

CARE International Foundation
Switzerland-Sudan



**The Value Chain of Groundnut, Tomatoes, Hides and Skins in
South and East Darfur and South Korofan States – Sudan**

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Dr. Ibrahim Ahmed Adam

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Executive Summary

As stated in the TOR there was a value chain study in the year 2016 covering East and South Darfur and South Kordofan States targeting three commodities namely groundnut, skins and hides and tomatoes.

Although in the last four years, the country has witnessed a tremendous change in different livelihoods aspects however the study constitute a base line bench mark and give glims to the current research. For the validation of the foresaid study, a careful understanding of the methodology, findings and recommendations are well undertaken to reveal the similarities and differences between the two studies. Nonetheless, it should not understand that the consultant has typically followed the same methodology used in the previous study.

Assessment criterion:

To accomplish the aforementioned objectives of the required assessment different but interrelated methods have been followed which included but not necessarily limited to the following:

- Review of the value chain analysis (2016) prevailed by Care and other relevant secondary data.
- Held discussions with the concerned Care staff in different target states during the tenure of field visit to develop a common understanding about (TOR)
- A trip was performed to the states of the target communities and all actors for familiarization and better understanding of the situation on the ground and foremost of which to carefully understand the value chain process of the intended commodities.
- Open discussions with stakeholders were held by using guide questions raised by the consultant to view the ideas of the target communities and to create conducive conditions for local participation.
- Meetings with Government Officials, Nongovernment Organizations (NGOs), wholesalers, farmers, brokers, retailers and manufacturers.
- Case studies: These involve face-to-face discussions with individual stakeholders where issues raised promptly by chance rather by design, in addition to narrative of some officials.
- Observations: This was done to get first hand impression of the existing situation, afterwards complemented by other methods to verify the information given.
- The foresaid methods have underpinned by camera for documentation.
- Following are the most observable factors limit the value chain process with respect to the three studied commodities in the three intended states:

- Unreliable seeds purchased from local traders and the segregation of the indigenous varieties deemed as principal reason for both low production and quality of groundnut and tomatoes.
- Habhazard used of insecticides, pesticides, weedicides and fertilizers application without scientific advice claimed to reduce the quality and spoiled the product. Death incidents have been reported due to fresh consumption of treated tomatoes.
- Unaffordable fuel cost is a limiting factor for water pumping to irrigate tomatoes; similarly high transportation cost induced growers to buy their product on the farm gate with relatively low price.
- Tomatoes market prices have twofold variable effects, during scarcity farmers obtained very lucrative revenue and otherwise incurred high losses. This situation calls for manufacturing the product as tomatoes paste by introducing small machines suitable for cottage industry. Likewise, tomatoes growers should be aware about the value added due to the improvement of post harvesting process by grading and good packing.
- Birli (Valley) in Blail Locality has straddled nearly five times in the past ten years to encompass large cultivable area. It is deemed as a serious problem which could renders sizable fertile area along the bank of the river out of use.
- Abu Karshola and Al Goz (Al Saysaban) Localities in south Kordofan are very famous for tomatoes production. During the season tenth of Lorries loaded by the product to different towns in North and West Kordofan States and even to the national capital (Khartoum) which has advocated the importance of paved feeder roads.
- Raw hides and skins have very low price and in most cases monopolized by a sole wholesale trader which regarded as a product with non-economic value.
- Ground slaughter areas, slabs and tennaries produce large quantities of hazardous waste which pollute the environment. Similarly the operating facilities in the whole study area are not in compliance with the environmental regulations. Water waste in Kass ternary is drained in the river which is used as a source of drinking water and the ternary is located in a residential area. Furthermore, the workers in all the traditional tanneris have no any protective dress (masks, cloves, clothes and shoes) and there is no periodic medical check.
- There are two big advanced ternaries in Nayala with a daily processing capacity amount to ten and three thousands of hides (sheep and goats) however, they are not operating because of logistical and operational constrains. Moreover, the private

sector in East Darfur (Al Daein) has initiated an idea of constructing advanced tannery and a big area of land allocated by the government. Nonetheless, the high capital requirement beyond the affordable capacity of the local investors calls for joint venture with other partners. Similarly, the South Kordofan State government has completed the study for building a big tannery in Al Goz Locality.

- Piles of hides stocked in stores due to the small window of foreign market associated with very low domestic market demand. Furthermore, the stocked hides exposed to insect damage and other micro-organisms rendered considerable amount of the product out of use. Likewise, raw hides with limited value added (drying) exported to Nigeria and other West African Countries for human consumption. Nevertheless, some people have an opinion that hides are processed by the importing countries and re-exported elsewhere. Moreover the pre tanned hides and skins which regarded as of low quantity used in manufacturing of shoes, bags and jackets for domestic use.
- As far as groundnut production and harvesting are concerned, small farmers are using traditional implements for agricultural practices and harvesting. However, recently animal driven ploughs have been introduced which assist in moderate increase of production. It is worth noting that some pioneers and big companies start to use tractors for sowing and harvesting coupled with the use of herbicides. However, harvesting is still a main challenge to groundnut growers, after manual pulling the whole plant fed to groundnut harvesters, which separate the pods from leaves and veins. Later pulling machines owned by a private company have introduced but still subjected to further adjustment and drivers training.
- Early after harvesting some farmers used to sell their raw crops because they are in need of money to satisfy their family obligations and probably to pay back the local money lenders. At that time the prices are very low and growers will not benefit from high prices obtained late in the season.
- Local rural shelling machines have been introduced, although they create value added, however, they are making big losses by mixing pods with kernels and bringing kernel with the peanut shells afterwards results in a dark low oil quality and poor storage properties and consequently low selling price.
- In the year 2017 a big producing and processing oil company (Dafoot) found in East Darfur (Al Deen). It has two complementary production lines, agriculture which is nearly fully mechanized and a groundnut manufacturing factory. After shelling, four main value added commodities are produced. Pure currnells (Nagawa) exported to China, Jordan and other Arabian Countries, oil, seed cake and roasted groundnut

processed afterwards to be used as children food supplements. A third line is under process for fodder making from cakes and groundnut by products.

- The data in the visited states are either unavailable, scarce, incomplete and sometime, contradictory. Hence, government data collecting institutions should be consolidated and supported to augment reliable data pertaining to production, harvesting, post. Harvesting, manufacturing and marketing for different products. Apparently reliable data is very essential for policy making and further improvement.

Recommendations:

The most anticipated relevant and affordable guided recommendations for care's intervention to map out how the value chain could change to benefit the target stakeholders are summarized as follows:

- The use of manure farming should be encouraged to avoid chemical fertilizers application. The animal dung is available and by doing so, there are two fold benefits, to produce organic food which is globally demanded and to clean the environment.
- An awareness campain should be launched about the serious use of chemical fertilizers, insecticides and pesticides without scientific advice. This method can be achieved by establishing rural workshops.
- Small revolving fund for disperate farmers to avoid local money lenders.
- Cottage industry should be encouraged like small shelling machines, small oil manufacturing units and the like. Similarly, the establishment of small plants for tomato paste.
- Small seed money for women traders selling salted groundnut and groundnut paste to promote their business.
- Community rural stores can build with scientific measures to avoid or minimize groundnut losses at the storage time.
- The domestic leather industry can be more complete by training the Articans working in this field (men and women). The National Technology Center can greatly help in this area.
- Herder awareness to avoid the mutilation of leather by thee use of marks and tattoo.
- The existing value added project specially for hides and skins could transcend the marketing and economic aspect to security and stability of households by supporting the efficient use of animal dung as fuel. Women could be relived from the efforts they exert and atrocities they endure in fetching fuel wood from distant insecure areas.

Chapter-1

(A) Introduction:

The project “Promoting Peace and socio-economic development for conflict-affected communities in Sudan” is operational integrated communities located in the conflict hotspot areas of the three states of South Darfur, East Darfur and south Kordofan, where the impact of resource based conflict and its recurrence is relatively high. The project aims to contribute to the sustainable peaceful coexistence, social stability, increased social cohesion, enhanced recovery and socio-economic integration among conflicting communities in the aforesaid states. The project will contribute to the sustainable development goals, more specifically gender equality, clean water and sanitation, responsible consumption and production, climate action and peace and justice strong institutions.

The project aims to achieve the following outcomes and outputs:

Outcome: Establishing local conflict prevention and resolution systems and strengthening the monitoring and early warning systems for conflict prevention and resolution and sustainable management of natural resources.

Outcome1:

Output: 1.1.Community Based Structures (such as Village Development Committees, Community Based Resolution Mechanisms and Natural Resources Management Committees) are established, strengthened and functional.

Output: 1.2.Community Based Natural Resource Management mechanisms are supported and functional to alleviate pressure and competition on natural resources, through community-based management approach.

Outcome2: Creating gender-responsive sustainable livelihoods opportunities with a focus on women and youth empowerment, economic resilience and skill strengthening.

Output: 2.1.Targeted women and men are engaged in inclusive and diversified income generating activities.

Output: 2.2.Targeted women and youth have received business and skills building training, and attained confidence and knowledge to claim their right.

(B) Purpose of the assignment:

In 2016, CARE has carried out a value chain study in East and South Darfur and South Kordofan states focused on three commodities namely Groundnuts, Skin and Hides and Tomatoes to reveal how these three-value chains work, their trends,

strengths, constraints, relationships and map-out how the value chains could change to benefit the target groups.

Furthermore, the main business solutions have been recommend. Therein, the consultant is required to update the study thoroughly with the view of introducing new information and new perspective.

However, more specifically, the consultant will:

- a) Undertake a review of the current study on the three value chains,
- b) Research other secondary data on the three commodities over the last few years to study trends, changes and relationships.
- c) Hold discussions with relevant producers, merchants, exporters and other relevant stakeholders engaged in the production and marketing of the three commodities.
- d) Collect other relevant information related to these three commodities as needed.
- e) Prepare an updated study with information on at least two of these three value chains.

(C)Theory of value chain:

A value chain is a business model that describes the full range of activities needed to create a product or services and comprises the steps that involve bringing a product from conception to distribution and everything in between such as procuring raw materials, manufacturing functions and marketing activities.

Similarly, a value chain analysis is the process of looking at the activities that go into changing the inputs for a product or a service into an output that valued by the customer. Value chain analysis are conducted by looking at every production step required to create a product and identifying ways to increase the efficiency of the chain.

Chapter -2

1. Prelude:

As stated in the TOR there was a value chain study in the year 2016 covering East and South Darfur and South Kordofan States targeting three commodities namely groundnut, skins and hides and tomatoes.

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3. Following are principal

Organizations, Officials, all actors and other relevant areas of interest (for more details see annex-)

- Research stations
- Government Officials
- International Non Governmental Organizations (INGOs)
- Non Governmental Organizations (NGOs)
- Traders (wholesalers, Retailers and mediators)
- Manufacturers
- Factories
- Community Based Organizations (CBOs)
- Tanneries
- Slaughter areas
- Markets
- Stores

4. Constrains:

- The field trip experienced some constrains, however it was not seriously preclude the consultant arrival to the target states.
- The prevailing insecurity situation in Kadogki for few days ago, hampered the arrival of the consultant to the town in the scheduled time & similarly, delayed the work permission issued by HAC. Consequently may preclude the submission of the assignment in the agreed time.
- High travelling cost due to the acute fuel shortage and long travelling time in wrack roads.

Chapter-3

3.1 Background about the selected products:

This chapter focuses on a brief background about the study commodities (prescribed by the TOR) to reveal their value chain interactions.

3.1.1 Groundnut:

Groundnut (*Arachis hypogaea*) is a member of a family leguminous and believed to have originated in Brazil. It is one of the most widespread and important food legumes in the world. It is also important cash crop in Sudan (FAO, 1977). There are many groundnut varieties worldwide, which estimated to 80 types. Generally, the crop distributed in the tropical and warm temperature zones. Presently it is cultivated in 108 countries of the world. The most producers are Asia followed by Africa and North Central America with total area 63%, 18.6% and 7.5% to Asia, Africa and Central America respectively (said Sitar, 2010). Furthermore, the world cultivated area of groundnut is about 22 million hectare produced about 28 million ton with average production (between 1.3-3 ton/hectare). The major groundnut producing countries were India, China, Nigeria followed by Sudan and Senegal (Said Sitarm2010)

3.1.2 Description of the plant:

Groundnut is a leguminous herb. It fixes nitrogen from the air, hence renders soils more fertile. However, under certain conditions the crop might be subject to the growth of the fungus Aflatoxin, which is carcinogenic (Youns, 2015). Nonetheless, there is very low awareness of the risks of aflatoxin. Poor harvesting and storage practices contribute to high Aflatoxin level (Irega Elamin, 2016).

3.1.3 Production of groundnut in Sudan:

Most of the area devoted to groundnut in the country is in the rain fed areas, but the very high yield in irrigated schemes mean that they may produce as much as two thirds of the nation's crop in drought seasons (Mirghani et al,2002). It is worth noting that in the irrigated sector, the crop grown in the Gezira, Rahad, New Halfa and White Nile Schemes.

Groundnut introduced is Gezira Scheme as nitrogen fixing legume. Generally the irrigated area accounted to about 19% of the total area grown and produced about 67% of the total groundnut production in Sudan (Said Sitar, 2010).As far as groundnut trade is concern, Sudan accounted for 17% of the world groundnut trade (Irega and Elamin, 2016). Nevertheless, there are other several sources of oil in the country: sesame, sunflower and cottonseed (table below shows the % of extraction of edible oil from seeds).

Table (3.1)Percentage of extraction of edible oil from seeds.

Seeds	%
Black cotton seeds	17
White cotton seeds	13
Sunflower seeds	33
Sesames	33
Groundnut	40

Source: Centre of Research and Industrial Advisory (2021).

3.1.4 The importance of groundnut:

It is of a great benefit to human, animal and soil, its kernels consists of the following:

- High oil content amount to 40-60% and over 50% of the groundnut harvested in the world crushed into oil for human consumption or industrial uses.
- Obtained very important vitamins, minerals and amino acids.
- Manufactured as butter, which is rich in protein, every 30 grams produce 188 calories, 4-8 grams protein, and 7.2 gram of carbohydrates and 2.5 grams of fiber. It is also a rich source of magnesium contains alpha-linoleum which is a fatty acid used for medical purposes to stop and or to minimize the prostate growth.
- It provides high quality cooking oil. The hull, which represents about 25% of the total mass production, used for animal feed and as well, the green leaves and veins, which are very palatable for animals.
- Groundnut used for manufacturing sweets, butter and other relevant products(Younis, 2015). It also hydrogenated to make vegetable ghee. Furthermore roasting groundnut with 1-4 percent salt is a common practice throughout the world which utilized in various forms as roasted, boiled, raw groundnut or paste (Treg and Elamin, 2016)

3.1.5 Some features that characterized groundnut production and marketing as viewed by (Mirgahani etal, 2002):

- Sowing date has a considerable effect on yield.
- The crop cost of production is increasing annually and productivity is fluctuating widely from season to another.
- Crop prices subjected to severe seasonal and annual variations.
- Strong grip of local merchants and moneylenders at usurious interest rates. This situation has exacerbated by a large number of the advanced sales at heavily discounted prices.

- The higher labor requirements and the increase in the labor wage rate lead farmers to adopt sharecropping system with local labors. This system has enormously reduced farmer's returns and has impeded the efforts of group marketing.
- Little effective competition among wholesalers.
- No published prices or other market intelligence information.
- Storage facilities are extremely limited with poor means of scientific measures.
- Crop quality varied considerably to the standards of cleaning, sorting and weighing.
- Empty sacs are sometimes unobtainable.
- High liquidity needs during harvest.

3.1.6 The potential of oil industry:

Edible oil industry depends on the variability of oil seeds, which affects, the sustainability of running factories, therefore almost most of the factories run intermittently according to the availability of the raw materials and their price. Table (3.2) shows the number of factories, their production capacity and distribution by slates while table (3.3) shows the refining capacity.

Table (3.2) the number of factories by states

States	Number of factories	The design capacity in thousand ton/year
Khartoum	46	1225
Gezira	43	319
White Nile	36	500
North Kordofan	54	164
South Darfur	24	38
Sinnar	12	58
Gadaref	4	18
Total	289	2329
Running	223	-

Source: Union of Industrial Chamber.

Table (3.3) Edible oil refining factories:

Factories	Design capacity in tons/day	Production capacity in tons/day
White Horse	100	80
Safola	300	200
Arabian Company	75	50
Al Ansari	50	40
Best	50	40
Al Ber Ragib	50	40
Marhab	80	50
Soud Al Bierair	100	80
Total capacity/day	856	570

Source: Union of Industrial Chambers.

3.1.7 Remarks:

- In an initiative of the Food Security Organization studies during the period 2004-2011 in the Arab world revealed the fact that olive seeds are the dominant seeds followed by groundnuts.
- The average annual production of seeds shows that Sudan is having relative advantage in Arab world in three oil seeds (groundnuts, sesame and sunflower).
- If Sudan doubled the productive agricultural area, particularly of sunflower and utilize the full capacity of extraction and reducing the loss of oils through the use of solvent method, Sudan could produce up to 1.5 million ton/year

3.1.8 Recommendations for the development and sustainability of the production of edible oil factories:

- Increasing areas under production of sunflower and groundnut.
- Production of sunflower seeds locally.
- Introduction of modern technological methods in the production of groundnut.
- Encouragement of the private sector for the production of sesame oil using modern technology for both export and local consumption.
- Encourage investment in storage particularly oil seeds at the production areas to stabilize the prices and to keep the quality of seeds.
- Coordination with the Ministry of Agriculture and other relevant authorities to plan clearly for the export of edible oils.

Table (3.4) Export of edible oils and seeds during the period (Jan.2012-Dec.2016)

Year	2012		2013		2014		2015		2016	
Commodity	Ton/ year	One thousand dollars	Ton/ year	One thousand dollars	Ton/ year	One thousand dollars	Ton/ year	One thousand dollars	Ton/ year	One thousand dollars
Sesame	21046.13	272000	251708	468610	299.707	46633810	303762.73	453477.97	25926.40	23200
Sesame oil	94.39	271.22	176.6	255.56	224.4	30.62	3135.46	569.42	322.8	49.39
Groundnut	4603	5677.76	321.23	459.23	8156.5	6122.58	424.14	2836.67	1881.732	1726.
Groundnut oil	170	69.300	724	2289	431.13	526.26		717.59		

Source: Sudan Customs Authority

3.2 Tomato:

3.2.1 Introduction:

Tomato *lycoperion esculentum* is a well known crop and a leading vegetable worldwide. The area under production estimated at 4.4 million hectares with a total harvest relatively amount to 120,384 million metric tons. Tomato ranks next to potato and sweet potato in production, but ranks first as canning crop (Ireg and Alamin 2016). Similarly at the national level tomato is the second vegetable crop after onions in terms of cultivated areas as it accounted to 18% of the total area of vegetables in 1999 (Hassain 2021). It is also widely consumed fresh and cooked among the Sudanese. There are many areas to benefit from dried tomatoes as slices or powder, in manufacturing pastries, pastries and juices and in fresh processed and dried export. Tomatoes are grown all over Sudan especially in the states of Gezira, the River Nile and west Darfur. The crop also produced around the cities and towns on seasonal flooded plains and in almost all the states with various degrees in area and production Khartoum State is one of the most important areas, which has experienced massive development in the production and marketing of tomatoes.

However, the crop handling is still dominated by traditional ways except for small segments in the state where modern farms, supermarkets and groceries exist. It is worth noting that vegetable crops will introduced in the Gezira scheme in the early 19305, at first they were confined to notable tenants, but gradually other tenants also became familiar with them.

Since then the area has expanded rapidly to cover 10% of the cotton area, which amounts to 50 thousand acres (Mirghani etal, 2002). Nonetheless, hard soils high summer temperature, shortage of irrigation water, limited tenants' technical knowhow, high cost of input prices among other factors reported as main vegetables constrains (Mirghani etal, 2002).

3.2.2 Varieties:

Many varieties have proven their compatibility with the conditions of Sudan, namely person, Early Pack, Money Maker, Asterin B among others. Some varieties are mostly not present in the Sudanese market due to the fact that their large fruit size and their properties suitable for the fresh market make them perishable under the prevailing harsh packing conditions and harsh transport. While others are desire able varieties to farmers because they distinguished by their heat tolerance and are, suitable for cultivation during the summer and autumn loop in addition to winter crop. Almost all of the aforesaid

varieties are of foreign origin; however, new national varieties were also bred including Sennar-1 and Sennar-2 are resistant to viral leaf curl disease.

Abdella and Somerset 98 which resistant to high temperature. Although tomato growers are using widely diversified varieties according to their own preference and personal experience, at the same time the national vegetable research scientists are working hard to produce domestic varieties suitable for the local environment. Likewise to research on the agricultural practices to improve both the quality and quantity of the product. Within the aforesaid context, the manager of the Horticultural Crops Research Station interviewed by the consultant has given the following notes:

- The Centre found in Madani and later relocated in North Khartoum (Shambat) since 2015. All national horticultural research scientists affiliated to the centre.
- The principal objectives are :
 - Variety improvement for all horticultural crops (vegetable, fruits, ornamental and medicine plants) by breeding and scientific agricultural practices which should approved by the national committee).
- Adopting the approved technology through extension method.
- She added that there are few researchers, most of them retired without proper replacement.

Horticultural Crops Research Centre



Manager



Centere

3.2.3 Environment:

Tomatoes need medium temperature during the day and low temperature at night to grow, bloom and bear fruit.

Hence the crop yield is completely related to the temperature and it is usually difficult to produce outside the winter which is the main season in the country. Nonetheless, some farmers used to produce tomatoes in the summer by following some gentle measures to the atmosphere around the plant and thus obtained high encouraging price. Likewise, green houses have been introduced for producing off season crop with very lucrative returns. Tomatoes can be grown in all types of soils except sandy, poor in nutrients. The crop production also succeeds in clay lands with good drainage specially if organic fertilizers have been used, then crop will be plentiful. Furthermore, irrigation is an important factor in tempering the atmosphere and prolonging the production season and making it successful especially in summer season. (Hussain, 2021).

3.2.4 Ripening stage:

Tomatoes have four stages of ripening. Fruits can be harvested in any of them depending on the dimension of the market or the time of consumption:

- a) The green fully grown phase: in which the fruit have reached the final size with a green whitish color at the floral end for the distant markets.
- b) The color shift phase: in this phase, the color shift begins at the floral end and the rest of the fruit remains green.
- c) The reddish-pink phase: at this stage the fruit turns red-pink in most parts of the fruit
- d) The fruit can be picked at this stage for transportation to market near the production sites .

The complete red phase :the fruit has reached the red color stage and it represent the last stage of the fruit ripeness during which the fruits are harvested to markets close to the sites of production or immediate consumption .

3.2.5 post harvest transactions:

Tomatoes are crops of medium respiration rate and the prolonged storage period depend on careful harvesting , the fruits are not scratched, injured or exposed to sunlight for along time . Also leaving parts of the sepals and pedicels on the fruit increases the life span and saves the fruits from the entry of pests and diseases . under modern storage conditions tomatoes can be stored for a period of one week to ten days under a temperature of 10 c and a relative humidity of 85-90% (Hussain, 2021).

3.2.6 Productivity:

The productivity of farmers fields ranges between 8-10 tons per acre and the productivity of research fields ranges between 12-18 tons / acre on the Giezira and 25-30 tons / acre in the Nile River .

This yield data reveals a big gab between the fields production and yield obtained by the research which implies to bridge this gab by reliable seeds, scientific agricultural practices and to minimize lossess during harvest.

3.2.7 Processing:

Tomatos in sudan is principally used as fresh for clomestic consumption. Nevethless, the government has exerted strenuous efforts to establish processing plants country wide since the late 1970s , however , the industry encounterd some challenges .

In late nineties there were five processing factories for both fruit and vegetables , only two of them were operating but far below the design capicity due to shortage of raw materials and improper management system (Ireg and Elamin2016).

3.2.8 Importance of tomato:

The crop is the most important vegetable in sudan . it is a rich source of minerals, vitamines(A,Band c) and organic acids . it is commonly used as raw ,cooked or processes product more than any vegetable (abdulrazig 2018)

3.2.9 Marketing:

Tomatoes handling is still dominated by traditional ways of marketing system and lacks.The conventional trade linkage system(Abdulrazig etal 2018). Likewise the central wholesaler market for tomatos exists only in big cities . The dominance of middle persons in the system leads to improper functioning of the marketing system and has amplified the gab between farm gate and retail prices (Ireg and Elamins 2016).

It is worth notung .that atomato value chain study carried by abdulrazig etal (2018) has revealed the following results : the degree of value addition was 53% at primary processor in the stage of farmer , 21.7 added in stage of middle persons , wholesalers added 10-2% and retailer added 15.1% . the high percentage of total profit was obtained by retailer (52.1%) while the farmer got the lowest (8.8%), however , both middleperson and wholesaler almost got equal percentages of the total profits (19.2%) and (19.9%) respectively .

Furthermore, the authors have urged the decision markets to take up initiative for strengthening the tomato value chain by establishing processing units in the production areas and as well to facilitate credit services to boost the production and reducing dependence on middle persons.

3.3 Hids and skins:

3.3.1 Overview:

The role that livestock plays in the economy and livelihood in Sudan as general and the study area in particular is immense . The current study aims to identify how a livestock and marketing of livestock by - product can be supported in order to better sustain the livelihood of different groups of stakeholders (Elmadni etc 2010).Although the study focuses in animal hide and skins,nonetheless,generally the term means an external integuments drived from birds (like ostrich) , fish, amphibiaus, reptiles and marnals .

Furthermore skins stands for small animals while hides from large animals (Ireg and Alamin 2016). Sudan ranks top in terms of livestock population compared to Tanzania , and Ethiopia the two second most important countries raising and exporting livestock in Africa.

According to the current estimated figures , Sudan has about 41.6 million cattle,43.3 million goats , 51.65 million sheep and 4.6 million camels. The enormous livestock population size produces an important renewable resources namely the hides and skins which have considerable potential to generate both domestic and export earnings.

Though only about 58-60% of hides and skins from slaughter animals end up at commercial collection point. Not with standing, the country has an enormous potential to be a major supplier of raw hides and skins, semi-processed leather , finished leather and leather products. The potential is based on the large number of livestock resources, abundant labor pool and liberalization market out look (Elmadani 2010).

Contrarily, the sector is cambered with many constrains to production and marketing which include lack of access to modern technology; improved breeds; lack of credit access; lack of transport means and poor road and railway system

Similarly, the major contrains in the skin and hide industry are, low prices per unit, lack of orgnised collection system from the producers; high tanning cost, high skins defects, lack of finance, high taxes and failure to produce high quality leather and moreover, the producer viewed the product of no value. Training and mind set changing would need to be done to livestock owners to make them aware of the value in the skins and hides. Concurrently the product should be properly processed and complemented with tranining on leather msnufacuring will bring the industry up from where it is now. It is worthnoting that the National Leather Technology Centre is a leading training institute in the techno;ogy of leather can play a major role in this area.

National Leather Technology Centre

The National Leather Technology Center founded In 1964 through a generous support from the United Nations Food and Agriculture Organization (FAO) and the United Nations Industrial Organization (UNIDO). It was affiliated to the Ministry of Animal Resources and it was named as Tanning Institute (T.I) .In 1993 the (T.I) was merged into the Research and Industrial Advisory Centre to serve as the technical entity for the Ministry of Industry.

The Activities:

1. Research in the technology of leather and hide, particularly in tanning and manufacturing.
2. To advice on the local, regional and international level on leather and hide
3. To compile technical and economical feasibility studies for the establishment of tanning enterprises, workshops and leather products.
4. Evaluation of leather and hide enterprises assets.
5. Conduct physical tests for leather and leather products.
6. Training in the field of leather and hide, particularly in tanning, manufacturing leather and leather products, such as: bags and its accessories, leather clothes (Jackets) and training in quality control of leather and hide products.
7. The N, L.T.C. is the reference centre for the COMESA Organization in the field of leather and hide. The Centre maintains International and regional relations, particularly With India, Tunisia, Egypt, Ethiopia, etc.
8. Cooperation with higher education for the training of higher studies students,
9. The Centre is having a library and is planning for an electronic library.

The trainees:

- Civil Society organizations special needs individuals, (the Blinds, the Deaf and movement disability).
- Organizations and individuals- Women societies, private and public sector.
- The training period is ranging between 15 days and one month.
- The basic of development: Currently, the government is the only supporter, which is not adequate to meet the ever-increasing demand for finance.

National Leather Technology Centre



3.3.2 Prospects and limitations of leather industry:

"The future of Sudan leather value chain is bright, however, the brightness can only be realized through collaboration among the government, private sector and Academia, Specialized Institutions" (Sudan leather value chain strategy 2016-2024).

With respect to aforementioned statement, through a participatory stakeholder's consultation, it was agreed that the following issues were undermining the performance of the leather value chain in Sudan:

- Limited or no collaboration among the stakeholders.
- Absence of viable long term and short term finance.
- Production of poor quality hides.
- Lack of human capacity.
- Limited enforcement of policies/ regulations and bureaucracy in export documentation.
- International sanctions.
- Export of rawhides and wet blue and production of poor quality finished leather.
- Absence of industrial parks.

To address the root cause of the identified issues the strategic objectives are summarized as follows:

- Strengthen horizontal and vertical collaboration among value chain players and stakeholders.
- Improve the production of quality hides and skins.
- Capacitate cottage industry for higher and value addition and competitiveness in domestic, regional and international markets.

- Promote quality and cleaner and environmentally sustainable production techniques and systems.
- Promote the production of value added products.
- Promote quality and cleaner and enviromently sustainable production techiques and systems.
- Improve policies and enhance efficiency and effectiveness in their implementation.
- Facilitate the establishment of leather industrial parks with common effluent treatment plans.

3.3.3 Global overview of the hides and skins industry:

The intesive report publishec by the Food and Agriculture Organization (FAO)-2013 entitled " world statistical compendium for raw hides and skins and leather footwear 1993-2012)" reveals the following factors: The hides and skins industry was severly hampend by the global financial crisis in the late 2005. Therein, global exports of hides and skins dropped by 5% in (2005-2009), while price fell by 30%. Nonetheless, there has been a steady recovery in prices in mid 2009. Table (3.5) bleow shows the world remarkable increase in leather value chain transactions.

Table (3.5) Global dynamic in trade of the leather value chain:

Product category	Average USD (billion)		Growth rate%
	1993-1995	2009-2011	
Rawhides and skins	4.7	5.4	14.9
Semitanned and finished leather	11.7	17.5	49.6
Footwear with leather upper	22.7	44.9	97.8

Source: Sudan leather value chain stretagy (2015-2024)

3.3.4 National overview:

Sudan globally ranked 9th in the production of bovine, 3rd in the production of sheep skin and 6th in the production of goatish while in Africa the country ranked first in bovine and sheep skin production and second in goatish production (PACT consultancy 2013). Allied to the enormous animal wealth resources, the leather industry has started long time ago and the first tannery was found in 1945. Since then many facilities have been established (18 tanneries, large and small in addition to many other under construction and in rural Sudan there are 30 tannerieis complexes and small factories in additon to 25 large, 250 medium and 350 small workshops for shoe making and an enromous number of artisans deating with the footwear and leather products. (PACT

consultancy 2013). Nonetheless, the structure and performance of non-food industry in Sudan is variable, but generally its role has been very weak. Many establishments have shut down because of high operating cost and lack of competitiveness in regional and world markets (African Development Bank Group, 2016).

In the world arena hides and skins became an important foreign exchange earner which is estimated at over USD 35 million/year, but the product is mostly exported in raw form coupled with unsustainable earnings in the last few years.

On the other hand the average quantity of total exported hides and skins dropped from about 5.78 million pieces in 2003 to 4.35 million pieces by 2007. The cattle hides share was 40% on average of the total exported hides and skins during 2003-2007. Pertinent to the foregoing discussion the main importing countries for hides and skins from Sudan are Pakistan, Lebanon, Turkey, China, Egypt, India, Italy, Saudi Arabia, Hong Kong, Syria, Mexico, France, Germany, Spain and Nigeris (Ireg and Alamin, 2016)

Chapter-4

Discussion and recommendation

This chapter deals with the existing situation of the value chain process for the three intended commodities (groundnut, tomatoes,, skins and hides) by states through the path of production, harvesting, manufacturing and selling.

4. South Darfur:

4.1 Groundnut:

The leading groundnut areas in Darfur are South and East Darfur states where groundnuts rank the second most important crop after millet. There is also significant groundnut production in West and North Darfur. The nitrogen fixing properties of groundnut as leguminous plant, it is a good rotation crop with millet, it is also generally more pest resistant. The crop is more labor intensive than either millet or sorghum especially in land preparation and harvesting (Smith, 2013). However, with the early nineties there was a breakthrough in animal traction when a new donkies plough was developed by the Western Savannah Development Corporation (WSDC). This intermediate technology widely adopted in South Darfur at that time and brought a significant area for groundnut under cultivation by individual households. Allied to this, the plentiful supply of agricultural labor from Internally Displace Persons (IDPs) from South Sudan also benefited groundnut farmer during the 1990s (Smith etal ,2013). With the outbreak of widespread conflict in Darfur commenced in 2003, both the groundnut harvested areas and production plummeted. Large farmers had been displaced. According to the data displayed in the table (4.1) during period (2012-2017) there was a sharp decline in the area sown by the groundnut and production while the period (2010-2011) witnessed a remarkable increase in the area and production. Likely, due to the small opened widow of security at the time.

Table (4.1) Area under production of groundnut

Greater South Darfur (South & East 2010-2019).

Year	Area	Production sag (45kg)	Production ton
2010	2173538	13227311	595229
2011	2326857	9922000	446490
2012	1817381	8396428	377839
2013	1121738	3809249	171416
2014	1194760	6475019	291376
2015	1510091	5386214	242380
2016	1503045	5626515	253193
2017	1495979	609650	271188
2018	1924784	9983330	449250
2019	1905579	9235890	415615

Source: The Greater South Darfur (South & East) 2021.

4.1.2 Limitations:

Problems encountered the production of groundnut in South Darfur as believed by the Agricultural Planning Administration Manager:

- Very small holdings associated with low fertility.
- Some vital agricultural inputs are either not available or available with difficulty such as tractors, fertilizers, insecticides, pesticides and improve seeds which have an utmost importance.
- Agricultural credit is not accessible to small farmers because either holdings are not registered or have no collaterals and personal identities.
- Security problems initiated due to the contradictory interest between farmers and pastoralists.
- Most farmers used to sell their crops early in the season with very low prices.

On the other hand with limited facilities some state Agricultural Departments have exerted strenuous efforts to solve the said problems (box below)

**The General Directorate of Technology and Guidance,
Ministry of Agriculture-South Darfur State**

Narrated the experience of Agricultural Integrated Comprehensive Solutions which is affiliated to National Ministry of Agriculture (undersecretary)

The main problems facing the production of groundnuts:

Low productivity due to the following reasons:

- Non existence of agricultural rotation, therefore some experimental farms were selected for the application of Nitrogen, Phosphor and Potassium (NPK), this experiment was very successful, the production increased by 20%.
- In the traditional agriculture, tools, such as, the indigenous harrow and hoe do not cover the required numbers of plants according to the recommendations of agricultural research station, it is either too much or too little and mostly too little, it is worth mentioning we are having a program, named as the comprehensive solutions, in that program a machine was introduced so as to control the number of sown seeds (seed rate) in addition to the use of all technological packages, which augment production and productivity, which is as follows:
 - Tillage using Reek (very fine tillage) for soft soils.
 - Sowing seeds as mentioned above.
 - Using herbicides following sowing of seeds and before germination, it was found to save in the eradication of herbs by a large percentage, which might reach 90%, therefore it helps in the work force problem. (scarcity of workers), time saving in the application of agricultural operations and in the reduction of costs.

Also we have experimental farms in more than 15 Localities with the assistance of the national program for integrated solutions in the rain fed agricultural sector, funded by the Federal Ministry of Agriculture.

Practical Experiment:

A group of graduates at Muhagria area in the State with the help of the Agricultural Extension, all field operations were done based on the information provided by the Integrated Solution Program, the increase in production was about 60%.

It is worth mentioning, that there is another experiment at Markundi area carried by the farmer Gadier All Zakin, whereas he applied enhanced seeds, sowing with the new sowing machine together with all other agricultural processes-the productivity increased by to 8 sacks, compared to the previous production of 2-3 sacks/Feddan.

The third experiment:

The third experiment was carried by the farmer Fadl Allah Musa, from Marla area, he used the newly introduced technological methods- in the first year he rented 50 Feddans ,he obtained 600 Sacks- he made use of that production and bought 1000 Feddans in the third year, he also bought a Tractor, a Harrow and 3 Harvesters (one for Ground Nuts and two for sorghum). He motivates other farmers to use the technologies.

The Agricultural Extension administration adopted the organization of workshops for awareness raising among farmers. There is a Weekly Radio broadcast in line with the agriculture calendar according with the various seasons of the year. There are other Organizations which support this program such as Care International.

One of the most significant problems is the lack of good improved seeds for groundnuts, the ICRI organization is helping in that course.

Four schools were chosen in four Localities; however the lack of resources impeded the spread of this idea.

It is worth mentioning, that there exists a facilitator who is having a weekly supervision program with the farmers.

Furthermore, the Ministry of Agriculture provided improved seeds and tractors and engaged in a pilot groundnut project with the United Nations Development Programme (UNDP) and with Dal Group to produce Aflatoxin free groundnuts (Smith et al, 2016). Pursuance to the foresaid efforts, the Research Station in Nayala has developed women farming school (Draib Al Reeh) with the main objective to boost the production through improved seeds and ultimately to promote the communities' livelihood. They have to take the lead for seed propagation with the close advise and supervision by the research scientists. The output is purchased by the research authority at encouraging prices, stocked part of it to the school society and the rest distributed to other communities, the experience hoped to be repeated elsewhere.



Table (4.2) shows the significant role of women in agriculture at the prevailing insecurity times when men are either flee to safer areas or engaged in other more secured jobs. Thereof, the complementary role of rural women in agriculture should be highly appreciated and supported.

Table (4.2) Gender division of labor in groundnut production before the conflict and during the conflict in South Darfur.

Agricultural activity	Pre-conflict: before 2003		During conflict 2003-2013	
	% of women's involvement	% of men's involvement	% of women's involvement	% of men's involvement
Ploughing	20	80	40	60
Planting	90	10	95	5
Weeding	70	30	80	20
Harvesting	80	20	90	10

Source: Smith et al (2013).

4.1.3 Harvesting:

It is cumbersome and costly operation comprise lifting, collecting, stocking and threathing to clean the pods from stems and leaves. The traditional threathing is done by using sticks, rakes and son on. However, some groundnut threathers have been introduced by the private sector, but only accessible to a very few number of farmers. After harvesting the crop is packed in plastic sacks. Harvesting is an important stage which determines further the quality of the product. In this stage, a serious fungal disease (Aflatoxin) which is sensitive to high humidity is likely to develop due to improper stocking and drying. The high level of Aflatoxin renders the product out of use specially in the arena of the international market.

Similarly, drying is also affecting peanut flavor which is one of the determinant factor in Omdurman's market. Equally it may alters the odor of the processed groundnut oil.

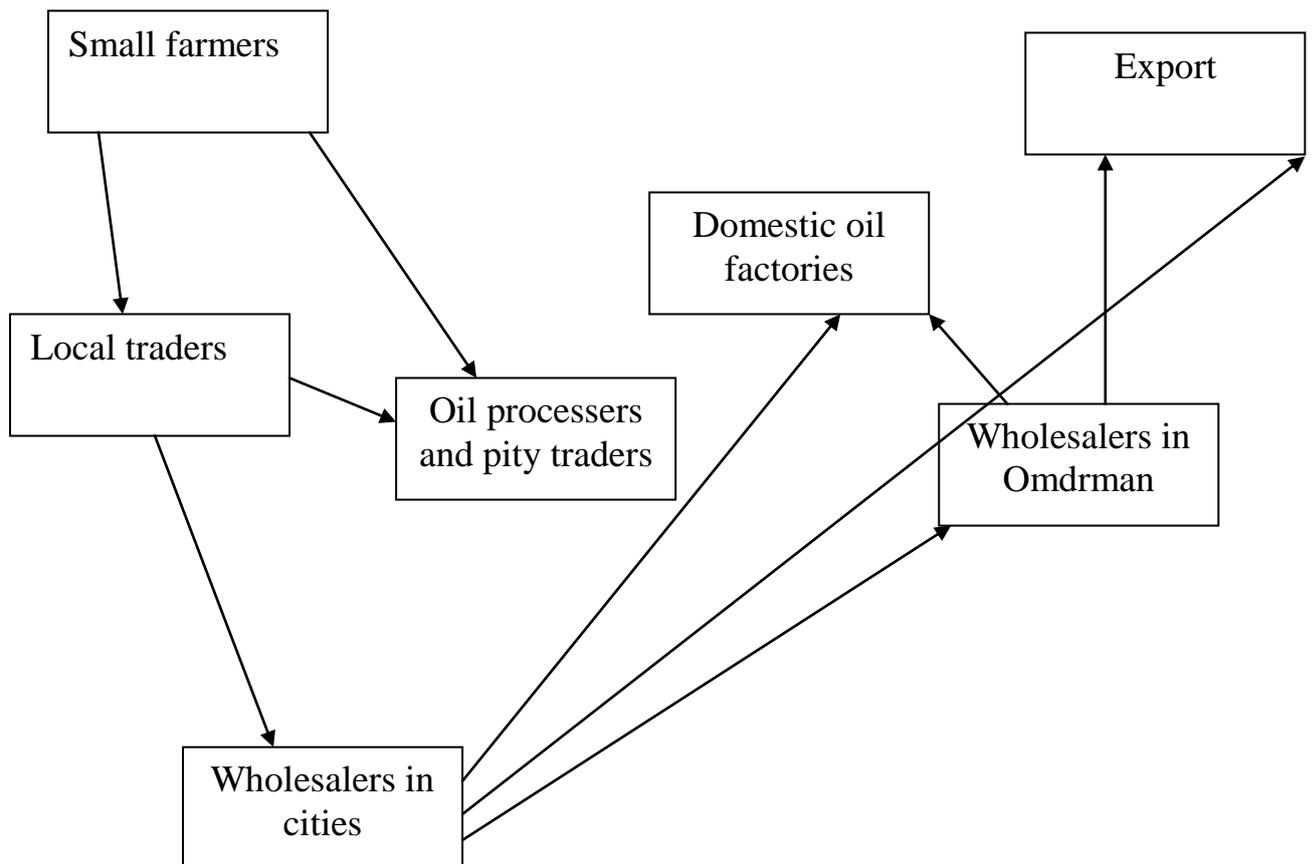
4.1.4 Groundnut marketing:

Marketing denoted series of activities involve in the creation of time, place, form and possession utility. In the study area some farmers sell part from their groundnut while they were harvesting to meet their family need and harvesting cost or sell immediately after harvesting for the same reason. However, there is no market information, hence market prices within the same village differ depend on quanties supplied and the seller's purchasing power (Said Sitar, 2010).

There are number of rural markets scattered everywhere in the study areas. Similarly, there are many mediators in these markets buying the farmer's produce with relatively lower prices and sell it to wholesalers in towns (Nayala, Al Deeain, Kadogli and other big cities). Nonetheless, there are considerable quantity of groundnut sold locally to meet the local demand of oil processors, women involve in the pity trading of peanut butter and roasted (Ireg and El Amin, 2016).

It is likely some farmers, retailers and wholesalers stocking the product and sell it late in the season with hopes of remunerative returns. It is worth noting that, in a consultation with some groundnut traders in Nayala during the interim of field visit, they believed that one of the major constrains in groundnut trade is the absence of stock markets through which transparent market is operating by selecting a good quantity of the production and pay a market fair complete price.

Figure 4.1 Schematic diagram of groundnut marketing channel



4.1.5 Value added:

The value of the three intended study commodities is the central theme of this study. In the case of groundnut, there are different scenarios of the value added. In rural areas early after harvesting some farmers used to sell their raw crops because they are in need of cash to satisfy their family needs and or probably to pay back their debts. In this case there is no value added or it is a zero level. Other farmers may stocked the crop for sometime and sell it by adding a time utility. However, due to the availability of small rural shelling machines, the common practice is shelling the crop before selling it, also it is a one level value added. Others after shelling crush the groundnut seeds to produce oil and seed cake with the output of three products. However, if the raw crop transported to the big city centers, place utility is added through transportation in addition to shelling by big machines, crushing in big oil factories and end up with seed cakes which is again manufactured as animal and poultry feed and furthermore, series of value chain are added.



Woman counting her money

4.2 East Darfur:

4.2.1 Groundnut:

4.2.2 Production and harvesting:

As far as production and harvesting are concerned in East Darfur State, they are more or less similar to agricultural practices as mentioned in the foresaid discussion with respect to South Darfur State. However, there are some factors with special relevance to East Darfur State which noted as follows:

- Groundnut cultivation area is estimated at about, two millions, five hundred feddans (2,500,000) which may be the biggest single sown area with groundnut in the country. Nonetheless, the target area is much larger because big farmers and

companies begin to use tractors with shallow ploughs (Karbash) hence put more areas under cultivation.

- The state owned two untapped agricultural projects which are the biggest in Greater Darfur, namely Um Ajaj with a total area accounts to hundred thousands and Abo Faama with an area of thirty thousand feddans.
- Farmers have developed a very good indigenous farming techniques, hence they are well acquainted to their ambient environment with regard to groundnut production.
- In the year 2017 a big producing and processing oil company (Dafot) found in the state (AlDeein). It has two complementary production lines, agriculture which is nearly fully mechanized and a groundnut oil manufacturing company. The agricultural sector has a partnership with farmers.

The company provides all the inputs including ploughing(dug foot cultivator) and harvesting, while the farmers offer their land and furthermore, supervising all the agricultural practices. Likewise, they should sell their products to the company at time they like and obtain the current price and share 44% from the net profit. The company has made a breakthrough by producing improved groundnut seeds with the assistance of farmers and close supervision and cooperation with the National Seed Propagation Department. The introduced variety (Goobash) claimed to have good properties, 20% increase in the production, early maturing (85 days), drought resistant and have uniform hard skin which is suitable for export as pure seeds (Nagawa). The company has also introduced the nitrogen, phosphorous and potassium (NPK) application by 25kg/feddan in accordance with the research advice and complemented with herbicides in small doses for weed control which claimed to be allowed by some exporting countries. These efforts have boosted the production. In the season 2019/2020, an average production of 21-25 sacks/feddan of raw groundnuts obtained compared to the previous very low production about 8 sack/feddan.

4.2.3 Limitations:

- Unimproved seeds are widely used, while improved seeds provided by the Federal Ministry of Agriculture cover only about 10% from the required seeds. Furthermore, farmers mix the indigenous and improved varieties. It is worthnoting that the seeds produced by Daffot Company only available to its partners.
- Very week extension services especially with respect to aflatoxin awareness.
- Although big farmers and companies use tractors for most of the agricultural practices, still considerable numbers of farmers use animal driven ploughs. The

ambivalence of these practices creates heated debate about the merits and demerits of the two systems. Some people have strong believed that the wide expanses of the cultivated areas by the use of agricultural machinery in a fragile area especially north the railway line will create substantial environmental hazards.

- Bean harvesters were brought in by private sector, but they are not available to every farmer, however, helped partially to solve the harvest problem.
- The infection of honeydew at the beginning of the formation of groundnut seeds leads to impeding production. This infection occurs for the first time in large quantities, the high humidity of the current year may be the reason. Locust (gabora) were in small quantities and got a large increase (outbreak) due to lack of aerial control.
- Infection of mouse as a biting lesion.
- Store pest such as groundnut beetle, this infection occurs because the store does not confirm the scientific specifications, hence the storage loss is estimated about 35-40%. Plant protection department provide warehouse fumigation service for an affordable cost but, farmers are not interested.



A privat Company used Tractors for Ploughing-East Darfur

4.2.4 Value added:

There is a similar pattern of value added as in South Darfur. Farmers are either sell their raw crop immediately after harvesting with a zero level value added. Others store the crop and sell it later in the season. The general trend is selling the groundnut after shelling whether in the local markets, state cities or transport it to Omdurman. However, some of the shelled nut either processed to oil by small manufacturing rural plants or big

factories in cities end up with seed cake which is very important in animal feed. Recently as mentioned before, a remarkable groundnut oil manufacturing company established in Al Deein (the capital city of East Darfur) producing five main value added commodities. Shelled groundnut, pure currents (Nagawa) exported directly to China and other Arabian countries, oil, seed cake and roasted groundnut processed afterwards to be used as children food supplements.

4.3 South Kordofan:

4.3.1 Groundnut:

4.3.2 Production and harvesting:

Groundnut is grown as one of the most important cash crop in the state to sustain the livelihood of a large number of rural dwellers. The famous producing areas are Al Goz (Debebat), Al Abassia and Al Todamon Localities. The sufficient rainfall availability is one of the encouraging factors for groundnut cultivation. For example the average rainfall is Al Goz North is 412mm, while there is a very high rainfall amounts to an average of 800 mm in the eastern localities namely Abassia and Rashad (IFAD). However, very high rainfall prolong the vegetable growth stage and consequently delay the maturity. The majority of farmers (85%) on average using traditional implements and methods like hoes, animal driven ploughs and the like for both agricultural practices and harvesting. Whilst, the minority depend on tractors by using light ploughs (Kharabash). Nonetheless, sticks, axes and rakes are the main helping equipments used during harvesting time to separate the pods from leaves and stems (Iessa, Field Survey 2021).

4.3.3 Limitations:

- Improved seeds are either unavailable or obtained with difficulty which induced farmers to cultivate unreliable indigenous varieties.
- The use of very traditional production methods could not help in further development of agricultural trait.
- Termite attack calls for seed treatment before sowing however, the fumigation cost is unaffordable.
- The development of a serious well known fungal disease (Aflatoxin) especially in humid environment.

4.3.5: Value added:

In all the study area (Darfur and Kordofan), there is a similar pattern of value added through the known marketing functions (time, form, place and possession utilities). Some farmers used to sell their raw product early in the season with relatively low village price, while others sell later by storing the raw crop and reap the anticipated

benefits of higher prices late in the season and/or shelling the groundnut before selling it. Moreover, by the establishment of small rural oil manufacturing plants, groundnut seed crushed to produce oil. It is worth noting that the produced oil is with low quality, poor storage properties and consequently low selling price. On the other hand, middle persons pursue to collect raw groundnut from villages and rural markets and transported to the wholesalers and manufacturers in Abassia and Debatat in which there are big oil factories for shelling and processing to obtain oil and seed cakes. However, some wholesalers, transport the shelled groundnut to Omdurman. We should not forget that some quantities of raw groundnut is consumed locally by making butter, salted groundnut and other uses.

4.2.6 Groundnut by-products:

Although there are different types of groundnut by-products including leaves, veins and stems and shells which are used for animal feed, however the groundnut cake has long been used for livestock and poultry fodder, but become increasingly important during the conflict years in both Darfur and Kordofan. In accordance to the mass rural dwellers movement to relative security areas (towns) which is in turn has fuelled a burgeoning dairy industry in many towns coupled with the security risk of livestock grazing in remote areas give more importance to the seed cake market (Smith et al 2013).

Moreover, the seed cake has an international market but said to be unsustainable. Furthermore, seed cakes produced by big factories more preferred than cakes produced by rural oil manufacturing plants. The latter is saturated with oil and liable to oxidation.

4.3.7 Groundnut (SWOT) analysis:

4.3.7.1 Strength:

- Flexible land tenure system allows outsiders to share land with land owners.
- Land is available and suitable for groundnut cultivation.
- The product is highly demanded as table food, snacks (salted and roasted peanut and butter) in addition to different uses of its by-products.
- Farmers have developed a good indigenous knowledge about groundnut cultivation and processing.
- The product has sustained the livelihood of considerable number of rural dwellers in the study area.

4.3.7.2 Weakness:

- The use of traditional implements which dominate large areas will not trigger the high potential of agricultural land.

- The government institutions such as Agricultural Extension Departments have limited facilities to conduct their message.
- No stock market in the study area, hence there is no proper system for the dissemination of market information and no proper bidding transactions.
- Limited access to agricultural capital.
- The small rural shelling machines and oil processing plants described as less efficient.
- Improper storage has lead to greater losses.
- Previous Farmer's Union are not existing, hence they have weak bargaining power while obtain inputs or sell their products.

4.3.7.3 Opportunities:

- The modernized and efficient shelling machines and oil processing factories established by the private sector as Daffoot Oil Industry in East Darfur (AlDeein) and other similar factories will greatly help in value added products.
- The availability of wide agricultural expanses like Um Ajaj and Abu Faama project in East Darfur give very high potential for groundnut cultivation.
- The growing world demand for groundnut pure kernels (Nagawa) and seed cakes give great opportunity for export trade.
- There is a great potential to produce organic food, which is highly demanded specially in the arena in international markets.

4.3.7.4 Threads:

- The uses of extensive doses of fertilizers, pesticides and herbicides without scientific advice is detrimental.
- The use of heavy ploughs in fragile soils will render them out of use in the near future.
- Transgression of livestock to farmer's harvest causes sometime, serious damage and furthermore could leads to conflict.

5. South Darfur:

5.1 Tomatoes:

5.1.1 Production and harvesting:

It is a quick remunerative cash crop. The famous two main area for tomatoes growing in South Darfur specially around Nayala the state capital city are Kass and Blail Localities. The agricultural practices are more or less similar in both South Darfur and South Kordofan.

Ploughing:

It is done by tractors using disc plough specially in heavy clay soils, but most soils put under tomatoes cultivation are light loamy soils. Other seed bed preparations are either done by animals or manually.



Farmers leveling soil for tomato growing

Sowing date:

Tomatoes have been planted in both winter and summer seasons, however, the latter practice is limited to skill farmers.

Irrigation:

The number of irrigation is the most determining factor that contributes positively to productivity increase.

Fertilizer:

Fertilizer application has significant effect on raising productivity, specially in nitrogen deficient soils. Farmers in Blail apply one sac of urea/feddan in the season, claimed to has remarkable success in vegetable growth and ultimately boost the production. Foliage fertilizers are also used.

Pesticides:

Different types of pesticides are used to control leaf curl, aphids and other diseases.

Harvesting:

It is a sole women business; the wage is determined by the number of collected boxes in accordance with an agreed rate. Afterwards, the harvest will be ready for marketing without grading, proper packing or any other post harvesting processes.



Women harvesting tomatoes

5.1.2 Marketing features:

Following are some factors characterizing tomatoes marketing in the study area (Darfur and Kordofan).

- Winter is the main production season, however, off-season crop is also produced though with less quantities. Thereof, the production is spread over the year, but the variation of cost arises largely out of differences in yields.
- Farmers' returns even more variable, the returns to producers on any-one day may vary enormously. It may be a matter of luck whether a given crop is harvested during a high price period or not.
- A wide range of intermediaries performing different marketing functions characterizing the selling process.
- The main transportation means from point of production to different marketing centres are lorries, animal, are also used to carry the product to nearby markets.
- Simple and inefficient packing materials are used i.e. tins, baskets and cartons which result in physical losses.
- Accurate and timely marketing information is not available similarly, there are no stock markets.

5.2 East Darfur:

5.2.1 Tomatoes:

The state has very limited area grown by tomatoes confined in the border localities with North Darfur Stat, namely KhazanGadeed, Sharia and Mahageria. The crop is sown by adopting water harvesting techniques. The clay soil is frequently in undated by food

during the rainy season, thereof, farmers avail the opportunity to grow vegetables with almost free irrigation cost. On the other hand, a pioneer farmer in Al Deein city has established a dairy and vegetable farm in small area irrigated by drilling water from deep bore wells at a very high pumping cost. Although he has a near market advantage, but competing with other distant growers have comparative advantage in tomatoes production. The main problems encountered by tomato farmers in East Darfur is the use of unreliable and very expensive seeds in addition to the milley bugs and boll worms infection. The foresaid tomato growers market their harvest in the nearby North Darfur State avoiding the high transportation cost to Al Deein city. Nonetheless, the growing city has a good vegetable market potential receiving tomatoes and other vegetables from both South Darfur and South Kordofan States.

5.3 South Kordofan:

5.3.1 Tomatoes:

5.3.2 Production area:

Tomato is one of the very important quick and lucrative cash crop in South Kordofan. It is mainly grown in Abu Karshola and Al Goz(AlSaysaban) Localities. During the season tenth of lorries loaded by the product headed to different towns in North and West Kordofan States and even to the national capital (Khartoum) which has advocated the importance of paved feeder roads.

Similarly, Al Dalang Locality is producing tomatoes with relatively small amount in Al Farshaya, Al Neela and Al Tokoma and sold in nearby localities. Furthermore, an area north KadogliBarno is also producing tomatoes and sold in Kadogli city.

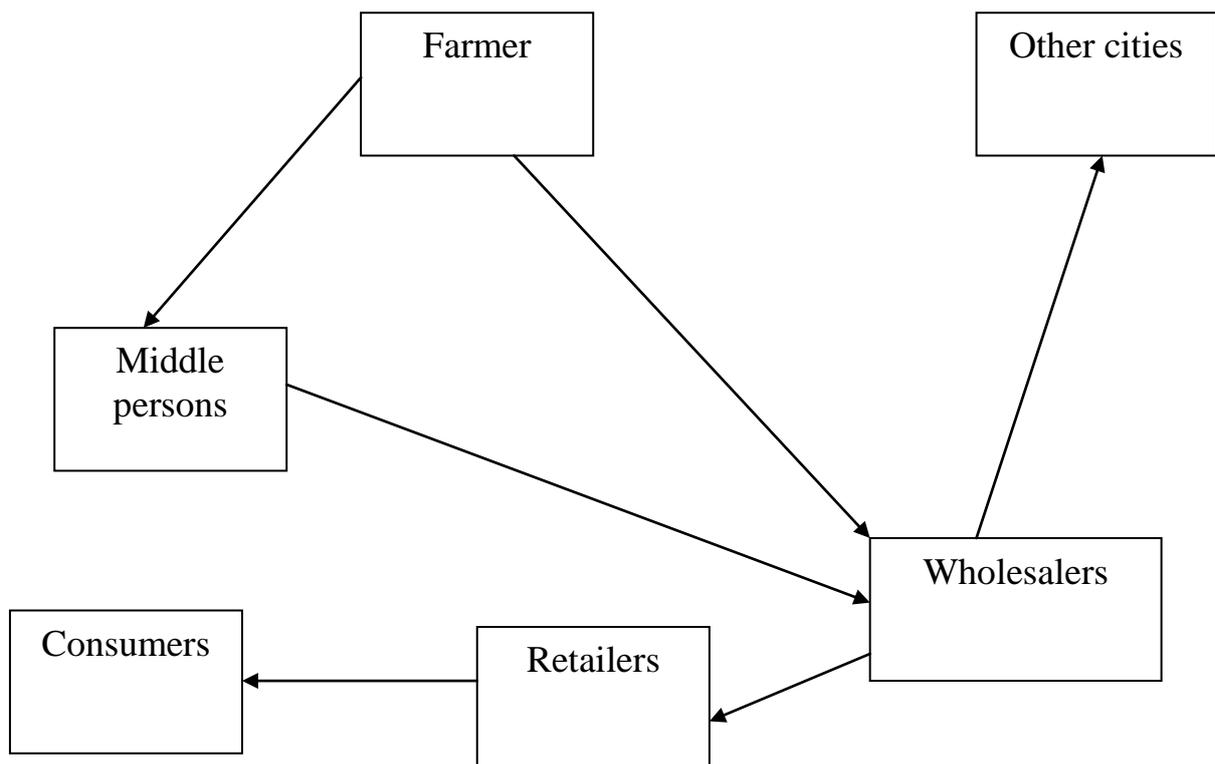
5.3.3 Limitations:

During the time of the field visit, extensive discussions have been held with a horticultural specialist working in the state Ministry of Agriculture and other specialist in Kadogli Research Station and they came with following limiting factors:

- Unreliable and very expensive tomato seeds, although there are some private horticultural specialist own seed centers.
- No proper agricultures practices such as proper seed rate, proper irrigation intervals and no germination test before sowing.
- None or very limited extension services in Dalang.
- Most of the trained horticultural (garden labors) retired without proper plan for replacement.
- Farmers less awareness has precluded their adoption to technologies released by research station.

- High fuel cost.
- Insect damage
- The use of extensive insecticides and pesticides without scientific advice is detrimental

5.3.4 Marketing channels:



The channel is very simple, the farmer is either sell to the middle person who is normally live in the village or elsewhere nearby while some big farmers also sell direct to the wholesalers. The middle person also sell to the wholesaler who sell part of product to retailers a ultimately to direct consumers. Moreover, the wholesalers after grading and repacking the product transport it to other cities whether in the same state or outside it. In this chain, the only value added is the transportation performed by the farmer and middle person in addition to the grading, repacking and transportation by the wholesalers. During the abundant harvest, tomato is dried and soldby some pity traders including women. Also, tomato paste is mad by small agitating machines and used for food, the practice is sometimes unhygienic and the product has limited storage time.



5.3.5 Tomatoes SWOT analysis:

Strength:

- The product is a quick remunerative cash crop.
- Farmers are well acquainted to the production of tomatoes by adopting their indigenous production techniques.
- The availability of suitable fertile soils.
- The growing awareness of rural as well as town dwellers about the vegetable food.

Weakness:

- Very traditional methods are used for production and processing.
- Limited access to agricultural capital and credit facilities.
- Poor agricultural extension services.
- During the abundant harvest very low price is obtained coupled with traditional processing methods.

Opportunities:

- The National as well as state Research Centers anticipated to produce heat tolerant and adaptable varieties, similarly they could suggest good agricultural practices to boost the production.
- There is a good chance to produce organic food.
- Many organizations are very keen to promote the cottage industry.

Threads:

- Some valuable agricultural land is rented to brick makers which is a remunerative investment.
- Galley erosion developed by some valleys (wadis) renders very large vegetable growing areas out of use (Blail Locality case).

- The extensive use of fertilizers and pesticides will spoil the crop and induce consumers to have negative attitude towards the crop.

5.4 South Darfur State:

5.4.1 Livestock:

The population of livestock (cattle, sheep and goats) in the greater Darfur exceeds 45 million head, and represents around 30% of Sudan's total livestock population, which indicates the importance of the region with respect to hide and skin sector (PACT-2013). Nonetheless rawhide and skins have very low price and in most cases monopolized by a sole wholesale trader which regarded as a product with no value. On the other hand, ground slaughter area, slabs and ternaries produce large quantities of hazardous waste which pollute the ambient environment. Similarly, the operation facilities in the whole study area are not in compliance with the environmental regulations. Wastewater in Kass tannery is drained in the river which is a source of drinking water and the tannery is located in a residential area. Furthermore, the workers have no any protective dress (masks, gloves, clothes and shoes) and no periodic medical check). Contrarily, a retired veterinary technician in Kass Locality narrated the historical experience for the processing of leather and hides at the abattoir (the use of special improved knives imported from England for slaughtering and flaying).

- Direct supervision by the veterinary technician for the prevention of using indigenous knives so as improve the quality of skins and hides.
- There are basins for the cleaning of skins directly after skinning and then spread for drying.
- Followed by the sorting of skins by the knife and the eye, then the classification process as follows:
 - Grade-1 good
 - Grade-2 close to good.
 - Grade-3 discarded
 - Grade-4- for local use

Then, under the veterinary responsibility, hides and skins taken to the store for grouping

- There is a wide deck for spreading skins so as to remove extra meat and to be fixed for stretching.
- In the second day, skins will be removed and turned towards the wool, and then powder will be dispersed on the skin for the prevention of rotting.
- The dried skins will be transported to Omdurman. Some clients request application of salt, skins will be spread and salt is applied at the rate of half the weight of the skin.

- After drying, skins are folded in (1mt x 1/2mt.) ready for export then stamped (using heat) according to the assigned grade.
- Butchers who carry the skinning process were awarded licenses. There is a law prohibiting the use of indigenous knives.



Al Deein Tannery – S.Darfur

On the other hand, the major government owned tannery in Nayalahas been closed for a number of years due to logistical and operational constraints. Recently the tannery has been allotted to the assets of the state of East Darfur. The state government is seeking to sell the tannery to the private sector, which seems to be interested in acquiring its land more than its processing operation. Another, Private sector tannery owned by Turkish company is operational in Nyala, but not at full capacity due to difficulties in the procurement of raw skins (PACT-2013). However, during the tenure of the field visit the consultant learned that the tannery was stop operating.

5.4.2 The value chain path:

- Hides and skins are mostly source from slabs (mustabas) and unregulated slaughtering facilities (illegal) with very low price as indicated by Osman Issa a wholesale trader in Nyala (10,20,500 SDG) for goats, sheep and cows raw skins and hides respectively. During market recession the raw product is thrown in the slabs, which creates unfavorable environmental hazards.
- In the first stage, hides and skins are exported unprocessed after air and salt drying, this step is more applicable for hides. The importing countries are Nigeria and other west African countries it is worth noting that some wholesalers stock the dry hides and skins in the first stage and sell them to tanneries.

- The second step is processing in tanneries and converted to leather. The processed skin in the form of wet blue (chrome tanned leather) are exported to international market, while low quality leather is sold to leather goods manufacturers domestically.

5.4.3 Suggestions:

- In order to fully utilize the hides and skins resources that are found in various part, of the pastoral areas, it is essential to establish well organized hides and skins collection and preservation enterprises managed by the private sector.
- Technical training for the veterinary technicians coupled with awareness raising about the high value of leather industry.

5.5 East Darfur:

5.5.1 Livestock:

East Darfur state is well endowed with an enormous number of livestock; previously it was described as a pastoral area (Dar Al Baggara). However, during the brunt of Darfur's conflict, some pastorates have lost their livestock asset and enduced to migrate to urban cities and other more safer areas. Moreover, the wide expanses of agricultural land limited the free movement of pastoralists. Nonetheless, the state is still rich with animal resources. The management as well as skin and hide processing is more or less similar to South Darfur and even worse in some aspects. According to the Manager of Animal Production Administration in East Darfur, there are only three stabs in Al Deein and are not satisfying the slaughter requirement. Furthermore, the state has nine localities, seven of them are practicing slaughtering and skinning on the groundnut with very low and mutilated hides and skins product. On the other hand, three is only traditional tannery in the city with very worst working environment. No water connection, no proper drainage system and no any protective measures for the hudge number of workers. It is worth nothing that the private sector in East Darfur (Al Deein) has initiated an idea of constructing advanced tannery, hence a big area of land allocated by the government. Nonetheless, the high capital requirement beyond the affordable capacity of the local investors calls for joint venture with other partners. As far as value added is concerned, there is a sole wholesaler; he used to stock the dry skins and hides in his warehouse. The skin has relatively good market, exported to Nigeria and other West African countries, while as was observed piles of hides stocked in the stores due to the small window of foreign market associated with very low domestic market demand. Furthermore, the stocked hides and skins exposed to insect damage and other migro-organisms rendered considerable amount of the product out of use (10000 pieces of skin

for goats and sheep). There is also a domestic market for the low quality of tanned skin used in shoe making.



Damaged of Stocked hides – East – Darfur

5.6 South Korofan:

5.6.1 Livestock:

Although there is no proper livestock statistics, but the state has different types of livestock spreading in all localities. Consequently, hides and skins represent a potential economic benefit specially for rural dwellers and all actors in the sector, however, the maximum benefit of the product may be hampered by many factors. In general, hides and skins are affected by pre-slaughter defects accumulated during the animal life pre-slaughter defects during slaughter, and post slaughter defects during handling, preservation and storage. Pre-slaughter defects including parasites and diseases (e.g. mange, tick infestation, lumpy skin disease, sheep and goat box, etc.).

Moreover, hand flaying using knives is the most common technique in pastoral areas. Poor flaying causes holes and cuts on the hides and skins, which consequently fetch lower prices because of the poor quality, and also results in higher rejection by tanneries.

Pursuance to the foresaid discussion, Kadolgli the state capital has only one slab for slaughtering without any hygienic measures. Nonetheless, the slab was ban due to the allegation of security reasons without the suggestion of an alternative place. The decision enticed butchers and citizens to slaughter animals everywhere in the residence area, which pollute the environment. On the otherhand there are three local tanneries, with low capacity and poor processing quality. The hides after processing sold locally to shoe makers and leather artisans, while some of the dried skins transported to Khartoum

and sold to big tanneries. Dry hides have relatively good market and sold to Nigerian agents. It is worth noting that the South Kordofan State government has completed the studies for building a big tannery in Al Goz Locality.

5.7 SWOT Analysis for hides skins:

A SWOT (strength, weakness, opportunities and threads (Good strategies will capitalize on strengths, improve weakness, utilize opportunities and attempt to lower, when possible, the threats (PACT-2013).

5.7.1 Strengths:

- Abundance in the production of hides and skins in the study area.
- Hides and skins from Sudan are known for their better quality word wide.
- Hides and skins industry is old well established in both Darfur and Kordofan.
- The sector can absorb as actors and/or employees a significant number of the targeted communities especially women, youth and poor families.

5.7.2 Weakness:

- Some skins suffer from surface damages caused before and during slaughtering.
- A large portion of the hides are exported raw. The industry is not producing finished leather.
- Old fashioned and traditional technologies are often being used in the industry.
- Leather products produced in the study area are of lower quality and not designed for export market.

5.7.3 Opportunities:

- Leather and leather products have the potential for becoming major commodities and products for export.
- Much support from government and development organizations can be mobilized.
- Affordable machinery and equipment which are suitable for small enterprises are now available to be utilized in improving the efficiency and product quality, as well as, effectively engaging poor families in the value chain.
- The leather industry is expanding globally through product diversity and better quality.

5.7.4 Threads:

- Poor infrastructure and lack of business development services.
- Unclear policies and commitment by the government towards the sector.
- Security threats and potential conflict outbreak.
- Deteriorating economic conditions and high inflation rate.
- Smuggling of raw skins beyond the country's border.

6. Recommendations:

It is assumed that following are the most relevant and affordable guided recommendations for Care's intervention to map-out how the value chains could change to benefit the target groups.

- To consolidate some Agricultural Department like extension to continue their programs about introducing new technologies and create awareness.
- Seeds are very important and vital input as the first entail stage for value added product. The seed propagation specially groundnut can be done by the corporation of financial agent, the National Seed Authority and farmers. Two groundnut varieties (Gobash and Sodri) with drought resistance and high oil content merits are recommended.
- The use of manure farming should be encouraged to avoid chemical fertilizers application. The animal dung is available and by doing so, there are two fold benefits, to produce organic food which is globally demanded and to clean the environment.
- An awareness campain should be launched about the serious use of chemical fertilizers, insecticides and pesticides without scientific advice. This method can be achieved by establishing rural workshops.
- Help small rural farmers (men, women and youth) to obtain animal traction ploughs. They could increase the sown area and ultimately increase the production, furthermore, limited the drudgery manual work.
- Women should be encouraged to form small associations and/or consolidate the existing ones to facilitate assistance given by care or other organizations and to strengthen their purchasing power. Furthermore, they should be advised to sell their product at least after shelling stage.
- Small revolving fund for disperate farmers to avoid local money lenders.
- Due to high fuel cost, small unit solar systems can assists in the irrigation of vegetable crops or at least provide farmers by plastic pipes to minimize water losses by evaporation and seepage, already some innovators introduced such techniques.
- Cottage industry should be encouraged like small shelling machines, small oil manufacturing units and the like. Similarly, the establishment of small plants for tomato paste.
- Small seed money for women traders selling salted groundnut and groundnut paste to promote their business.

- In areas which have no access to the groundnut bi-product market (leaves and shells) women can be encouraged and assisted to stock small number of ruminants for efficient use of such products.
- Community rural stores can build with scientific measures to avoid or minimize groundnut losses at the storage time.
- The domestic leather industry can be more complete by training the Articans working in this field (men and women). The National Technology Center can greatly help in this area.
- Herder awareness to avoid the mutilation of leather by thee use of marks and tattoo.
- The prevailing deplorable situation in local tanneries can be improved by health awareness and providing protective dress for labors (gloves, masks and shoes). With periodic health check.
- The existing value added project specially for hides and skins could transcend the marketing and economic aspect to security and stability of households by supporting the efficient use of animal dung as fuel. Women could be relived from the efforts they exert and atrocities they endure in fetching fuel wood from distant insecure areas.
- Support up in the provision of seeds, since seeds are the most important element in the production process.
- Support Agricultural Extension for the expansion of guidance messages.
- Introduction of intermediate environmentally friendly technologies. The \ Agricultural Extension Administration is endowed with a well trained human resources having long accumulated experience.
- Assist She Farmer's schools which were established by the Agricultural Extension Administration, it is a shared program.

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Annex-1

Terms of Reference for Value Chain Study Consultancy

Promoting peace and socio-economic development for conflict-affected communities in

Sudan November 2020

CARE Sudan

Background:

The Project “Promoting peace and socio-economic development for conflict-affected communities in Sudan” is operational in targeted communities located in the conflict hotspot areas of the three states of South Darfur, East Darfur and South Kordofan, where the impact of resource-based conflict and its recurrence is relatively high. The Project accords priorities to women, men, and youth that are suffering from long years of internal conflict and displacement, frequent eruption of clashes due to competition over the already meager resources as a result of the influx of South Sudanese Refugees and the ongoing economic crisis in the country. The absence of rule of law and weakened government structures in the targeted locations is further amplifying the suffering of at-risk population groups. This Project plans to add value to alleviate suffering and ensure sustained peace through supporting community-based resolution mechanisms, catchment based natural resource management, locality and state level peace building initiatives and gender sensitive programming. The project will ensure the already existing initiatives by CARE and other actors are complemented to enhance synergy and maximum reach to the needy individuals and community groups for continued interaction and fair share of benefits from assets and resources created or rehabilitated by the action.

Project scope:

This project aims to contribute to the sustainable peaceful coexistence, social stability, increased social cohesion, enhanced recovery and socio-economic integration among conflicting communities in East Darfur, South Darfur and South Kordofan. The peace and confidence building activities related to this project are essential in fostering stability and creating a momentum across those most unstable areas of Sudan, as the country is currently under major threat of further destabilisation. The project will contribute to the Sustainable Development Goals, more specifically Gender Equality (#5), Clean Water and Sanitation (#6), Responsible Consumption and Production (#12), Climate Action (#13) and Peace and Justice Strong Institutions (#16).

The proposed action will support establishment or strengthening of systems for local conflict prevention and resolution and sustainable management of natural resources. This action will have a direct impact on peaceful coexistence of communities in targeted areas of East and

South Darfur and South Kordofan by ensuring inclusive participation for dealing with the local underlying causes of conflict in the area through community based mechanisms that will enhance recovery, support conflict resolution and prompt the management of natural resources. The action will contribute to stability and peaceful coexistence in the two states through building economic relationship across conflicting groups, alleviating pressure on natural resources, diversifying and strengthening economic opportunities.

The project aims to achieve the following outcomes and outputs:

Outcome 1 Establishing Local conflict prevention and resolution systems and strengthening the n monitoring and early warning systems for conflict prevention and resolution and sustainable management of natural resources.

Output 1.1 Community Based structures (such as Village Development Committees, Community Based Resolution Mechanisms and Natural Resources Management Committees) are established, strengthened and functional.

Output 1.2 Community Based Natural Resource Management mechanisms are supported and functional to alleviate pressure and competition on natural resources, through community-based management approach.

Outcome 2 Creating gender-responsive sustainable livelihoods opportunities with a focus on women and youth empowerment, economic resilience and skills strengthening

Output 2.1 Targeted women and men are engaged in inclusive and diversified income generating activities

Output 2.2 Targeted women and youth have received business and skills building training, and attained confidence and knowledge to claim their rights.

Purpose of the assignment

In 2016, CARE carried out a Value Chain Study in the three states of East and South Darfur as well as South Kordofan. The Study which focused on Groundnuts, Skin and Hides and Tomatoes was intended to obtain deep understanding of how these three value chains work, their trends, strengths, constraints, relationship, and map-out how the value chains could change to benefit the target groups of some of the potential areas where CIS operates in. The study was carried out by a research team consisting of value creation expert (lead consultant), and Development expert (Team Leader), in addition to 6 enumerators.

The findings related to the Groundnuts value chain illustrated the production and productivity, with full descriptions to the agricultural process, harvest and post-harvest operation. It also brought quantitative statistics about the cultivated land and the household production and productivity. It moved to analyse the market and its Price Trend, and the factors affecting the price trend. The findings also covered the consumer preferences of peanuts and its derived

products, which led to a SWOT analysis that wrapped the chain from production to the final consumers. Finally, the data informed the recommendations of the main sustainable business solution that CARE and its local partners can support. The major recommended business solutions for the Groundnut value chain problems revolved around creating more economic benefits through more investment on people knowledge and Skills, connecting everybody with everybody in the chain, and facilitating access to better technologies.

The findings related to the skin and hides value chain started by providing statistics on the different stages along the chain. The industry related to skins and hides is very poor, and the production is very small compared to the number of slaughtered livestock. The findings also included analysis to the skin market and its price trends. The market analysis has consistently led to other analysis for the actors and their value addition in the chain. The flow of the hides and skins in the study area share some similarities and differences. Most of the skins produced for tanning is collected in Nyala for South Darfur skins, Eddain for East Darfur and some of north Darfur skins, and in Umrwaba for South Kurdofan, and then hides are exported from Darfur and Kurdofan to Khartoum or to Nigeria through Elgennina in West Darfur, and Eltina in North Darfur. The main business solutions recommended to improve the skin value chain is focused on increasing the awareness of pastoralists and improving the butchers skills to increase the skin productions and quality, attracting new leather production companies to shake the monopoly of the skin wholesalers and to give more opportunities for employment. It is also recommended to bring more actors as leather processors and organize them into associations to help them to explore new opportunities.

The findings related to tomato value chain started also by exploring the actual production and productivity, and then understanding the market and tomato price trend, and studying the potential opportunities that can come out from the actual possibilities around tomato value chain and its derived products. The main recommendation for CARE in Tomato chain is focused to create new economic benefit from the value chain through more investment on farmers capacity, facilitating of credit opportunities through VSL and other financial linkages, and attracting of new suppliers of small scale processing machines in order to create more local demand on the derived products.

The Consultant will be provided with the Value Chain Study on the three commodities (Skin and Hides, Groundnuts and Tomatoes) that was prepared in 2016. He/She will be charged with the task of updating that study thoroughly with the view of introducing new information and new perspective.

More specifically, the consultant will:

- a) Undertake a review of the current study on the three value chains;

- b) Research other secondary data on the three commodities over the last few years to study trends, changes and relationships.
- c) Hold discussions with relevant producers, merchants, exporters and other relevant stakeholders engaged in the production and marketing of the three commodities;
- d) Collect other relevant information related to these three commodities as needed;
- e) Prepare an updated study with information on at least two of these three value chains

Duty Station

The Consultant will be based in Khartoum with possible field travel to South Kordfoan, South Darfur or East Darfur if needed.

Duration:

The duration of this assignment is 1 month.

Start date: 20 November 2020

Outputs

The Consultant will produce the Final Study Report which should consist of a table of contents, an executive summary, an introduction, findings and analysis, recommendations and conclusions and annexes, graphs and tables.

Qualifications and Experience:

- Education: Degree in Economics, Rural Development, Peace building or other related studies
- Experience: in economic empowerment, economic research and analysis, commodity analysis or capacity building and market research.
- Excellent analytical skills
- Language: Strong command of English and Arabic languages
- Communications: Good writing skills in the English Language
- Computer: Good computer skills

Note: Interested applicants are advised to submit their application with updated CV and reference checks to Adam Ali, procurement manager Adam.Ali@care.org and Amir Economic Empowerment Coordinator Amir.Baker@care.org within five days of advert.

Annex-2

People, organizations and officials met

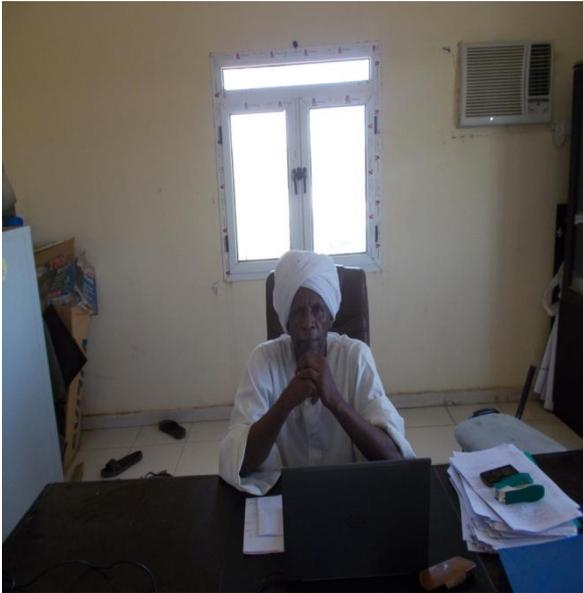
The consultant has managed to visit the capital cities of the three intended states and some localities in South Darfur. Thereof, following are the Non Government Organizations (NGOs), Producers, Manufacturers, Wholesalers, Retailers and Officials whom the consultant met, interviewed and participated in the Focus Group Discussion (FGD).

1. Meetings with the Care staff in the three states namely South and East Darfur and South Kordofan to develop a common understanding of the Terms of Reference (TOR) and draw a road map for consultation of the different stakeholders according to the existing socio-economic and security situation.
2. Meetings with the Head Office UNDP (Nayala).
3. Meetings with the General Director of the Ministry of Agriculture (South Darfur).
4. Meetings with the Planning Manager-Ministry of Agriculture (South Darfur).
5. Meetings with the Head of the General Administration of Technology and Extension-Ministry of Agriculture-South Darfur State.
6. Meetings with some staff of the -Agricultural Research Station-South Darfur State.
7. Meetings with the Executive Manager-Kass Locality South Darfur State.
8. Meetings with Assistant General Director of Ministry of Agriculture-Kass Locality - South Darfur State.
9. Meetings with the Animal Wealth Unit Administration-Kass Locality -South Darfur State.
10. Meetings with Group of Workers in Kass Tannery -South Darfur State.
11. Meetings with women farming schools- Blail Locality -South Darfur State.
12. Meetings with Head Office- FAO –Nyala -South Darfur State.
13. Meetings with the Manager of Animal Wealth Sector -South Darfur State.
14. Meetings with the Manager of Agricultural Bank-Nyala -South Darfur State.
15. Meetings with the Manager of Makawi Al Shareef Company. Previously he was head of Industrial Chamber -South Darfur State.
16. Meetings with the Manager of Rawang Al Haya Oil Industry -South Darfur State.
17. Meetings with the previous union head of groundnut producers -South Darfur State.
18. Meetings with the General Director of the Ministry of Agriculture- El Deein -East Darfur State.
19. Meetings with the Head of Plant Protection Department-East Darfur State.
20. Meetings with the staff of the Agricultural Planning Administration-East Darfur State.

21. Meetings with the previous Manager of Animal Wealth Sector -East Darfur and his subordinates.
22. Meetings with the previous General Director of the Ministry of Agriculture -East Darfur.
23. Meetings with the group of workers in El Deein Tannery -East Darfur State.
24. Meetings with the Director of Saliheen Agricultural Company (Dafoot) -El Deein East Darfur State.
25. Meetings with the Director of Badareldeen Oil Factory -Al Deein East Darfur State.
26. Meetings with the Manager of Agriculture and Natural Resources Sector and Acting General Director of the Ministry of the Agriculture– Kadogli-South Kordofan State.
27. Meetings with the Head of Horticultural Department– Kadogli-South Kordofan State.
28. Telephone contact with the station Manager of Sudanese Arab Company for Seed Production– Al Obeid-North Kordofan State.
29. Meetings with the Director of Hide Improvement– Kadogli-South Kordofan State.
30. Meetings with the General Director of Research Station and her subordinates– Kadogli-South Kordofan State.
31. Meetings with the Planning Administration Manager- Ministry of Finance– Kadogli-South Kordofan State.
32. Moreover, meetings with different stakeholders, namely producers, manufacturers, wholesalers, retailers, vegetable seed traders and the like.
33. Meeting with the Manager of the Horticultural Crops Research Centre-Khartoum North (Shambat).
34. A visit to Leather Technology Centre – Khartoum.

Annex-3

Photos



1-Head of extention unit – Minist-of Agricuture
South Darfur



Ministry of Agric-South Darfur



2- A woman counting money After selling her
groundnut - kass- S.Darfur



Intervieweed Assistan General Agric.manager
kass-S.Darfur



3- A Veterinary Farmacy – S.Darfur



4- kass Tennery – S.Darfur



5- Seed Trader – Kass locality- S-Darfur



A farmer in blail locatity - S.Darfur



6- Fertile Agric – soil allocated for brick making – S. Darfur



7- A woman vegetable Retailer- S.Darfur



Tomato Farmer - S.Darfur



8- A Truck loaded with raw groundnut



A groundnut Market- S.Darfur



9- A Farmer Broad casting fertilizers



Women harvesting tomatoes



10-Farmers leveling soil for tomato growing



plastic pipe for irrigation



11-Brli river (wadi) encompassed fertile Agric-land



12- Woman Farming school-Blail locality – S.Darfur



13-Finished leather Displayed for selling



Raw Hide



14- Shoes and bags makers



15- Department of Animal wealth – East Darfur



16- Damaged stored hides – East – Darfur



17- Hide processing – East Darfur



18- C are offices



19- Daffoot company – East Darfur



20- A Poineer Farmer in south Kordofan Deling – Introduced a solar system and an oil manufacturing unit



21- Kadogli Research station



Head Kadogli Research station



22-Scientist in Kadogli Research station



23- A wholesale hide and skin trader – Kadogli South-Kordofan

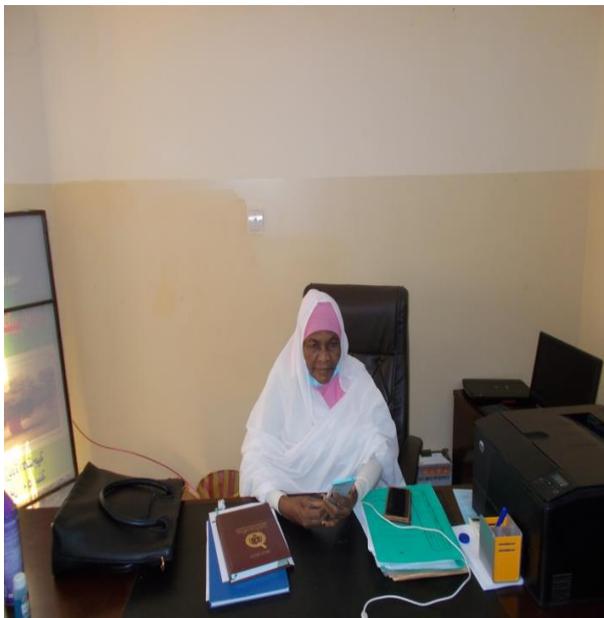


24-Tomatoes wholesaler in Kadogli-South Kordofan Head of planning unit-Ministry of Finance- S. Kord.



25- National Leather Technology Center
National Leather Technology Center (Feb.2021)

Training Course Performed by



26-Manager of Horticultural Crops Research Centre

Horticultural Crops Research Centre



27- Nayla Tannery – Waste Materials Flow into a Drinking Water Source