use</p>

3.4 Response to recommendations made by Terminal Evaluation

The Project has taken action in line with the recommendations made by Terminal Evaluation as follows.

Table 3.24: Response to the recommendations made by Terminal Evaluation

Recommendations	Responses
<p>The rural development activities have grown up to generate profits that are accumulated in their bank account as “K-TOP Fund” (hereinafter referred to as “the Fund”) from January 2014. SMOAFIAF is expected to strengthen their system in order to utilize the Fund only for rural development activities in a transparent manner.</p>	<p>The Project confirmed with SMOAFIAF that K-TOP funds were to be utilized for rural development after deposited at the existing account of the ministry. Rural Development Section started book-keeping, thus establishing reporting system with PME.</p>
<p>Five-year Extension Plan, which is the action plan and financial estimations to continue pilot activities, needs to be formulated and approved by SMOAFIAF.</p>	<p>The Project has formulated the 5-year action plans for each zone and theme. They were shared and approved at a seminar held in April 2014.</p>

3.5 Achievements of the Project Purpose and Outputs in the Agriculture and Livelihood Cluster

The achievement of the Progress Purpose and Outputs in the Agriculture and Livelihood Cluster are summarized as follows.

1) Achievement of the Project Purpose

Table 3.25: Achievement of the Project Purpose

Indicators (Baseline in 2011 and Target for 2014)	Means of verification	Status of achievements
<p>Satisfaction rates of farmers who have participated in extension activities by the Project on extension services are increased by 60% in each target zone (HZ, FIZ, TRZ and MRZ)</p>	<p>The Project carried out the questionnaire survey (Project Record of the Sample Survey)</p>	<p>Satisfaction was obtained. Satisfaction rates of farmers were on average 91.5%, exceeding the target rate..</p>
<p>No. of rural development activities that have been confirmed as sustainable ones (2 with 1 for IGA and 1 for livelihood improvement)</p>	<p>Project document</p>	<p>Several pilot activities are on-going in a sustainable manner (e.g. the small</p>

Indicators (Baseline in 2011 and Target for 2014)	Means of verification	Status of achievements
		restaurant and biscuit making). The K-TOP fund supports other 8 activities.
Arrangement of budget and allocation of necessary extension officer to implement next 5-year extension plan formulated by the Project	Project documents and ministerial documents	Budgetary arrangements were made for each zone and theme. Personnel arrangements were discussed in the ministry.

2) Achievements of the Outputs

Table 3.26: Achievements of the Outputs

Indicators (Baseline in 2011 and Target for 2014)	Means of verification	Status of achievements
<p>1-1 Skills and knowledge regarding "Cultivation techniques", "Risk Management" and "Marketing activities (e.g. co-purchasing inputs)" acquired by extension officer and related staff increased, which are measured by CUDBAS score (3.0 point or more for 3 officers out of 4).</p> <p>1-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 5 kinds)</p> <p>1-3 Increased number of activities such as collaborative purchase and direct sale by farmers, which are made, revised, and distributed (from 0 to 5 kinds).</p>	<p>1-1 Baseline and End line survey (Ability Map / CUDBAS chart)</p> <p>1-2 Records of TTEA (Registration record for extension materials)</p> <p>1-3 Records of TTEA</p>	<p>1-1 Equal to/ more than 3.0 points of CUDBAS scores obtained by 3 officers out of 4 on the three aspects</p> <p>1-2 In total, 10 kinds of materials prepared.</p> <p>1-3: 6 kinds of activities engaged by farmers' groups, i.e., cabbage production, direct sale, onion storage, co-purchasing inputs, wholesaling B-class vegetables to women group, and raising seedling on tray.</p>
<p>2-1 Skills and Knowledge regarding "Feasibility study (e.g. farm budget analysis)", "Finance" and "Extension in FIZ" acquired by extension officers and related staff increased, which are measured by CUDBAS score (3.0 point or more for 3 officers out of 4).</p> <p>2-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 3 kinds)</p> <p>2-3 More than one farmers' association is formed, which adapts new methods with new variety of crops introduced by the Project</p>	<p>2-1 Baseline and End line survey (Ability Map/CUDBAS chart)</p> <p>2-2 Records of TTEA (Registration record for extension materials)</p> <p>2-3 Records of TTEA</p>	<p>2-1 Equal to/ more than 3.0 points of CUDBAS scores obtained by 3 officers out of 4 on the three aspects</p> <p>2-2: In total, 8 materials prepared.</p> <p>2-3: 2 groups engaged in new crop production</p>
<p>3-1 Skills and knowledge regarding "Basics on water harvesting (WH)", "Application of WH techniques in the field" and "Extension in TRZ" acquired by extension officer and related staff increase, which are measured by CUDBAS score (3.0 point and more over for 2 officers out of 3).</p> <p>3-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 4 kinds)</p> <p>3-3 Increased number of farmers in the target area</p>	<p>3-1 Baseline and End line survey (Ability Map/CUDBAS chart)</p> <p>3-2 Records of TTEA (Registration record for extension materials)</p>	<p>3-1 Equal to/ more than 3.0 points of CUDBAS scores obtained by 3 officers out of 3 on the three aspects</p> <p>3-2 In total, 3 materials prepared.</p>

Indicators (Baseline in 2011 and Target for 2014)	Means of verification	Status of achievements
who adopt water harvesting methods year by year	3-3 Records of TTEA	3-3 In total, 123 farmers received machinery services for terrace making and produced improved variety of sorghum in the 2 nd pilot season, compared to 5 pilot farmers in the 1 st season.
<p>4-1 Skills and knowledge regarding "Appropriate combination of agricultural machineries", "Operation & maintenance of agricultural machineries" and "Extension in MRZ" acquired by extension officer and related staff increase, which are measured by CUDBAS score (3.0 point and more over for 3 officers out of 4).</p> <p>4-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 4 kinds)</p> <p>4-3 Increased yield of crops and evidences of efficient operation and maintenance of agricultural machinery by farmers association in pilot areas</p>	<p>4-1 Baseline and End line survey (Ability Map/CUDBAS chart)</p> <p>4-2 Records of TTEA (Registration record for extension materials)</p> <p>4-3 Records of TTEA</p>	<p>4-1 Equal to/ more than 3.0 points of CUDBAS scores obtained by 3 officers out of 3 on the three aspects</p> <p>4-2. In total, 3 materials prepared.</p> <p>4-3 AMSA in Abuda served 198 farmers, gaining 30, 328 SDG, while that in El Karda served 367 farmers, obtaining 35,134 SDG. Yields have increased from 179 (2012) to 250 (2013) in Abuda and 80 (2012) to 250 (2013) in El Karda.</p>
<p>5-1 Skills and knowledge regarding "Sustainable system for extension", "Mobilization of women's group", and "Finance & marketing" acquired by extension officer and related staff are increased, which are measured by CUDBAS score (3.0 point and more over for 3 officers out of 4).</p> <p>5-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 4 kinds)</p> <p>5-3 Increased number of sustainable training course by own budget</p>	<p>5-1 Baseline and End line survey (Ability Map /CUDBAS chart)</p> <p>5-2 Records of TTEA (Registration record for extension materials)</p> <p>5-3 Records of TTEA</p>	<p>5-1 Equal to/ more than 3.0 points of CUDBAS scores obtained by 3 officers out of 3 on the three aspects</p> <p>5-2 In total, 5 materials prepared</p> <p>5-3 K-TOP funds established with commissions from pilot businesses such as TTEA restaurant and used for supporting training course to other women</p>
<p>6-1 The 5-year extension plan according to pilot activities is formulated</p> <p>6-2 No. of the meetings regarding budget and techniques by directors</p>	<p>6-1 Records of project (Monitoring sheet)</p> <p>6-2 Records of project (MM on director and technical coordination meetings)</p>	<p>6-1 The 5-year extension plan prepared with budget estimates. Discussion for approval in progress</p> <p>6-2 20 meetings held so far</p>

3.6 Coordination with Other Donors in the Agriculture and Livelihood Cluster

The Project has made various coordination and collaboration with other donors, as shown in the table

below.

Table 3.27 : Present situation of coordination with other donors

Donor	Plan	Actual situation	Issues and measures
FAO UNHCR UNDP	Overall coordination	Coordination meeting (informal) (April and June 2013)	In order to avoid competition regarding human resource arrangement for each project, it was agreed to propose the formal coordination with the SMOAFIAF.
FAO	To discuss how to support the introduction of sunflowers in FIZ	Coordination meetings held on area demarcation and information sharing (Oct. 2012 and Jan.2013) The extension officers trained by the Project, provided training of cash book to farmers supported by FAO. (June 2013) Marketing of sunflowers and technical review of sunflower production (Feb., 2014)	While putting SMOAFIAF as one of implementation partners, FAO is to provide direct support to 200 farmers by offering production costs for the 1st year. This approach entails different natures from the service delivery by the Project. At the technical review workshop, more participation of farmers in terms of cost-sharing was agreed. For the next season, SMOAFIAF should make alignment among the donors in terms of cost-sharing and extension approach.
FAO	Information sharing on TRZ	Field visit by FAO to the pilot village of the Project (Dec., 2012)	FAO has a plan to introduce the WH techniques. They visited our pilot village to collect information and exchange opinions.
Practical action	Overall coordination	Coordination meeting (Dec., 2012)	Practical Action, as well as other donors, was concerned about the capacities of SMOAFIAF for service delivery. It was found that a lot of expectations was given to our Project.

4. Training outside Sudan, Equipment Procurement and Facilities Rehabilitation/Construction in the Agriculture and Livelihood Cluster

4.1 Training in Japan

The Project conducted training in Japan in September 2011 and May 2013. The table below shows the outlines of each training program.

Table 4.1: Outline of training in Japan

Date	Sept., 5 to 16, 2011	May 8 to 20, 2013
Theme	Agri. policy and extension systems in Japan	Horticulture and rural development
Participants	DG, directors, section chief (5 persons)	Extension/ technical officers (6 persons)
Programs	<p><u>Training in/around Tokyo: 3 days</u></p> <ul style="list-style-type: none"> • Agri. policy and extension system • Rural development activities in Japan • Tomato processing and direct sale <p><u>Training in Hokkaido:6 days</u></p> <ul style="list-style-type: none"> • Agri. development plan in Hokkaido • Visit to an extension center • Visit to JA • Support for Agri-business development • Machine & service by private sector 	<p><u>Training in/around Tokyo: 3 days</u></p> <ul style="list-style-type: none"> • Extension system and horticulture • Rural development activities in Japan • Tomato processing and direct sale <p><u>Training in Saga:6 days</u></p> <ul style="list-style-type: none"> • Agriculture in Saga • Horticultural crop promotion(e.g. onion marketing, branding orange) • Visit to an extension center • Introduction of new crops (lemon grass) • Visit to JA
Findings and Action Plan	<p><u>Major findings</u></p> <ul style="list-style-type: none"> • Making regional plans with zoning • Service delivery by many actors (e.g. public and private and JA) • Multi-functions of JA including rural development • Low quality products for food processing with value addition e.g. tomato jams. • Rural development includes not only income generation but also KAIZEN <p><u>Action plan made by trainees</u></p> <ul style="list-style-type: none"> • Information sharing at ministerial level • 5-year extension plan per zone • Creating farmers' groups for economic activities • Direct sale • Introducing KAIZEN in rural development 	<p><u>Major findings</u></p> <ul style="list-style-type: none"> • Quality-oriented promotion incl. organic • Multi-functions of an extension officer incl. farm management and stakeholder coordination. • Low quality products for food processing with value addition e.g. tomato jams. • Direct sale near farms. Recording system of production and selling volumes enables shop management with a few persons (i.e. group selling). The diversity in products for sale and attractive display adds values. <p><u>Action Plan made by trainees</u></p> <ul style="list-style-type: none"> • For rural development, using low quality products for food processing, development of new products and nutrition campaign e.g. of pigeon peas • For direct sale, introducing group selling, KAIZEN in display and business attitude (more smiles and clean environment) , diversification of selling goods through collaboration with other farmers • For horticulture and extension, coordinate with financial institutions especially for house.

The participants of each training, after coming back to Kassala, held a seminar to share their findings and action plan with other officers. Most of them worked with the Japanese experts and implement action plans in a course of the pilot activities of the Project.

4.2 Training in another country

The Project implemented the training in Kenya from 14th to 21st March in 2014. The outlines of the training are as described below.

Table 4.2: Outlines of training in Kenya

Duration	14-21, March, 2014
Theme	Mechanized agriculture and water harvesting (WH) technique
Trainee	4 TTEA officers and 2 Land Use Department officers
Contents	<p>Lecture: 2 Days</p> <ul style="list-style-type: none"> • Introduction of WH technique in Kenya • Cooperative society and NGO in Kenya • Conservation Agriculture in Kenya • National strategies for agricultural mechanization in Kenya <p>Field Visit: 4 Days (Nakuru, Kitui, Makuweni)</p> <ul style="list-style-type: none"> • Agricultural market in Nairobi • NDUME (Maker of agricultural machineries) • Dealer of agricultural machineries (Massey Ferguson, etc.) • Agricultural Mechanization Center and Agricultural Technology Development Center in three states • Large and small scale dams for agricultural use
Lessons learned and action plan	<p>【Lessons Learned】</p> <ul style="list-style-type: none"> • Kenya promotes conservation agriculture as a part of national policy in agriculture. • Machinery selection for conservation agriculture is promoted in Kenya. • Appropriate machinery use and management system is well established in Agriculture Mechanization Centre in Kenya. • Small scale water harvesting dams are established in semi-arid area by national government and state governments. <p>【Action Plans】</p> <ul style="list-style-type: none"> • Preparation seminar for Action Plan • Participants selected “drip irrigation with rainwater harvesting system” and “Surface water harvesting technique (technique to construct dike to change flow of surface water)” • Workshop for making Action Plan • Open workshop on the Action Plan (tentative)

By the end of the training in Kenya, participants were divided into two groups based on topics. After the training, the Japanese expert has given guidance for preparation for action plan. Each group made action plan according to the guideline, and hold workshop on the action plan to discuss.

4.3 Equipment procurement

The list of procured equipment during project implementation is presented in the Annex 5 of the main report.

4.4 Facility rehabilitation/ construction

The Project has established i) Multi-purpose Hall and ii) Agricultural Machinery Garage to support pilot activities as well as other development activities undertaken by Kassala State Government.

Table 4.3: Outlines of Multi-purpose Hall

Facility Name	Multi-purpose Hall
Purpose	To provide venues and business functions for having seminars and training
Structure	Steel structure with concretes in 169 m ²
Completion	July in 2012

Table 4.4: Outlines of Agricultural Machinery Garage

Facility Name	Agricultural Machinery Garage
Purpose	To keep the sets of agricultural machineries provided by the Project
Structure	Steel structure in 259 m ²
Completion	March 2013

As regards Multi-purpose Hall, the Project assisted SMOAFIAF in setting the fare of utilizing the facility and developing formats for registration documents and recording books. Since the completion of construction, the hall has been used for training and seminars for farmers in WEH and meetings with locality officers and local leaders.

Agricultural Machinery Garage has been used as a place to keep machineries during lean season (from December to April). Since SMOAFIAF has a plan to continue the pilot activities in WEH with procurements of new sets of tractors, the garbage is to be utilized more and more.



Multi-purpose Hall



Agricultural Machinery Garage

5. Recommendations for Achievement of Overall Goal

Overall goal:

Basic Human Needs of the people in Kassala State are ensured by enabling them to access quality public services by the State.

Prior to this Project, the extension service delivered by SMoAFIAF focused on emergency assistance through the distribution of seeds and other inputs for sorghum production with the aim of rescuing the people from hunger brought by the civil war. This Project, however, altered the nature of the service, entailing capacity development of SMoAFIAF and the establishments of equipment and facilities. In order to attain the overall goal mentioned above, SMoAFIAF should maintain the understanding of the features of this Project and undertake its responsibilities with reflection of the lessons learnt through the Project. It is of crucial importance for SMoAFIAF to build a robust system for delivery of extension services to farmers and women. The following are recommendations for the future direction.

1) Enhancement of ownership within SMoAFIAF

Prerequisite to sustaining the Project impacts and outputs is the enhancement of sense of ownership at institutional level. Respective department should formulate plans and estimates budgets necessary for their service and coordinate with PME for approval. This may result in appropriate resource allocation at the ministry.

2) Formulation of 5-year and annual plans

In April 2014, the 5-year extension plans and budgetary framework were formulated by the Project for the continuation of the pilot activities in each zone and theme. In line with this mid-term plan, TTEA and other related departments should prepare annual plans, taking into account progresses made and issues encountered during implementation. The annual plans should be examined and approved by PME, so as to make official arrangement and launch.

3) Appropriate assignment of extension/ other technical officers

The Project has been engaged in building capacities of the officers for particular issues and themes of development. The officers capacitated by the Project are useful resources to sustain or develop extension services. Frequent reshuffling of staff, especially transferring the Project C/Ps to positions which are not relevant to the pilot activities, may bring negative impacts on continuation of the activities and service delivery. Careful consideration should be therefore taken in making personnel arrangements within the ministry.

4) Allowance to extension/ other technical officers

There seems to be a principle rule of not-paying allowance to extension/ other technical officers on the understanding that their salary includes everything. Yet many donors and NGOs, other than JICA, provide substantial allowances to them, which creates an incentive gap between the officers engaged in donors/NGOs activities and those who are not. It is strongly recommended that SMoAFIAF make a clear explanation to her staff regarding the policy of allowance, so as not to discourage officers who have been working seriously without external incentives.

5) Management and maintenance of equipment and facilities provided by the Project

The Project has provided various kinds of equipment and facilities to SMoAFIAF. The ministry, after

the completion of the Project, should manage and maintain those resources in a sustainable manner. In order to do so, small-scale activities of KAIZEN, as has been introduced in Agri. Machinery Section and Rural Development Section e.g. for making an inventory, should be continued and replicated in other sections of TTEA and department of SMoAFIAF.

6) Maintaining cost-sharing approach in extension services

Cost sharing approach, including pay-back system, has been adopted in extension services for FIZ and TRZ. In addition, HZ has also launched on-farm demonstration with pay-back system, in which farmers are supposed to return SMoAFIAF initial costs rendered by the Project after harvesting and selling their produce. Yet, many other donors/NGOs still employ conventional approach by giving materials and services to beneficiaries with free of charge. This situation may create confusion or confliction among farmers. Our empirical evidence suggests that farmers be willing to pay some costs to receive truly-demanded services, e.g., for terrace making. SMoAFIAF therefore should present a clear policy to potential farmers as well as to other donor/NGOs for the alignment of extension approach.

7) Utilization of K-TOP funds

The Project has established K-TOP funds based on the success of business models for rural development. From now on, Rural Development Section of TTEA is required to manage the funds in a transparent manner through book keeping. Realizing the transparent operation, SMoAFIAF are to utilize the funds for other rural development activities. It should also be kept in mind that sustainable management of the funds depends on continuation or development of the production activities. Effective supports to women's business are basis of the utilization of the funds.

8) Enhancement of collaboration among the departments of SMoAFIAF

It is of crucial importance for technical departments to collaborate with each other in providing services to farmers/ women effectively and efficiently. TTEA should work with Horticulture or Land Use Departments by articulating roles of each and mechanism for collaboration in order to meet the needs of farmers/women.

9) Flexibility in the number of group members

For group formation, Association Act in Kassala requires, at least, 25 members per group. However experience shows that the numbers of group members should be flexible according to activities and situations. This ensures the sustainability of group activities and management. And in the future, a group could be developed as business goes well, thus reaching 25 members as required by the act.

添付資料 Appendix

1-3: Project Design Matrix (PDM ver. 4.1) – Agriculture and Livelihood Cluster

Name of the Project: Capacity Development Project for Provision of the Services for Basic Human Needs in Kassala, Sudan (K-TOP Project)

Duration: May 2011 – April 2014 (3 years)

Date: 3 Jul. 2013

Target Area: Kassala State (4 zones)

Target Group : Officers in SMOAFIAF

PDM Version 4.1

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATIONS	IMPORTANT ASSUMPTIONS
OVERALL GOAL Basic Human Needs of the people in Kassala State are ensured by enabling them to access quality public services by the State.	No. of households who have direct (face-to-face) access to extension services of agriculture and livelihoods (TTEA, Horticulture and Land Use Departments) in Kassala State (from 25,000/year to 50,000/year)	Annual Reports of MoAFIAF	
PROJECT PURPOSE The capacity of Kassala State Government for providing agricultural and rural development services to small scale farmers and women is strengthened.	<ol style="list-style-type: none"> Satisfaction rate of farmers who have participated in extension activities by the Project, for extension service are increased by 60% at March 2014, in each target zone respectively, those are "Horticulture Zone (HZ)", "Flood Irrigation Zone (FIZ)", "Traditional Rain-fed Zone (TRZ)", and "Mechanized Rain Fed Zone (MRZ)". No. of rural development (RD)activities that have been confirmed as sustainable ones (2 with 1 for income generation (IG) and 1 for livelihood improvement (LI)) Arrangement of budget and allocation of necessary extension officer to implement next five year extension plan which make sure to sustain the outcome of the Project. 	<ol style="list-style-type: none"> Endline Survey Project monitoring records for IG (e.g. record of pay-back) and Extension plan prepared by RD section that shows the LI activity Document of SMOAFIAF 	The officers continue activities after the project.
OUTPUTS			
<ol style="list-style-type: none"> Extension worker and other technical staffs are able to utilize technologies/knowledge for verifying profitability of horticulture crops in "Horticulture Zone (HZ)" 	<ol style="list-style-type: none"> Acquired skills and Knowledge regarding "Cultivation techniques", "Risk Management" and " Marketing activities (e.g. co-purchasing inputs)" by extension officer and related staff are increased, which are measured by CUDBUS score (3.0 point and more over for 3 officers out of 4). No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 5 kinds) Increased number of activities such as collaborative purchase and direct sale by farmers, which are made, revised, and distributed (from 0 to 5 kinds). 	<p>CUDBAS* scores</p> <p>No. of training / extension materials which are made, revised, and distributed</p>	<p>The officers trained remain even after projects</p> <p>No natural disasters occur.</p>

<p>2 Extension worker and other technical staffs are able to utilize technologies/knowledge for introducing new cash crops in "Flood Irrigation Zone (FIZ)".</p>	<p>2-1 Acquired skills and Knowledge regarding "Feasibility study (e.g. farm budget analysis)", "Finance" and "Extension in FIZ" by extension officer and related staff are increased, which are measured by CUDBUS score (3.0 point and more over for 3 officers out of 4).</p>	<p>CUDBAS* scores</p>	<p>Quality of seeds is not deteriorated.</p>
	<p>2-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 3 kinds)</p>	<p>No. of training / extension materials which are made, revised, and distributed</p>	
	<p>2-3 More than one farmers' association is formed, which adapts new methods with new variety of crops introduced by the Project</p>	<p>CUDBAS* scores</p>	
<p>3 Extension worker and other technical staffs are able to utilize technologies/knowledge for stabilizing production of staple food crop in "Traditional Rain Fed Zone (TRZ)".</p>	<p>3-1 Acquired skills and knowledge regarding "Basics on water harvesting (WH)", "Application of WH techniques in the field" and "Extension in TRZ" by extension officer and related staff are increased, which are measured by CUDBUS score (3.0 point and more over for 2 officers out of 3).</p>	<p>CUDBAS* scores</p>	
	<p>3-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 4 kinds)</p>	<p>No. of training / extension materials which are made, revised, and distributed</p>	
	<p>3-3 Increased number of farmers in the target area who adopt water harvesting methods year by year</p>	<p>CUDBAS* scores</p>	
<p>4 Extension worker and other technical staffs are able to utilize technologies/knowledge for providing agricultural mechanization services in "Mechanized Rain Fed Zone (MRZ)".</p>	<p>4-1 Acquired skills and Knowledge regarding "Appropriate combination of agricultural machineries", "Operation & maintenance of agricultural machineries" and "Extension in MRZ" by extension officer and related staff are increased, which are measured by CUDBUS score (3.0 point and more over for 3 officers out of 4).</p>	<p>CUDBAS* scores</p>	
	<p>4-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 4 kinds)</p>	<p>No. of training / extension materials which are made, revised, and distributed</p>	
	<p>4-3 Increased yield of crops and evidences of efficient operation and maintenance of agricultural machinery by farmers association in pilot areas</p>	<p>CUDBAS* scores</p>	
<p>5 Extension worker and other technical staffs are able to utilize technologies/knowledge for creating sustainable rural development activities for extension offices in selected zones.</p>	<p>5-1 Acquired skills and Knowledge regarding "Sustainable system for extension", "Mobilization of women's group", and "Finance & marketing" by extension officer and related staff are increased, which are measured by CUDBUS score (3.0 point and more over for 3 officers out of 4).</p>	<p>CUDBAS* scores</p>	
	<p>5-2 No. of training materials for extension officers and extension materials for farmers, which are made, revised, and distributed (from 0 to 4 kinds)</p>	<p>No. of training / extension materials which are made, revised, and distributed</p>	
	<p>5-3 Increased number of sustainable training course by own budget</p>		

6 Institutional support of SMoA for extension service is strengthen.	6-1 5-year extension plan according to pilot activities is formulated 6-2 No. of <u>the meetings regarding budget and techniques by directors in SMoAFIAF</u> (0 (2010)=> 12 times/year (2013))	Paper of the 5-year extension plan Meeting Records	
ACTIVITIES			
1.1 Conduct training on cultivation techniques on horticulture crops for extension and other officers			
1.2 Conduct training on co-purchasing inputs and direct sale for extension and other officers	A. Inputs from Japanese side		PRECONDITIONS
1.3 Conduct new/improved extension activities (e.g. demonstration farm, study tours)	A-1 Assignment of experts		Kassala State Government is serious to improve their public services to the local population.
1.4 Prepare training / extension materials	A-2 Counterpart training in Japan and other countries		
2.1 Conduct training <u>on the planning of new crop introduction</u> for extension officers	A-3 Provision of equipment		
2.2 Conduct training on financing for extension officers.	A-4 Operational expenditure		
2.3 Conduct new/improved extension activities (e.g. study tours, public relations)	B Inputs from Sudanese side		
2.5 Prepare training / extension materials	B-1 Assignment of Sudanese counterparts		
3.1 Conduct training on water harvesting technologies for extension officers.	B-2 Local Component budget		
3.2 Conduct training on yield survey for extension officers.	B-3 Facilities		
3.3 Conduct new/improved extension activities (e.g. Farmer-to-farmer extension, public relations)			
3.4 Prepare training / extension materials			
4.1 Conduct training on appropriate combination of machineries for extension officers.			
4.2 Conduct training on operation and maintenance for extension officers.			
4.3 Establish extension system (e.g. association extension, public relations)			
4.4 Prepare training / extension materials			

<p>5.1 Conduct training on improved technologies for extension officers</p> <p>5.2 Conduct training on income generating activities for extension officers</p> <p>5.3 Conduct training on revolving fund for extension officers</p> <p>5.4 Establish extension system (e.g. sustainable women's group)</p> <p>5.5 Prepare training / extension materials</p> <p>Hold meetings with the committee of the</p> <p>6.1 directors of relevant departments <u>to allocate budget after the project.</u></p> <p>Hold coordination meetings among</p> <p>6.2 departments <u>to strengthen technical linkage</u> in SMoA.</p> <p>6.3 Formulate Five Year Action Plan according to result of pilot activities</p> <p>6.4 Formulate Annual Action Plan in parallel to Five Year Action Plan</p> <p>6.5 Hold workshops to review and discuss the result of pilot activities</p> <p>6.6 Prepare activity reports</p> <p>6.7 Identify roles of private sectors</p> <p>Hold workshops to realize increased capacity</p> <p>6.8 of extension workers in SMoA for concluding pilot activities</p> <p>Coordinate relevant departments to prepare</p> <p>6.9 budget and allocate extension staffs, so as to continue Action Plan even after the Project.</p>		
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* CUDBAS is the method of checking the abilities of officers in undertaking tasks assigned. The abilities of each officer are scored with from 1 (lowest) to 5 points (highest). In CUDBAS, point 1

Ability Map

		Name⇒													
		Abubaker		Allaelden		Nur		Badreldeen		Fatima		Aljali			
		Age⇒		36											
		Exp., year ⇒		6											
Theme		Before	Now	Before	Now	Before	Now	Before	Now	Before	Now	Before	Now		
	1	Unable to do independent/ Don't know anything/ No knowledge													
	2	Able to do but still need help/ Little knowledge													
	3	Able to do by their own/ has knowledge/ reliable													
	4	Fairly capable/ Know a lot/ Can guide but not creative													
	5	Capable to do completely and can instruct other/ Sufficient knowledge/ Can improve (can teach /develop/ advice etc)													
Varieties		2	4	2	4	2	4					3	4		
		1	4	1	4	1	4					1	5		
	3	Sub-Average		1.5	4	1.5	4.0	1.5	4.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2	4.5
Cultivation		1	3	1	3	1	3					1	4		
		2	4	2	4	2	4					2	5		
		2	4	2	4	2	4					2	5		
		1	2	1	2	1	2					2	4		
		1	3	1	3	1	3					2	4		
	5	Sub-Average		1.4	3.2	1.4	3.2	1.4	3.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.8	4.4
Pest control		1	3	1	3	1	3					1	3		
		1	2	1	2	1	2					1	3		
	4	Sub-Average		1.0	2.5	1.0	2.5	1.0	2.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.0	3.0
Physiology and ecology		1	2	1	2	1	2					1	3		
		1	3	1	3	1	3					1	3		
		1	2	1	2	1	2					1	2		
	4	Sub-Average		1.0	2.3	1.0	2.3	1.0	2.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.0	2.7
Management		1	2	1	2	1	2					1	2		
		1	2	1	2	1	2					1	2		
		3	3	3	3	3	3					3	3		
		Sub-Average		1.7	2.3	1.7	2.3	1.7	2.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.7	2.3
Assessment		1	3	1	3	1	3					1	3		
		1	2	1	2	1	2					1	3		
	4	Sub-Average		1.0	2.5	1.0	2.5	1.0	2.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.0	3.0
Marketing: Buy Input Together		1		1	4										
Marketing: Buy Input Together		1		1	4										
Marketing: Buy Input Together		1		1	4										
Marketing: Buy Input Together		1		1	4										
Marketing: Buy Input Together		1		1	4										
	5	Sub-Average		1.0	#####	1.0	4.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Marketing: Direct Sale		2	3	2	3					2	5	2	4		
Marketing: Direct Sale		2	3	2	3					2	5	2	4		
Marketing: Direct Sale		1	3	1	3					NA	NA	1	3		
Marketing: Direct Sale		1	3	1	3					1	3	1	3		
Marketing: Direct Sale		1		1								1			
Marketing: Direct Sale		1		1								1			
Marketing: Direct Sale		1		1								1			
	3	Sub-Average		1.3	3.0	1.3	3.0					1.3			
Extension Materials				2	4							NA	NA		
Report															
	2	AVERAGE		1.2	2.8	1.2	3.0	1.3	2.8	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.4	3.3

Ability Map

1	Unable to do independent/ Don't know anything/ No knowledge
2	Able to do but still need help/ Little knowledge
3	Able to do by their own/ has knowledge/ reliable
4	Fairly capable/ Know a lot/ Can guide but not creative
5	Capable to do completely and can instruct other/ Sufficient knowledge/ Can improve (can teach /develop/ advice etc)

		Name⇒		Moatz		Abass		Tahir		MD Ebrahim		Badreldeen	
		Age⇒		38		35				31		31	
		Exp., year ⇒		5		5				5		6	
Theme		Before	Now	Before	Now	Before	Now	Before	Now	Before	Now	Before	Now
Feasibility Study: Feasibility Study	Can do farm budget analysis	2	5	2	3		4	2	4	2	3		
Feasibility Study: Feasibility Study	Can do simple market analysis	2	3	2	4		2	2	3	2	3		
Feasibility Study: Feasibility Study	Can identify short-listed crops through the feasibility study	2	3	1	4		2	1	3	1	3		
Feasibility Study: Understanding Cash C	Know sunflowers in technical aspects	3	4	1	1		1	3	4	3	4		
Feasibility Study: Understanding Cash C	Know pigeon peas in technical aspects	3	4	1	1		1	3	4	NA	NA		
	Sub-average	2.4	3.8	1.4	2.6	0	2	2.2	3.6	2.0	3.3		
Extension: Awareness/ Mobilization	Can increase farmers' awareness/ can tell the purpose of introducing n	2	3	2	4		3	2	3	2	3		
Extension: Awareness/ Mobilization	Can make farmers plant the cash crops	1	4	1	1		1	1	1	NA	NA		
Extension: Demonstration Farm	Can plan and implement activities e.g. training in the demonstration plot	4	5	3	3		3	3	3	NA	NA		
Extension: Demonstration Farm	Can tell the difference of extension approaches bet. TTEA demo and Di	4	5	3	1		4	3	4	NA	NA		
Extension: Marketing	Can link farmers with buyers	1	5	1	1		2	1	2				
	Sub-average	2.4	4.4	2.0	2.0	0	2.6	2.0	2.6	2.0	3.0		
Finance: Finance	Know the procedures and payback rule of finance (e.g. Bank or donors)	2	4	1	1		2	2	2	NA	NA		
Finance: Cash Book	Know about a cash book, incl difference betwn finance and cost/benefit	3	4	2	3		3	3	4				
Finance: Cash Book	Can keep the cash book or do monitoring farmers' books	1	4	1	1		3	1	3				
Finance: Cash Book	Know benefits of new crops and how to compare the benefits with the f	1	3	1	1		3	1	2				
	Sub-average	1.8	3.8	1.3	1.5	0.0	2.8	1.8	2.8	0.0	0.0		
	Average	2.2	4.0	1.6	2.0	0.0	2.5	2.0	3.0	1.3	2.1		

Ability Map

1	Unable to do independent/ Don't know anything/ No knowledge								
2	Able to do but still need help/ Little knowledge								
3	Able to do by their own/ has knowledge/ reliable								
4	Fairly capable/ Know a lot/ Can guide but not creative								
5	Capable to do completely and can instruct other/ Sufficient knowledge/ Can improve (can teach /develop/ advice etc)								
	Name⇒	Muhammed Alamin		Muhammed Abeizeid		Muhammed al Hasssa		Khalid Bashir	
	Age⇒								
	Exp., year ⇒								
Theme		Base line	Present	Base line	Present	Base line	Present	Base line	Present
Basic knowledge on water harvesting (WH)	Can explain varieties of WH techniques	1	3	2	2	2	3	3	3
	Know important points in terrace construction	1	3	1	3	2	3	4	4
	Know principle of leveling technologies	1	3	1	3	1	3	4	4
	Know characteristics and advantages of leveling	1	3	1	1	1	3	4	4
	Know characteristics and advantages of loading machine	1	3	2	3	2	4	3	4
	Know characteristics and advantages of chisel plow	2	3	2	3	2	3	3	3
	Know characteristics and advantages of wide level disk	2	3	2	3	2	3	2	3
	Know suitable sorghum varieties for WH terraces	2	3	2	3	3	4	3	4
	Can measure soil moisture	2	3	2	2	2	3	3	4
	Sub-Average	1.4	3.0	1.7	2.6	1.9	3.2	3.2	3.7
Building improved water harvesting terraces (Skill to apply in the field)	Know the present situation of farmer's WH terraces	2	3	1	1	3	4	2	3
	Can make plan for construction terraces in the village	2	4	1	1	4	4	3	3
	Can select suitable sites for WH	2	4	1	2	4	4	3	4
	Can select appropriate locations for WH terraces	2	4	1	2	4	4	3	4
	Can select appropriate catchment area	2	4	1	2	4	4	3	4
	Can make leveling with water hose	2	3	1	1	1	3	4	4
	Can make easy measurement using GPS	2	3	1	1	1	3	1	3
	Know patterns of rainfall in Rain-fed area	2	3	2	2	4	4	3	3
	Know characteristics of the soil	3	3	3	3	4	4	3	3
Know suitable time for crop production	3	3	3	3	4	4	3	3	
	Sub-Average	2.2	3.4	1.5	1.8	3.3	3.8	2.9	3.4
Extension of water harvesting techniques	Can introduce new technologies at field day	2	3	1	1	3	4	3	4
	Can understand and apply the results of the research	2	3	2	2	2	2	2	2
	Can make survey on crop productivity (Crop Assessment)	3	3	3	3	4	4	4	4
	Can explain the results of the survey at Field Day to the farmers	3	3	3	3	4	4	2	3
	Can collaborate with machinery section in TTEA and operate machineries of	2	4	2	2	3	3	2	3
	Can prepare machineries which are necessary for terrace construction	2	4	1	1	2	3	3	3
	Can make linkage with land use and TTEA	2	4	1	2	2	3	2	3
	Know Farmers-To-Farmers extension	2	4	1	1	3	4	1	4
	Know the importance of make extension material	2	3	2	2	2	2	2	3
	Can explain participatory (cost sharing) system to farmers	1	3	1	2	3	4	2	3
	Can collect terrace construction fees from the farmers?	1	3	1	1	1	3	1	2
	Know how to prepare/hold field day	2	3	2	2	3	4	1	3
	Know how to prepare/hold F-to-F training course	2	3	2	2	3	4	1	3
	Sub-Average	2.0	3.3	1.7	1.8	2.7	3.4	2.0	3.1
	Average	1.9	3.2	1.6	2.1	2.6	3.5	2.7	3.4

				Name⇒		Abubakar		Salema		Moatz		Taber		Mohammed Makii		All	
				Age⇒													
				Exp., year ⇒													
				BL	PS	BL	PS	BL	PS	BL	PS	BL	PS	BL	PS	BL	PS
Basic knowledge on agricultural machineries and mechanization planning	A	1-1	know different types of tractor	3	3	3	3	3	4	3	3					3.0	3.3
	A	1-2	know different types of implement for land preparation	3	3	2	3	2	3	2	3					2.3	3.0
	B	1-3	know different types of planter	2	3	2	3	3	3	2	3					2.3	3.0
	B	1-4	know different types of sprayer	2	3	2	3	2	3	2	3					2.0	3.0
	B	1-5	know different types of harvesting machine	2	3	2	3	2	3	1	3					1.8	3.0
	A	1-6	know different types of thresher	3	3	3	3	3	3	2	3					2.8	3.0
	B	1-7	know different type of baler	2	2	1	3	1	2	1	3					1.3	2.5
	A	1-8	know different type of trailer	2	3	2	3	2	3	2	3					2.0	3.0
	A	6-1	can analyze field condition for mechanization	2	3	2	3	2	2	2	3	2	3	2	3	2.0	2.8
	A	6-2	can estimate working time	3	3	3	3	2	2	2	3	2	3	2	2	2.3	2.7
	B	6-3	can do machinery selection	1	3	1	3	1	2	1	3	1	2	1	3	1.0	2.7
	C	6-4	can estimate machinery costs of use	1	2	1	2	1	2	1	2	1	2	1	2	1.0	2.0
C	6-5	can estimate capacity of field coverage	1	2	1	3	1	2	1	3	1	2	1	3	1.0	2.5	
			Sub-average	2.1	2.7	1.9	2.9			1.7	2.9			1.5	2.5		
Operation & Maintenance	A	1-9	can operate and maintain tractor	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d						
	A	1-10	can operate and maintain chisel plough	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d						
	A	1-11	can operate and maintain disc plough	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d						
	A	1-12	can operate and maintain ridger	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d						
	B	1-13	can operate and maintain loader	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d						
	B	1-14	can operate and maintain planter	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d						
	B	1-15	can operate and maintain sprayer	2	2	3	3	3	3	1	3					2.3	2.8
	B	1-16	can operate and maintain mower	2	3	1	2	1	3	1	3					1.3	2.8
	A	1-17	can operate and maintain thresher	2	3	1	3	1	3	1	3					1.3	3.0
	B	1-18	can operate and maintain trailer	2	3	1	3	1	3	1	3					1.3	3.0
	A	1-19	can operate and maintain baler	1	3	1	2	1	3	1	3					1.0	2.8
	C	7-1	know device and structure of tractor	4	4	4	4	3	3	2	3	2	2	2	3	2.8	3.2
	C	7-2	know machinery management	3	3	3	3	2	2	2	3	2	2	2	3	2.3	2.7
	C	7-3	can inspect tractor's condition	3	3	3	3	3	3	1	3	1	1	1	3	2.0	2.7
	C	7-4	can keep machinery appropriately	4	4	4	4	4	4	3	3	3	3	2	3	3.3	3.5
	A	7-5	can keep record of machinery use	3	3	3	3	3	3	1	3	2	3	2	3	2.3	3.0
A	7-6	can keep record of cash flow in machinery use	1	3	1	3	1	2	1	3	1	3	1	3	1.0	2.8	
C	7-8	can organize cost effective machinery service	1	3	1	3	1	2	1	3	1	3	1	3	1.0	2.8	

Ability Map

1	Unable to do independent/ Don't know anything/ No knowledge
2	Able to do but still need help/ Little knowledge
3	Able to do by their own/ has knowledge/ reliable
4	Fairly capable/ Know a lot/ Can guide but not creative
5	Capable to do completely and can instruct other/ Sufficient knowledge/ Can improve (can teach /develop/ advice etc)

			Jawhir		Arafa		Basamat		Howida		Hajir		Ihsan	
			Baseline	Present	Baseline	Present	Baseline	Present	Baseline	Present	Baseline	Present	Baseline	Present
1-1	A	Can prepare production action plan	1	3	—	—	1	3	1	3	1	3	1	3
1-2	A	Can create good work environment	2	3	2	3	2	3	3	3	2	3	2	3
1-3	A	Can do equipment management	2	4	2	3	2	3	2	3	2	3	2	3
1-4	A	Can do need assessment	2	3	2	3	2	3	2	3	2	3	2	3
1-5	A	Can do training	2	3	3	4	2	3	2	3	1	3	1	3
1-6	A	Can prepare training materials and curriculum	1	3	1	2	1	3	2	3	2	3	2	3
1-7	A	Can conduct training sessions	2	4	3	4	2	3	2	3	1	2	1	2
1-8	A	Can coordinate with relevent training institutions	2	3	2	3	2	3	2	3	2	3	2	3
1-9	A	Know basics of health and hygienic information	2	4	2	3	2	3	2	3	2	3	2	3
1-10	B	Can ensure working place hygiene	2	3	2	3	2	3	2	3	2	3	2	3
1-11	B	Can provide awareness of labor's personal hygiene	1	3	1	3	1	3	1	3	1	3	1	3
1-12	A	Can provide awareness about saving	2	3	2	3	2	3	3	3	3	3	3	3
Sub-average			1.8	3.3	2.0	3.1	1.8	3.0	2.0	3.0	1.8	2.9	1.8	2.9
2-1	A	Can assist production group's formation and organization	1	4	—	—	1	3	1	4	1	3	1	3
2-2	A	Can supervise implementation of activiies	2	4	—	—	2	3	2	4	2	4	2	4
2-3	A	Can mobilize team work	1	3	—	—	1	3	1	3	1	3	1	3
2-4	A	Can show leadership skills	1	3	—	—	1	3	1	3	1	3	1	3
2-5	B	Can solve problems	1	3	—	—	1	3	1	3	1	3	1	3
2-6	A	Can organize group meeting	1	4	—	—	1	4	1	4	1	4	1	4
2-7	A	Can focus discussion at the meeting	2	3	—	—	2	3	2	3	2	3	2	3
2-8	B	Can organize awareness raising session	2	4	—	—	2	3	2	4	2	4	2	4
2-9	A	Can make good facilitation	2	3	—	—	2	3	2	3	2	3	2	3
Sub-average			1.4	3.4	—	—	1.4	3.1	1.4	3.4	1.4	3.3	1.4	3.3
3-1	A	Know financial information recording	1	3	—	—	1	3	1	3	1	3	1	3
3-2	B	Know financial book keeping	1	3	—	—	1	3	1	3	1	3	1	3
3-3	A	Know cash transaction control	1	3	—	—	1	3	1	3	1	3	1	3
3-4	A	Can do market survey	1	3	1	3	1	3	1	3	1	2	1	2
3-5	B	Can do study about demand and supply	1	3	1	2	1	3	1	3	1	2	1	2
3-6	A	Can consider customers interests and needs	1	2	1	2	1	2	1	2	1	2	1	2
3-7	B	Can improve services to attract customers	1	3	1	3	1	3	1	3	1	3	1	3
3-8	B	Can consider products diversification	1	3	1	3	1	3	1	3	1	3	1	3
3-9	A	Know packaging and labeling	1	3	1	3	1	3	1	3	1	3	1	3
3-10	B	Can do advertisement campains	1	3	1	2	1	3	1	3	1	3	1	3
Sub-average			1.0	2.9	1.0	2.6	1.0	2.9	1.0	2.9	1.0	2.7	1.0	2.7
Average			1.4	3.2			1.4	3.0	1.5	3.1	1.4	3.0	1.4	3.0

