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Production and Marketing of Vegetables Crops in Khartoum State, Sudan

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Abstract – **Khartoum State ranks top among other states in Sudan regarding to production and consumption of vegetables that relates to the higher increase in population growth, income level and nutritional awareness.**

Vegetable crops usually are produced by small farmers in Khartoum State and there is many problems and difficulties face the farmers. There are no use of agricultural machinery in production and harvesting of vegetables in addition to high cost of production and marketing problems. This paper's aim is to develop a detailed description of socio economic characteristics, farming system, production and marketing of vegetables' crop in Khartoum State. It also aims to assess the problems and obstacles which face the vegetables farmers.

Farmers use both local and improved seeds verities to grow vegetable crops. The use of seeds depends on the type of the crop; for example, imported improved seeds are a must to use when growing crops like potatoes due to the unavailability of technology to produce them locally while local or imported seeds can be used to grow the onion crop. The increased production cost of some crops leads to increasing vegetables prices when they are offered in the market so that the price could be rewarding compared to production cost. Nevertheless, this affects the demand on these crops negatively. Vegetables' farmers not having appropriate places for displaying and selling the crops in big and central markets, especially with the considerable number of merchants who display their vegetables in seasons which might lead to decreasing vegetables prices because of the increasing supply. The high taxes and commissions of the market. This makes vegetables prices increase which, in return, leads to prices instability.

Keywords – **Production, Marketing, Vegetable, Sudan.**

I. INTRODUCTION

Vegetable and vegetable products especially processed forms imported form an essential part of the food in most African countries. This involves the use of limited hard-earned foreign exchange available. Vegetables are important items in the human diet because they supply nutrients such as vitamins and minerals and the bulk of roughage the body needs and which are often lacking in most traditional staple foods.

Vegetables are known to enrich some diets with nutrients including lipids, carbohydrates and vitamins [11]. Vegetable crops are important for almost every household. According to [4], vegetables add flavor to the food and also provide considerable protein, vitamins and minerals. Most vegetables are low in starch content and are a good source of phytonutrients. They serve as roughage, which promotes digestion, and prevent constipation. Vegetable crops not only improve the nutritional quality of diets, the production of vegetables under irrigation and their marketing provides many people with employment in the dry season.

Like other agricultural commodities, low producer and high consumer prices characterizes vegetable markets a phenomenon that suggests an inefficiency marketing system [1].

The increasing populations of most tropical countries have led to a new awareness of the importance of vegetable crops as a source of food, accompanied by the realization that many vegetables can supply essential nutritional materials which may not be readily available from other sources [14]. Vegetables play an important role in income generation and subsistence. Recent surveys carried out by the Natural Resources Institute in Cameroon and Uganda provide evidence that vegetables offer a significant opportunity for the poorest people to earn a living, as producers and /or traders, without requiring large capital investments. They are important items for poor households because their prices are relatively affordable when compared to other food items [13].

The basic trust of the economics of agricultural production at the micro level is to assist individual farmers or group of farmers to attain their stated objectives through efficient intra farm allocation of resources during a period or over a period of time. Economics of agricultural production is achieved either by maximizing output from given resources or minimizing the resources required for producing a given output [2].

Vegetable production and harvested area in the Sudan had increased over time from 1990 to 2004, but the yield had fluctuated during that period.

Vegetable production in the Sudan had increased over the last 10 – 15 years from 1980 – 1995 from approximately 795000 MT to 900000 MT. More specifically, tomato production grew from 86000 MT to 151000 MT during this period. Onion production increased from 33000 MT to 40000 MT [6].

In 1990 the total grown area with vegetable in Sudan was about 122000 Fadden, less than 1 percent of the total cultivable area in the country. Although the area of vegetables is much less compared to other crops in the country, the returns generated by these crops were considerably high [3].

[15] Reported that 54 percent of the pump schemes lie in the eastern part of the main Nile constituting the main production area for vegetables in Khartoum State. They are characterized by good soil and relatively enlightened experienced producers.

Khartoum State has an international airport which encourages the development of specialized vegetable export industry in the country [3].

Vegetables are usually produced by small farmers in rain-fed areas, irrigated private farms or the big government schemes. Compared with cash crops like cotton and with

the staple food grains, little attention has been paid so far to vegetable production. Therefore, reliable data on the area and production of vegetables are difficult to obtain. With respect to regional distribution, the Central State is by far the most important production area, followed by the Northern State. Production in the remote areas of Western and Southern Sudan is subsistence-oriented [8].

The important vegetables produced in Sudan are onion, potato, tomato, okra, cucumber and egg plants. With regard to area, onion ranks first, followed by tomatoes. Also widely grown are okra, cucumbers and eggplant. Onion is grown all over the country but is concentrated in the Central and Northern States. It occupies about 25% of the area under vegetable production. The main onion production period is the cooler season, from October to April. Tomato is grown almost all over the country, along the banks of the Nile and other rivers and in the irrigated schemes. Production of tomatoes is concentrated in the cooler winter season. Cucurbits are warm-season crops which are grown almost everywhere in the Sudan. Watermelons and pumpkins are popular in Western Sudan and are extensively grown during the rainy season in Kordofan [8]. Sudan like other developing countries faces many marketing problems like shortage in marketing finance, unstable prices, high tax and fees in addition to weak infrastructure. The contribution of marketing system to agricultural development is under question. The inadequate marketing services such as transport, credit, storage, packing, handling and processing hinder the expansion of agriculture in response to growing demand of agriculture produce.

Lack of market information current or old information constrains marketing services supply in Sudan. Producers, traders and consumers generally lack accurate information on demand, supply and prices. Unavailability of credit facilities is another factor that affects marketing and agricultural development. When producers get credit money from village traders (as shail system), they tend to repay this loan in kind and in low prices as agreed before which are much lower than the prevailing market prices. Producers (borrowers) are usually at more risk averse than lenders, and are after willing to pay a premium to avoid risk [5].

Major constraints in vegetable production are the followings:

1. Lack of sufficient improved management technologies.
2. Inadequate financial and credits facilities.
3. Land fragmentation.
4. Poor vegetables seed production.
5. Limited application of agricultural research findings due to inadequate extension services.
6. Low productivity due to poor and traditional cultural practices.
7. High cost and improper local transportation.
8. Weeds, pests and diseases. [10].

II. METHODOLOGY

2.1 Quantitative Research Method:

In this study a quantitative research method was used to generate the information from women entrepreneurs. Quantitative research method are research methods a research methods dealing with numbers and thing that is measurable in a systematic way of investigation of phenomena and their relationships. It is used to answer questions on relationships within measurable variables with an intention to explain, predict and control phenomena [12].

Quantitative research methods fall under the broad heading of descriptive research. This type of research corresponds identifying the characteristics of an observed phenomenon, or exploring correlations between two or more entities. There are three types of descriptive research: observation studies, correlational research and survey research.

[10] Defined survey research as a study on large and small population selecting samples chosen from the desired population and to discover relative incidence, distribution and interrelations. The ultimate goal of survey research is to learn about a large population by surveying a sample of the population; thus we may also call it descriptive survey or normative survey.

2.2 Data Collection:

This study used both secondary and primary data. The secondary data was collected from papers, reports, technical documents, and previous researches.

The primary data of this study was collected through a structured questionnaire. The field survey was carried out during the period from October – December 2012 in Khartoum State (Northern countryside.).

2.3 Sample and Sampling Procedure

Population is a larger group with one or more characteristics in common from which a sample is obtained [9].

A sample of 120 vegetables' farmers was selected from four villages ElGalaa, Hillat Eljaaly, Hilat Giddam and Eljazeera from ElNouflab area in the northern country side of Khartoum State.

Beneficiaries were selected with simple random sampling technique, in order to use simple random sampling, it is necessary to obtain listing of the population. The blind draw simple random sampling was used to select vegetables' farmers from every village. The name of every available farmer in the area at the time of survey was written in a piece of paper, then all of these papers were taken and put inside a container. Then the container was shaken to ensure that names were thoroughly mixed. Then somebody was asked to draw 30 papers from every village containers as a sample.

2.4 Analytical Techniques:

The primary data was analyzed using the Statistical Packages for Social Sciences (SPSS). The results which were obtained from the analysis were presented in form of tables of frequency and percentage**.**

Descriptive analysis was used to analyze the data of the study. Tabular, and simple statistical tools were used to analyze the socio-economic characteristics of vegetables farmers, production and marketing cost of vegetables in Nouflab area in the northern countryside of Khartoum State.

III. Result and Discussion

- Generally speaking, all vegetables farmers in Khartoum State are men and there are no women working in agriculture. Agriculture is the basic profession for vegetables farmers in Khartoum State because it is agricultural land by nature, and because agriculture is the common profession that is inherited from ancestors. Vegetables' farmers are distributed among all age groups, most of whom has practiced agriculture from an early age with their fathers and then, by accumulated experience, it became their profession.
- It seems, by observation, that the educational level is low among farmers, particularly the elders which is due to not paying much attention to education in addition to the believe that agriculture as a stable, balanced, and economic activity abandons the need for education. Younger farmers are more educated and some of them practice agriculture as an additional activity. For this category, educational importance is represented in its role in improving the quality and quantity of agricultural production.
- Farmers' children help their fathers with their work as a sort of housework. This help is considered necessary as they acquire experiences which might be useful in their lives as well as assisting their fathers.
- Children's assistance in agriculture is divided into two categories. Some children help their families with agricultural work while studying at school and performing some simple tasks that do not require physical effort and do not contradict with educational acquiring. Whereas the second category represents a problem of children employment because they perform tasks that require far older individuals and it their permanent work in the field affects their admission at school.
- Vegetable farmers depend on letting the land they grow despite the high renting rates and the fact that almost 50% of farmers' own lands, however they tend to prefer renting to expand the cultivated area and they are not satisfied with the owned land.
- Most of vegetable farmers in Khartoum State grow an area of 15 acres or less. The small amount of cultivated area could be referred to capital limitation and the high cost of vegetable production.
- Farmers use both local and improved seeds verities to grow vegetable crops. The use of seeds depends on the type of the crop; for example, imported improved seeds are a must to use when growing crops like potatoes due to the unavailability of technology to produce them locally while local or imported seeds can be used to grow the onion crop.
- Farmers normally use a part of the current season crops as seeds for the coming season. The repeated usage of the crop seeds for many years might lead to lowering the quality and quantity of vegetables crops production, in particular, vegetables that require a specific type of seeds with specific specifications such as potatoes crop where repeated cultivation of the same generation could possibly lead to lower productivity and quality greatly. Therefore, farmers who grow potatoes crop make sure that they buy imported seeds despite its high cost to guarantee the success of the crop in terms of quality and quantity.
- Seeds amounts used to cultivate a single acre vary according to vegetables' types as amounts produced by a single acre vary based on the amount of seeds, putting in consideration the seasons because some vegetables are summer ones, others are winter ones while another type can be produced all over the year.
- Potato seeds amounts used to cultivate a single acre is about 6 sacks of imported seeds which produce about 121 sacks per acre. However, the quantity varies a lot if the seeds are a part of a previous crop. Whereas the amount of seeds used to cultivate onion is 4 pounds and gives an average of productivity estimated by 85 sacks per acre. Seeds amount used to cultivate a single acre of tomatoes is about 0.5 pound and gives an average of productivity of 186 cans per acre.
- We can see that the highest production cost of the potato crop for a single acre is the cost of the seeds which represents 33% of the total production cost. On the other hand, the highest cost of onion production for a single acre is the cost of preparing land which represents 22% of production cost. The highest cost of tomato production for a single acre is the cost of harvest which represents 28% of the total production cost. The highest cost of leaves crops, cucumber, and carrot and beans production for a single acre is the cost of preparing land with a percentage of 24.5 of the total production cost. The highest cost of okra, chili, pepper, aubergine and zucchini crops is the fertilization cost.
- Vegetables farmers use different methodologies to store different crops types; some crops types such as potatoes are stored in refrigerators, others are kept in storehouses, other types such as onion are stored in pergolas where there is ventilation, others are kept in Matamir (holes in the ground) and others have no ability to be stored.
- Farmers package their crops in different packaging vessels such as sacks, plastic bags, cans and some crops are not packaged at all, instead they are transported to the market unbridled.
- High cost vegetables crops (in terms of production and marketing), such as potato, followed by onion and tomato, tend to have high profits. On the other hand, there are crops that cost low with high financial return like beans. There are also crops with average cost and average return such as zucchini and aubergine.
- The highest cost of marketing for potato per a single acre is storage cost which represents 64% of the total marketing cost of the crop. Storage cost increases in accordance with storage duration as potatoes are stored in refrigerators with a duration that can reach up to 8 months. The highest cost of marketing for onion per a single acre is the packaging (in canvas sacks) cost represented in 39% of the total marketing cost for onions. The highest cost of marketing for tomato per a single acre is the packaging cost which is represented

in 34% of the total marketing cost. This could be due to the fact that tomatoes are a sensitive crop and able to be damaged therefore it needs a working force to pack it cautiously.

- There are many marketing issues that face vegetables farmers in Khartoum State. These issues are illustrated in not having appropriate places for displaying and selling the crops in big and central markets, especially with the considerable number of merchants who display their vegetables in seasons which might lead to decreasing vegetables prices because of the increasing supply.
- Moreover, it is evident that the increased production cost of some crops leads to increasing vegetables prices when they are offered in the market so that the price could be rewarding compared to production cost. Nevertheless, this affects the demand on these crops negatively. One more issue of marketing of vegetables crops is the high taxes and commissions of the market. This makes vegetables prices increase which, in return, leads to prices instability.

Table No. (I) Average production cost of vegetables crops per a single acre in SDG

Items	Potato		Onion		Tomato		Leaves, cucumber, carrot and beans		Okra, chili, Pepper, aubergine and Zucchini	
	Freq.	Percent.	Freq.	Percent.	Freq.	Percent	Freq.	Percent	Freq.	Percent.
Land preparation	585	9.4%	1200	21.7%	486	10.6%	700	24.5%	486	12.5%
Labor	673	10.8%	570	10.3%	395	8.1%	217	7.6%	395	9.8%
Seeds& pesticides	2043	32.9%	1125	20.3%	700	14.4%	399	13.9%	550	13.6%
Irrigation	450	7.2%	375	6.7%	347	7.1%	207	7.2%	347	8.6%
Land rent	309	16.1%	1000	18.0%	1000	20.7%	271	9.5%	500	12.4
Harvesting	649	10.4%	750	13.5%	1350	27.9%	407	14.2%	600	14.8%
Fertilizer	800	12.9%	508	9.1%	550	11.4%	650	22.7%	1150	28.5%
Total	6200	100%	5528	100%	4828	100%	2851	100%	4028	100%

Source: Field Survey 2012.

Table No. (II) Average Marketing cost of vegetables crops per a single acre in SDG

Items	Potato		Onion		Tomato		Leaves, cucumber, carrot and beans		Okra, chili, Pepper, aubergine and Zucchini	
	Freq.	Percent.	Freq.	Percent.	Freq.	Percent	Freq.	Percent	Freq.	Percent.
Packing vessels	600	15.4%	500	38.9%	310	26.4%	122	15.1%	279	23.2%
Packing	252	6.4%	208	16.2%	400	34.1%	157	19.5%	300	25.0%
Transportation	262	6.7%	337	26.2%	240	20.5%	200	24.8%	276	23.0%
Taxation	142	3.6%	123	9.5%	120	10.2%	259	37.1%	188	15.6%
Storage	2500	64.4%	------	-----	------	-------	------	------	------	------
Others	122	3.1%	115	8.9%	100	8.5%	96	11.1%	156	3.0%
Total	3878	100%	1283	100%	1170	100%	834	100%	1199	100%

Source: Field Survey 2012

Freq. = Frequency, Percent. = Percentage, SDG = Sudanese Pound.

IV. Conclusion

Horticulture is considered the main activity to field crop production in the northern countryside of Khartoum State, it is an important activity for many smallholder farmers as it created employment, improved household food security and nutrition and enhanced livelihoods. Farmers use both local and improved seeds verities to grow vegetable crops. The use of seeds depends on the type of the crop; for example, imported improved seeds are a must to use when growing crops like potatoes due to the unavailability of technology to produce them locally while local or imported seeds can be used to grow the onion crop. The quality of imported seed potato have declined, because the commercial companies and individual importers focus on high profits and ignore the quality of seed potato and consequences on potato production and famers loses. The other problem that farmers suffer from is the very high cost of potato production, especially the cost of imported certified seeds (planting materials).

The study revealed that poor infrastructure for storage, transportation and marketing of vegetables contributed to losses to the farmers. Smallholder farmers generally focused on production activities and showed relatively little interest in post-harvest and marketing activities. From the study, it would appear the produce is usually intended for the local domestic markets. They are no appropriate places for displaying and selling the crops in big and central markets, especially with the considerable number of merchants who display their vegetables in seasons which might lead to decreasing vegetables prices because of the increasing supply. As such, the commodities pass through a short and simple marketing chain until they get to the final consumer.

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