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1 May 2016 to 31 January 2017

Enhanced Local Value Addition and Strengthening Value Chains



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(UNIDO)**

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List of Acronyms

AMTIP:	Agricultural Marketing and Transformation Investment Programme
APC:	Agro Processing Centre
BEAD:	Bahr El Ghazal Effort for Agriculture Development
EU:	European Union
FAO:	United Nations Food and Agricultural Organization
FSTP:	Food Security Thematic Programme
GBEG:	Greater Bahr el Ghazal
GIZ:	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
NBG:	Northern Bahr El Ghazal
PPP:	Public Private Partnership
SORUDEV:	South Sudan Rural Development Programme
SSDP:	South Sudan Development Plan
UFSLM:	Urban Food Security, Livelihood and Market Project
UNIDO:	United Nations Industrial Development Organizations
UNOPS:	United Nations Office of Project Services
WBG:	Western Bahr El Ghazal
WFP:	United Nations World Food Programme
ZEAT:	Zonal Effort for Agriculture Transformation

1. Description

1.1. Name of Coordinator of the grant contract:

- Mr. Namal Samarakoon

1.2. Name and title of the contact person:

- Mr. Namal Samarakoon (Project Manager)
- Mr. Ram Kishore Prasad Singh (Chief Technical Advisor)

1.3. Name of beneficiary in the Action:

- United Nations Industrial Development Organisation (UNIDO)

1.4. Title of the Action:

- Enhanced Local Value Addition and Strengthening Value Chains

1.5. Contract number:

- FED/2014/353-881

1.6. Start date and end date of the reporting period:

- 1st May 2016 to 31st January 2017

1.7. Target country(ies) or region(s):

- Great Bahr el Ghazal Region of South Sudan: Northern Bahr El Ghazal (NbG) , Western Bahr el Ghazal (WbG), Lake and Warrap States

1.8. Final beneficiaries and target groups¹ (if different) (including numbers of women and men):

- Target groups - Individuals or group of farmers (new and already existing producer groups) in the four states of the Greater Bahr el Ghazal region.
- Final beneficiaries - Farmers, micro-scale entrepreneurs, rural communities and the government institutions (800 numbers)

1.9. Country(ies) in which the activities take place:

- Great Bahr el Ghazal Region of South Sudan: Northern Bahr El Ghazal (NbG) , Western Bahr el Ghazal (WbG), Lake and Warrap States

2. Progress on Implementation of Action Activities

2.1. Executive summary of the Action

During the reporting period a number of activities were implemented in the project target locations in the Greater Bahr el Ghazal (GBEG) region but sudden eruption of conflict in Wau in June and in Juba during July forced suspension of implementation for nearly three months. Also challenges were faced in accessing target village locations due to prolonged rainy season and insecurity in some target areas. Construction of the agro processing centers took longer time than planned due to inaccessibility of the target locations due to bad road condition, insecurity along some roads and unavailability of construction materials on time in the GBEG region. In spite of these challenges construction of four agro processing centers were completed and training of farmers on post harvest management and storage of food grain crops were implemented in all 19 target villages benefiting 475 farmers by December 2016. Private operators have been selected for day to day operation and management of the agro processing centers and rice mill at Aweil. Business plans for the agro processing centers and rice mill has also been prepared and shared with the stakeholders for their feedback. Synopsis of action progress and achievements are summarised below:

- A number of consultative meetings conducted with different stakeholders at County and Payam level to inform them the recommendations of the validation workshops and explain in detail about UNIDO plan of action for implementation of the value chain upgrading strategies. During the meetings, project partners and stakeholders were informed about the project target locations and activities to be implemented for the selected commodities.
- Thematic workshops on *Enhancing cooperation, coordination and improving synergy among stakeholders* were conducted in different states to discuss with project partners and stakeholders about planned activities and agree on roles and responsibilities of different actors in the value chain. During the workshop deliberations were also held on sustainable model for the ownership and management of the agro processing centres being established by the project at different locations.
- Sensitization of communities around agro processing centres and target villages were completed to inform them about upcoming trainings in the village and facilities developed at the agro processing centers and how they can benefit from the available facilities.
- Basic data from the project target villages were collected which include demographic details, major crops grown and average area under cultivation, number of existing farmers groups and VSLAs, agencies working and nature of activities implemented, nature of post harvest activities carried out and methods used, etc.

- A total of 475 farmers (170 female) from 19 target villages (25 from each village) were trained on different aspects of post harvest management and storage of food grain crops. Training duration was two working days in each village.
- A training manual on Post Harvest Management and Storage of Sorghum, Groundnut and Rice was developed and presented before the stakeholders in a workshop for their feedback and inputs for further improvements. The manual was further revised based on inputs received from the workshop participants and other stakeholders.
- Farmers in the target villages have been supported with 100 units of metal bins of 250 kg capacity (made of used oil drums) and 100 units of galvanized iron sheet metal bins of 400 kg capacity.
- Project beneficiaries were also supported with 500 sets of Purdue Improved Crop Storage (PICS) bags in order to promote improved storage structure and good practices in the project target locations.
- Plan developed for implementation of activities related to the fishery value chain in the Lake state. Market assessment has been conducted in and around Lake Yirol area and fisher folks and the local government informed about the planned activities related to fishery value chain. A total of 50 fisher folks who will receive training on improved fish handling and preservation techniques and locations for construction fish smoking ovens have been identified.
- A training manual on improved fish handling and preservation techniques is being developed and first draft is expected to be available before end of Feb 2017.
- Procurement of training materials and tool kits for the fishermen groups is under process.
- Project has procured 5,000 polythene plastic bags each of 100 kg capacity for the Aweil Rice Scheme. The bags will be delivered to the Aweil Rice Scheme before end of February 2017.
- A training of trainers programme was implemented in partnership with the UN World Food Programme (WFP) and a total of 32 participants (05 female) from GBEG region participated in the training programme and improved their knowledge on skills about improved post harvest management practices including storage and store management and collective marketing. Training duration was three working days.
- Training module developed and plan finalised to train about 120 (about 30 from each state) participants in the four states of the Greater Bahr El Ghazal region on basic entrepreneurship and business management skills, fundamental accounting and book keeping. Participants will be state and county government officials, representatives from Chamber of Commerce, members of the management board of the agro processing centers

and rice mill and members from the board of management of slaughter houses supported by the GIZ and UNIDO in the GBEG region.

- Construction of four agro processing centers has been completed which consists of one hall (processing area), two rooms (one office room and one store) as well as one toilet and shower block within a fenced premise. The main building has been constructed using red bricks and standard pre-casted hollow cement blocks.
- Procurement of equipment and machinery for the agro processing centre and Rice mill has already been completed. Equipment together with a 20 feet container had arrived Nimule boarder of South Sudan in November 2016 but could not be transported to the project locations due to inaccessibility of roads due to prolonged rain and poor security situations in selected project locations. Therefore, equipments were stored at Juba and it has been planned to transport them to the project sites by mid-February 2017. Also necessary arrangements have been made for the testing and installation of machines at different locations.
- In addition, it is planned to support the agro processing centres with some office furniture's such as office table, chairs, file cabinet and other items for storage of products like storage shelf and wooden pallets. Procurement of these equipments is under process and it is expected to be delivered by March 2017.
- Operators for the four agro processing centres and rice mill in Aweil have been identified and in order to find out feasibility of the investment and guide the management of the agro processing centres draft business plans have been prepared for the Kangi, Ayein, Gok Machar APCs and Aweil Rice Mill. Business plan for the Aduel APC will be finalised before March 2017.

Moreover, it is requested to the EUD to allocate additional resources to UNIDO for establishment of additional four agro processing centres in the region along the feeder roads constructed by the WFP and nearby counties which have high potential for value addition and processing due to surplus production of some of the cash crops like groundnut and sesame. Additional resource will also be used for the implementation of supplementary activities in the target locations for ensuring sustainability of the project interventions.

2.2. Results and Activities

Output 1: Potential commodities identified and upgrading strategy for at least five value chains finalized

Activity 1: Rapid market analysis to identify the potential commodities

Market analysis in Lake State was conducted with the help of an international consultancy agency. Moreover, three related missions were also conducted by the international and national consultants during the inception phase. One mission was for the general agricultural produce and two others were more specific to fisheries in Lakes and Hides and Skins in Western Bahr el Ghazal State. Based on the market assessment and field visit altogether seven commodities were identified for further analysis and verification by the stakeholders to select five most promising commodities in the region based on potential for value addition and value chain development. The seven identified commodities were sorghum, groundnut, sesame, rice, fish, poultry and leather (hide and skin). Detail report on this activity was reported in detail in the 1st annual report.

Activity 2: Potential commodities identified and upgrading strategies finalised

A total of three workshops to present the findings of the market assessment and for final selection of potential commodities in the target areas for the value addition and value chain development as well as confirmation of upgrading strategies were conducted in the GBEG States. The workshop at Wau was jointly conducted for the Warrap and the Western Bahr El Ghazal States whereas separate workshops were conducted for the Northern Bahr el Ghazal and Lake States. The five commodities identified and target areas selected for different project intervention are summarised below:

Commodities selected		Sorghum, Groundnut, Rice, Hide and skin, Fish
Target States and Commodities:		<u>WBG</u> : Sorghum and Hide and Skin <u>NBG</u> : Sorghum, Groundnut, Rice and Hide and Skin <u>Warrap</u> : Sorghum, Groundnut and Hide and Skin <u>Lake</u> : Groundnut, Hide and Skin and Fish
States	Counties	Payams and commodities:
WBG	Jur river county	Wau Municipality (Hide and Skin) Kangi Payam (Sorghum), Kangi market (APC), Udici Payam (Sorghum)

NBG	Aweil Center	Aweil Municipality (Hide and Skin), Aweil Rice Scheme (Rice)
	Aweil North	Malual North Payam (Sorghum), Gok Machar market (APC) and Malual West Payam (Sorghum),
Warrap	Twic	Turalei Payam (Sorghum and Groundnut), Ayein market (APC)
	Gogrial West	Kwajok municipality (Hide and Skin) Aleik North Payam (Sorghum and Groundnut)
Lake	Rumbek Center	Rumbek Municipality (Hide and Skin)
	Rumbek East	Aduel Payam (Groundnut), Aduel market (APC) Atiaba Payam (Groundnut) and Pachong Payam (Groundnut)
	Yarol East	Yorol Lake (Fish)

Moreover, activities related to value chain development for each commodity were presented during the 6th QRM at Aweil in April 2016 to obtain feedback from different stakeholders. Based on the inputs and feedback from the partners and stakeholders, final list of actions for each commodity were finalised and implementation of activities started effective mid-2016. Activities identified related to different commodities are as follows:

Groundnut and Sorghum VCD:

- Identify at least 25-30 progressive farmers in each Boma.
- Training producer groups on improved post harvest techniques (drying and storage) including primary processing and value addition.
- Training producer groups/coops on group management, conflict management, business management and financial literacy (book keeping and accounting).
- Linking producer groups to the potential buyers and explore new buyers.
- Linking producer groups to the nearest processing centres.

Hide and Skin value chain:

- Training on improved flaying methods
- Training on improved de-fleshing & de-fatting techniques
- Training on improved preservation and processing methods
- Introducing improved low-cost drying structures
- Developing/improving market linkage by exploring new markets/traders

Rice value chain:

- Introduction of power operated paddy ripper
- Introduction of power operated paddy thresher
- Installation of a two stage rice mill with capacity of 1-2 MT per day
- Training of farmers on operation and use of ripper and thresher
- Training of farmers on basic maintenance of ripper and thresher
- Training of operators on operation and basic maintenance of rice mill
- Training of managers on business management and book keeping

Fish value chain:

- Training of fisher folks on improved drying and smoking techniques
- Training of fisher folks on hygiene and sanitation
- Introduction of low cost dryers and smoking kilns
- Developing market linkages through promotion of collective marketing

Output 2: Five upgraded value chains strategies implemented*Activities 3: Implementing the upgraded strategies for the selected five commodities***Stakeholders meetings and workshops**

A number of consultative meetings were conducted with different stakeholders after identification of target locations and commodities to inform them the recommendations of the validation workshops and explain in detail about UNIDO plan of action for implementation of the value chain upgrading strategies. During the meetings, project partners and stakeholders were informed about the project target locations and activities to be implemented by UNIDO for the selected commodities. In addition thematic workshops on *Enhancing cooperation, coordination and improving synergy among stakeholders* were conducted in different states during June 2016 to discuss with project partners and stakeholders about planned activities and agree on roles and responsibilities of different actors in the value chain. During the workshop deliberations were also held on sustainable model for the ownership and management of the agro processing centres being established by UNIDO at four different locations.

It was finally agreed by the stakeholders that keeping in view of present political and economic condition in South Sudan it will be best to establish these APCs under public-private-partnership (PPP) model where the local government will be the owner of the facility where as day to day operation and management of the centres will be managed by a private operator selected for this purpose. Because local government does not poses technical knowhow and there is no financial mechanism in place to operate and manage these centres on sustainable

and profitable manner as well as plough back the profit for its expansion. It is evident that the private sector is more experienced in managing business and poses better capacity to manage the agro processing centres. Also the private individual can take timely action to maintain machinery as compared to the government due to bureaucracy and financial capacity.

Moreover, GIZ is also planning to establish/support four slaughter houses and a ware house in the GBEG region on Public-Private-Partnership (PPP) mode. Thus establishing APCs on PPP model will be in line with other component of ZEAT BEAD project. During workshops, criteria for selection of private operators were also developed and agreed upon which are as follows:

Selection criteria for the private operators

- Should be a South Sudanese individual or company
- Should have legal entity to do business in South Sudan
- Should have some previous experience of managing businesses
- Should have good working relation with the local communities and government
- Should be willing to invest part of the profit for the expansion of activities at the center
- Should have a operational bank account with minimum balance of SSP 15,000
- Should have good networking ability
- Should not have criminal record

Through group activities roles and responsibilities of different actors involved in the value chain were identified and agreed upon as follows:

Role and responsibilities of the local and state Govt.

- Provide security
- Allotment of land for agriculture purpose
- Construction of roads
- To regulate agriculture & seed policy
- To strengthen access to finance by strengthening agriculture bank
- Regulate monitoring mechanism for proper implementation of program

Role and responsibilities of NGOs/UN agencies:

- Capacity building of farmers toward modern agriculture practices
- Provision of improved quality seeds
- Encourage farming by food for work
- Capacity building of govt. extension worker and local community leaders
- Provide improved tools and implements to the farming communities at subsidised rate
- To promote rural financing by VSLA

- Formation of producers and marketing groups
- Establish demonstration farms

Role and responsibilities of private sector:

- Provide better marketing opportunities to the farming communities
- Provide loan to farmers
- Buy farmers produce at reasonable price
- Provide quality inputs like seed & tools at reasonable price
- Promote contract farming

Role and responsibilities of the farming communities

- Timely cultivation
- Monitoring of crop regularly
- Accept new ideas
- Adopt & implement knowledge provided by NGOs
- Group formation & group activity

After final selection of target villages, a sensitization meeting was conducted in each village to inform community about selection of their villages and possible interventions from UNIDO under the ZEAT-BEAD Project. Communities were informed about planned training on post harvest management and they were advised to identify 25 progressive farmers who wish to attend the training. Local communities were also informed about upcoming agro processing centres in their area and how they will benefit from the facility.

Village data collection

Basic data from the project target villages were collected which include demographic details such as number of households in the villages and households which are female headed, total population, major crops grown and average area under cultivation, number of existing farmers groups and VSLAs, agencies working and nature of activities implemented, nature of post harvest activities carried out and methods used, distance from the nearest trading centre, distance from the agro processing centre, etc.

Major crops grown in almost all villages include sorghum, groundnut and sesame. In some villages in Warrap state maize is also grown in small area (1 to 2 feddans) whereas millet is mainly cultivated in Lake State with average area of about one feddan. Main post harvest activities include threshing with the use of local sticks, sun drying on ground without use of tarpoline or any other improved method, cleaning by winnowing and milling with the use of local mortar and pestle. Food grains and seeds are mainly stored in traditional storage structures with limited protection for insects and pests. Therefore, farmers lose about 20 to 30% of the produce due to poor storage methods. Village profile is presented as Annexure I.



Farmers training on post harvest and storage of food grain crops in village

Practical on use of PICS bags



Farmers receiving metallic bins and PICS bags after training



Farmers with PICS bags



Training on post harvest management and storage of food grain crops

Training of farmers on post harvest management and storage of food grain crops were conducted during November and December 2016. Prior to start of the training, a training manual on *Post Harvest Management and Storage of Sorghum, Groundnut and Rice* was prepared and presented before the stakeholders in a workshop for their feedback and inputs for further improvements. The manual was further revised based on inputs received from the workshop participants and other stakeholders. Copy of the final draft of the manual is attached as separate annexure to this report. A total of 475 farmers from 19 target villages (25 from each village) were trained on different aspects of post harvest management and storage of food grain crops. Training duration was two working days in each village. In addition, farmers were supported with 100 units of metal bins of 250 kg capacity (made of used oil drums) and 100 units of galvanized iron sheet metal bins of 400 kg capacity and 500 sets of Purdue Improved Crop Storage (PICS) bags in order to promote improved storage structure and good practices in the project target locations. Further detail about this training is explained in next section.

Training on improved fish handling and preservation techniques

A detail plan has been developed for implementation of activities related to the fishery value chain in the Lake state. A mission was undertaken in January 2017 to collect basic data available at the fishery department in Yirol, to carry market assessment in and around Lake Yorol and to inform local government and fisher folks about the planned activities related to fishery value chain. During the mission, discussions were held with the local government and fisher folks to spot suitable locations for constructing fish smoking ovens and identify fisher folks who will participate in the training on improved fish handling and preservation techniques. Detail assessment report is enclosed as Annexure II of this report. It is planned to construct smoking ovens and train at least 50 fisher folks working in the Lake Yirol area on improved fish handling and preservation techniques. Training duration will be five working days. Also a training manual on improved fish handling and preservation techniques is being developed and first draft is expected to be available before end of Feb 2017. Two groups of fisher folks (25 per group) will be supported with two improved smoking oven and two sets of fish processing tool kits. Design of the fish smoking oven and bill of quantity is enclosed as Annexure III.

Support to Aweil Rice Scheme

Under the Aweil Rice Scheme (ARS) about 600 farmers are cultivating land of nearly 3,100 feddans for production of rice every year. Annual production of rice under the Aweil Rice Scheme is approximately 800 tonne. At present harvesting and threshing is done manually resulting to higher loss of produce. Therefore, project decided to introduce paddy reaper and motorised thresher to improve harvesting and threshing activities. In addition, a single pass two stage rice mill has been procured to install under the premises of the Aweil Rice Scheme. Moreover, for storage of the paddy and rice produced at the rice mill it is necessary to support the Aweil Rice Scheme with good quality bags made of polyethene plastic to prevent damage of

paddy and rice by pests and weevils. Therefore, project decided to procure 5,000 polythene plastic bags each of 100 kg capacity for the Aweil Rice Scheme. The bags is expected to be delivered to the Aweil Rice Scheme before end of February 2017.

Output 3: Capacitated at least 800 actors performing in value chain and practicing the technological and business tools for value addition enhancement

Activity 4: Building capacity of at least 800 actors to operate in the value chain and to increase local value addition.

Training of farmers on post harvest management and storage of food grains

Post-harvest loss of food grains was observed very high in the project target areas due to lack of knowledge and use of appropriate storage and other post-harvest practices. Therefore, it was planned to train farmers in the project target villages on post harvest management and storage of food grains. Training duration was two working days at each village. Main objective of the training programme was to equip participants with knowledge and practical skills on different aspects of post harvest handling and safe storage of food grain crops. Detail training module is enclosed as Annexure IV of this report. However, major topics covered during the training in each village were as follows:

- Harvesting process
- Threshing practices
- Drying methods
- Cleaning and grading
- Principal causes of loss of quality and quantity
- Improved storage methods
- Marketing channels and benefits of collective marketing

Trainings were conducted during November and December 2016. A total of 475 famers were trained on post harvest management and storage of food grain crops of which 170 were female. State and village wise details of participants are presented in the Table 1.

Moreover, prior to start of the training, a training manual on *Post Harvest Management and Storage of Sorghum, Groundnut and Rice* was prepared and presented before the stakeholders in a workshop for their feedback and inputs for further improvements. The manual was further revised based on inputs received from the workshop participants and other stakeholders. Copy of the final draft of the manual is attached as separate annexure to this report.

Table 1: Village wise number of participants trained on Improved PHM and Storage of Food Grains

#	State	County	Payam	Boma	No. of participants		Total
					Male	Female	
1	NBG	Aweil North	Malual North	GOK Machar	19	6	25
2	NBG	Aweil North	Malual North	Adhal	16	9	25
3	NBG	Aweil North	Malual West	Mathiang	8	17	25
4	NBG			Majak Baai	17	8	25
5	NBG			Manyiel	19	6	25
Total Northern Bahr el Ghazal					79	46	125
6	Lake	Rumbek East	Aduel	Billing	22	3	25
7	Lake	Rumbek East	Aduel	Thonic	22	3	25
8	Lake	Rumbek East	Atiaba	Dogic	18	7	25
9	Lake	Rumbek East	Atiaba	Maboric	23	2	25
10	Lake	Rumbek East	Atiaba	Pan-Awac	11	14	25
Total Lake					96	29	125
11	Warrap	Twic	Turalei	Ayien Amoul	13	12	25
12	Warrap	Gogrial West	Alek North	Makuac Pagong	17	8	25
13	Warrap	Gogrial West	Alek North	Majok	10	15	25
14	Warrap	Gogrial West	Alek North	Achol Pangong	22	3	25
15	Warrap	Gogrial West	Alek North	Panliet	6	19	25
Total Warrap					68	57	125
16	WBG	Jur river	Kangi	Kangi	17	8	25
17	WBG	Jur river	Kangi	Achol guot	18	7	25
18	WBG	Jur river	Udici	Barurud	17	8	25
19	WBG	Jur river	Udici	Ajugo	10	15	25
Total Western Bahr el Ghazal					62	38	100
Grand Total					305	170	475

In addition, project introduced low cost storage structures like metal bins and PICS Bags in the project target bomas to assess usefulness of the technology and collect feedback of the farmers about new technology. Farmers were supported with 100 units of metal bins of 250 kg capacity (made of used oil drums) and 100 units of galvanized iron sheet metal bins of 400 kg capacity. Also 500 sets of Purdue Improved Crop Storage (PICS) bags were distributed among the project beneficiaries in order to promote improved storage structure and good practices in the project target locations.



Farmers with PICS bags

Farmers training on post harvest management and storage of food grains



Training of Trainers on post harvest management and storage of food grains

Training of Trainers on post harvest management and storage of food grains



Training of Trainers (TOT) on post harvest management and storage of food grains

At present knowledge and skills of the extension workers in the project target areas of the GBEG region are very limited on post harvest management of different food grain crops. Therefore, it was planned to train agricultural extension workers working with the local government and staffs of the partner organization in different states of the GBEG region on post harvest management and storage of food grain crops. Training of trainers programme was implemented in partnership with the UN World Food Programme (WFP). Training was conducted for three working days at Wau during 6th to 8th December 2016. A total of 32 participants (05 female) from GBEG region participated in the training programme and improved their knowledge and skills on improved post harvest management practices including storage and store management and collective marketing. The 18 hrs training program covered seven major topics as detailed below:

#	Topic	Duration
1	Harvesting Process <ul style="list-style-type: none"> • Stage and time of harvesting • Tools used for harvesting • Precautions to be taken during harvesting 	2 hr
2	Threshing practices <ul style="list-style-type: none"> • Common threshing methods practiced for different crops • Improved threshing methods 	2 hrs
3	Drying methods <ul style="list-style-type: none"> • Reason for drying • Traditional drying methods vs. best drying practices • How to test dryness or moisture content (salt test and biting test) 	3 hrs
4	Cleaning and grading <ul style="list-style-type: none"> • How cleaning, sorting and grading is done in the community • Recommended practices 	3 hr
5	Principal causes of loss of quality and quantity <ul style="list-style-type: none"> • Primary insects and pests • Secondary insects and pests • Sources of insects and pests infestation • Methods of controlling primary insects and pests • Methods of controlling secondary insects and pests 	3 hrs
6	Storage methods <ul style="list-style-type: none"> • Traditional storage structures (advantage and disadvantages) 	3 hrs

	<ul style="list-style-type: none"> • Factors influencing storage practices • Types of improved storage structures • Methods of practicing good store hygiene 	
7	Marketing channels and benefits of collective marketing	2 hrs

Training of fisher folks on improved fish handling and preservation techniques

During March 2017, it is planned to construct smoking ovens and train at least 50 fisher folks working in the Lake Yirol area on improved fish handling and preservation techniques. Training duration will be five working days. Also a training manual on ***Improved fish handling and preservation techniques*** is being developed and first draft is expected to be available before end of Feb 2017. Two groups of fisher folks (25 per group) will be supported with two improved smoking ovens and two sets of fish processing tool kits. Five days (about 30 hours) training program will include major topics as detailed below:

#	Topic	Duration
1	Environmental sanitation and personal hygiene while fish handling <ul style="list-style-type: none"> • Safety and hygiene • Maintaining processing area • Instruction on disposal of solid and liquid wastes 	0.5 day
2	Different fish species <ul style="list-style-type: none"> • Identify the common fish species • Know the name of fish species available in their area • Fish grading etc. • Difference of fat and lean fish • Fish Habitat 	0.5 day
3	Fish preservation techniques using <ul style="list-style-type: none"> • Sun drying and • Wet salted methods 	1 day
4	Fish smoking using oil drum oven	1 day
5	Fish smoking using brick oven	1 day
6	Storage and packaging for long duration transport <ul style="list-style-type: none"> • Traditional storage structures (advantage and disadvantages)- How to construct small storage facilities • Factors influencing storage practices • Types of improved storage structures • Methods of practicing good store hygiene • Fish transportation Knowledge of using available transport means in the area	0.5 day
7	Marketing channels and benefits of collective marketing	0.5 day

Training of stakeholders on basic entrepreneurship and business management skills

UNIDO has established four agro processing and training centres in the GBEG region. In addition, the Aweil Rice Scheme is being supported with equipment like power reaper, paddy thresher for promoting mechanization and a small capacity rice mill to locally produce good quality rice. The APCs and rice mill will be established under PPP mode in which the local county government will be owner of the facility but it will be operated and managed by the private operators identified for the purpose. These centres are to be self sustaining and to be operated on profit but at present the local stakeholders have very limited business management skills and knowledge on accounting and book keeping. Therefore, project is planning to train altogether 120 (about 30 from each state) participants in the four states of the Greater Bahr El Ghazal region on basic entrepreneurship and business management skills, fundamental accounting and book keeping. Participants will be state and county government officials, representatives from Chamber of Commerce, members of the management board of the agro processing centers and rice mill and members from the board of management of slaughter houses supported by the GIZ and UNIDO in the GBEG region. Training duration will be at least three working days at each location. The main objective of the training programme is to equip participants with fundamental knowledge on different aspects of business management, accounting, book keeping and basic entrepreneurship skills. Major topics covered during the training at location will be as follows:

- Basic entrepreneurship
- Importance of book keeping
- How to prepare and maintain accounting records
- How to calculate profit and loss
- Managing business cash and accounts
- Financial and marketing management

Three working days (about 18 hours) program at each location will involve at least six major topics as detailed below:

#	Topic	Duration
1	Basic entrepreneurship: <ul style="list-style-type: none"> • What is business? Who is an entrepreneur? • Managing own business; Making best use of time; • Practicing business ethics; • Forms of business; Problems encountered by business owners; 	3 hrs
2	Importance of book keeping <ul style="list-style-type: none"> • Understanding importance of book keeping; • Basic book keeping concepts and best practice in book keeping; 	3 hrs

	<ul style="list-style-type: none"> • Understanding income and expenses; • What is income and expenditure; • Basic calculation and use of symbol and drawings; 	
3	<p>How to prepare and maintain accounting records</p> <ul style="list-style-type: none"> • What is cash book and how to write cash book; • Various books to be kept for proper record keeping of any business activities; • Entry system in bookkeeping (single and double entry system); • Importance of daily balancing of cash book and how to do it; • Basic understanding of assets and liabilities; 	3 hrs
4	<p>How to calculate profit and loss</p> <ul style="list-style-type: none"> • Understanding difference between income and profit; • Understanding difference between expenditure and loss; • Calculating income and expenses and profit and loss; 	3 hrs
5	<p>Managing business cash and accounts</p> <ul style="list-style-type: none"> • Advantage and disadvantage of keeping savings in home, bank and saving groups; • Understanding credit management; • Problems in buying and selling on credit; • Importance of keeping records of purchase and sale on credit; • Managing accounts, managing cash and credit/loan; 	3 hrs
6	<p>Financial and marketing management</p> <ul style="list-style-type: none"> • Financial controls and system, • Credit institutions and sources of finance, • Marketing concepts, marketing strategy, doing simple market research, competitors analysis, marketing plan, promotion and advertising; 	3 hrs

Output 4: Four agro processing centres established and fully equipped in selected locations and farmer organizations benefitted directly from project assistance for the establishment of self-sustainable micro-processing pilot centres

Activity 5: Plans and design drawings for four Agro-processing pilot centres finalised, APC established in selected locations and fully equipped and commissioned

APC locations and mode of operation

Four self-sustainable, fully equipped pilot agro processing centres (APCs) with links to the producer groups in the nearby areas are in the process of being established in locations identified mainly based on the feeder roads being constructed by UNOPS. Locations of the agro

processing centres are at Kangi market in the Jur River County of the Western Bahr-el-Ghazal State, Gok Machar market in the Aweil North County in the Northern Bahr-el-Ghazal State, Ayein market in the Twic County in the Warrap State and at Aduel market in the Rumbek East County in the Lake State. Kangi market APC is located at the Kangi to Kayango road whereas the Gok Machar APC is located on the Gok Machar to Mayom Angok road. Ayein APC is situated on the Achol Pagong to Panlieth road constructed by UNOPS in Warrap state.

During early 2016, project contacted the locality authorities to demarcate a land of minimum 20m x 20m size at each location and issue land title in favour of the planned activities. Demarcation of land and issue of land title has already been completed for all centres. Kangi centre will be established adjacent to the agricultural warehouse planned by the GIZ. Therefore, obtaining land title for the Kangi centre is entrusted to the GIZ.

It has been decided that all centres will be established under the Public Private Partnership (PPP) mode in which the local government will be the legal owner of the centre but it will be managed and operated by a private operator identified by the project in consultations with the local authorities. UNIDO will follow the guidelines prepared by GIZ on administrative and legal framework for Public Private Partnership in the GBEG Region. Project will train the private operators on day to day operation and maintenance of the equipment and machinery established at the centre. In addition, operators will also receive training on business management, accounting, book keeping and marketing. It is planned that project will help operators preparing detailed business plan for each centre.

Construction of APCs

Construction of the main building together with a toilet block and fencing around the premises has been completed at all four agro processing centres. Each APC consists of one hall (processing area), two rooms (one office room and one store) as well as one toilet and shower block within a fenced premise. The main building has been constructed using red bricks and standard pre-casted hollow cement blocks. The main building is of 50 sq. meter area (10m x 5m) which consists of one store and one office each of 2.5m x 2.5m and working area of 37.50 sq. meters (7.5m x 5m). The toilet block consists of one pit latrine with a squatting hole and one shower room. The toilet block has been roofed with corrugated zinc sheets.

The total fenced area is around 400 square meters with 80 meters length and 2 meters height with iron pipe poles, barbed wire purlins and covered with chain link wire mesh to prevent animal without hurt. The main entry gate consists of steel gate size of 4.2m wide x 2.1m high comprising two numbers of open able double leaf each size 2.1m x 3.0m high, complete with all iron mongery and locking devices, including three coats of approved quality oil paint.



View of Kangi Agro Processing Centre (main building, toilet block and fencing)



Women groups learning winnowing and grading during training on post harvest management and storage of food grain crops



Procurement of equipment and machinery

Procurement of initial equipment and machinery for the agro processing centre and Rice mill has already been completed. Equipment together with a 20 feet container had arrived Nimule boarder of South Sudan in November 2016 but could not be transported to the project locations due to inaccessibility of roads as a result of prolonged rainy season and poor security situations along some roads. Therefore, equipments were stored at Juba and it has been planned to transport them to the project sites by mid-February 2017. Also necessary arrangements have been made for the testing and installation of machines at different locations. List of tools and equipment purchased for the processing centres and their distribution at different locations are as follows:

Table 2: List of equipment and machinery to different centres

S. N.	Center	Item and Quantity
1.	Aduel	<ul style="list-style-type: none"> • Groundnut oil mill- 1 • Sorghum grinder-2 • Groundnut sheller- 2
2.	Ayein	<ul style="list-style-type: none"> • Sorghum mill- 1 • Sorghum grinder-3 • Groundnut sheller- 1
3.	Kangi	<ul style="list-style-type: none"> • Sorghum mill- 1 • Sorghum grinder-3 • Groundnut sheller- 1
4.	Gok Machar	<ul style="list-style-type: none"> • Groundnut oil mill- 1 • Sorghum grinder-2 • Groundnut sheller- 1
5.	Aweil Rice Scheme	<ul style="list-style-type: none"> • Rice mill- 1 • Paddy reaper-2 • Paddy thresher- 2

In addition to above equipments it is also planned to support the agro processing centres with some office furniture's such as office table, chairs, file cabinet, etc. and items for storage of products like storage shelf and wooden pallets as described in below table:

Table 3: List of office furniture and storage items to different centres

S. N.	Centre	Item and Quantity
1	Kangi Center	Office table-02 Office chairs-06 Cupboard-01 Storage shelf-01

		Wooden pallets-10
2	Gokmachar Center	Office table-02 Office chairs-06 Cupboard-01 Storage shelf-01 Wooden pallets-10
3	Ayen Center	Office table-02 Office chairs-06 Cupboard-01 Storage shelf-01 Wooden pallets-10
4	Aduel Center	Office table-02 Office chairs-06 Cupboard-01 Storage shelf-01 Wooden pallets-10
5.	Aweil Rice Scheme	Plastic bags- 5,000

Selection of private operators for the agro processing centres

GIZ under the AMTIP Project funded by EU through ZEAT BEAD Programme is planning to support four slaughter houses in the GBEG region on public private partnership (PPP) mode. Therefore, keeping in view of the experiences of GIZ's on Public Private Partnership (PPP) approach for management and operation of the slaughter houses in the Greater Bahr El Ghazal region and following several meetings and discussion between the project stakeholders in which it was resolved and agreed upon that the rice mill and the pilot Agro-Processing Centres constructed by UNIDO in four locations in the Greater Bahr El Ghazal region (former WBG, NBG, Warrap and Lakes States) shall be also operated under PPP mode. Which necessitate that the facility will be legally owned by the local government but it will be operated and managed by a private business person identified for this purpose by the management board established for each center.

In May 2016, the UNIDO project team in consultations with the States and County authorities, developed criteria for the selection of private operators and together with the county authorities initiated call for proposal for the management of the APCs. Call for submission of application by the interested companies or individual business entity/individual was drafted and published in the counties headquarters where the APCs are located.

The call for proposals which was published in June 2016 at the three locations (with exception to Aduel in Lakes State) contained clearly stated criteria, terms and conditions, deadline and place where the application should be submitted. Unfortunately, the process was interrupted

due to Wau and Juba incidences in late-June and early-July, respectively. The process was revived during October 2016 and selection of the private operator for the Kangi, Ayein, Gok Machar agro processing centres and the Aweil Rice Mill were completed by December 2016. Actions pertaining to the selection of the private operator for the Aduel center in the Lake state were initiated in December 2016 and identification of operator was completed by January 2017.

Process involved setting up a committee by the county authority for the scrutiny of the received proposals/applications and interview of the interested applicants to take a final call for identification of the best possible option and selection of operator for the centre. Operators' selection report for Kangi APC is enclosed as Annexure V to this report. Based on above stated procedures, the individual or business entity finally identified as operator for each centre is mentioned in the table below:

Table 4: Name of private operator for the agro processing centres and rice mill

No.	Name of centre	Operator
1	Kangi:	Mr. James Buolla Pael (a business person based in Kangi market who owns a retailer shop at Kangi Market for the last eight years)
2	Ayein:	Mr. Kuot Ngong (with 12 year years of managing business in GBEG region and CEO of the Raamloi Quality Seeds Company)
3	Gok Machar:	Mr. Andrea Majok Deng Bol (a successful businessman since 1993 and owner of wholesale and hardware shop at Gok-Machar)
4	Aduel	Mr. Lino Marial Abiel (managing director of Dom De Eden African Farm (a farming based community organisation in Lake State)
5	Aweil Rice mill	Mr. Abdella Wed Abdella (an individual business person who owns a retailer shop at Aweil Town and has been in business for the last 11 years. He also has a farm at the Rice Scheme)

Establishment of management board for the agro processing centres

Project is in process of establishing a management board for each centre with representations from the county, state ministry of agriculture, private operator and UNIDO. Main role of the management board will be to take strategic decisions to ensure smooth operations of the centre and best possible use of the facility within the centre and provide quality service to the local community at affordable price. The Board approves:

- Service fees;
- Budgets and progress reports
- Expenditure and audit reports;
- Major investments;
- The principles and levels of revenue sharing amongst partners;
- The appointment of a manager for the facility in consultations with the private operator.

The board will meet at least twice a year, but as often as requested by at least 51% of its members. The board will be chaired by the Kangi Payam Chief, which will also hold the secretariat. The secretariat will be responsible for the preparation of agendas, minutes and memos for the board meetings. The private operator will submit to the secretariat monthly income and expenditure reports for distribution to the board members. Annual budget and half yearly progress and expenditure reports will be prepared by the private operator at least two weeks ahead of a scheduled board meeting and secretariat will distribute them by at least one week before the meeting.

In addition, a MOU is being developed explaining roles and responsibilities of the main stakeholders of the agro processing centre i.e. local county authority, state ministry of agriculture and UNIDO. Main purpose of the MOU is to develop a coordination framework to ensure that each organization understands and fulfil their roles and obligations and they are complementary, mutually reinforcing and help smooth operations of the agro processing centres. MOU will document the collaborative efforts by the three parties (the Ministry, the County and UNIDO) towards the sustainable use of the facility and operation and management of the agro processing centres. It is expected that the MOUs will be finalised by March 2017. In addition to the MOU, project is also assisting the county officials to develop a detail contract agreement with the operator selected. The agreement will explain in detail the roles and responsibilities of the two parties for the day to day management of the agro processing centres.

Business plan for the agro processing centres

In order to find out feasibility of the investment and guide the management of the agro processing centres a draft business plans have been prepared for the Kangi, Ayein, Gok Machar APCs and Aweil Rice Mill. Business plan for the Aduel APC will be finalised before March 2017. The business plan has laid out the purpose, products, pricing, governance, management and marketing strategy of the centre. The ultimate goal of the business plan is to guide management decisions that ensure long term operations of the centre and a fair distribution of proceeds amongst the partners in the venture. The business plan shall be updated annually on the basis of performance of the centre against the set targets. Calculations are based on projections and assumptions because very limited reliable quantitative data is available on the current agricultural production and productivity in the area around the APCs. The SWOT analysis will guide and help the management to utilize the available opportunities based on existing strengths and overcome challenges and weaknesses.

Business plan for the Kangi agro processing centre is enclosed as Annexure VI to this report.

2.3. Updated Log frame matrix

	Intervention logic	Objectively verifiable indicators of achievement	Sources and means of verification	Assumptions
Overall objectives	Contribute to improved food security and income for rural small holders in GBG by enhancing value addition and strengthening value chains	% decrease of target households food insecurity (Target: at least 20% target HHs reported reduction in food insecurity)	Baseline assessment Annual Statistical	Acceptable level of peace
Specific objective	Upgrading value chain strategies implemented and actors capacitated operating in value chain and value addition enhanced.	% increase in processing of commodities at rural level (Target: at least 30% of the target HHs reported processing of agricultural produce at village or APCs) Increase in income of the target beneficiaries (Target: at least 20% of the target HHs reported increase in income))	Baseline study FAO/WFP annual assessment reports Annual statistics report	Acceptable level of peace
Expected results / Outputs	1-Potential commodities identified and upgrading strategy for at least five value chains finalized. 2-Five upgraded value chains strategies implemented 3-At least 800 actors capacitated performing in value chain and practicing technological and business tools for value addition enhancement	Number of potential VA analyzed (Target : 07 commodities) Number of VC strategies validated (Target :5VC with implementation plans) Coordination meetings (Target: 3 per states) Thematic workshops (Target: 3 per state) Number of training workshops: 40 Number of trainees :800 trainees	Reports of the VA analysis. Technical fiche by product Consultant report on VC Validation workshop reports 5 VC strategy plans documents Project periodic reports Workshop reports	Acceptable level of peace

	4-12 micro agro-processing pilot centres identified and supported with technical drawing and details and four fully equipped	Number of MOU with the target communities Target:04	List of trainees Curricula documents Training reports MOU documents Project reports List of equipment	
Activities	<p>Activity 1: Rapid market analysis to identify the potential commodities. Including market assessment in Lake State.</p> <p>Activity 2: Analyzing potential commodities and formulating upgrading strategy for at least five potential commodities.</p> <p>Activity 3: Implementing the Upgraded strategies for the five commodities selected.</p>	<p>Field investigation : Staff and expertise back up from UNIDO</p> <p>Study outsources</p> <p>Expertise from UNIDO</p> <p>VC specialist and consultants</p> <p>Validation workshops</p> <p>Coordination with partners, implementing agencies and NGO's</p> <p>Workshops: 6 thematic workshops</p> <p>Meeting :5 /state</p>	<p>Market assessment study document</p> <p>Technical report</p> <p>Technical fiche by product</p> <p>Consultant and study reports on VC upgrading strategies.</p> <p>Validation document from workshop</p> <p>Minutes of meetings</p> <p>Upgrading strategies report</p> <p>Field reports</p> <p>Project progress reports</p>	<p>Acceptable security levels.</p> <p>Experts available</p> <p>Project locations accessible for study</p> <p>Acceptable level of peace</p> <p>Round the year accessibility</p>
	<p>Activity 4: Building capacity of at least 800 actors to operate in the value chain and to increase local value addition.</p> <p>Activity 5: Finalizing plans and design drawings for four agro-processing pilot centers and established in selected locations, fully equipped and commissioned.</p>	<p>Technical and business skills related training.</p> <p>Total number of training workshops: 40</p> <p>Design plan for four centers finalized</p> <p>Four (4) centers constructed and equipped</p>	<p>Training reports</p> <p>List of trainees</p> <p>MOU with communities</p> <p>List of equipment</p>	<p>Acceptable level of peace</p> <p>Stakeholders willing to cooperate with project</p> <p>Acceptable level of peace</p> <p>Round the year accessibility</p>

2.4. Work plan from February to December 2017

No.	Activity	F	M	A	M	J	J	A	S	O	N	D
1	Community sensitization in Lake State villages											
2	Selection of operator for Adual APC											
3	Procurement and distribution of plastic bags for ARS											
4	Procurement of office furniture and equipment for APCs											
5	Developing and signing of contracts with the APCs and rice mill operators											
6	Testing, transport and installations of imported tools and machines											
7	Prepare business plan for Adual APCs											
8	Data collection in the target vilages and other locations (fish + H&S)											
9	Formation/strengthening of village producer groups and fishing groups											
10	Formation of Management Board for the APCs and Rice Mill											
11	Developing M&E tools and protocols											
12	Fish processing training manual											
13	Construction of fish smoking oven											
14	Training on fish processing											
15	Procurement of additional tools and equipment for APCs and Rice Mill											
16	Training of beneficiaries on use and maintenance of tools and equipment											
17	Implementation of activities related to the Hide and Skin value chain											
18	Infrastructure development for Rice Mill											
19	Training on use and maintenance of reaper, thresher and rice mill											
20	Linking producer groups to the potential buyers and explore new buyers											
21	Linking producer groups to the nearest processing centers											
22	Training on business management, accounting, book keeping and marketing for the manager of the APCs, Slaughter houses, rice mill, representatives from Chamber of commerce and state government officials											
23	Training of famers on improved groundnut processing methods											

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3. Beneficiaries/affiliated entities and other Cooperation

UNIDO is closely working with all ZEAT-BEAD, SORUDEV and FSTP partners as well as in close coordination with the local, state and national government. Regular consultations took place with the officials of the Ministry of Agriculture, Ministry of Animal Resources, Ministry of Trade and Cooperative and Chamber of Commerce of the four states in the GBEG region where project is being implemented. All stakeholders are well informed about the UNIDO approach on value chain development and activities being implemented in different target locations.

During secondary data collection and validation of information received during the stakeholder's workshop close coordination established with the authorities at the County and Payam level. Coordination and sensitisation meetings were conducted with beneficiaries at the village, payam and county level.

Linkage and synergies have been developed with other partners of the ZEAT-BEAD project. A number of meetings with the EU funded GIZ AMTIP project were conducted to improve information exchange and sharing experiences on implementation of different project activities. UNIDO has identified Hide and Skin as one of the value chains and closely working with the GIZ-AMTIP to support slaughter house operators, butchers and traders on improving quality of hide and skin, storage facility and market development. A number of meeting and discussions held during the implementation period to avoid duplication and increase synergy for activities in the target areas as well as to learn from each other experience of value chain development.

In addition, a close cooperation with the GIZ AMTIP project is established for support and establishment of agricultural ware house in Kangi market. UNIDO has established an agro processing centre in Kangi close to the agricultural ware house which will be constructed and supported by the GIZ.

UNIDO has established agro processing centre in those area where UNOPS is constructing feeder roads. Therefore, close linkages have been established with UNOPS during identification of markets for establishment of the agro processing centres. UNIDO together with UNOPS carried out assessment of market infrastructure in three states and developed joint plan for supporting construction of some additional facilities in the trading centers where agro processing centers have been established. UNOPS will support construction of market shed, rehabilitation of bore wells and water supply system in Kangi, Gok Machar and Ayein market. Also UNOPS will construct toilet blocks for men and women in these market locations.

4. Visibility

UNIDO is fully committed to the EU Communication and Visibility Plan of the Indirect Management Delegation Agreement. To recognise and promote EU as donor of the ZEAT-BEAD Project a number of activities have already been initiated as outlined below:

- During all the meeting with the stakeholders and implementing partners it is recognised that the ZEAT-BEAD Project has been funded by the European Union.
- Banners and posters during meetings and workshops contain EU logo and recognise funding received from the European Union.
- Project official letter head also contain logo of the European Union.
- 5,000 plastic bags being supported to the Aweil Rice Scheme. Rice bags are printed and indicating support from the EU and ZEAT BEAT Project.
- T-Shirts with UNIDO and the EU logo in front side and a message to promote improved storage practice printed and distributed among project beneficiaries and stakeholders.
- Stickers showing EU as donor of the ZEAT BEAT Project and implemented by UNIDO printed and fixed on the metallic bins which were distributed among the farmers in GBEG region during the post harvest management training.
- Signposts indicating EU as donor is planning to be fixed at all the markets where APC will be established.
- News article about EU as donor of the ZEAT BEAD Project and activities implemented under the project were published in the South Sudan news papers to disseminate achievements under the project.



Some articles published in the local news papers in South Sudan in annexed to this report as Annexure VII

Name of the contact person for the Action:

Namal Samarakoon

Signature:

Location: Vienna, Austria

Date:

Annexure I
Village Profile

Payam/ County/ State	Bomaa	Number of HHs			Population			Farmer groups		VSLA		Distance from nearest trading center (km)	No. of Grinding mill in the village	Distance to nearest grinding mill (Km)	Main crops and avg area per HH (Fed)	Agency presence in the village
		MHH	WHH	Total	Male	Female	Total	# farmer groups	# farmers/gro up	# of VSLA	# of Members /VSLA					
Kyango/Jur River/WBG	Achol-Guot	1,202	600	1,802	5,114	7,500	12,614	3	50	0	0	6	0	6	Sorghum (4), Groundnut (3), Sesame (2)	HARD, AFORD, UNOPS
Kangi/Jur River/WBG	Ajugo	1,205	95	1,300	4,400	6,000	10,400	3	10	0	0	10	0	10	Sorghum (3), Groundnut (2), Sesame (2)	HARD
Kangi/Jur River/WBG	Kangi	1,750	150	1,900	6,200	9,000	15,200	3	10	3	20	0	3 (broken)	0	Sorghum (5), Groundnut (3), Sesame (2)	HARD
Kangi/Jur River/WBG	Barurud	650	100	750	2,600	3,400	6,000	0	0	0	0	31	0	30	Sorghum (5), Groundnut (3), Sesame (2)	Nil
Turlei/Twic/Warrap	Ayien	770	100	870	2,140	3,500	5,640	4	100	0	0	0	0	60	Sorghum (10), Groundnut (5), Sesame (3)	World Vision, WFP, Goal, ADRA
Kuac North/Gogrial West/Warrap	Makuc Pagong	436	44	480	880	2,000	2,880	3	60	0	0	8	0	60	Sorghum (3), Groundnut (4), Sesame (2)	WFP
Kuac North/Gogrial West/Warrap	Achol Pagong	439	66	505	1,560	3,000	4,560	3	90	0	0	26	0	40	Sorghum (4), Groundnut (3), Sesame (2)	WFP, ACF
Kuac North/Gogrial West/Warrap	Majok-Akur Kuac	394	56	450	1,660	2,000	3,660	3	90	0	0	5	0	70	Sorghum (3), Groundnut (2), Sesame (2)	WFP

Kuac North/ Gogrial West/ Warrap	Pan Leith	500	80	580	3,000	3,300	6,300	3	90	0	0	15	0	15	Sorghum (3), Groundnut (5), Sesame (1)	World Vision, WFP,NRC, ACF
Malual North/ Aweil North/ NBG	Adhal	3,911	410	4,321	11,313	8,887	20,200	2	75	0	0	10	6	10	Sorghum (3), Groundnut (3), Sesame (1)	CWW, Samaritan Plus
Malual North/ Aweil North/ NBG	Gok- Machar	9,397	500	9,897	19,002	20,584	39,586	4	120	0	0	0	6	0	Sorghum (3), Groundnut (2), Sesame (1)	CWW, Samaritan Plus
Malual West/ Aweil North/ NBG	Mathing	5,727	498	6,225	13,442	11,450	24,892	2	70	1	25	17	0	17	Sorghum (2), Groundnut (3), Sesame (0.5)	CWW
Malual West/ Aweil North/ NBG	Majak Baai	3,980	279	4,259	15,837	9,717	25,554	3	90	2	50	14	0	1	Sorghum (3), Groundnut (2), Sesame (0.5)	GAA, CWW
Malual West/ Aweil North/ NBG	Manyiel	4,113	568	4,681	8,201	10,748	18,949	0	0	0	0	17	1	17	Sorghum (3), Groundnut (3), Sesame (2)	GAA
Aduel/ Rumbek East/ Lake	Billing	2,002	208	2,210	7,500	5,000	12,500	5	200	2	165	7	1	7	Sorghum (3), Groundnut (5), Sesame (3)	NPA, FAO, ACROSS
Aduel/ Rumbek East/ Lake	Thonic	1,633	300	1,933	8,470	7,000	15,470	5	150	2	100	10	0	10	Sorghum (3), Groundnut (5), Sesame (3)	NPA, FAO, ACROSS
Atiaba/ Rumbek East/ Lake	Dongic	925	200	1,125	3,700	5,300	9,000	3	45	4	120	15	2	15	Sorghum (3), Groundnut (5), Sesame (2)	NPA, FAO, ACROSS
Atiaba/ Rumbek East/ Lake	Maboric	700	185	885	3,085	4,000	7,085	10	300	3	117	10	1	10	Sorghum (3), Groundnut (5), Sesame (2)	NPA, FAO, ACROSS
Pachong/ Rumbek East/ Lake	Panawac	600	89	689	2,000	3,512	5,512	2	100	2	60	10	2	15	Sorghum (3), Groundnut (5), Sesame (2)	NPA, FAO, ACROSS

Annexure II

EU Project on Enhanced Value Addition and Strengthening Value Chains in the Greater Bahr El Ghazal Region, South Sudan

**Report on Fishery Assessment, Yirol, Lakes State****Background:**

UNIDO is implementing the EU funded project “Enhanced local value addition and strengthening value chains” in the States of Northern Bahr El Ghaza (NbG), Western Bahr el Ghazal WbG), Lakes and Warrap. The overall objective set for the global action by EU is to contribute to the improvement of food security and income of the population of the target beneficiaries in the Greater Bahr El Ghazal region of South Sudan with the specific purpose of improved food security and income for rural small holders in consideration of the axial role and the important potential of small holders to boost the rural economy and reach a sustainable food security level in the country. Under the Result /Output 3 of The EU global action, the overall objective of UNIDO action is to contribute to improved food security and income of the rural communities in the Great Bahr el Ghazal by enhancing value addition and value chains. The specific objectives of the UNIDO action include developing and implementing upgrading strategies for identified value chains and capacity building of actors operating in the value chains and scaling up of technological and entrepreneurial features. Through this action UNIDO will focus on small household producers and small private business owners to create a sustainable and simple marketing network by developing and implementing upgrading value chain strategies. It will focus as well on building the capacity of the different actors to operate in the value chain and tune to technological and business features for more value addition of their production asset.

Post-harvest loss of fish is very high in the project target area due to lack of knowledge and use of appropriate methods for fish handling, preservation and other post-harvest practices. To address this gap UNIDO planned to train about 50 fisher folks (men and women) working in the Lake Yirol on improved fish handling and preservation techniques. In addition UNIDO planned to construct two fish smoke oven in selected location in Yirol.

This mission was planned to collect basic data available at the fishery department in Yirol as well as to carry market assessment and observations.

Findings:**1- Market Observations:**

The Yirol main market is described as one of the busiest markets in the Lakes state. The market is divided into several sectors, such as construction material market, food commodities market, community market (mainly for framers) and fish market.

The fish market is located at the North West part of the main market. The fish market structure (6m X 12m) was built by the Stichting Nederlandse Vrijwilligers (SNV) under the

Water for Lakes project (Funded by The Netherland Government and Implemented by Mott Mac Donlad). The market structure was buildt out of red bricks and iron sheet roofing. The structure is equipped with 12 stalls for displaying the fish in addition to cleaning slab at one side. The fish is normally being supplied from eight different lakes and rivers around Yirol. The main source supply is Lake Yirol, Payii River, Pagarau and Wut Thou. The fish is being brought by three different actors;

- 1- Fishermen
- 2- Brokers
- 3- Traders



Fish market constructed by SNV and is currently being used by fishermen and traders



The fish cleaning platform is part of the fish market; both fresh and sundry fish are being sold

Transportation:

The fish is normally packaged in plastic or woven sacks and mainly being transport by motorbikes to the market locations. Both dry (sundry) and fresh fish are being sold there. At the time of our visit we observed six stalls out of 12 being occupied by fish traders. It was estimated that about 76 fishermen and women are selling their produces in Yorol fish market. The price of dry fish is SSP250/- each which is about 70cm long and 5-10cm thick and price of the fresh fish is about SSP60/- per kg.

2- Yirol Lakes Observation:

Yirol Lakes is being described as all season with constant supply of fish. There are about 20 fishing camps with a total number of nearly 500 fishermen. There are no organized landing sites. During our visit to the lake site we could observe some fishing canoe carrying fish. Normally the fishermen sales their fish directly along the river and the remains is taken to the nearby market.

Location for the new smoke oven: The state ministry of Agriculture in consultation with the fishermen groups have identified a location close to the Lake Yirol where the smoking oven shall be constructed. The location is close to the port and fishing landing site. If constructed the smoking oven shall be used by the fishermen and the local communities for fish processing.



The place located for the fish smoke oven is on the high land along the Lake Yiorl



Fishermen and women cultivate vegetables along Lake Yiorl during the dry season.

3- Payii River observation:

Payii River is one of the longest rivers in Lakes state. The river is also famous for the fishery resources. Our visit to Pagarau was suggested by the Hon. Minister of Agriculture in Yiorl. There is said to be about 50 fishing camps along the Payii River of which 20 camps are around Pagarau.

Location for the second smoke oven: Pagraua is about 20 km from Nyang county Hqs and 50Km from Yiorl town. During the visit we had observation on the fishing activity along the Payii River. During our visit we observed one fishing boat (canoe made out of palm tree) that arrived with both dry and fresh fish. The fresh fish is estimated to be about 150kgs and the dry fish is about 70kgs.



Incomplete fish smoke oven constructed by SNV in Pagarau; Payii River where fishing takes place



Place located for the second fish smoke oven in Pagarau along Payii river



Fish being displayed on the floor for sale. No Market structure or stall available around Payii River

4- Meeting Eastern Lakes (Yirol) State Ministry of Agriculture:

On the 26th of Jan, we met with the Hon. Philip Kot Job, Minister of Agriculture in Yirol. During the meeting we explained to him about the activities implemented by UNIDO in the Lake State under the EU funded project ZEAT-BEAT as well as the reasons of our visit to Yirol. We explained to the minister that UNIDO planned to support the fishery sector with construction of two smoke ovens and training the fishery folks on fish processing and preservation. The minister welcomed the idea and appreciated the plan and directed the Director of Fishery at the State to support us with the data related to fishery as well as decide on the location where the ovens might be constructed.

During the meeting with Mr. Abraham Gum Majak the Director of fishery we understand that there were groups of fishermen trained by Stichting Nederlandse Vrijwilligers (SNV) and some were taken for exchange visit to Uganda. The training took place in five (5) fishing camps namely; Payii, Anyii, Wut Thou, Guol Yier and the number of people trained were 491 out of which are 56 female. Training conducted by SNV was mainly on fish processing and preservation.

The Director suggested that there is a need for the training at two places namely in Lake Yirol area and in Pagarau payam under Nyang County.

5- Meeting with Nyang County Commissioner:

During the meeting the commissioner was brief on the project planned activity to train fishery folks and construct the smoke oven. The commissioner stated that his county is the main fish production area where in Lake Shambe they have about 800 fishermen who are doing the fishing activity. The commissioner appreciated the initiative taken by UNIDO to

support the fishery sector with the necessary training to reduce the post harvest losses. He asked the fishery department to allocate the piece of land where the oven will be constructed.

6- Existing preservation and processing technique:

The fishery folks are using basic processing techniques mostly sun drying and salting. They stressed the need to be trained on other preservation and processing technology to enable them to minimize their post-production loss and improve income.

Table: Basic data on fishery in Yirol

#	State: Eastern Lakes	County	Yirol Centre	Adur	Nyang
		Payam	Yirol	Wut thou	Pagaru
		Boma	Mit nyin	Wut thou	Majak Panarok
1	Name of fishing camp		Payii Fishing camp	Waut fishing capm	Panarok fishing camp
2	Total number of fisher folks		96	60	44
3	Total Population Approx.		Nil	Nil	Nil
2	Name of Landing site		Mit nyin	Anyii	Payii
	No. of Fish traders		35	Nil	100
3	Facility available at the landing site		Fishing net, hooks and palm tree canoes		
4	Fishing season		April to September		
5	Common fish species		(Tilapia, Labeo, Barbus, Distchodus, Citharims, Marmyus, Latee, Heterotis, synodontis, cymroraches) Ding rial, Lake, Atur, Reec-col, Apuoth, Theen and Ngok		
6	Common fishing inputs		Fishing net, hooks and palm tree canoes	Fishing net, hooks and palm tree canoes	Fishing net, hooks and palm tree canoes
7	Source of inputs		SNV supplied 1boat	-	-
8	Technical skills available		-	-	-
9	Nearest trading centre		Yirol fish market	Yirol fish market	Yirol fish market
10	Agencies who supported fisher folks		SNV	Nil	Nil
11	Activity implemented by agencies		Training of fishing, net braiding, VSLA	Training of fishing, net braiding, VSLA	Training of fishing, net braiding, VSLA
12	Post-catching activities followed		Cleaning, and removal of unwanted organs	Cleaning, and removal of unwanted organs	Cleaning, and removal of unwanted organs
13	Common storage methods (fresh fish)		Not available	Not available	Not available
14	Common storage methods (dry fish)		Sacks and stores build out of bricks or mud	Sacks and stores build out of bricks or mud	Sacks and stores build out of bricks or mud
15	Processing activities		Sun drying	Sun drying	Sun drying
16	Problem faced by the fishermen		Lack of technical skills and good fish handling practices	Lack of technical skills and good fish handling practices	Lack of technical skills and good fish handling practices

#	State: Eastern Lakes	County	Yirol Centre	Adur	Nyang
		Payam	Yirol	Wut thou	Pagaru
		Boma	Mit nyin	Wut thou	Majak Panarok
17	Focal person name		Abolic Manyang 0921535384 0954840365	Donato Mathing Anin 0923238807	Abraham Gum Majak 0955945442

1- Proposed list of trainees in Yirol – Panyang Fishing group

S. N.	Names	Contact
1.	Abolic Manyang Kewol	0921535384
2.	Maluac Mader Akok	0921480425
3.	Mangar Rim Anyak	0924451248
4.	Acieng Makwac Anyak	0920283798
5.	Pamaker Makur Muga	
6.	Mabor Manyang Nekga	0925476902
7.	Mayen Makur Akec	0923050593
8.	Magok Nek Nyariel	0926118471
9.	Adut Malual Ayom	0923276813
10.	William Deng Aleth	0921520288
11.	Jacob Yach Amceding	
12.	Akucpie Anyuot Beng	0924439899
13.	Bol Kuai Beng	0921458350
14.	Makor Adut Arier	
15.	Mading Madol Mayen	0927072484
16.	Anhiem Manyen Yak	0926953954
17.	Makur Iman	0928114971
18.	Mayur Nyariel	0924483550
19.	Ngor Mading	
20.	Deng Garang Akec	
21.	Laat Mading	
22.	Atarach Mayen	
23.	Icut Makuac	
24.	Mabor Mading Arok	0924439889
25.	Jok Makeny Aleng	
26.	Machiek Anyong	

2- Proposed names for fishery training at Pagarau – Pagarau Fishery group

S. N.	Names	Contact
1.	Abud Rang Achol	Nil
2.	Marial Beng Thong	Nil
3.	Machiek Madngdhal Madit	Nil
4.	Malook Mading Atong	Nil
5.	Makuac Badc Apuol	Nil
6.	Adut Mariec Monydit	Nil
7.	Akot Mayor Amuontok	Nil
8.	Majur Nian Malual	Nil
9.	Achol Kakic Akuc	Nil
10.	Yier Malon Martiua	Nil
11.	Deng Roc Riak	Nil

12.	Kakic Acueteth Koth	Nil
13.	Adhiec Kuc Dut	Nil
14.	Matoc Magar Tuog	Nil
15.	Mator Hanchieng Dhier	Nil
16.	Majak Makur Marur	Nil
17.	Madiar Kuc Chnot	Nil
18.	Ngor Makur Marur	Nil
19.	Awel Mariec Bok	Nil
20.	Kot Makur Akucpir	Nil
21.	Cagai Kuek Riak	Nil
22.	Tomac Magurn Bol	Nil
23.	Major Madthieng Achol	Nil
24.	Along Majur Majak	Nil
25.	Makur Mador Riak	Nil

Annexure III**Bill of Quantity of Fish Smoking Oven**

No.	Description of the Items	Quantity	Unit Price	Total Cost
1	Excavation and Earth work			
	Excavation to depth of 20/20cm	7.2 M		
	Sub Total			
2	Foundation works (One & Haft Bricks)			
	Bricks	1,100		
	Mud clay	4 m ³		
	Sub Total			
3	Masonry Works			
	Bricks	4,320 Pcs		
	Mud clay	10 m ³		
	Sub Total			
4	Structure Works			
	Steel poles	6 Pcs		
	Angle steel	12 Pcs		
	Sub Total			
5	Lintel Works + Tray Holders			
	Lintel 4 pieces			
	Iron bar y 10	1 Pcs		
	Iron bar y 16	2 pcs		
	Cement	10 Pcs		
	Aggragate	4m ³		
	Sub Total			
6	Roof Works for smoking oven and shed			
	GI Sheet 28 Gauge	10 Pcs		
	Nail for roofing	3 Kgs		
	Sub Total			
7	Fixing of Doors			
	Door metal for oven 0.50m/0.50m	2Pcs		
	Door metal for oven 1m/1.2m	2 Pcs		
	Door for Store 1m/0.90m	2 Pcs		
	Sub Total			
8	Vent pipe 2 meters	2 Pcs		
9	Wiremesh for tray (2.2mx1.2m)	4 pcs		
10	Total Materials Cost (1 to9)			
11	Labour cost	40 %		
	Total Cost			

Design of the Fish Smoking Oven



NOTES

-ALL DEMENSION ARE IN METER
UNLESS SPECIFIED CHANGE CAN ONLY
BE POSSIBLE
AFTER CONSULTATION WITH THE
DESIGNER



Job Title

Location

Client UNIDO

Drawing Name
Perspectives

Drawing Status
Architectural Drawing

Drawn by

Drawing Scale
1:100

Annexure IV

Training details on Post-harvest Management and Storage of Food Grain Crops

Day	Topic/Sub-topics	Points of discussion	Learning activities	Resources used
1	<p>Orientation (20mins)</p> <p>Introduction to Post Harvest Management (1hr)</p>	<ul style="list-style-type: none"> Arrival ,Assembling, & Registration of farmers Issuing of T-shirts provided by UNIDO to the participants Opening remarks by officials, Self introduction and Welcoming of participants Definition of PHM Importance of PHM -Food safety -Quality assurance -Better and longer storage -Better protection from pests -Better protection from moulds(Poisonous Aflatoxins) -Reduction of losses(Quality and Quantity) -Better marketing opportunities Causes and sources of Post-harvest losses -Improper harvesting, handling and processing techniques -Harvesting immature and over mature crops -Labour shortage during harvesting -Birds, rodents, insect pests, termites & fungi -Poor drying methods and inadequate storage facilities -Rough transportation/loading/un loading 	<p>Documentation and signing of list of attendance by the participants</p> <p>Audience</p> <p>Teaching session where farmers listen to the trainer/Translator</p> <p>Questions and Answer session at the end of the topic</p> <p>Group Discussions</p> <p>Brainstorming</p>	<p>Note books and pens</p> <p>Hall, Chairs, desks</p> <p>Translator</p> <p>PHM Training Manual</p> <p>Flip charts</p> <p>Marker pens</p> <p>Teaching aids and Posters printed in various languages</p>
	Harvesting	<ul style="list-style-type: none"> Definition 	Interactive	PH Training

	(1hr)	<ul style="list-style-type: none"> • Preparations to make before harvesting • Goals of good harvesting • Process of harvesting in the farmers community • Stage and timing of harvesting • Tools used for harvesting by the community • Losses incurred during harvesting • Precautions to be taken by the farmer during harvesting 	session where the trainer will ask questions to establish how the farmers carry out the harvesting and Practical demonstration on correct methods of harvesting of specific crop	Manual Posters Stationery Sickle/Maloda Knife/ Panga Synthetic bags, woven sacks, Traditional baskets, wheel barrows, ox-drawn carts, Tarpaulins, Mats Bicycles
	Drying process (1.5hrs)	<ul style="list-style-type: none"> • Definition • Importance & Reasons for drying grains • How drying is done in the community- Give recommendations on the best drying practices • Recommended moisture content for safe storage; 12-13% for cereals; <10% -Pulses • Determination/testing moisture content in the grain (Using a Moisture testing meter), Salt method, biting method 	<p>Demonstrate the best drying practices (drying under the sun)</p> <p>Demonstrate simple methods of moisture testing e. g salt test, Biting test</p>	Black polythene sheet Transparent polythene sheet Tarpaulins Raised platforms Woven sisal bags Clear glass jar with lid Dry common salt Grain sample
	Threshing /Shelling (1.5hrs)	<ul style="list-style-type: none"> • Definition • Time required for threshing depends on; <ul style="list-style-type: none"> -Variety of grain, or nut -Degree of dryness of grain -Method of threshing (Manual vs motorized) • Common traditional threshing practices <ul style="list-style-type: none"> -Beating with sticks on the ground or in sacks -Mortar and pestle -Grinding on stones • Guidelines for improved threshing efficiency • Losses during threshing <ul style="list-style-type: none"> -Threshing loss(Incomplete threshing) -Scatter loss(Eaten by 	<p>Establish how the farmers thresh their grain and teach the best threshing practices</p> <p>-Demonstrate threshing using a simple hand held thresher if available</p>	Sacks Tarpaulins Hand held grain thresher

		domestic animals) -Separation loss(Grain disposed with chaff) <ul style="list-style-type: none"> How farmers can minimize threshing losses 		
	Cleaning/Winnowing (1hr)	<ul style="list-style-type: none"> Definition(Removal of chaff and other impurities) Principal-Lighter materials are blown by air; Heavier foreign materials like stones are handpicked or sieved Importance of cleaning grains before storage Methods of cleaning/winnowing (Small and Large scale) e. g wind and drop technique, using a mesh screen/sieve Losses incurred during winnowing Minimizing grain losses during cleaning 	Establish how farmers do their winnowing Give recommendations of the appropriate methods Farmer groups can also invest on mechanical threshers and winnowers Questions and Answers session	Tarpaulins or plastic sheets Sacks/storage bags Traditional baskets Screen/wire mesh frame for sieving
2	Quality Assurance (Max. 2hrs) a) Pest control (40mins)	<ul style="list-style-type: none"> Types of insect pests and examples <ul style="list-style-type: none"> ✓ Weevils- <i>Sitophilus</i> species ✓ Larger grain borer- <i>Prostephanus truncates</i> ✓ Lesser/Smaller grain borer-<i>Rhizopertha dominica</i> ✓ Angoumois grain moth-<i>Sitotroga cerealella</i> ✓ Bruchids -e.g Bruchid beetles Losses caused by insect pests <ul style="list-style-type: none"> ✓ Weight loss of the grains ✓ Loss in quality/reduced market value& prices ✓ Promotion of mould development ✓ Reduced germination potential ✓ Reduced nutritional value Sources of infestation 	Assist the farmers to visually identify storage pests in their grain stores and damage caused by each pest Interactive session, ask the farmers how they control pest in stored grains and share your experiences on better pest control methods Inspect a farmers store and establish the main sources of	Pest infested/damaged grains Insect pictorial aids for pest identification (coloured) PHM Training manual Posters Insect pests specimens Insecticide dust Candles

		<ul style="list-style-type: none"> ✓ Residues at home or farm ✓ Structure/store itself i.e cracked walls, old sacks ,thatch or bamboo ✓ Old sacks containing the pests ✓ Natural habitats e.g. seed pods, rotting wood, bark • Methods of pest control <ul style="list-style-type: none"> ✓ Chemical control ✓ Drying attacked grain for 1 hour will kill weevils(Solarization) ✓ Sterilizing of food grains ✓ Mixture of ash and pepper mixed with grain ✓ Neem products ✓ Use of tobacco ✓ Use of sand(Physical disruption of the pest movement) ✓ Storage of grains in air tight containers(Hermetic storage, Use of metal drums & PICs bags) ✓ Use of metal silos(Traditional and improved) ✓ Smoking-wood fire- For Seed grains ✓ Storing in a clean place(Store hygiene) 	<p>infestation</p> <p>Demonstrate Solarization procedure in case of re-infested grains</p> <p>Demonstrate how to sterilize old sacks infested by pests(Hot water treatment and dipping in insecticide solution) then hang to dry before storing grain</p> <p>Demonstrate advantages of hermetic storage by comparing grain storage in PICs and normal woven sisal bags</p> <p>Demonstrate preparation of grains before storage in silos</p> <p>Assist the farmer in determining how much insecticide to apply</p>	
	<p>b) Control of moulds (Aflatoxins)</p> <p>(30mins)</p>	<ul style="list-style-type: none"> ✓ What is Aflatoxin? ✓ How can you tell when your grain is contaminated? ✓ Why is Aflatoxin dangerous? ✓ What can u do to prevent Aflatoxin 	<p>-Questions and answers session</p> <p>-Identification of aflatoxin infested grain either in the</p>	<p>PHM Training Manual</p> <p>Pictorial aids to help farmers identify grains infested with Aflatoxins</p>

		contamination?	field or in store	
	c) Termites Control (30mins)	<ul style="list-style-type: none"> ✓ Timely harvesting ✓ Application of used oil/diesel around the store ✓ Removal of bark from post supporting granary ✓ Physical removal of the termites ✓ Spreading of ash at base of granary ✓ Mixture of cow urine with salt applied at the base of the granary ✓ Application of synthetic chemicals 	Demonstration	Used engine oil Termiticides
	d) Rodent control (40mins)	<ul style="list-style-type: none"> • Types of rodents • Signs of presence of rats in the store • Losses/Damage caused by rodents • Control methods <ul style="list-style-type: none"> ✓ Rat guards ✓ Rodenticides ✓ Physical traps/Baits ✓ Biological control (domestic cat) ✓ Clean compound 	Demonstration by group visit to the store to check for presence or signs of rodents in the store Notes taking	PHM Training Manual
	e) Control of Birds (30mins)	<ul style="list-style-type: none"> • <i>Quelea quelea</i>, Weaver bird • Losses caused by birds <ul style="list-style-type: none"> ✓ Feeding ✓ contamination • Control measures (Scare crows), keeping guard, Use of any other material producing movements e.g. strings 	Group discussions Interactive sessions Questions and answer sessions	Note books

	f) Grain Storage (2hrs)	<ul style="list-style-type: none"> • Definition • Practicing good storage hygiene • Methods/storage structures, their advantages and disadvantages <ul style="list-style-type: none"> ✓ PICs Bags(Hermetic bags) ✓ Metal silos/Bins ✓ Metal Drums and plastic containers ✓ Common woven sacks or synthetic sacks • Proper Packaging /Palleting or stacking during storage(Not more than 10 bags high), Leaving plenum between bags and wall, Grain should not be in contact with the floor • Losses caused by poor storage e. g moulds, spillage etc. 	<p>Ask the farmers how the store their grains and share the modern/improved methods of grain storage e. g PICs bags, GI Sheets silos, Metal bins</p> <p>Ask farmers to pick a sample of stored grain and bring close to the nose! (Sound grain should not be mouldy, rotten or discolored.) Demonstrate the difference between the normal sack and PICs Bags</p>	<p>PICs Bags Nylon Sacks GI silos Metal bins</p> <p>-Pictorial aids to identify other methods of storage</p> <p>Interactive session</p>
	Contract farming and Collective marketing(Group marketing) (1 hr)	<ul style="list-style-type: none"> • Definition of terms • Advantages of CF to the farmers • Advantages of CF to the buyers • Challenges of CF to both the farmers and buyers • FAOs CF guiding principals <ul style="list-style-type: none"> ✓ Common purpose-Win-win situation ✓ Open dialogue ✓ Readability of contracts ✓ Clear documentation ✓ Transparency in price determination ✓ Clear mechanisms to settle disputes ✓ Transparency • Advantages of collective marketing <ul style="list-style-type: none"> ✓ Farmers attain 	<p>Interactive session between the trainer and the farmers</p> <p>Questions and answers session</p> <p>Visit to a bulk grain store/Warehouse</p>	<p>Note books and pens</p> <p>Sitting space</p>

		<p>economies of scale</p> <ul style="list-style-type: none"> ✓ Improvement in post harvesting Handling and storage through acquiring central storage facilities e. g silos ✓ Bulking of products hence attracting large scale buyers ✓ Better access to market information ✓ Bulky purchase and transportation of inputs reducing cost of production ✓ Better bargaining power for better prices • Starting and sustaining group marketing • Challenges in marketing of cereals and pulses <ul style="list-style-type: none"> ✓ Post harvest losses ✓ Inadequate Storage facilities ✓ Bulking ✓ Infrastructure ✓ Draught in marginal areas ✓ Quality standards 		
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Annexure V



EU Project on Enhanced Value Addition and Strengthening Value Chains in the Greater Bahr El Ghazal Region, South Sudan



Report on Selection of the Private Operator for the Kangi Agro- Processing Centre, Kangi County, Wau State

1.0 Background:

Drawing the decision based on the experiences of GIZ's Public Private Partnership (PPP) approach for management and operation of the slaughter houses in the Greater Bahr El Ghazal region and following several meetings and discussion between the project stakeholders in which it was resolved and agreed upon that the pilot Agro- Processing Centre constructed by UNIDO in four locations in the Greater Bahr El Ghazal region (former WBG, NBG, Warrap and Lakes States) shall be operated under public private partnership (PPP) mode. This means the facility be legally owned by the local government but it will be run, managed and operated by a private business person.

In May 2016, the UNIDO project team after consultations with the States and County authorities, developed criteria for the selection of operator and call for proposal for the management of the APCs. In addition to that a process for recruitment of private operator was initiated. Call for submission of application by the interested companies or individual business entity/individual was drafted and published in the counties headquarters where the APCs are located.

The call for proposals which was published in June 2016 at all the locations with exception of Aduel Lakes State contains clearly stated criteria, terms and conditions, date line, and place where the application should be submitted. Unfortunately, the process was interrupted due to Wau and Juba incidences by the end of June and early July, respectively. The process was revived during October 2016 and selection of the private operator for the Kangi agro processing center finished by early November. Process will continue during November and early December to finish identification and selection of operators for the remaining three agro processing centers.

2.0 Formation of the selection committee

UNIDO project team had a meeting with the Director General (DG), State Ministry of Agriculture Wau State on Monday 31st of Oct 2016 at the State Ministry of Agriculture HQs. During the meeting, the DG was briefed on the progress of the project and the planned activities. In addition, UNIDO informed the DG that the project is now in the process of recruitment of a private operator to run and manage the APC in Kangi and for this he was requested to facilitate the formation of a selection committee which he readily accepted.

The DG formed the selection committee which initially comprised of eight (08) members representing all the related sectors and stakeholders.

2.1 Composition of the Committee:

The committee comprises of the State Director of Agriculture, County Executive Director, UNIDO project coordinator, Paramount Chief and community leader, women and youth representatives, Chairman of the Chamber of Commerce, Agriculture and Industry and a representative from local security office.

2.2 Duties and Responsibilities

The committee was assigned to carry out the following duties and responsibilities based on the TOR.

- Evaluate applications and business proposals submitted by the applicants
- Shortlist applicants based on their rating
- Evaluate the financial capacity of the applicants shortlisted
- Conduct personal interviews with the shortlisted applicants
- Decide the right applicant for APC operation
- Announce the successful applicant
- Any other duty deem necessary for the selection of an appropriate private operator.

3.0 Committee Findings and Recommendations

After the committee members were notified through written letters and telephone calls, the committee members agreed to meet on the 2nd of Nov 2016 to carry out their assignments and the applicants who submitted their application were also informed to attend the scheduled interviews.

3.1 Meeting place and time

The committee members met on 2nd November 2016 at the Kangi main market between 11.00 AM to 3.00 PM

3.2 Agenda

- Brief background about the UNIDO's project
- Evaluation of applications (personal interview and the business proposal).
- Shortlist applicants based on their rating
- Evaluation the financial capacity of the applicants shortlisted
- Announce the successful applicant
- AOB

3.3 Attendance

#	Name	Sex	Position	Institution	Contact	Remarks
1.	Gatano Guido A.	M	Director of Agriculture;	County Department of Agriculture	0956122204	Chairman
2.	Arkangelo Ucuir Lual	M	Executive Director	County HQs	0926020722	Co-Chairman
3.	Daniel Ruben Ateng	M	Project Coordinator	UNIDO	0955937744	Secretary
4.	Undero Uyu Chol	M	Chairman of Chamber of Commerce	County Chamber of Commerce	0924162965	Member
5.	Arkengleo Deng Akot	M	Paramount Chief	Local Authority	0924162974	Member
6.	Luka Santino	M	Head of Security	County Security	-	Member
7.	Abuk Madut Upiou	F	Women representative	Women Group/Union	-	Member
8.	Atong Ujuok	F	Member	Women Group/Union	-	
9.	Mary Akau Akot	F	Member	Women Group/Union	-	
10.	Akol Simon Uiieth	M	Youth representative	Youth Group/Union	0925298014	Member
11.	Bol Bol Akec	M	Member	Youth Group/Union	-	
12.	Rodulf Unguec	M	Community Leader		0923092063	

3.4 Minutes of Meeting:

3.4.1 Brief background about the UNIDO's project

The meeting was officially opened by the Chairman of the selection committee. On his opening remarks he welcomed all the committee members and explained that the committee is tasked to review and evaluate the applications submitted and select the right person to operate the APC for the coming one year. He requested UNIDO project coordinator to give a brief background of the project and explain what is expected by the end of this meeting.

UNIDO project coordinator explained that UNIDO is implementing a project on value addition and value chain development in the Greater Bahr el Ghazal region of South Sudan. Project is funded by the European Union (EU) and it is part of the overall ZEAT-BEAD programme jointly implemented by FAO, UNOPS, GIZ and UNIDO. Main objective of UNIDO action under the ZEAT-BEAD Project is

developing and implementation of value chain upgrading strategies for the five identified commodities (groundnut, sorghum, rice, fish and hide and skin) and capacity building of actors operating in the identified five value chain in the Greater Bahr el Ghazal region.

UNIDO is focusing specifically on small household producers and small private business owners to create a sustainable and simple marketing network by developing and implementing upgrading value chain strategies. It will focus as well on building the capacity of the different actors to operate in the value chain and tune to technological and business features for more value addition of their production asset. UNIDO will carry its activities under this project in a concerted and coordinated approach with the other implementing agencies and NGO's delivering under the EU global action. The commodities identified by UNIDO for upgrading value chain include sorghum, groundnut, rice, fish and leather (hide and skin).

In addition, UNIDO is in the process of establishing four agro processing and training centers in the GBEG region with modest facility for sorghum grinding and groundnut oil production and build capacity of farmers groups and other stakeholders on post harvest management, storage and marketing of agricultural produce.

In June 2016, during the validation workshop in Wau, it was decided that the agro processing center shall be managed under Public Private Partnership (PPP) mode where the local government will be the legal owner of the facility but it will be operated and managed by a private operator. In order to manage the Kangi agro processing centre, the State Ministry of Agriculture, Wau State together with the County Agriculture Department and UNIDO published a call for proposals from private businessman or companies for the commercial operation of the APC in Kangai.

The call for proposals/applications was published on June 24th, 2016 and only one application received. Then the call for application was republished on 18th Oct 2016 and deadline was extended for some more time but no any additional application received.

Therefore, after consultations with the relevant authorities at the State and County level it was agreed that the submitted application will be evaluated and a decision will be taken based on the findings. This is the reason why we are here today to evaluate the application and take a decision.

3.4.1.2 Reactions:

The chairman thanked UNIDO project coordinator for the lengthy explanation on the background of the project and for briefing the meeting on why they are here today and what is expected from the committee members. The chairman asked the committee members to give their opinion of the situation at hand that there is only one candidate applied and wanted to know the way forward for this meeting.

3.4.1.2.1 Paramount chief reaction:

The paramount chief of Kangi County thanked UNIDO for the effort and follow-up to ensure construction of APC on reasonable time. He said that as Kangi Paramount Chief and in the name of the entire Kangi Community are very appreciative to UNIDO and the EU for allocating required fund to implement this project. He said that UNIDO gain their trust for fulfilling their promises they have made early this year when we had the first meeting with them and when they requested for the piece of land where the APC is currently build. He said that they are waiting for the other agencies that made their promise such as GIZ to come and build the warehouse. Also he encouraged UNOPS to continue the road construction.

About the call for submission of application to run the APC, the paramount chief said he is very aware of the whole process and he has seen by his eyes the advertisement was posted in many places around Kangi and the nearby villages. The paramount chief attributed the reasons for people not applying was most likely due to the conditions put on the advert especially the two last conditions i.e.:

- Willing to re-invest part of the profit for the expansion of activities at the APCs.
- Must have bank account with at least 10,000 SSP.

He explained that the Kangi Business Community is very poor and they have very little money to invest on the APC. He also explained that very few have bank accounts and their balance maybe very low and might not reach up to 10,000 SSP mentioned in the criteria for applications. He also said that although only one person has applied but it is believed that the applicant has the capacity to operate and sustain the operation of the APC. Therefore, he advised the committee to proceed with their work to look into the document for evaluation and interview and then decide.

3.4.1.2.2 Women representative reaction:

The women representative started by acknowledging the work done by UNIDO so far and said that as women community they are very happy because they believe that the APC shall help them a lot and will make their life easier because at present local community maily grinding sorghum using traditional methods with consume time and energy. She also commented that this is the first project of its kind in Kangi and she encouraged UNIDO to continue doing this good work.

As for the application process she said that they were also aware of the call for proposal and she regretted that no women applied. The women representative supported the opinion of the paramount chief that the committee continue their work to evaluate the received proposal.

3.4.1.2.3 County Executive Director reactions :

The County Executive Director said that he has also been following the progress of the construction of Kangi APC and he is very happy that the project has reached to this stage and now the building is ready awaiting the arrival of the machines. He commended UNIDO and the EU for this great addition to Kangi market. He said that the Kangi market is growing very fast and the marketing activities have increased rapidly in recent time as compared to the last two years. He said people can see especially during the market day's local community are coming all the way from Buarurd, Kuajok and Wau to buy local produce and he believed when the APC is fully operational and GIZ build the warehouse this market shall prosper.

In regards to the call for proposal he said that the county authorities have been involved in the process right from the first day. He mentioned that it is unfortunate that only one person had applied even though he encouraged many people to try their luck.

3.4.1.2.4 Resolution by the committee members:

The chairman of the committee seconded the idea of the paramount chief, women representative and the executive director that given the situation only one candidate has applied we need to go ahead with the evaluation process. **DO YOU SUPPORT THIS IDEA THAT WE GO AHEAD TO EVALUATE THIS APPLICATION?** Asking the committee members and further suggested whoever support the idea that we should go ahead with the evaluation should raise his hand up. All the group members raised their hand up in the support of the continuation of the evaluation of the only one proposal received.

3.5 Evaluation of application, personal interview and business proposal submitted by the applicant

The chairman requested the applicant to appear in front of the panel and requested his application to be presented in front of the committee. The executive director who is the co-chair of the committee brought the application and opened the envelope in front of the committee members and handed it over to the chairman. The chairman asked the committee secretary to read loudly the application to the committee member as they are taking notes on the application for deliberation.

3.5.1 The applicant was asked the following questions:

- Applicant Name: James Buola Piel
- Date and place of birth: 01/01/1983
- Nationality: South Sudanese
- Address: Kangi, Wau State
- Professional: Business man
- Marital Status: Married

The following points/criteria were considered for the evaluation of the application:

3.5.2 The applicant/ Candidate (60 marks)

The candidate was evaluated on the following criteria

- a. Must be a South Sudanese individual or company (25 Marks)

He got "YES" because the applicant is a South Sudanese

- b. Must be a legal entity to do business in South Sudan (5 marks)

He got "YES" because he is individual business person who owns a retailer shop at Kangi Market for the last eight (8) years

- c. Have some previous experience of managing a business (10 marks)

It was confirmed that he had been doing business for the last 8 years in Kangi main market and his shop is visible to everyone.

- d. Have good working relationship with local communities & local authorities (5 marks)

The paramount chief, youth representative, security and police, executive director and the women representative all confirmed that they had known the applicant since the childhood and he enjoyed good relationship with the local community and authorities.

- e. Have no previous criminal records (5 marks)

The security and police representative were asked if the applicant has committed any previous criminal offense or was jailed before. The security representative testified that the applicant has a clean record and have not been suspected or arrested of any crime.

- f. Willing to re-invest part of the profit for the expansion of activities at the APCs (5 marks)

The committee chairman asked the applicant if he is ready to reinvest and expand the APC? The applicant answered YES i.e he is willing to invest and expand the APC if he is offered to run and manage the APC.

- g. Must have bank account with at least 10,000 SSP (5 marks)

The applicant said that he has a bank account with the Kenya Commercial Bank (KCB) and he has above 40,000 SSP in his account. The Committee could not immediately verify his claim. So he was asked by the committee to submit latest bank statement within one week time from the date of this interview.

3.5.3 Evaluation of the application and business proposal (40 Marks)

The application and the business proposal were evaluated on the SMART analyses approach (10 marks).

There was a short business proposal presented by the applicant that was evaluated and the committee resolved that it has to be improved to reflect the actual plan on how the applicant wanted to do the business activities at the APC. Also the proposal should include a projection of how much profit expected out of the APC quarterly and how the profit shall be distributed among the stakeholders.

3.5.4 Evaluation of the financial capacity of the applicants' shortlisted (30 marks)

The local community including some member of the evaluation panel acknowledged that the applicant is a successful business person and his current shop worth of above 120,000 SSP. In

addition to the community testimony the applicant said that he is financially capable since he has been doing business with FAO and other agencies in relation to seeds business.

4.0 Committee Resolution:

After deliberation on the result of the both the personal interview, assessment of the application and business plan, the committee resolved that **Mr. James Buolla Pael** is qualified to be nominated for the management of operation of the Kangi Agro-processing Centre at Kangi main market on condition that he should improve the business proposal submitted for the running and management of the APC.

4.1 Follow up actions:

S/n	Description	Responsible person	Dateline
1.	Submission of Final Business Plan	James Buolla	End of Nov 2016
2.	Submission of latest bank statement	James Boulla	10 th Nov 2016
3.	Notification letter to the selected applicant	Daniel Ruben and Mr. Katano. Director of Agriculture and the Executive Director	Nov 2016
4.	Draft of the contract of management of the APC (PPP contract agreement)	Mr. RKP Singh, Daniel, DG State Ministry of Agriculture and County Authority	December 15, 2016
5.	Signing of the contract	James Buolla, Mr. RKP Singh, DG State Ministry of Agriculture and County Authority	Early January 2017
6.	Handing over the APC to the private operator	Mr. RKP Singh, Daniel, DG State Ministry of Agriculture and County Authority	Early January 2017

Business Plan

Kangi Agro-Processing Centre

EU Project on Enhanced Value Addition and Strengthening
Value Chains in the Greater Bahr El Ghazal region, South
Sudan

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1. Introduction:

Kangi market in the Jur River County of Wau State is the strategic market connecting WFP feeder road with UNOPS road and at centralised location between three capital cities and big markets of the Greater Bahr el Ghazal region of South Sudan namely Kwajok, Aweil & Wau. It is also centrally located in the Jur River County, which had an estimated population of 201,947 in 2014. An estimated population of Kangi Payam is 6,800 persons with an average household size of 6 persons. The population is a mix of Luo and Dinka tribes. They are mainly agro-pastoralist, although the Luos are more agricultural oriented and the Dinka are primarily pastoralist. According to FAO (2015) estimate nearly 58% of the population is relying on crop production and around 14% on livestock as a main source of livelihoods. The average farm size in the Western Bahr el Ghazal state varies from 5-10 feddan, of which an average 2.5 feddan is being cropped annually.

2. Objective of the Centre:

The overall objective of this centre is to provide a sustainable sorghum milling facility to the communities at affordable price. Specific objective includes:

- To provide milling service at affordable price to the nearby communities.
- To generate livelihood opportunities for the local youths by engaging them in different productive activities.

3. Production and Marketing

3.1. Agriculture Production System

The agricultural production system in South Sudan and in the Greater Bahr el Ghazal region is entirely rain-fed due to absence of an appropriate irrigation system. Generally the rainy season starts in April/May and ends in September/October. Irregular rain and prolonged dry spells can decimate production and productivity. Farming is mostly done in traditional way using indigenous tools and saved seeds. Absence of use of fertilizers and crop protection chemicals leads to very low productivity. Some farmers use oxen and donkey ploughs but their numbers are very low. Sorghum and Groundnuts are the major crops grown in the Jur River County and these two crops are cultivated by over 70% of the households and sesame is grown by around 50% households. Maize and Cassava are slowly entering into the farming system and often intercropped with sorghum and sesame. As a perennial crop, however, it is mainly the food source for animals during the dry season and is often destroyed by livestock.

3.2. Sorghum Production in Kangi

Farming communities in the Jur River Country are involved in subsistence farming therefore, production per feddan ranges between 300-500 Kg which is lowest among African countries. Traditional farming practices, lack of availability and use of improved seeds, inappropriate farming tools, absence of chemicals and fertiliser and lack of extension support services are some of the main reasons for poor productivity of agricultural crops in the Kangi area.

A study shows that there has been a drastic change in cereals production in the Jur River Country during 2011 - 2014. However, reliability of data can be questioned due to high fluctuation of area under cultivation and productivity, as it is shown in the below table:

Table 1: Cereal production data for Jur River County during 2011 and 2014

Year	Area	Yield (Kg/ha)	Production (MT)	Surplus
2011	10,650	1100	7,668	-7885
2014	32,094	1,300	24,276	2631

(Source: Financial & Economic analysis of Kangi Warehouse)

We are limiting our studies to Kangi Payam only because of the size and capacity of the Agro-processing unit which may be just enough to serve nearby population only. Moreover, in the absence of reliable data, an estimated hypothetical data is used for the assessment of production. Total Population of the Kangi Payam is 6,800 with an average household size of six. Based on available data we can conclude that there are around 1,135 families in Kangi Payam. Average area under cultivation is approx. 2.5 feddan in so the total approximate area under cultivation would be around 2,837 feddan. If it is assumed that about 60% of total area under cultivation is under sorghum then total area under sorghum would be about 1,700 feddan. Assuming average production is about 440 Kg per feddan then total available sorghum in the Kangi Payam would be about 748 MT.

Table 2: Estimation of sorghum production in Kangi Payam

Total Population	Average Family Size	Total Families	Average Cultivation Area	Total Area under Cultivation	Area under Sorghum (60%)	Average Production per feddan	Total estimated Production(MT)
6,800	6	1,135	2.5	2,837	1,700	440	748

3.3. Sorghum Grinding Volume in Kangi Payam

Kangi Payam is spread in a large area. Some of the villages are very far from Kangi market and majority of the villages are not accessible with proper all weather roads. So, it is possible that communities living far away from the Kangi main market would not be able to avail the facility due to distance from centre and absence of reliable transport system. In addition, it is assumed that some poor households of the nearby community who are lacking cash (affordability) may not utilise the services offered at the agro processing centre. Thus if it is assumed that only about 40% of the total households will avail the service of processing unit then total annual available quantity for sorghum grinding would be about 300 MT.

Table 3: Estimation of sorghum availability for grinding in Kangi Payam

Total Available Sorghum in Kangi Payam (MT)	Total Available quantity (40%)for Grinding mill (MT)	Total working days in a year	Total quantity available for Grinding per day in MT (300 working Days)
748	300	300	1.00

3.4. Services Provided by the APC

APC will mainly offer sorghum grinding service to the local communities where anyone can use the facility on payment basis. However, in future it can also offer other services like producing and selling groundnut paste, sale of agro inputs and other value added products for income generation.

3.5. Market and Marketing of APC

The primary customer of the sorghum mill and other facilities at the APC will be the local communities' members living around the Kangi market. Under current production system community members will only be able to use the sorghum mill for grinding sorghum for consumption purpose. Fee for sorghum grinding will be most critical factor to attract customers as source of income of the majority of the local community in the Kangi Payam are limited therefore, they may not be able to pay high grinding fee.

4. Facility Components and Layouts:

4.1. Compound

The Agro-processing Centre (APC) in Kangi is constructed in 2016 with EU funding. It is situated in 20 M² compound. The compound is fenced to keep stray animal out. The APC is build on the compound is a single building of 50m² (10m x 5m) that holds the administration block and storage facilities.

4.2. Administration / staff room

The administration area is located in the main building and consists of an office for the staff.

4.3. Store room

The store room is located in the main building room for temporary storage of produce brought by customers.

4.4. Toilet and shower

One toilet and shower block is constructed within the compound.

5. Economics:

5.1. The Business Case

5.1.1. Importance of Agro-processing Centre:

At present Kangi market is lacking professional sorghum mill. Therefore, establishing a sorghum mill with other support services will ensure assured and regular service at affordable price to the local community members. It will also reduce the drudgery of women who are mainly responsible for pounding of sorghum at household level for consumption. In addition, GIZ is planning to establish a warehouse facility at Kangi market next to the APC where local traders will be able to store different products and sale during off season. Thus availability of sufficient quantity of grain throughout the year will help local community to buy food grain from the local market and get it milled at the agro processing centre.

5.1.2. The Structure and Justification of the PPP

In the Public-Private Partnership that underlies this business plan, the initial investment for the centre is financed by UNIDO that operates in close collaboration with the local government. The infrastructure will be property of the Kangi Payam. However, to ensure efficient operations, daily management, maintenance and repairs will be carried out by a private operator by the stakeholders in consultations with UNIDO. Grinding service fees will be decided by a management board set up for overall guidance and supervision of activities conducted at the agro processing centre and the profit will be shared between the two stakeholders in a manner that rewards the parties fairly for their financial risks and responsibilities.

The PPP, in this case public sector financing combined with private sector management, is expected to yield the following results:

- The availability of the sorghum grinding facility at the APC. It can be safely assumed that neither the government nor the private entrepreneur would have been able to finance a fully equipped service centre under the current economic realities;
- Efficient operations and maintenance of the APC brought about by clear performance criteria that have to be met for the private operator to keep his contract;

- Reinvestment of revenues into the APC. In case of public sector management revenues generally would revert to the state and little, if any, would be ploughed back into the operations;
- Long-term revenue streams for the local government and the private operator.

5.2. Sorghum Milling Cost and Profits:

In the absence of reliable service and liquid cash, manual pounding of sorghum is one of common practice in Kangi Payam. Some of the local community members are using existing mill at Kangi market which operates only few days in a month due to mechanical problem and other management issue. People prefer finer sorghum flour that results from mechanised milling that is why there is also great demand for this service.

Currently, it costs 10 SSP/kg (US\$0.11) to mill locally but these prices are varying with currency fluctuations. From the field visit it can be concluded that there is enough sorghum available with the communities for grinding into flour. Furthermore, field interviews suggest that people rely on buying sorghum from market (Wau market) only when sorghum is not locally available, implying that 100% of the local population either relies on the existing mill or pounding sorghum for consumption in Kangi Payam for all the months of the year when local grain is available but due to old machine it remain close for several days in a month so ultimately forcing them to pound sorghum for home consumption. It was observed during market survey that people prefer to buy grain and have it milled locally or pound it.

As mentioned above, the alternative to mechanical milling involves a time and labour intensive manual process. A back of the envelope calculation reveals the driving force of individual demand: it takes about 10 minutes to process 25 kg of sorghum grain into sorghum flour at the local mill, and costs SSP 250 (US\$2.77). At a typical pace of hand pounding one kg of sorghum need at least an hour. Thus hand pounding of 25Kg sorghum would require at least about 25 hours. Using the wage of an agricultural worker of SSP 150 (US\$1.66) for 8 to 10 hours work per day, the labour cost of manual pounding is about SSP 18.75 (US\$0.21) per hour or SSP468.75 (US\$5.21) for 25 hours. Therefore, the labour cost of hand pounding is much more than of mechanically milling and also the end product is of inferior quality. Besides the implication on demand for the milling service, this has major social implications on gender roles and income generation. Women almost always bear the responsibility of hand pounding. Relieving women from the arduous work of hand pounding will ensure availability of more time for other productive activities, a direct opportunity to increase income, and to attend school, an opportunity to increase future earning potential.

Table 4: Comparison between Manual Pounding & Milling of Sorghum

Type of Power	Manual labour	Mechanised
---------------	---------------	------------

▪ Quantity of Sorghum (Kg)	25	25
▪ Grinding time	25 hr	10-15 min
▪ Total cost (SSP)	468.75	250
▪ Per unit cost (SSP)	18.75	10
▪ Quality	Coarse	Fine

5.3. Operating Cost:

Due to currency fluctuation it is quite difficult to estimate different costs. However, different costs are calculated based on assumptions and current situation. The operational costs for the APC can be categorized as follows:

- Staff costs: Salaries and Food Allowance
- Sundries: all expenses related to items that are dispensed and used up in the operations of the APC.
- Transport costs for the manager and staff
- Maintenance costs
- Miscellaneous cost: all unforeseen cost

Table 5: Comparison Between Manual Pounding & Milling of Sorghum

Staffs	Cost Per Month (SSP)	Total Month	Total (SSP)
• Manager cum Operator	8,000	12	96,000
• Cleaner	3,000	12	36,000
• Sundries	30,000	12	360,000
• Local transport	2,000	12	24,000
• Repair & Maintenance	Lump sum		10,000
• Miscellaneous	3500	12	42,000
Total	46,500		568,000

Above table shows that total annual operational cost for Kangi APC will be approximately SSP 568,000.

5.4. Revenue:

The only source of income for APC will be service charges for grinding of sorghum flour. The estimated approximate operational expenditure will help us to determine the required

quantity of sorghum required for grinding and service charges in order to make APC profitable.

Table 6: Calculation of breakeven point at different quantity and processing fee

Grinding fee SSP/Kg	Quantity required per month					
	5 MT	10 MT	15MT	20MT	25MT	30MT
3	15000	30000	45000	60000	75000	90000
5	25000	50000	75000	100000	125000	150000
7	35000	70000	105000	140000	175000	210000
12	60000	120000	180000	240000	300000	360000

Above table indicate that APC can charge only SSP 3 per Kg if it grinds 20 MT per month. By increasing service charges per kg APC can achieve breakeven with lesser quantity like in case at SSP12 per kg break even can be achieved at just 5 MT. Higher service charges will attract lesser customers as communities are lacking cash. Therefore, management board may decide the grinding fee keeping in view of the financial interest of the centre and the paying capacity of the local community.

5.5. Revenue sharing principles between the partners

Revenue sharing between the partners is based on annual negotiations, whereby an annual fee for the Private Operator is agreed. The centre manager and the Kangi Payam share the profit of the centre after all operating costs and an investment reserve have been deducted from the gross income. The Management Board annually based on projected income and expenditure provided by the Private Operator shall set the sharing arrangement.

6. Growth Opportunity of Agro-processing Centre:

The idea of putting sorghum mill is, it will be functioning as the anchor economic activity, as it is believe that the completion of the Kangi–Kuajok road by WFP and the Kangi-Bar Urud road by UNOPS put Kangi in the crosshairs of the three major towns in the region: Wau, Aweil, and Kuajok. Undoubtedly this will increase trade in Kangi, and may cause Kangi to grow quickly into a major trading centre.

The growth of Agro-processing centre will determine on following:

- **Production of sorghum:** Current production of sorghum is very low in Kangi Payam and it is believed that with time and development of facilities production will increase. UN agencies and NGOs are distributing better inputs and educating farmers about improved farming technique which will also contribute to increase in production and productivity of sorghum.

- **Type of equipment available at the agro-processing centre:** UNIDO has decided to put a sorghum milling unit in Knagi and planning to add additional facility for groundnut processing. Management board and other development partners may decide in future to add machinery based on need and requirements for processing additional crops.
- **Addition of storage facility:** One may assume to provide storage facility along with processing unit based on area under cultivation, total production and trading response to newly develop Kangi market.
- **Services from APC:** Currently people are not enjoying services provided by existing mill and some of them believe that they cannot afford to avail the existing services. So, growth will depend on service provided at affordable price or may be innovative pricing or payment methods. For example: payment in term of grain than cash.

By setting growth figures for each of the separate parameters one can estimate how much cereal volume will be brought to the agro-processing centre in Kangi in the next 10 years. The corresponding volume of other crops can be calculated by setting values for the following parameters:

- Volume of sorghum for processing: Total quantity of sorghum that will be available for grinding every day
- Volume of other crops like groundnuts and sesame that is available with farmers in case of additional oil processing unit.
- Volume of agricultural crop that is surplus with farmers to store and storage period for which they want they want to store their produce.
- Number of communities members who can afford service

Based on above mention parameter all the three major crops are taken into consideration to estimate the future growth. Based on assumption it can be concluded that current available quantity for sorghum grinding is very low and it seems that selected sorghum grinder is appropriate to meet the current local demand. In below table it is assumed that with increased economic activity, area under cultivation will increase and yield will also increase with the effort from the local government and non-governmental organizations.

Table 7: Projected total availability of Sorghum for milling

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Total Area Sorghum (ha)	680	714	750	787	827	868	911	957	1005	1055	1108
Yield (Kg/Ha)	1100	1122	1144	1167	1191	1214	1239	1264	1289	1315	1341
Production (MT)	748	801	858	918	985	1054	1129	1210	1295	1387	1486
% Available for Grinding	40	42	43	45	47	48	50	52	55	57	60
Total available for Grinding	299	336	369	413	463	506	564	629	712	791	891
Average available per day (300 Days in a year)	1.00	1.12	1.23	1.38	1.54	1.69	1.88	2.10	2.37	2.64	2.97
Total working Hr	8	8	8	8	8	8	8	8	8	8	8
Average Grading per Hr (MT)	0.12	0.14	0.15	0.17	0.19	0.21	0.24	0.26	0.30	0.33	0.37

Table 8: Total availability of Groundnuts & Sesame

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Total Area Groundnuts & Sesame (ha)	386	405	426	447	469	493	517	543	570	599	629
Yield (Kg/ha)	900	918	936	955	974	994	1014	1034	1054	1076	1097
Production (MT)	347	372	398	427	457	490	524	562	601	644	690
% Available for Milling	40	42	43	45	47	48	50	52	55	57	60
Total available for Milling	139	156	171	192	215	235	262	292	331	367	414
Average available per day (300 days in a year)	0.46	0.52	0.57	0.64	0.72	0.78	0.87	0.97	1.10	1.22	1.38
Total Working Hr	8	8	8	8	8	8	8	8	8	8	8
Average milling per Hr (MT)	0.06	0.07	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.15	0.17

This model is using compound growth for area under cultivation at the rate of 5% and yield at the rate of 2%. These data are based on assumptions and data collected during the field visit.

7. *SWOT Analysis*

A summary of SWOT analysis is as follows:

Strength:

- Communities around Kangi are producing sorghum, groundnuts and sesame and are willing to use APC
- Substantial profit can be made if good services are provided
- Existing mill is in poor condition and communities are not satisfied with the available services
- Proposed machineries are advance and required low maintenance and repair

Weakness:

- Lack of local availability of technical skills for repair and maintenance of machinery
- Lack of cash with communities

Opportunities:

- Strategic location of Kangi APC will attract other economic activities in and around the APC
- Potential of increase in production and area under cultivation with the effort of INGOs and NNGOs
- Potential to add processing facility for groundnut and sesame oil
- Potential to takeover warehouse prepared by GIZ

Threats

- Poor connectivity and lack of cash may hinder people to avail service
- Insecurity may affect production and operation of APC

8. Governance and Management

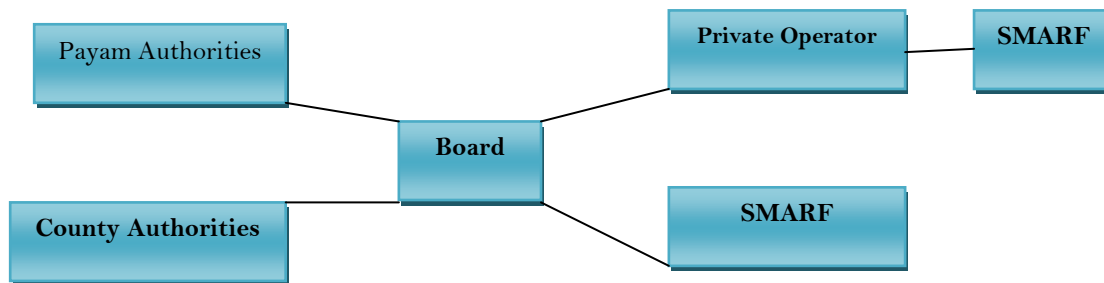
8.1. Governance:

8.1.1. Company Structure

The Kangi Agro-processing centre will operate under a Public-Private Partnership model with two main partners:

- The Kangi Payam Authorities
- The private operator

The two partners are represented in the Management Board of the APC.



8.1.2. Board:

The role of the management board is to take strategic decisions that ensure smooth operations of the facility, so as to provide quality services to local traders. The Board approves:

- Budgets, progress reports, and expenditure/audit reports;
- Major investments;
- Service fees;
- The principles and levels of revenue sharing amongst partners
- The appointment of a General Manager for the facility as proposed by the private operator.

The Board will meet at least twice a year, but as often as requested by at least 51% of its members. The board is chaired by the Kangi Payam Chief, which will also hold the secretariat. The secretariat is responsible for the preparation of agendas, minutes and memos for the board meetings. The Private Operator submits to the Secretariat monthly income and expenditure reports for distribution to the Board members.

Annual budgets and half yearly progress reports and expenditure reports are prepared by the private operator at least two weeks ahead of a scheduled Board meeting and are distributed by the Secretariat at least one week before the meeting.

8.2. Management:

8.2.1. Management Team

A Manager cum Operator shall carry out day-to-day management of the facility, under the overall responsibility of private operator. The Manager cum Operator appoints other staff as needed based on an annual staff plan approved by the Board.

The following staff categories will be appointed:

- Operator: responsible for all the milling activities.
- Cleaners: keep the APC and compound clean.

8.2.2. Staff rule

All staff will have a staff contract that complies with the labor laws of South Sudan.

8.3. Financial Management

8.3.1. Financial Manual

The Private Operator will maintain financial records and produce financial reports as per the South Sudan national standards for accounting. The Manager cum Operator shall draft a finance manual for approval by the Board that lays out in detail the financial procedures and reporting formats and frequencies to be followed.

8.3.2. Financial transactions and records

The account shall keep proper financial records of income and expenditure in appropriate accounting system. All financial transactions shall follow clearly laid-down procedures, with respect to fund requisition, procurement and fund accounting. Supporting documentation for each transaction shall be filed for audit.

8.3.3. Financial reporting

The manager cum operator will prepare monthly and annual financial reports. All reports will be printed and properly filed.

Annexure VII

Articles Published in South Sudan News Papers

Wednesday Dec. 21, 2016 — JUBA MONITOR

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Post-harvest management improves food security: UNIDO



Farmers during Post-Harvest Management and Storage of Food Grain Crops training in Wau (file photo)

By Jale Richard

The United Nations Industrial Development Organization (UNIDO) says good post-harvest management and storage can help to improve food security. Mr. Ram Kishore Prasad Singh, Chief Technical Advisor at UNIDO said the organization's programme to improving food security in in greater Bahr-el Ghazal has recorded success in reducing post-harvest losses that improves food security. "By preserving gain quality and quantity through adopting best post-harvest practices, farmers will not only have more food to eat but also more surplus to sell," Kishore said. "They will be able to store crops longer and decide when to sell in order to fetch higher price." He said due to poor handling and storage practices at the household level, within the first three months, most farmers loose up to 40% of their harvest to insects, pests, mould and moisture. "Simple and affordable steps like proper drying, improving storage and marketing infrastructure and adopting best post-harvest practices can drastically reduce food losses and increase availability of food at household and local level. This

also means improved food security and increase resilience to shocks for small scale farmers." Kishore explained. He said UNIDO recently trained 475 farmers from 19 villages in the greater Bah-el-Ghazal region on improved post-harvest management and storage of food grains. He said they have also trained tutors who will later train the local farmers with post-harvest practices to increase food security. "We are giving them seeds, tools and extension services to improve their production so that food security is increased," Kishore said. "It is not just about production because about 30 to 40 percent of food when not stored properly it will go as on waste." He added that UNIDO distributed 500 PICS bags and 200 metallic bins to the targeted farmers that will significantly reduce their post-harvest lost. The UNIDO chief technical advisor said a new project will soon be launched in the greater Equatoria that to help the people suffering from food insecurity to save up to 40% of food losses by practicing best post-harvest measures.

DAY

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Wednesday, December 21, 2016 - Vol. 2, Issue No. 314

UNIDO addressing Post Harvest Food Loss Problem in the Greater Bahr El Ghazal Region

Project is to improve food security and income of the rural small holders in the Greater Bahr el Ghazal (GBEG) region.

Under the ZEAT-BEAD Project, the overall objective of The United Nations Industrial Development Organization (UNIDO) action is to contribute to improved food security and income of the rural communities in the GBEG region by enhancing value addition, implementing value chain upgrading strategies and build capacity of actors involved in the value chain.

UNIDO has trained recently a total of 475 farmers from the 19 target villages in the GBEG region on improved on post harvest management and storage of food grains. In addition, UNIDO distributed 500 PICS bags and 200 metallic bins among the target farmers. Due to support from UNIDO under the ZEAT-BEAD Project in the GBEG region, target farmers will be able to significantly reduce their post harvest losses. By preserving gain quality and quantity through adopting best post harvest practices, farmers will not only have more food to eat but also more surplus to sell. In addition, they will be able to store crops longer and decide when to sell in order to fetch higher price.

Moreover, UNIDO in partnership with the UN World Food Programme (WFP) implemented a training of trainers (TOT) programme on Post Harvest Management and Storage of Food Grain Crops in Wau to train 32 agricultural officers and extension workers from the state ministry of agriculture and representatives from International NGOs working in the GBEG region like NRC, HARD, VSF-Germany and Concern Worldwide, etc. During the three days training participants learnt different aspects of post harvest handling and safe storage of food grain crops. Major topics covered during the training were harvesting process,

threshing practices, drying methods, cleaning and grading, principal causes of loss of quality and quantity, storage methods, marketing channels and benefits of collective marketing.

The United Nations Industrial Development Organization (UNIDO) project on "Enhanced Value Addition and Strengthening Value Chains in the Greater Bahr El Ghazal region, South Sudan" is funded by the European Union (EU) and it is part of the overall ZEAT-BEAD Project jointly implemented by UNIDO, UNOPS and GIZ. Main objectives of UNIDO action is developing and implementation of value chain upgrading strategies and capacity building of actors operating in the identified value chains in the GBEG region. UNIDO is focusing specifically on small household producers and private business owners to create a sustainable and simple marketing network by developing and implementation of upgrading value chain upgrading strategies. The commodities identified by UNIDO for upgrading value chains include sorghum, groundnut, rice, fish and leather (hide and skin). UNIDO is establishing four agro processing and training centers in the Greater Bahr El Ghazal region with modest facility for processing of sorghum, groundnut, rice and fish. In addition, UNIDO is building capacity of farmers and other stakeholders on post harvest management, storage and marketing of agricultural produce.

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UNIDO address Post Harvest Food Loss in Greater Bahr El Ghazal

By Benjamin Takpiny

The United Nations Industrial Development Organization (UNIDO) project funded by the European Union (EU) has addressed post-harvest loss problem in the Greater Bahr El Ghazal region.

As part of its effort to support small holder farmers and agricultural market in the country the European Union (EU) has launched a comprehensive rural development Programme with a total budget of Euro 80.0 million to improved food security and income for rural smallholders in the Greater Bahr el Ghazal region.

In the statement seen by dawn, the Main goal of the Zonal Effort for agricultural Transformation - Bahr El Ghazal Effort for Agricultural Development (ZEAT- BEAD) Project is to improve food security and income of the rural small holders in the Greater Bahr el Ghazal (GBEG) region.

The statement added the overall objectives of UNIDO action is to contribute to improved food security and income of the rural communities



in the GBEG region by enhancing value addition, implementing value chain upgrading strategies and build capacity of actors involved in the value chain.

According to the statement, UNIDO has trained recently a total of 475 farmers from the 19 target villages in the GBEG region on improved on post-harvest management and storage

of food grains.

In addition, UNIDO distributed 500 PICS bags and 200 metallic bins among the target farmers. Due to support from UNIDO under the ZEAT-BEAD Project in the GBEG region, target farmers will be able to significantly reduce their post-harvest losses. By preserving grain quality and quantity through adopting best post-

harvest practices, farmers will not only have more food to eat but also more surplus to sell. In addition, they will be able to store crops longer and decide when to sell in order to fetch higher price.

The UNIDO in partnership with WFP implemented a training of trainers (TOT) Programme on Post-Harvest Management and Storage of Food Grain Crops in Wau to train 32 agricultural officers and extension workers from the state ministry of agriculture and representatives from International NGOs working in the GBEG region like NRC, HARD, VSF-Germany and Concern Worldwide, etc. During the three days training participants learnt different aspects of post-harvest handling and safe storage of food grain crops. Major topics covered during the training were harvesting process, threshing practices, drying methods, cleaning and grading, principal causes of loss of quality and quantity, storage methods, marketing channels and benefits of collective marketing

weekend that they warmly welcome the national dialogue President Salva

well have achieved something more substantial," he said.

have expressed concerns over the escalation of violence, warning of geno-

country," he said.

UNIDO addressing Post Harvest Food Loss Problem in the Greater Bahr El Ghazal Region

PRESS RELEASE

Global food production has reached a record high in recent years. However, nearly one-third of the all food produced for human consumption is lost or wasted and post harvest food loss is one of the main cause for food insecurity for millions families across the world. Food losses happen at every stage of the supply chain as commodities get damaged, spoiled or lost while harvested, handled, processed, stored and transported. Post harvest food loss is one of the major contributing factors to food insecurity and under nutrition directly impacting the lives of millions of poor, small holder farming families in South Sudan. Due to inadequate handling and storage practices at the house hold level, within the first three months after harvest, farmers lose up to 40% of their harvest to insects, pests, mould and moisture. Whereas simple and affordable steps



like proper drying, improving storage and marketing infrastructure and adopting best post harvest practices can drastically reduce food losses and increase availability of food at household and local level. This also means improved food security and increase resilience to shocks for small holder farmers.

As part of its effort to support small holder farmers and agricultural market in South Sudan the European Union (EU) has launched a comprehensive rural development programme in South Sudan with a total budget of Euro 80.0 million to improved food security and income for rural smallholders in the Greater Bahr el Ghazal region. Main goal of the Zonal Effort for agricultural Transformation - Bahr El Ghazal Effort for Agricultural Development (ZEAT- BEAD)

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