Existing *Natural Resources* in North Darfur State & their Potentialities for supporting the Livelihoods of Rural Communities – North Darfur – Sudan

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Abstract- The objective of this research is to study the capabilities of the five capitals of sustainable livelihoods in the rural areas of North Darfur state. This is to estimate the different capabilities of those capitals and their potentialities to support the rural peoples. The methodology used in the research is the participatory approach assessment tool the participatory approach assessment tool has emerged as advancement or combination of principles used in the Participatory Rural Appraisal (PRA) and the basic concept of the Sustainable Livelihood Approach (SLA) as it was called by the British Department for International Development (DFID). The methodology used for this survey was through the adoption of group discussion method with the communities in the visited areas in the study area. Semi-structured questionnaires were prepared and used for answering the questions related to this study. Two questionnaires were used in this study. First questionnaire was focused on importance and availability of issues related to livelihood elements, namely, the natural resources, physical resources, human resources, financial resources, and social resources. Second questionnaire was focused on various issues related to use of natural resources, namely, allocation of land for different purposes, main products provided by the forest, types of cultivated crops, average productivity of cultivated crops, farm size, sources of income generating activities, animal holdings, availability of pasture, water sources, etc. The collected data were tabulated and analyzed using excel package to produce tables and graphs. The analyzed data has concluded into a number of findings included: The indicators of livelihood have shown significant gaps between their importance and their availability especially with regard to natural resources, financial resources, physical resources, and human resources. Moreover; the assessment results have indicated, low productivity of food security, limited ownerships of resources related to farming. Deficiency in production of natural resources, this is attributed to small farm holdings, rainfall fluctuations, security concerns, inability of communities to resolve their own problems. In some cases despite the availability of lands, soil fertility, human desire, but the security concerns normally impedes many of them to make use of their resources and eventually get confined in limited areas. Finally detailed discussions about the deficiencies and availabilities of natural resources were presented and specific recommendations were drawn with regard to those issues and their complications in the future.

Index Terms- Natural resources – five pillars – Kebkabiya – North Darfur State – Adam Adoma Abdalla– Livelihood – Zeraiga – Dar Al Salam – Kalamendo – Participatory Approach

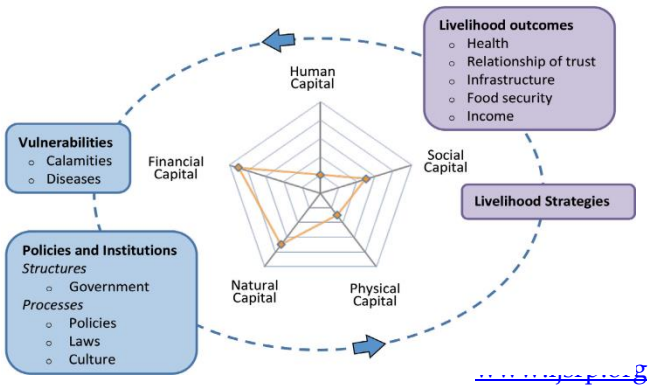
I. Introduction

The participatory approach assessment tool has emerged as advancement or combination of principles used in the Participatory Rural Appraisal (PRA) and the basic concept of the sustainable livelihood approach (SLA) as it was called by the British Department for International Development (DFID). The assessment tool was designed for the evaluation of the impact of different natural resource management approaches on a specific target group. The focus lies on local concerns by communities and individuals with regard to natural resource management. According to Chambers (1994) the PRA as a term is being used to describe the growing family of approaches and methods that enable local people to bring in their knowledge and perception into decision making processes (Chambers 1994). The basic idea of the sustainable livelihood approach is based on five pillars, the five livelihood assets are: human capital (HC), Social capital (SC), Physical Capital (PhC), Natural Capital (NC), and Financial Capital (FC).

According to Bebbington (1999) one of the principal reasons why rural people have not been able to improve their livelihood derives from the failure or inability to defend their existing capitals or to turn them into new livelihood sources, e.g. turning FC into natural resource enhancement. Participatory methods offer tools for the required understanding on local level and further serve as a medium within which social values and scientific strategies can be combined (Evans et al. 2006, Wollenberg et al. 2005, Salafsky and Wollenberg 2000).

Five Capital Assets of Livelihood:

Figure 1: Five capitals of the sustainable livelihood framework:



II. OBJECTIVES

The overall objective of this assessment is, to identify the nature of the current/potential situation of the natural resources in the three localities (Kabkabiya, Dar El Salam and Kalemindo)) in North Darfur State - Sudan.

1. To explore the current/existed practices of Natural Resources Management mechanisms in the study area.
2. To identify the existed natural resources in the target areas.
3. Strong sustainable solutions recommended
4. Comprehensive NR assessment report produced and shared with stakeholders

III. RESEARCH METHODOLOGY

As it has been already stated, the chosen participatory tool is a combination of already existent PRA (Participatory Rural Appraisal) methods applied in the context of the SLA (Sustainable Livelihood Approach). The data are gathered through participatory methods mainly consist of two components which differ usually in their character. Measures of products are generally accepted as quantitative numbers (numeric value) whereas values as livelihood perceptions, cultural non-use values and individual options are of qualitative character (categorical values, ordinal and nominal). A value or observation can be described as ordinal if the data can be put in order (e.g. combined with a ranking scale). Ordinal data can be counted and ordered deliberately but cannot be measured specifically. Studying livelihoods starts with the identification of the relevant stakeholders. Though the interpretation of the analyzed indicators can differ depending on the interest of the stakeholder, it is inevitable to identify different stakeholder or focal groups. The selection of the participants within such focal groups should be randomly. The assessment is mainly depending on five livelihood capitals, naming HC, SC, Physical Capital, NC and Financial Capital forming the pillars of the investigating tool for the sustainable development approach, commonly accepted as the livelihood framework. Apparently there are many slightly different variations in definition for the five livelihood capitals.

The checklist of the assessment indicators had been prepared based on the livelihood five capitals. The questionnaire has been prepared based on the checklist indicators. It contained the livelihood five capitals and the main indicators for each capital (varying between three to six indicators for each capital). Each indicator has contained two questions including the importance of the indicator and the availability of the indicator. The answer for each question was given three options as follows: The importance of the indicator:

1. Not important
2. Medium important
3. Very important)

While for the availability of the indicator as follows:

1. Not available
2. Medium available
3. Very available).

The implementation of this tool was based in the focus group discussions attended by different stakeholders in the community. In order to collect the data related to the status of the natural resources in the community under-study; the researcher starts the process by asking the participants about the first indicator and then opens the gate for an open discussion among the participants; he should allow the participants for debate to come up with consensus answer for every selected indicator for each livelihood capital. The aim of this process is to give the participants in each community the opportunity to rate the importance and availability of each indicator for each livelihood capital. On this regard the participants were given the freedom to debate and come into consensus decision about the level of importance and level of availability of each indicator in their community. Once the process related to data collection is finalized. The next step would be the tabulation of the collected data and placing them in tables for further analysis capable to describe the status of the natural resources in the area under-study in terms of its importance and availability. The analysis of the tabulated data had included using spider-gram technique to represent every single capital rankings. This process of analysis is displaying each focus (importance and availability) separately. Arranging the data separately in one diagram visualizes the discrepancy between the importance and the availability of an indicator. Also frequency diagram was used for a possible frequency distribution of the availability of a capital's rankings. Figure-1 is representing the linkages between the five capitals of livelihood and the indicators of each capital. It should be noted that the indicators for each capital are not fixed to those mentioned, but those are the main ones.

IV. STUDY AREA

North Darfur State was selected for the purpose of this study for many reasons. Firstly: The majority of the populations drive their livelihood through harnessing the natural resources. Secondly: The whole area has been severely affected by deterioration of natural resources. Thirdly: the area has been described by low rainfall. Fourthly: The majority of the population are facing sever poverty. However, the survey was conducted in three localities in North Darfur namely Kalamendo, Dar Al Salam, Kabkabiya.

a. SAMPLE SIZE

The sample size was obtained by the following formula:

(1) $$ss = \frac{Z^2 * (p)*(1-p)}{c^2}$$

(2) Sample size = ss ÷ 1 + ((ss-1) ÷ pop.

Z = Z value (e.g. 1.96 for 95% confidence level). P = Percentage picking a choice, expressed as decimal (0.5 used for sample size needed). C = Confidence interval, expressed as decimal (e.g., .05 = ±5). pop = Population

The sample size was determined by the desired level of precision. Scientifically, it is known that the degree of precision increases as sample size increases. Also the level of precision can be increased by strata issuing more homogeneous sub-samples (Abdalla, H. S., 2008). Therefore due to homogeneity of the socio-economic characteristic of the agricultural community in North Darfur State and insecurity situation; the researcher

selected twelve focus group discussions (villages) across the study area.

V. ANALYSIS TECHNIQUES

Once the process related to data collection is finalized. The next step would be the tabulation of the collected data and placing them in tables for further analysis capable to describe the status of the natural resources in the area under-study in terms of its importance and availability. The analysis of the tabulated data shall include using spider-gram technique to represent every single capital rankings. This process of analysis is displaying each focus (importance and availability) separately. Arranging the data separately in one diagram visualizes the discrepancy between the importance and the availability of an indicator. Also frequency diagram shall be used for a possible frequency distribution of the availability of a capital's rankings. Figure-1 is representing the linkages between the five capitals of livelihood and the indicators of each capital. It should be noted that the indicators for each capital are not fixed to those mentioned, but those are the main ones.

VI. THE RESULTS

Table 1: Current/Existed Practices of Natural Resources Management: Table-1 Main sources of livelihood in the study area:

Locality	% of Farmers	% of Herders	Sources of livelihood		
			Farming %	Rearing Animals %	Trading %
Kalamendo	89	56	100	100	90
Dar Al Salam	91	36	86	57	57
Kabkabiya	91	22	100	75	100
Average	90	39	96	80	84

Table 1: is showing the main sources of livelihood of the population in three localities. On average about 90% of the population in the three localities are practicing farming, and about 39% are animal herders as well. The majority of the populations are driving their livelihoods from three main sources, namely farming rearing animal, and trading. The minimum number of herders was observed in Kebkabiya (22%) locality. This was attributed to the fact that about 25% of the populations in the locality are considered as Internally Displaced Persons residing in the urban areas and not rearing animals. Focusing on farming and rearing animals has led into competition over limited natural resources in the area. Latter analysis would explain the types of competition over natural resources and their effects on the livelihood of the population in the study area.

Table 2: Average Farm Size in the three localities:

Locality	Average farm size in mukhamas		
	Smallest farm size	Medium farm size	Largest farm size
Kalamendo	2	5	16
Dar Al	1.5	3	5.5
Kabkabiya	0.5	1	1.5
Average	1.5	3	8.5

The farm size per household is determined by various factors namely, potentiality of access to land, financial capabilities, security situation, family size etc.. The farm size was ranged from small, medium, and large. According to this assessment the smallest farm size is 1.5 hectares; medium farm size is three hectares, while the largest farm size is 8.5 hectares. On average about 35% of the populations are cultivating medium farm size , 55% cultivating small farm size, and only 10% are cultivating large farm size. The least farm size was observed to be in Kebkabiya locality. This is also attributed to the fact that many populations were not capable to access their original farms. On the other hand lands in the remote areas were used by animal herders which make it difficult for the farmers to access or to cultivate. This has made concentration of farmers along the wadis in small areas.

Table 3: Main crops cultivated in the study area:

Locality	Yield of Main crops in tones per hectare					
	Farme	Mille	Dura	Sesam	Groundnut	Watermelo
	89	0.2	0.72	0.4	0.72	0.38
Dar Al	91	0.4	0.9	0.8	0.63	
	91	2.0	1.98	12.0	0.45	
Average	90	0.8	1.26	2.4	0.63	0.38

Millet, sorghum, sesame, and groundnut were the main crops cultivated in the area. The yields for these crops were noticed to be very low. Table 3 is indicating the yields of some crops. On average the yield of millet was about 0.8 tons per hectare, 1.26 tones for one hectare of sorghum, and 0.63 tons for one hectare of groundnut. The highest yield per hectare for all these crops was observed to be in Kebkabiya locality. The farmers in Kalamendo and Dar Al Salam have maximized the farm size to compensate the low productivity of crops in those localities. Increasing the farms size has strong link with the availability of grazing for the animals. This is another sign of competition over natural resources. Bearing in mind there are significant number of nomads especially in the locality of Kalamendo. Beside these crops other crops were also cultivated, these are mainly vegetable crops such as tomatoes, potatoes, onions, beans, watermelon, etc.. the importance of these crops are varying from one locality to another. Kebkabia is quite famous on cultivating vegetable crops. The populations have long history on cultivating these crops. These crops are cultivated along the wadis under irrigation using pumps for lifting water. Nevertheless; many farmers are complaining about the intervention of animals before the completion of the harvest season. This risk has even led into elimination of late-maturity

crops from the crop combination in the area. The farmers in Dar Al Salam are also harnessing the banks of the wadis for cultivation of vegetable crops. But the concentration of these crops was observed in Shangil Tobay in the western part of Dar Al Salam locality.

Table 4: The Soil quality and Land fertility:

Locality	Soil qualities	
	Medium quality	High quality
Kalamendo	60%	40%
Dar Al Salam	29%	71%
Kabkabiya	25%	75%
Average	40%	60%

The communities were asked to evaluate the fertility of their farmlands according to their experiences if it is very poor in terms of fertility, medium quality, or very fertile. On average about 40% of the communities were informed that the soil fertility of their farmlands were classified as medium quality, while 60% have classified their farmlands as high quality. This information indicates that the soil quality is not one of the problems facing the population in the study area.

Table 5: Land allocation and Land use:

Locality	Percentages of Land allocation in each		
	Farming	Grazing	Forest
Kalamendo	43	52	34
Dar Al	67	31	8
Kabkabiya	36	54	33
Average	48	48	28

The communities have been interviewed about the average allocation of their area land for different purposes. On average according to perception of those communities about 48% of the land in their respective areas was used for farming, also 48% of the land was used for grazing of their animals. But only 28% of their lands were considered as forest lands. However; this allocation is different from one locality to another locality.

Figure-2 is indicating that the Dar Al Salam is the poorest in terms of forest availability, while Kalamendo is the richest locality in terms of grazing and forests. This is mainly due to concentration of the population in the urban areas due the recent conflict in Darfur. But the most important element to be noticed is the tremendous decreasing of forests in Kalamedo and Dar Al Salam localities.

Figure 1 is indicating the land use for the three communities (localities) under study.

Table 6: Forest Products:

Locality	Percentages of communities		Availability of forest products	
	Gum Arabic	Firewood/ building	Grazing	Fruits
Kalamendo	100	100	60	40
Dar Al	29	86	0	29
Kabkabiya	0	100	100	63
Average	48	96	56	44

The forests are very important component for the livelihood of the rural communities. Table-6 is showing the percentage of communities who claimed the products provided by their forests. Communities in the three localities were interviewed about the availability of forest products in their respective areas; on average about 48% of the communities have perceived that the forests are providing them with Gum Arabic. The majority (96%) of population in the three localities are informed about their dependence on the forests for firewood and building materials. About 44% of the communities have informed that forests are providing their communities with fruits for their own consumption and marketing purposes

Table 7: Animal Holdings:

Locality	Percentage of households with different animal Species			
	Cattle	Sheep	Goats	Camels
Kalamendo	90	90	90	20
Dar Al	71	86	86	0
Kabkabiya	80	79	96	75
Average	80	85	91	32

This table indicates the ownership of different animal species, but does not indicate the number of animals per household. The average holding within the IDPs communities is very minimal

Table 7 is showing the ownership of animal holdings by different communities. On average about 80%, 85%, 91%, and 32% of the communities have claimed the ownership of cattle, sheep, goats, and camels respectively. This does not indicate the number of animals per household, but it indicates the ownership of particular animal species by each community. This also indicates the availability of animal species and potentiality of competition over natural resources in case of resource scarcity. In this regard in Kebkabiya locality 100% of communities own cattle, sheep, goats and 75% own camels. Therefore the potentiality of competition over natural resources related to animal needs is very high.

Table-8 Main water sources in the study area:

Locality	Percentage of main water sources in the three localities					
	Borehole	Deep wells	Shallow wells	Hand pumps	Dams/ reservoi	Other
	80	10	0	10	40	10
Dar Al	71	0	0	43	86	0
	0	13	88	88	0	0
Average	52	8	28	44	40	4

Table 8 is showing the main sources of water in the study area. The research has shown the diversification of water sources in the study area. However; the available water for human or animal use is remained as one of the major problems facing most of the population in the study area.

Figure 2: Water point in Abu Zeraiga village

Figure 2: is showing the people queuing in Abu Zeraiga village in Dar Al Salam locality for getting water.

Status of livelihood elements in the study area:

Further analysis was focused on the five pillars described as the five capitals of the livelihoods for the population. These are namely the Human Capital, Financial Capital, Social capital, Natural Capital, and Physical C. Different localities have showed acquisition of different levels of the aforementioned capitals. However; the variations was not so significant, most of the localities are sharing similar characteristics of these capitals. Figure-1 to figure-8 are showing the perception of the communities about the livelihood pillars. For understanding the perception of the communities regarding the availability of the different livelihood pillars in each locality; it is recommended to combine reading spider chart and the frequency diagram for each locality.

Spider chart is normally indicating the general importance of the livelihood element and to what extent it is available in the area. While the frequency diagram is showing the perception of community about the availability of the livelihood element in the study area; it gives the percentage of the community who evaluated the availability if it is not available at all or moderately available, or very abundant. Given the possible differences between the localities in terms of the availability of the livelihood elements; the analysis was focused in each locality independently.

Figure 3. The status of natural resources in Kalamendo locality:

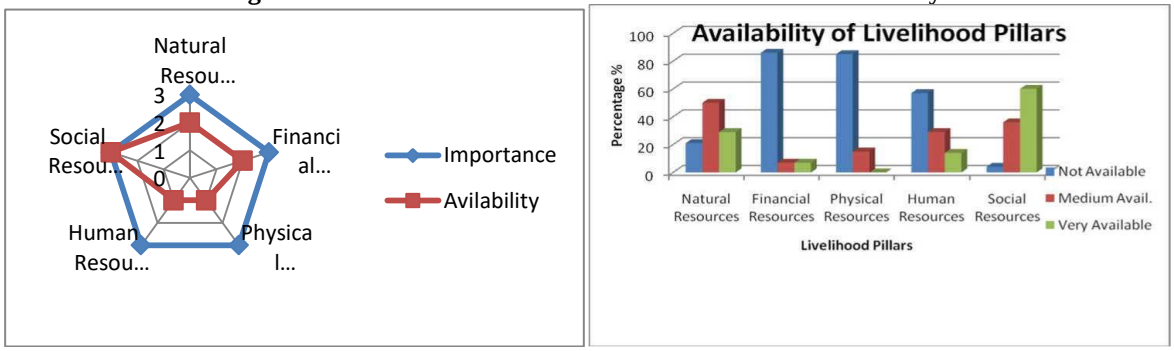


Figure 4. The status of natural resources in Dar Al Salam Locality:

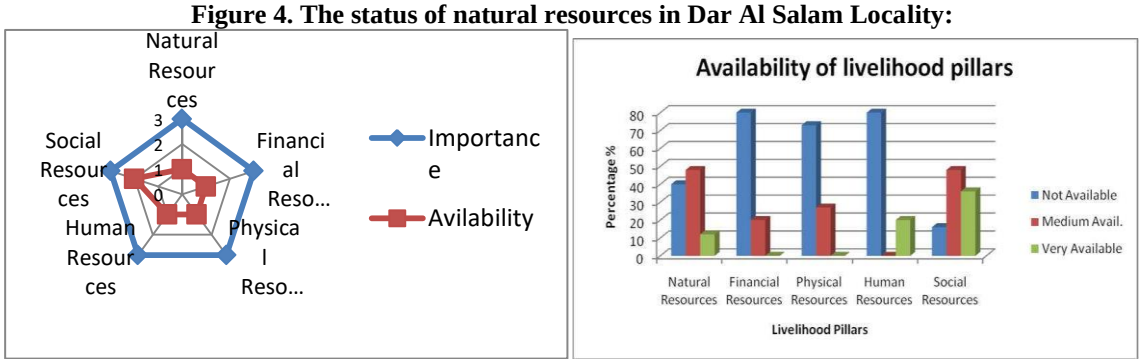
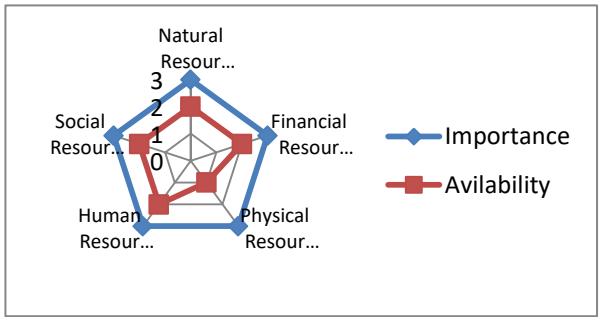
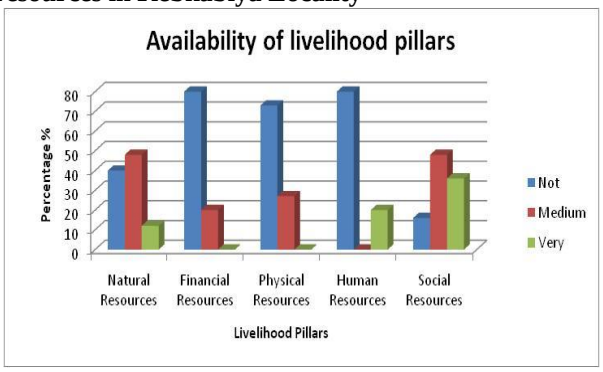


Figure 5. The status of natural resources in Kebkabiya Locality





The line in blue color is indicating the importance of the livelihood element, while the line in red color it's availability. The area in between is indicating the gap in the specific livelihood element.

vFigure 3 has shown the livelihood elements status in Kalamendo locality. The assessment has shown significant gaps in the availability of most of the livelihood elements pillars; this is with exception to social resources which seems to be well available compared to other livelihood elements. Figure 3 has indicated approximately 80% of the communities have stated the deficiency of natural, financial, physical, and human resources in their areas and less than 20% of the communities who have stated the availability of the aforementioned resources in their areas. It has been clearly indicated the availability of social resources in the locality of Kalamendo. Nearly 60% of the communities have stated the abundance of social resources in this locality compared to less than 5% who stated the deficiency of social resources.

Approximately over 80% of the communities in Dar Al Salam locality (figure 4) have described unavailability of livelihood resources related to financial and physical. Also 55% and 20% of the communities described unavailability of human resources and natural resources respectively. Based on these data it has become very obvious that there are large gaps between the importance and availability of the resources with exception of social resource which shown to be available to some extent in the three communities.

Kebkabiya locality (figure 5) is not an exceptional case. Approximately 60% of the communities have indicated that financial and physical resources are not available. And about 40% of the communities have described the natural resources and human resources as not available. In conclusion the analysis has stated a clear gap between the importance of the livelihood elements and their availability in the three localities.

Summary and conclusion of the Livelihood status in the study area:

Financial Capital: Financial saving, access to credit and remittances & and income levels over time are the main items affecting the financial situation of the communities. All communities have stated the importance of the financial saving and the remittances. Nevertheless; the availability of these items was described to be very scarce in most of the communities and completely not available in some of them.

Physical Capital: The lack of FC has directly affected the status of the PhC. The communities have stated the scarcity of agricultural implements for increasing the crop productivity, land size, household assets, and other infrastructures related to availability of water, electricity and access to roads.

Human Capital: Educational and health levels were described as very important for the livelihood of the communities. But the quality of these services was described to be very low and also very expensive. At the same time due to rainfall shortage and failure of crop production the labour was described to be available but not fully utilized.

Natural Capital: Soil fertility, access to land, water availability, grazing sources, forest resources, ownership of herds, gum Arabic trees, and land productivity were described by the communities in the three communities as the main natural resources affecting the livelihood of the people. These resources with exception of soil fertility were described as either moderately not available or scarce. The scarcity of these elements could lead into competition between different communities and it has great potentiality to lead into friction between the communities and sometimes might lead into conflicts between the communities.

Social Capital: Adherence to rules, Relationship of trust, Mutuality of interest, Leadership (accountability of elected representations), Ethnic networks, and Social organizations (clubs, football team, professional unions) are questions were used to evaluate the status of social element. In this regard all communities have claimed the high availability of these elements. This is with exception of some communities in Kebkabiya locality. Apparently this is logic due to the conflict situation in the area. The appearance of high degree of social elements among the communities in the three localities; it gives the impression that the level of cooperation between the communities is promising to support the livelihood pillars.

Deficiencies and Availabilities of Natural Resources elements in the study area:

Figure 6: Kalamendo Locality

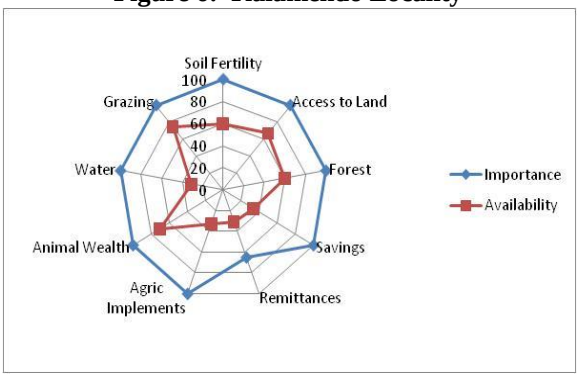


Figure 7: Dar Al Salam Locality

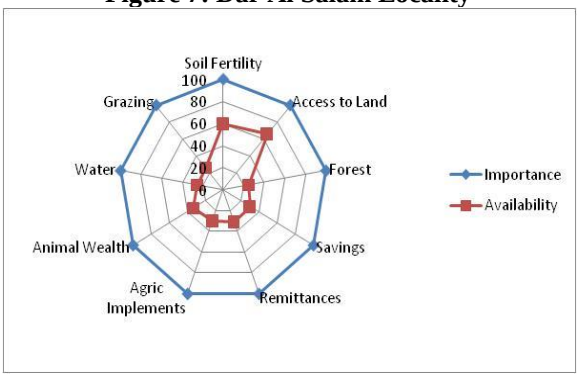
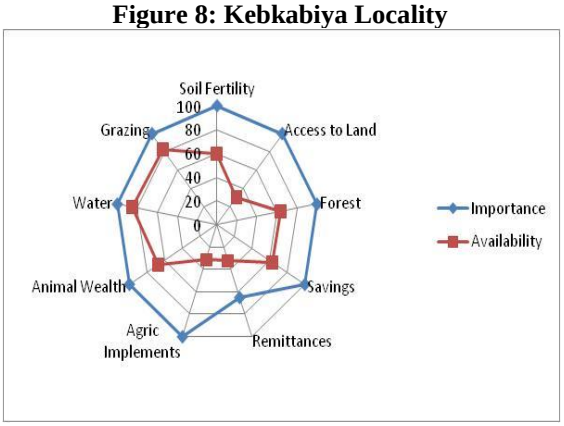


Figure 8: Kebkabiya Locality



Special care was devoted for the natural resources pillar which is the main area for this research. Specific issues related to the status of natural resources elements in the study area were discussed in more details below. The discussion was focused on the degree of importance and availability of access to land, forests, water, savings, agricultural implements, remittances, animal wealth, and soil fertility. In general there are huge gaps between the importance and the availability of most natural resources elements. But these gaps and availabilities were varying between locality to another. The upcoming details would give more explanations on this regard. These details are originated from the aforementioned figures (Figure 6, Figure 7, and Figure 8).

Access to land: Access to land was considered by significant number of communities as one of the important elements for the livelihood of the population. About 67% of the communities in the locality of Kalamendo have described the access to land as secure but only 30% of the communities in Kebkabia locality have described the access to land as secured, that means about 70% of the communities in Kebkabiya have challenges to access to land. The major reasons were mentioned as security concerns and not shortage of land.

Access to Water: Water was described by all communities as an important element. But only 31% and 25% of the communities in Kalamendo and Dar Al Salam respectively have described the availability of water in their respective areas. This indicates that approximately 75% of the communities in those localities are suffering to get water for human consumption and for watering their animals. The shortage of water was due to three reasons: the water sources are limited; inadequacy of water amounts in the available water sources, and the long distances to reach the water source itself. But 85% of communities in the locality of Kebkabiya have state the availability of water in their areas. It should be noted that all communities in Kebkabiya are getting water from the shallow wells along the valleys.

Animal Holdings: Approximately 70% of the population in Kalamendo and Kebkabiya own different animal species (no matter how many animals per household) and only 33% of the population in Dar Al Salam were claimed to own animals. The animal species were included cattle, sheep, goats, and camels in Kebkabiya. The populations who own small number of animals were normally keep them around the household yard and those who own large number of animals are normally keeping them away from the household peripheries.

Access to Grazing: About 75% and 83% of the communities in Kalamendo and Kebkabiya respectively have stated the availability of grazing in their areas; this is compared to only 26% of the communities in Dar Al Salam who confirmed the availability of grazing for the animals in their locality. That means about 74% of the population in Dar Al Salam are facing the shortages of grazing to their animals. The shortage of grazing and water in Dar Al Salam has led into complication of living situation to many people. To cope with such situation some of the populations have decided to migrate with their animals searching for water and grazing. Other groups of populations who were not able to migrate (probably due to limited number of their animals or due to other reasons) they have decided to collect the available grasses around their villages and even some of them have migrated to other villages for collection of grasses or hay. The collected grasses are kept for the dry season. Migrating to other areas for hay collection would cost the traveler to have strong donkey or more if available for carrying the grasses. The journey normally takes 1-2 days and so forth for 2-3 months after the rainy season. The purpose of this activity is to collect the grasses and give it to animals during the dry season when the grasses become Scarce in the area. This activity has stimulated many people to collect the grasses for trading purposes which has become source of income generating activities to many people. This probably types of trading mentioned by the communities in table-1.

Savings & Remittances: Financial savings is an important indicator about the capability of population to cope with the fluctuation of natural resources. Nevertheless; the populations in the three localities have shown low degree of capabilities to make savings or even no expectations of receiving remittances

from outside the area. Only about 30% of the population have the capability to make some savings or might receive remittances from other sources. Exceptionally in Kebkabiya locality about 63% of the population who are capable to make savings. This capability need to be noted as sign of capability of communities to make capital accumulations.

Agricultural Implements: the agricultural implements in this study was meant by the irrigation pumps, animal traction technology implements, tractors, pesticides sprayers, etc.. Use of technology is highly essential for increasing the productivity and the farmer income. Unfortunately only about 31% of the populations have confirmed to own some agricultural implements. This fact is linked with the inability of the populations to make savings or to acquire financial resources from any source such as lending institutions to help them obtain some technological inputs.

Soil Fertility: It seems that soil fertility is not a major problem in the study area. 60% of the populations have informed that their land is fertile, but the rainfall fluctuations are the major problems for the land productivity in the study area. People in the study area are using two types of lands; sandy soils and clay soils (along the valleys and the flooded areas). Most of the population using the clay soil they claim the high fertility of those lands. But rainfall fluctuations in many cases impede the utilization of those lands and low productivities of most crops. Water harvesting techniques are mechanisms capable to solve some of these problems. There were many local attempts to make interceptions along the valleys especially along the valley shared by the localities of Kalamendo and Dar Al Salam, but the incapacity of the populations are always behind the failures of such attempts. Any interventions related to such techniques would make positive outputs.

Forest: About 62% of the populations in the localities of Kalamendo and Kebkabiya have claimed the availability of forests in their areas. But only 25% of the populations in Dar Al Salam locality have claimed the availability of forests in their areas. That means about 75% of the population in Dar Al Salam locality have lost their forests over the past years. During the field survey it appeared that the majority of the populations are still using local material to build the houses, mass collection and transportation of firewood and charcoal to urban areas especially to Al Fasher. Even the description of forest availability is only meant by availability of some trees cover compared with other areas which are completely bare soils. Most of the populations did not confirm the availability of wildlife in their forests which means that the forests are of low density. Some populations are getting some wild food from their forests such as gum Arabic. However; those who claimed the availability of forests they confirmed that their forests are providing them with all local material for building of their houses.

Recommendations:

The study recommends the following

1. Provision of water

a) Increasing water capacity in Dar Al Salam locality

b) Management of existing water points in Kalamendo locality.

c) Construction of reservoirs for the herders in Kebkabiya locality and drilling of new water points in the grazing areas in Kalamendo locality to reduce the pressure in the water points for human consumption.

2. Food security:

a) Provide protection for the IDPs to cultivate their farms in Kebkabiya locality

b) Protect the farms during the harvest time in Kebkabiya locality

c) Construction of small dams along the valleys in Dar Al Salam & Kalamendo localities for seasonal cultivation.

3. Environment:

a) Encourage the population in the localities of Kalmendo and Dar Al Salam to use environmental friendly material for buildings.

b) Increasing the capacity of the local civil society organization on issues related to environment conservation such as protection of the existing forests and initiation of communal forests. In this regard it is highly essential to provide the local organizations with enough training programs to help them play positive role on environmental issues. This is for the three localities.

4. Capital formation:

Most of populations (20%) in the locality of Kalamendo and Dar Al Salam have indicated that they have no ability to make savings. About (60%) of the population in Kebkabiya have the ability to make saving. Putting into considerations these facts; it has become quite clear that those populations are not in a position to increase their farming sizes or to improve the agricultural practices using their own resources. Hence, provision seeds of early maturity varieties and agricultural implements are of high value.

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