The Role of Vet Care Organization on Enhancement of Rural Women in Dry Lands in Bara Locality North Kordofan State, Sudan

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Abstract: The current study was conducted in Bara Locality, North Kordofan State; in 2017.The overall objective of this study was to identify the role of Vet Care OrganizationVCO on Rural Women Enhancement in Bara locality. The objectives were to evaluate previous intervention by VCO and identify lessons, to investigate women knowledge about climate change and agricultural practices and the causal factors of climate change, to Identify opportunities for future development by determining the optimum crop combination that maximize the profit. Primary data were collected via constructed questionnaire introduced to households. A sample size of 144 (72 with and 72 without the project) households representing about (18.3%) from total households (786) living in the study area were selected using simple random sampling technique. Data were analyzed using descriptive statistics, Gross Margin analysis, and linear programming model. The results showed that, majority of the respondents in and out project have knowledge about climate change (77.8% with project versus 80.6% without project) and they identify the indicators of climate change as fluctuation of rainfall, soil degradation and pests. VCO project of Women Empowerment succeeded to achieve a considerable amount of its objectives where all respondents received training in agricultural activities, agricultural inputs and drip irrigation system. Also gave good economic impact by improving productivity of crop production 50% more than before, 100% of them confirm that they received drip irrigation system and technical training in installation and maintenance and training in vegetable production, 86.1% confirmed that they got benefits from extension services and 90.3% of them confirmed they received environmental identification. The results revealed that on average gross margin per feddan for sorghum, millet, groundnuts, sesame and Roselle were SDG 1025.25, 1422.5, 832, 1758 and SDG 661 respectively. The optimum crop combination was to cultivate 5.434 feddan of sesame to get maximum gross margin equals SDG 9553 plus growing some food crops as millet and sorghum according to their gross margin results. 97.2% of the respondents mentioned that VCO project has succeeded in achieving its objectives. The study recommends the cultivation of sesame as cash crop and millet and sorghum as food crops.

Keywords: Optimality, VCO, Dry lands, Gross Margin, North Kordofan

I. INTRODUCTION

The past three decades have witnessed a steadily increase in the global awareness of the plight of impoverished women in developing countries and the need for social, economic, political and gender equity as well as access to fundamental human rights.

Since the late 1970s, NGOs have played an increasingly prominent role in the development sector, widely praised for their strengths as innovative and grassroots driven organizations with the desire and capacity to pursue participatory and people centered forms of development and to fill gaps left by the failure of states across the developing world in meeting the needs of their poorest citizens. Vet-Care Organization (VCO) is a Sudanese non-governmental, non-political, non-ethnic, non-religion and not-for-profit organization; with independent legal entity established in accordance with the Humanitarian and Voluntary Work Act. VCO was founded in 2003 by a group of Sudanese professionals who worked in rural development projects (Sudan Village Concept projects I&II) while they were University students.VCO aims at empowering rural communities to achieve food security, improve livelihood and peace through helping them develop their organizational and technical capabilities and support them with technical inputs and link them with relevant resources and markets. In order to achieve its strategy, VCO activities are guided by three priority themes:

- Improvement of Sustainable Rural Food Security and livelihood
- Support of Social Services

☐Community development and peace building

Women make significant contributions to the rural economy in all regions of the world. In developing countries, women make up on average about 40 per cent of the agricultural labour force, ranging from 20 per cent in Latin America to 50 per cent or more in certain parts of Africa and Asia. Women's roles range from being cultivators on their own or others' plots – as unpaid or paid workers, employers or employees – to being wage-laborer's in on- and off-farm enterprises, alongside their key role as providers of unpaid care work in their households and communities. However, in many settings women face more constraints than men in accessing key productive resources such as land and services such as credit, extension and social protection; they face wage discrimination in rural labour markets and often work without remuneration on family farms. This limits their capacity to contribute to agricultural production and take advantage of new opportunities. On average women spend 85–90 percent of their time each day on household food preparation, child care and other household chores. Women's triple work burden in the productive, reproductive and social spheres, in contrast to men's, limits their potential to take advantage of new opportunities. (FAO andSOFA,2011). The Beijing Declaration and Platform for Action (1995) emphasized the need for the formulation and implementation of policies and programmes that improve the situation of women producers in rural areas increase their incomes and provide household food security. Non-governmental organizations (NGOs) are now recognized as key third sector actors on the landscapes of development, human rights, humanitarian action, environment, and many other areas of public action,(Lewis,D,2007). The past three decades have witnessed a steadily increase in the global awareness of the plight of impoverished women in developing countries and the need for social, economic, political and gender equity as well as access to fundamental human rights. Women have achieved significant progress in some parts of world but continue to be marginalized and undervalued in the developing world (Augusto and Zahidi, 2005). Societal beliefs continue to hinder progress in women's empowerment in many parts of the developing world (Cohen, 2006). Compared to men, women in developing countries work longer, receive less money, have more responsibilities, have less schooling and have poorer health (Ghorayshi& Belanger, 1996). Since the 1980s, there has been considerable growth in the volume of research that focuses on the conditions, lives and experiences of women in developing countries have been witnessed (Ghorayshi& Belanger, 1996). As a result, almost every country has established policies, programs, and government ministries to deal with the issues facing women (Ghorayshi& Belanger, 1996).

Women play an important role in dry lands development, managing land, crops, forest and water resources, which affect the livelihood options of families.In many of the dry agricultural areas of the world, including much of Africa, women traditionally devote much of their time and effort to the land. They grow process, manage and market food and other natural resources. They may have gardens, work in the fields, raise small animals, co Many invest great vigour and energy into ensuring the day-to-day survival of their families and communities (Reynolds, et al., 2003). Recent discussions of climate change in rural areas including dry lands are important not only because of the threat of climate change itself, but also because this literature specifically attempts to illuminate the broader context of environmental, demographic and socio-economic trends that shape vulnerability to climate change and are sometimes referred to as 'non-climate stressors' in climate change literature. There are a range of global trends that are affecting the prosperity and prospects of rural communities in developing countries (Dasguptaetal, 2014). Rural areas, globally, are particularly vulnerable to climate change, because of their already higher levels of reliance on agriculture and natural resources make them especially sensitive to climate variability, extreme climate events and climate change, and because of 'existing vulnerabilities' such as poverty, lack of investment, remoteness, isolation and poorer levels of education (Dasguptaet al, 2014). Land rights are important for the resilience of individuals, households and communities. Women tend to have access to and control of weaker 'bundles' of land rights as compared to their male counterparts in developing countries, although patterns are context specific,(UN, 2013; Deere and Doss, 2006; Adelman and Peterman, 2014). The root of inequality with respect to women's land rights is found in patriarchal gender norms in statutory and customary land tenure systems, as well as on-going processes of land privatization,(IFAD, 2006,and FAO, 2003,Agarwal, 1994and Adelman and Peterman, 2014).Women have limited decision-making authority and representation with respect to land, and institutional gender bias and capacity impede women's land rights, (Bezabih and Holden, 2010andSircar and Pal, 2014). In some dry land societies there are particularly strong patriarchal and communal sociocultural norms which can exclude women: In sub-Saharan Africa and Asia, settlement patterns are mainly (i.e. women settle in the husband's community and on his land) and women tend to be restricted to use rights derived from men through marital status, which is linked to male lineage,(Berge et al., 2014; Odgaard, 2012). A number of obstacles constrain dry land women's access to animal health care. In sub-Saharan Africa, the key factors have been identified by Miller (2011): men receiving most of the training and replacement stock; information being

shared through usually male-dominated dip tank committees or livestock producer groups;

Limited sharing of information by men with their wives, livestock training oriented towards men. Dry land women tend to have more limited access to markets than their male counterparts and opportunities are being missed because of the focus on larger stock. lack of access to credit because of a lack of collateral; limited experience in capturing value in value chains; limited access to markets; a lack of time for income generating activities; limited self-confidence; lack of access to family and community decision-making, including in development projects ,(Rota *et al*, 2012) Dry land girls and women tend to have much less access to education. Educational achievement overall is low for pastoral areas of African countries compared to national averages and girls fare worse than this, for example in Kenya (Krätli and Dyer, ibid).Resilient households tend to have higher levels of education and this was perceived to partially account for their higher levels of access to diverse sources of income, (UNDP, 2014).

II. PROBLEM STATEMENT

Bara is one of North Kordofan 8 localities, and it lies in the northern part of the state, about 40 km from Elobeid and 740 km from Khartoum, with 361,000 inhabitants. The targeted areaof project six villages (Omgalaji, Aldrais, Omshegel, Altegour, Alsider and Algeneina villages, with 5,500 inhabitants) distributed in two administrative unit Jerejekh and Bara rural. The Agricultural system in the area is traditional rain–fed sector, women play crucial roles in food production, rearing of small animals and income generating activities. There are some perceived needs and constraints in the target population limit the contribution of women to household food security and improving livelihood standard in the project area including.

- Environment of chronic draught, shortage and the social climate of patriarchy.

Objectives of the study

The overall objective of this study was: to evaluate the role of Vet Care Organization on enhancement of rural women in dry lands.

While the specific objectives were distinguished as:

1. Evaluate previous intervention by vet care and identify effects
2. Investigate women indigenous knowledge about climate change and agriculture practices.
3. Identify opportunities for future prospect development.

III. MATERIALS AND METHODS

Data Sources

In order to achieve the research objectives, the study utilized both primary and secondary data. The study focuses on household unit to fulfill the objectives. The secondary data were obtained from different sources, such as references, internet and workshop reports, journals, periodicals, previous studies and publications related to topic to gather essential information and data.

Sampling techniques and sample size

Primary data was collected from field using constructed questionnaire introduced to households by direct interviewing. Questionnaire was pre-tested and validated. A sample size of 144household represents about (18.3%) from total of households (789) living in the research area was selected appendix 2. Due to similarity in agriculture production conditions and great homogeneity of the small farmer household in socio-economic characteristics in terms of resource acquisitions, income source and consumption habits, the study adopted simple random sampling technique to reduce the sampling errors and increase the reliability of the results. From the six villages where the project works a total of 144 respondents were selected randomly .

Methods of analysis

Descriptive statistics

The study utilized descriptive statistical analysis (averages, frequency distribution and percentages) as well as infernal statistics, the importance of information obtained using statistics. (Musaab, 2011).

Gross margin analysis

Gross margin analysis was used for variable cost and returns analysis of the various crops grown in the study area, and it is a method of organizing data and information about the costs and returns of various alternative activities to calculate gross field returns. Itis necessary to know the field prices of crops and the total cost of production for each crop. The calculations are based on the following formulas:

Total Returns = productivity/Fed x selling price.

Net Returns = total returns — total variable cost

Hence the income from cash crops is quantified as the main source of household income. Other sources such as livestock and the off-farm incomes are also determined.

Returns of Livestock production is calculated as follows:

Income N x Q x S x P

100

Where: N = the total number of households in each rural council of the locality.

Q = the percentage of households owned animals in each rural council.
P = the number of animals sold annually.

S = the selling prices. (Musab,2009).

Off-farm income comes from practicing different activities often or during the agricultural season such as the fire wood and charcoal collection, hand farm work, village trader, city work and remittance.

The average off-farm income s estimated by collecting the returns from each activity. Household net income could be accounted by adding these incomes (Musab,2009).

Linear programming analysis

Expression of linear programming model

MaximizeZ= ∑cjxj+$\sum$cj*xj* objective function

Subject to:

$\sum$aijxj≤ bi constrained equation

Xi and xj* ≥ 0 non-negativity constraint activities

Where:

Z = maximization function subject to the following constraints

Land/feddan.

Labor (man-days)

Capital (SDG)

Productivity (Kg/fed).

The activities:

Sesame production = X1

Groundnuts production = X2

Rosella production =X3

(i)Land (feddan)

a I jxj<Cl
(3.1) …….

a I j is the available land

Where cL is the size of household cultivated land.

(ii) Labor (man-days)

rndij< D
(3.2) ……

Where:

D is the available man-days for the production activities.

mdij is the required man-days fir the production activities.

(iii) Capital (SDG)

k I j x j <Wk
(3.3) ……..

Where:

Wk is the amount of available working capital

Kij is the amount of required working capital.

(iv) Productivity Kg/fed.

a ij P D > p
(3.4) ……..

Where:
P is the available productivity for production activities.

aijPD is the required productivity for production activities.

Maximize Z = 2 cjxj + cj*xj* (i.e. objective function) (3.5)
Subject to constraints

aijxj< bi constrain equation

Xj an dxj> o

Where:

Z = gross margin.

Cj = price of production.

Cj* = price off-farm production.

= level at productivity activity”. Xj*

Xj* level of off-farm.

aij = resources required.

bi = resource available.

J = number of activities.

i = number of resources.

IV. RESULTS AND DISCUSSION

Knowledge and indicators of Climate Change in VCO project in Bara locality

Long experiences with climate change in targeted area and availability of indigenous knowledge of climate change among respondents within and out project. According to table (1) the study showed that, majority of respondents in and out project have knowledge of climate change were, 77.8% in project versus 80.6% out project. Also respondents in and out project have knowledge of climate change and they can identify the indicators of climate, 31.9% Fluctuation of rain from project respondents versus 9.7% out project, 2.8% Soil degradation for in project versus 4.2% out project, 5.6% pests for in project versus 8.3% out project, 37.5% Fluctuation of rain, Soil

degradation and pests for in project versus 58.3% for out project.

Table (1) Knowledge and indicators of Climate Change in VCO project in Bara L.

Items	Within Project %	Out Project %
Knowledge of climate change		
Yes	77.8	80.6
No	22.2	19.4
Indicators of Climate change		
Fluctuation of Rain	31.9	9.7
Soil degradation	2.8	4.2
Pests	5.6	8.3
Fluctuation of rain, Soil degradation and pests	37.5	58.3

Field survey 2017

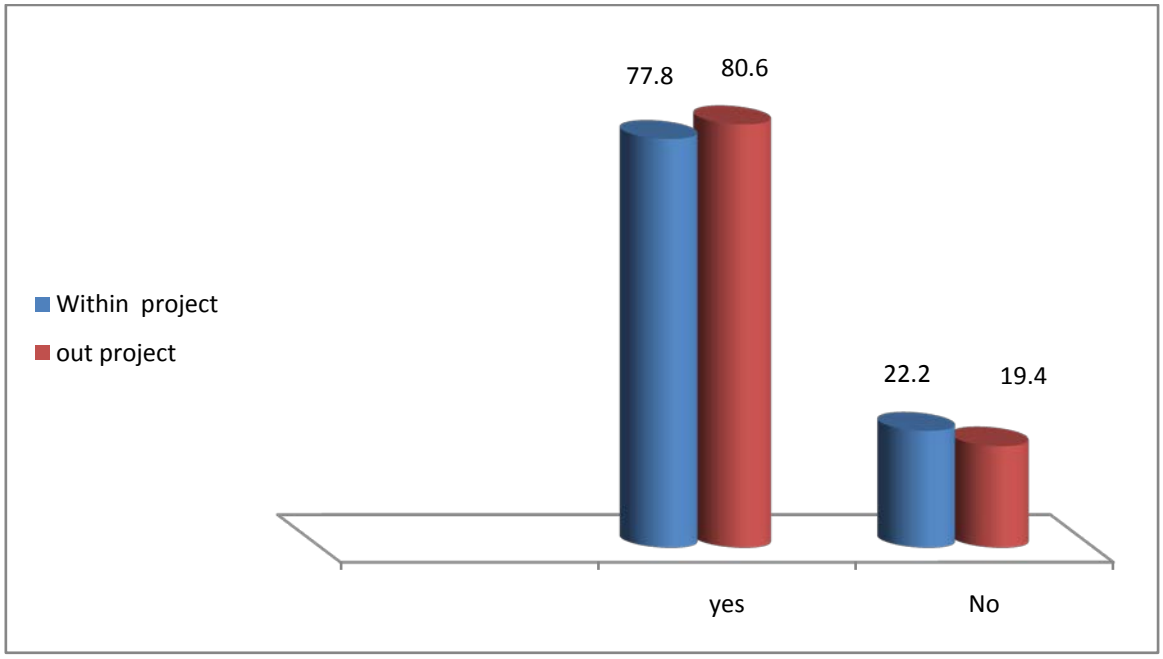

Figure 1: Knowledge about Climate Change in Bara L.

Jubraka* production and drip irrigation system in VCO project of Bara L.

To increase household's income and nutrition VCO succeeded to train 104 household women in drip irrigation, technical training in installation and maintenance of drip irrigation besides training in vegetable production. According to table (2),100% of the respondents confirmed that they have Jubraka, while 88.9% confirmed, that they received training in vegetables production from the project, vegetables produced by respondents in their jubraka were, 48.6% grow cucumber, watercress, okra, 51.4% grow Tomatoes, cucumber, watercress, okra, while 100% of them confirm that they used drip irrigation system in their Jubraka , while100% of respondents confirmed that they received training in drip irrigation from VCO project, where 65.3% of them faced problems of drip irrigation compare with 62.5% that they benefit from drip irrigation system in their Jubraka.

***small piece of land around houses in a village cultivated by women for vegetables and other family needs production**

Tabl:(2) Jubraka production and drip irrigation system in VCO project of Bara L

Items		Within Project
		%
Availability of Jubraka		
	Yes	100.0
Training in vegetable received from VCO		
	Yes	88.9
	No	11.1
Types of vegetables produced		
cucumber, watercress, okra		48.6
Tomatoes', cucumber, okra and watercress.		51.4
Type of irrigation		
drip irrigation		100.0
Training of drip irrigation received from VCO		
Yes		65.3
No		34.7
Problems of drip irrigation system		
Yes		62.5
No		37.5
Benefits of vegetable produced by drip irrigation		
Increased Income		12.5
Improvement of family Nutrition		51.4
Increased Income and Improvement of family Nutrition		23.6
Increased Income, Improvement of family Nutrition and Social Participations.		12.5

Field survey 2017

Extension Services in VCO project in Bara locality

Agricultural department of Bara locality has Memo random of understanding(MOU) with VCO to provide technical support for the respondents during project period .Result in table (3) revealed that, the frequent visits of extension officer to the respondents during VCO project , were, 19.4% weekly visits, 69.4% after two weeks,8.3% after three weeks,2.8% per month, where of them(86.1%) confirmed their benefit from extension services provided by agricultural department in Bara locality during VCO project, compared with 90.3% of respondent received environmental identification from extension services providers .

Table (3) Extension Services in VCO project in Bara locality

Items	Within Project
	%
Extension visits	
Weekly	19.4
after two week	69.4
after three weeks	8.3
per month	2.8
Visit benefits	
Yes	86.1
No	13.9
Environmental identification received from extension	
Yes	90.3
No	9.7

Field survey 2017

4.9. Gross Margin Analysis Results

Gross Margin of the Crops:

On average gross margin per feddan for sorghum, millet, groundnuts, sesame, Roselle were SDG 1025.25 , 1422.5, 832, 1758 and SDG 661 respectively. Table (4).

Table (4): Partial Crop Budget for Bara locality by kg and SDG/Feddan

Item	SDG				
	Millet	Sorghum	Sesame	Groundnuts	Roselle
Land rent	57	50	50	65	50
cleaning	59	54	51	55	40
Plowing	95	60	59	62	50
Seeds	9	15	15	18	11
cultivating	51	50	62	58	40
first weeding	86	114	52	65	80
harvesting	88	87	55	50	45
collecting	50	58	49	45	49
Threshing	51	63	60	-	50
pesticide	-	-	-	-	-
deportation	8	9	6	4	4
sack	9	6	6	6	6
Total V. cost	**589**	**567**	**465**	**428**	**497**
Yield (Kg/fed)	298	275	266	180	200
Field price	6.75	5.79	8.36	7	5.7
Gross output	2011.5	1592.25	2223	1260	940
Gross margin	**1422.5**	**1025.25**	**1758**	**832**	**661**

Source: field survey 2014,

Optimal Solution for Linear Programming Model:

The optimum crops combination for the household in the study area was to cultivate 5.434 feddans of sesame to get a maximum total gross margin of SDG 9553.Table (5).

Table (5) optimal solution of the linear programming model in Bara Locality

Crop	Area/ feddan	Gross margin/Feddan	Value/SDG
X1	0	1422.5	0
X2	0	1025.25	0
X3	5.434	1758	9553
X4	0	832	0
X5	0	661	0
Total			9553

Project Assessment from Respondents Point of view within the project:

Study revealed that 97.2 from respondents mentioned that the project has succeeded and applicable. According to table (6), general assessment of VCO project activities were, 40.3% Successful and applicable for the project areas in terms of the application, 56.9% Successful and needs some improvements to be applicable with the project areas.

Table: (6) Project Assessment from Respondents Point of view within the project

Items	Within project
	%
Successful and applicable for the villages in terms of the application.	40.3
Successful and needs to some improvements to be applicable with the areas.	56.9
It is not successful and must be reconsidered.	2.8

Field survey 2017

V. CONCLUSIONS

100% of the respondents confirmed that they have Jubraka, while 88.9% confirmed that they received training in vegetables production. 100% of them confirmed that they received training in drip irrigation from VCO project and 62.5% confirmed that they got benefits from drip irrigation system in their Jubraka. 86.1% of the respondents received extension services, provided by, agricultural department, Bara locality during VCO project, and majority of respondent received environmental identification from extension services providers. On average gross margin per feddan for sorghum, millet, groundnuts, sesame, Roselle were SDG 1025.25, 1422.5, 832, 1758 and SDG 661 respectively. The optimum crop combination was to cultivate 5.434 feddan of sesame to get maximum gross margin equals SDG 9553 besides growing some food crops.97.2 % of the respondents mentioned that the project was successful and applicable.

VI. RECOMMENDATIONS

- To adopt the optimality by growing sesame in large scale plus some food crops.

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