Measuring Food Consumption using Coping Strategies Adopted by Farm Households in the Dry Land Sector of Sudan

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1. INTRODUCTION AND BACKGROUND

Measuring food security in the developing countries is very important. Although, it's costly assessment of both incidence and severity of food insecurity is necessary. Food security is defined as "people having at all times physical, social and economics access to enough food which meet their dietary needs and food preferences for an active and health live" (FAO, 2002). Considering this definition, food security has different dimensions. It can be measured by food frequency, food intake, coping strategies and anthropometry. Sudan is one of the developing countries with severe problems of food insecurity. The rural people are highly depending on agricultural sector in their livelihood and food consumption. Recently, this sector has experienced a continuous deterioration which appeared by declining its contribution to GDP from 49.9% in 1999 to 35.9% in 2008 (BS, 2009). On the other hand, the wide spread of poverty as well as other economic obstacles were lead to aggravate the dilemma of food insecurity in the country (Faki et al, 2009). In spite of the intervention of the government and Non-Governmental Organizations (NGOs) to improve the food security, people are still suffering from food deficit.

2. PROBLEM STATEMENT AND OBJECTIVE

The dry land sector of Sudan is characterised by traditional farming system and rainfall fluctuation assemble with difficult management of crops cultivation. Furthermore, drought and desertification have a significant impact on declining the productivity of food and cash crops. Thus, majority of farm households is facing a problem of food deficit due to the low access to food and lack of income earning from agriculture and related activities. This situation is obligating the farm households to adopt different coping mechanisms in order to secure their food consumption. The coping strategies which were adapted are acceptable and applicable under the culture and traditional sphere. Therefore, households had adjusted their food consumption by cutting the size and frequency of meals and changing their food diet (Teklu *et al*, 1999). Consequently, the objective of this study is to evaluate various strategies to cope with food insecurity. The study also describes and measures these coping strategies when farm households have no access to enough food within and between the seasons.

3. METHODOLOGY

This study based on a micro-level, and it is derived from a cross sectional primary data. The structured household questionniare is used to collect the data from 200 farm households in 17 villages distributed in the localites of Sheikan, Um-Ruwaba and Bara. The localities are allocated in the Western part of Sudan namely North Kordofan State. The data were collected in 2009 through the multi-stage random sampling technique. Moreover, focus group discussions with the key informants in the village communities were also conducted.

Data analysis procedures consist of descriptive statistics and Coping Strategies Index (CSI). The CSI is developed by CARE/WFP (2003) to measure the food security situation. The basic idea of CSI is to combine the frequency and severity of coping strategies. The frequency of coping strategies requires the means of scoring of relative frequency which measures how many days per week a household had to rely on the various coping strategies ranking from "never" to "every day". The severity of coping strategies is measured using focus group discussion via asking the

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individuals to classify their coping strategies based on their opinion (1=less severe, 2=moderate, 3=severe and 4=very severe). The means of scoring reflect the severity weight of each coping strategy that household has adopted. Thus, the CSI score is calculated by combining of both "frequency" and "severity" of coping strategies. The result of the CSI score denotes that a household with a higher value is more food insecure compared with a household with a lower value.

4. RESULTS AND DISSCUSSION

4.1 Descriptive statistics

The descriptive statistics reveals that eighty two percent of farm households have a problem of food insecurity. From those 88% have problem during the autumn (rainy) season. They recorded their problems as: higher food prices (21%), distance to market (20%), insufficient of income (23%), higher food prices and market distance (17%), higher food prices and insufficient of income (17%), market distance and insufficient of income (2%). About 78.5% of the repondents did not have enough money to buy food while, 76% did not have enough food during the past 30 days of both dry and rainy seasons.

4.2 Coping Strategies Index (CSI)

The individuals in the selected localities set a degree for each developed coping strategy based on the severity. Therefore, the average severity weight is calculated by multiplying the average degree of severity for each strategy by the consensus ranking of the same strategy. The result of the average severity weight is presented in Table1. It obviously exhibits that the individuals give low severity degree for "rely on less preferred and expensive food" while, they are given high severity degrees for "asking for help" and "send household members to eat everywhere". This is because these coping strategies are indicating the source of shame in Sudan. Conversely, "slaughter of livestock" is a very severe coping strategy since livestock is a source of income and wealth for the rural farm households.

Table 1: Result of average severity weight for various coping strategies in the selected localities

Coping strategies	Sheikan	Um-Rwaba	Bara
Rely on less preferred and less expensive foods	2	2	2
Borrow food, or rely on help from a friend or relative	4	6	4
Purchase food on credit	4	4	4
Gather wild food or harvest immature crops	6	6	6
Consume seed stock held for next season	6	8	6
Send household members to eat elsewhere	8	8	8
Skip entire days without eating	6	6	6
Reduced number of meals eaten per day	4	4	4
Migration for labour	6	6	6
Slaughter of livestock	8	8	8
Asking for help *'mosada'*	9	10	10

Alternatively, the results of the relative frequency explain the difference between using the same coping strategy in dry and rainy seasons (see Table 2 and 3). Comparing the two tables, it undoubtedly appears the increase in the weight of relative frequency for adopting the coping strategies in rainy season compared to dry season. The main reason for that is that the farm households are attempting to fill the food consumption gap during the autumn season.

Table 2: Frequency of coping strategies during the dry season

Coping Strategies	Never / week	Hardly at all <1/ week	Once in awhile 1-2/ week	Pretty often 3-6/week
Rely on less preferred and less expensive foods	34	77	46	0
Borrow food, or rely on help from a friend or relative	46	39	72	0
Purchase food on credit	34	45	78	0
Gather wild food or harvest immature crops	62	66	25	4
Consume seed stock held for next season	67	55	35	0
Send household members to eat elsewhere	142	15	0	0
Skip entire days without eating	60	74	21	2
Reduced number of meals eaten per day	41	61	34	21
Migration for labour	0	16	59	82
Slaughter of livestock	70	42	35	10
Asking for help or *'mosada"*?	153	2	2	0

Table 3: Frequency of coping strategies during the rainy season

Coping Strategies	Never / week	Hardly at all <1/ week	Once in awhile 1-2/ week	Pretty often 3-6/week	Every day
Rely on less preferred and less expensive foods	0	4	30	87	36
Borrow food, or rely on help from a friend or relative	3	10	67	49	28
Purchase food on credit	0	6	66	70	15
Gather wild food or harvest immature crops	111	33	13	0	0
Consume seed stock held for next season	4	22	86	45	0
Send household members to eat elsewhere	121	36	0	0	0
Skip entire days without eating	8	51	88	7	3
Reduced number of meals eaten per day	0	23	49	57	28
Migration for labour	97	40	14	6	0
Slaughter of livestock	69	47	33	8	0
Asking for help or *'mosada"*?	151	4	2	0	0

However, the relative frequency and severity weight together are used to obtain a quantitative measurement of food security known as coping strategies index (CSI). The CSI score for both rainy and dry seasons is illustrated in Table 4. It obviously emerges from the table that Um-Ruwaba locality has a higher CSI in rainy season of about 69.7 score relative to other localities. This indicates that Um-Ruwaba is more food insecure comparable to Bara and Sheikan during the rainy season. On the other hand, Um-Ruwaba and Sheikan have the same CSI score of about 36.9 in the dry season. The result of CSI score denotes that there is a significance difference between dry and rainy seasons. This means that farm households are facing a problem of food deficit and they are becoming more food insecure in rainy season due to the seasonality effects. The CSI score reflects that there is no significant difference among the situation of food insecurity between the localities in both seasons. In contrast, the percentage food gap between rainy and dry seasons relative to dry season for the selected localities is demonstrated in Table 4. The level of the percentage food gap is high for Um-Ruwaba of about 89% whereas, for Bara and Sheikan the percentage food gap makes a difference of 78% and 71% respectively (see Figure 1). This result exhibits that in Um-Ruwaba there is higher food consumption gap relative to other localities.

Table 4: Coping Strategies Index (CSI) Score in both rainy and dry seasons

	Selected Localities						Total (N=200)		
	Sheikan (N=84)		Um-Ruwaba (N=58)		Bara (N=58)				
Seasons	Mean	St.D.	Mean	St.D.	Mean	St.D.	Mean	St.D.	T-test
Rainy	63.2	36.9	69.7	35.3	66.8	35.7	66.1	36.0	-20.45***†
Dry	36.9	23.8	36.9	22.4	37.6	22.5	37.1	22.9	

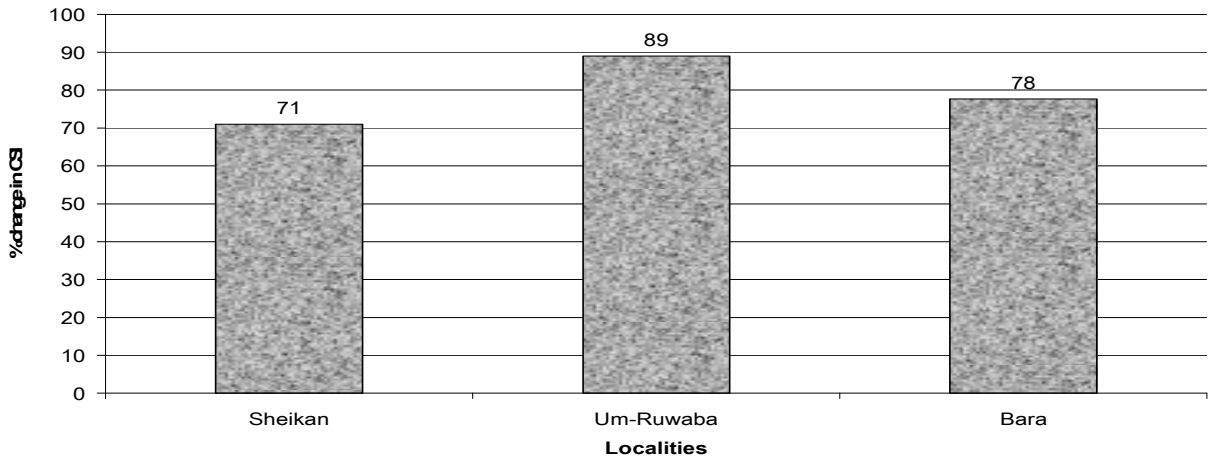

Figure 1: The percentage food gap between rainy and dry seasons in the selected localities

5. CONCLUSIONS AND RECOMMENDATIONS

The result of CSI reflects that the farm households are suffering from food insecurity within and between the seasons. The seasonality has also a greater impact on their food security status. The problem of inaccessibility to food is clearly emerging due to food deficiency particularly in rainy season (hunger period) during June to October. This occurs mainly due to lack of income which contributes negative to food accessibility. The study recommends that more attention should be given to the farm households in the dry land sector of Sudan particularly during the rainy season. Supporting the farm households is required through successful policy decision-making to facilitate the access to food, improving access to market, credit and encouraging the off-farm activities. As well, the periodic monitoring of food security and food subsidy are necessary needed during the rainfall period to reduce the food consumption gap.

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† Significant difference at 1% level