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Market Oriented Study on Onion Production Through Value Chain Approach in Agricultural Regions of the Gambia

Saikou E. Sanyang

Department of Agriculture,
Regional Agricultural Directorate of North Bank Region, Kerewan, Gambia

Abstract: The agricultural sector in the Gambia is the main provider of food and income for its population, especially rural communities whose livelihood comes from crops and livestock production for income generating activities. The production of vegetables is recognized by the government and contributes 4% of GDP. There are many vegetable crops grown by women, but recently onion production has gained more attention in the farming communities. Onion has simple agronomic, practice and high economic returns with good management practices. The objective of the study is to examine the linkages of onion producers along the value chain, yield, income and constraints. The methodology was random sampling with sample size of 183 respondents using structured questionnaire through face-to-face interview in six agricultural region of the Gambia. The study reveals that, 30.1% of the producers earned an income of >D10, 000 while on average 16.4% were found to earned D6000 respectively. In addition, production constraints are lack of storage facilities and inadequate market outlets of 25.7 and 20.8% respectively.In conclusion, value chain approach was proved to be most effective and efficient of producing onions. Therefore recommends, the government, NGOs and private sector to support women in their wake of improving their livelihood through onion production.

Key words: Onion production · Value chain · Market · Agricultural regions · Gambia

INTRODUCTION

The agriculture is the main provider of food and income for its population, where 70% of livelihood comes from crops and livestock production. The production of vegetables is recognized by the government and contributes 4% to GDP. Agriculture system in the Gambia, is mainly rain fed, largely fragmented into small size plots. It is characterized by low input, use of low technology and consequently resulting to low outputs and 60% of the arable land is being cultivated. There is room for improvement by increasing production area and productivity per unit area under cultivation. Onion production by women producers faces stiff challenges that affect yields and income.

Onion is considered as one of the most important vegetables produced on large scale in The Gambia. The area under onion is increases from season to season due to higher turn-over per unit area of production in small scale irrigation areas. In spite of the fact that, areas were increased, the productivity of onion is much lower than other African countries. The low productivity may be attributed to the limited availability of quality seeds and inadequate production technologies among the others. The objective of this study is to examine the linkage of onion producers along the value chain, constraints and possible solutions. The significance of this research work is to disseminate the idea of value chain approach to women onion producers that would contribute immense income to all the actors involved in the approach, to improve food security and reduce poverty. It is anticipated that value chain development initiatives like this will benefit farmers in gaining better prices for their produces. Notably, the focus of most of these value chains interventions have been on facilitating smallholder farmers' linkage to the market in order to increase profit and reduce poverty. Much less attention has been paid on the impact of these value chain

Corresponding Author: Saikou E. Sanyang, Department of Agriculture, Regional Agricultural Directorate of North Bank Region, Kerewan, Gambia.

interventions on changes in traditional gender roles and relations especially in production and accessing markets of the agricultural products. Women producers in the Gambia have been encouraged to go in for massive onion production. Value chain intervention or upgrading strategies that do not consider women participation are more likely to have negative impacts on production. There is need to understand women participation in value chain development activities their roles and responsibilities can have impact on their livelihood. This should also be backed by ideal agricultural policy framework of projects and programmes contributing immensely to investment and socio-economic development of the nation. Therefore, the government, non-governmental organizations and donors that support government initiatives adopted the value-chain approach in addressing the problems of agricultural production, processing and marketing in rural communities of the Gambia.

Literature Review: The importance of agriculture in fostering socio-economic development of poor countries like The Gambia can never be over-emphasized. Many developing countries focus on agricultural production as a poverty reduction strategy. In that regard, massive efforts and resources are being spent on improving agricultural production, productivity and promoting market access by smallholder producers [1]. Onion is normally a season crop which forms a storage bulb, produces flower and seeds completing its life cycle during one growing season in the tropics. There are two types of onion varieties grown in the Gambia, the yellow and red onion. To achieve a density of 700,000 plant/ha in this case, between 5 and 6 kg of seeds is needed per ha. The full growth cycle takes between 110 and 150 days. The most widely used production method is direct sowing in nursery beds. The seedlings are transplanted after 45-55 days when they have 5-6 leaves, 15cm in height with a stem thickness of a pencil [2]. The planting density varies from 350,000 to 700,000 plants per ha, it depends on diameter of the bulb to be produced. The seedlings are usually transplanted at 10cm distance in beds of 5-7 rows, 20 cm apart. The full growth cycle (seed to harvest) takes between 110 and 160 days [3].

Planting bulb techniques conserve 50-55 days compared to traditional methods sowing in the nursery, the best result are obtained in the sahelian region where the optimum production period is April. Sowing may be carried out manually in the nursery at the rate of 10g of seed per meter square in rows 10cm apart and mechanized sowing requires 25-30 kg of seed per ha is done in strips of 4 rows, 25 cm apart. Bulb formation techniques require short-day varieties and correct choice of the sowing period [4]. It must be planned in such way that early bulb formation under the effect of lengthy days combined with accelerated maturity due to high temperatures. The root system is fibrous, spreading just beneath the soil surface to a distance of 30 to 46cm. Therefore, in monoculture, onion tolerates crowding, particularly in loose, friable soils such as peat and mud. Competition from aggressive root system as from weed growth severely limited onion growth [5]. Adequate soil moisture is required throughout the growing period particularly at bulb formation, for repining, a dry period is required 5 to 7 days, during which more than 50% of the roots drops. Watering should be reduced as soon as 30% of the plants started dropping their leaves. Irrigated onions are sweeter and less pungent than dry land onions, particularly important for Vidalia onions [6]. Onions are particularly sensitive to weed competition; because the young plants have shallow-roots with cylindrical upright leaves may compete poorly with fast-growing weeds [7]. Therefore a high standard of weed control are needed throughout the growing season to prevent serious loss of yield [8]. Disease management require a systems approach involving practices such as rotation, sanitation, optimum fertilization, preventive pesticides, appropriate harvest time, proper handling and storage. If one or more of these practices are omitted, disease management is significantly compromised [9]. Importantly, fertilizer application is needed to develop strong and healthy plants, which shades the bulb during development [10]. Late varieties are highly susceptible to warm weather bacteria diseases and may require harvest before optimum maturity to prevent wide spread infection with bacterial diseases [11]. The ultimate yield of onion usually determine by the number of leaves that were formed prior to bulb formation. Hence bulb formation, in each cultivar is triggered by a specific day length; early planting is the most effective method of improving bulb size as a key primary factor that contributes to yield [12].

However, early planting coincides with cool air temperature or cool wet soil and untimely maturity of the crop will be plummeted. Onion production plays an important economic role in enhancing the living standard of producing farmers. A current level of onion production and prices shows immense potentials in increasing the

income of local farmers. Profit from onion cultivation, especially galmi onion, compares to cash crops such as chili pepper and potato and onion is rich, comparatively cheaper food [12, 13]. It provides all important nutrients such as proteins, minerals and vitamins, thus daily consumptions are necessary for balance diet. It is consume in many homes almost daily in wide variety of dishes, onion is not only having a unique taste and essential for every dish but also has remarkable nutritional and medicinal value [14, 15]. It is an essential part of some herbal medicines and also used as tonic for man power. Growth in onion production has been partly driven by the availability of improved varieties for a particular climate and condition present in the Gambia. Major improvements were made in developing resistance to bolting (seed stalk development) among fall planted varieties and to pink root, a soil borne pathogen of onion [16, 17]. Primarily, it is imperative to highlight the issue of value chain approach in the production of onions in six agricultural regions of the Gambia. The value chain intervention anticipates that, as women are involved in value chain development activities the benefits obtained will also trickle down to women involved. [18] Argue that the work that women and men take up within the chain may have implication on other economic activities such as subsistence farming for other crops, income generating activities or household tasks on women roles and relation within the household at the community level. The impact of value chain intervention on women roles and relations are always tricky as farming systems differ from place to place [19]. It is imperative to have empirical evidence from many perspectives as possible whether value chain interventions change women roles and relations and how such changes would have impact on women. In agricultural value chains, women make up a large part of the work force. However, the benefits women derive from their participation in the value chain are frequently violated and their contribution to the economy is largely invisible. In the context of value chain development, excluding women, results to underutilization of their labour force which may decrease agricultural productivity. The involvement of women in agricultural production has increased; their participation in value chain development activities is concentrated in lower levels of the value chain especially in production [20]. According to the [21] there is a growing trend of more women being involved in agriculture, as men seek alternative income generating activities in non-farm activities?

Nevertheless, due to the nature of most rural societies, women generally do not have the same rights to productive resources as men. While women involvement in agricultural production contributes to increased production and export of high value crop [22] women do not equally benefit as men this is partly because of the gender relations that segregate women from participation or benefit from certain tasks in agricultural value chains.[23] In their research on the impact of value chains on gender and empowerment found that positive changes for women with respect to their access to capital, training and extension.Women in developing countries are widely recognized as the face of farming, especially among smallholders [24]. The growing trend of women's engagement in agriculture, commonly referred to as feminization of agriculture, has resulted in changes of gender roles. For example [25] found that, in some areas women participation in agricultural activities have increased due to absence of men who have moved out into non-agricultural income generating activities in urban areas extension, decision making in the production process and position in the chain has been realized. In such instances women are responsible for taking care of the family farm, participate more in nonfarm activities to supplement income from farm activities, receive wages and start making marketing decisions over all household issues that were the male domain. Changes in gender relations is an important factor in determining the division of labour between what is considered productive and reproductive; this is argued to be the basis for the distribution and allocation of work, income, wealth and assets and productive inputs [26].

MATERIALS AND METHODS

Study Area: The survey was directed to value chain approach starting from production, processing, distribution, marketing to consumption. The sampling method was random sampling with a sample size of 183 onion producers from the six agricultural regions. The regions are West Coast Region, North Bank Region, Lower River Region, Central River Region North, Central River Region South and Upper River Region and the colours depicts the regions as shown in Figure 1. The data collection targets only the women producers into the business of onion production as an important commodity for women producers. All the data set were analyzed by using statistical package for social science (SPSS)

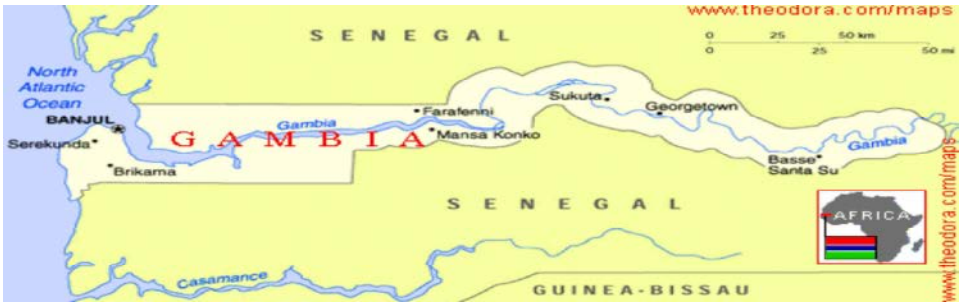

Fig. 1: Shows the study area of the six agricultural regions.

computer software, which facilitated the generation of descriptive statistic using frequency and percentage.

RESULTS AND DISCUSSION

The issue of gender equity in agricultural production in relation to onion production is prominent in the six agricultural region of The Gambia. In the horticulture sub-sector, women are the drivers of onion production and marketing. In Table 1 the number females engaged in onion production outweigh their male counterpart representing 96.2 and 3.8% respectively. The government, NGOs and agricultural projects should give maximum support and create incentives for male farmers to venture into onion production. According to scientific research confirms that closing the gender gap in agriculture can improve agricultural productivity, with additional benefits that would increase the income level of farmers. According to the [22], there is a growing trend of more women being involved in agriculture as men seek alternative income generating activities in non-farm activities. Therefore, women contribution in agricultural development can have multiplier effect on socio-economic parameters of the country.

The result in Table 2 showed that 90.7% of the respondents were married while 5.5 % of respondents were divorcees. Importantly, creation of opportunities for onion production and other income generating activities would go a long way for not married and divorcees to earn their living, otherwise they would engage in order activities that is against the norms and culture of the society thus, becoming a burden to the society. The married farmers have added advantage from their marital status, since they can acquire services rendered by their husbands as free labour. Importantly, house wives contribute to domestic work in bringing improvement in the living standard of occupants. Furthermore, [25] found that the placement of women in strategic organizational positions helps to correct household and chain power imbalances in the value chain aimed to commercialize onion production in the Gambia.

Table 1: Gender status.

Gender	Frequency	Percentage (%)
Male	7	3.8
Female	176	96.2
Total	183	100

Table 2: Marital status.

Marital status	Frequency	Percentage
Married	166	90.7
Divorced	10	5.5
Separated	1	0.5
Not married	6	3.3
Total	183	100

Table 3: Number of children.

Children	Frequency	Percentage (%)
Two	18	9.8
Four	43	23.5
Six	51	27.9
Eight	39	21.3
Ten	29	15.8
Without children	3	1.6
Total	183	100

In the Gambia, household with many children is a blessing for those without children. The result from the survey showed that, among the onion producers with children is higher than women farmers who do not have children. In Table 3, 27.9% of the respondents on average bear six children followed by four children representing 23.5% respectively. According to [17] children's contribution in farm families bears importance and the women producers who want to diversify their production pattern may also capitalize on their children's contribution in the family.

The ethnic composition differs from region to region of the rural Gambia. The survey result in Table 4 out of 183 women producers 115 of them are Mandinka's representing 62.8% followed by Fulla's respectively while the lowest tribes were Wollof's and Jola's. Furthermore, other tribes include Manjago, Telibongo, balanto representing 7.7% of the population. In the Gambia, highest ethnic group in terms of population is the Mandinka tribe who are mainly engaged in agricultural production. Therefore, considering their population can bring meaningful contribution in the development and promotion of agriculture [13] in a similar study concurred with this study proving that, the Mandinka tribe is the dominant tribe in the horticulture sub-sector of the Gambia.

The results from Table 5 below showed that there was more youthful age involved in the production of onion from the six agricultural (26-35 years and 36-45 years) 26.2% and 22.4% respectively. This will give more production strength to women producers in the near future to be actively in onion production. In a similar research done in the North Bank Region the result also reveals the same age groups of 26-36 and 37-47 respectively. The implication of this finding is that, if youthful ages of female producers are not given the courage and motivation to venture into massive onion production will result to retrogressing of yields in the long term. The appropriate use of agricultural technologies, infrastructure and labour-savings techniques by women can serve as the most suitable solution [26].

In many of the developing world where Gambia is not exceptional lack of education or inadequate knowledge prevent women from achieving their full potential in agriculture as in the other productive sectors. The result indicates that the level of illiteracy is high among the respondents who did not attend formal education depicting 51.9% while 36.6% attended informal education. Only 3 and 18 out of 183 were found to have junior secondary and primary education in Table 6 respectively. In addition, attainment of education by women producers may also augment their skills in the most profitable manner. According to [22] education may influence on the choice of production and thus better selection of improved inputs, would have positive impact on output and income. In agriculture, farmers experience on seed selection can affect quality and volume of output having a direct bearing on the income of women producers [26].

Table 4: Ethnic groups.

Tribe	Frequency	Percentage (%)
Mandinka	115	62.8
Wollof	8	4.4
Fulla	24	13.1
Sarahule	15	8.2
Jola 7	3.8	
Others (specify)	14	7.7
Total	183	100

Table 5: Age groups.

Groups	Frequency	Percentage (%)
<15 9	4.9	
15-25	6	3.3
26-35	41	22.4
36-45	48	26.2
46-55	51	27.9
56-65	24	13.1
66-75	4	2.2
Total	183	100

Table 6: Educational level.

Schools attended	Frequency	Percentage (%)
Primary	18	9.8
Madarassa	67	36.6
Junior secondary	3	1.6
Not attended	95	51.9
Total	183	100

The results in Table 7 showed that, majority of the respondents in the study areas were said to be in onion production as their main activity or occupations depicting 65.6% while others (specify) such as petty trading and entrepreneurship representing 18% respectively. Onion production in the six agricultural regions is gaining momentum because of its high return to earnings. As a result women producers chose onion as the main occupation activity because of it turn-over. In similar research [24] in North Bank Region also proves that women in that region were also massively engaged in onion production as their source of income generation. The engagement of women onion producers as a business venture would also serve as job creation for women and youths thus contributing to national economy.

The issue of experience in meaningful agricultural production is very important as the saying goes experience is the best teacher. According to the results obtained in Table 8 showed that, out of 183 respondents 47 were engaged in onion production for five years thus representing 25.7% while 39% of the respondents had 10 years of experience. However, women farmers who were engaged in onion production for 20-30 years would

Table 7: Main occupation.

Occupation	Frequency	Percentage (%)
Not mentioned	24	13.1
Business	6	3.3
Vegetable producer	120	65.6
Others(specify)	33	18.0
Total	183	100

Table 8: Numbers of experience.

Numbers of years	Frequency	Percentage (%)
< 5years	1	0.5
5 years	47	25.7
10 years	39	21.3
15 years	41	22.4
20 years	21	11.5
25 years	12	6.6
30 years	22	12.0
Total	183	100

Table 9: Total land area (ha).

Hectare	Frequency	Percentage (%)
< 2.0ha	27	14.8
2.0ha	47	25.7
2.5ha	43	23.5
4.0ha	8	4.4
5.0 29	15.8	
>5.0 29	15.8	
Total	183	100

have more knowledge and skills. Therefore, her production risk would be minimal and her experience would greatly contribute on her livelihood.

The legitimate lack of access to land is a stiff challenge, women producers are facing in the rural communities of the Gambia. Generally, women have limited access to land because they not are recognized as beneficiaries in terms of inheriting land. Land is the most limiting factor of agricultural production for vulnerable or less privilege producers [5]. The survey result in Table 9 showed that, the total land access by women producers is 2.0ha and 2.5ha representing 25.7% and 23.5% while 15.8% were found to cultivate 5ha and >5ha respectively. Notably, production and promotion of onion production in the six agricultural regions would need adequate availability and access to land by producers.

Therefore, imperative for the government to develop land reform policies that would allow women producers to have access, rights and ownership of productive land. Importantly, policies can have significant impact on social and economic gain specifically on related goals of livelihood, food security and poverty alleviation of onion producers. Moreover, representation at the local level, on village development committee, district councils and land allocation, the absence of women will have serious implications for decision-making processes on resource allocation. According to [24] in order to understand how gender roles and relations change in value chains is important to combine value chain analysis with the gender approach on development activity.

Table 10: Different onion varieties.

Varieties	Frequency	Percentage (%)
Red creole	40	21.9
Galmeh	137	74.9
Grano Texas (yellow)	6	3.3
Total	183	100

Table 11: Main source of seeds.

Source of seeds	Frequency	Percentage (%)
GHE 40	21.9	
NATC	3	1.6
Lumo	39	21.3
Local traders	59	29.0
Farmers	4	2.2
Gift (projects, agriculture)	44	24.0
Total	183	100

In rural communities of the six agricultural regions usually cultivate different onion varieties basing on early maturing, storage conditions and marketability. Notably out of 183 respondents 137 of producers were found to cultivate galmeh variety representing 74.9% while 21.9 and 3.3% for red creole and granotexas in Table 10. Galmeh variety is widely grown by women producers because of its early maturing and long period of storage according to women producers. The galmeh variety has become a prominent variety accepted by women farmers in the country because its quality attributes, thus contributing to the production of quality and safety onions.

Quality and viable seeds are limiting factors to onion production and promotion in rural areas of the Gambia. Furthermore, an exorbitant price of seeds also serves as deterrent to massive onion production. The survey result in Table 11 reveals that 29.0% of seed source comes from local traders who visit weekly lumos or moving from one village to another. Furthermore, the study reveals that 21.9% of respondents purchased onion seeds from Gambia Horticulture Enterprise. Importantly, GHE should open more outlets in the six agricultural regions as this will reduce the burden of producers travelling from far and wide distance. The public-private partnership would also strengthen the relationship between different stakeholders in the process of agricultural development and promotion hence contributing to economic growth.

The result in Table 12 showed that, 88% of the respondents produced onions in the dry season usually call the cool season while 7.7% and 2.7 % indicates all year production and wet season respectively. The policy implication is to encourage onion growers to produce all year production through the provision of wet season onion varieties to bridge the gap of dry season production.

Labour is an important factor of production in the field of agricultural economics, the provision of labour is a challenge to women onion producers in the six agricultural regions of the Gambia. The result in Table 13 showed that 94.0% of the respondents used family labour to produce onion while 5% of the respondents indicate communal and hired labour respectively. Importantly, women producers with children usually assist their mothers in the gardens by providing labour in terms of watering, weeding and harvesting of onions.

In production cost maximization is very important because cost has bearing effect on the profit of an enterprise. The result in Table 14 showed that out of 183 respondents 32.8% incurred production cost of D1500 while the highest production cost is 12.0% depicting D6000 respectively. The production variables include seeds, labour, fertilizer, pesticides, transportation, market fees and maintenance of fences and well. Moreover, women producers who incurred production cost of D6000 usually produces on a large scale with more than 40-80 beds cultivated.

The level of onion production in the rural communities of Gambia for the past years is surmounting because of its economic importance and high turn-over rate against other vegetable crops. The survey result in Table 15 reveals that 50.3% of the growers indicate others (specify) meaning that the number of beds cultivated is far more than 20 beds. The implication of this study is that, the onion producers should focus on productivity by cultivating reasonable number of beds with proper management and have better harvest rather than cultivating huge area with little or no harvest.

In the field of agriculture yield is a determining factor of input-output relationship. Primarily, better yields can have multiplier effect on income level according to literature. The result in Table 16 showed that, out of 183 producers 67 were found to harvest more than 30 bags representing 36.6% of the sample population. In the result table further reveals that 32.2 and 13.7% of producers were found to harvest 11-15 bags and 16-20 bags respectively. In considering the trend of the yield pattern, the author is with the opinion that, onion production can serve as good enterprise while improving the livelihood of women farmers through the support of well design agricultural policy. Further, private sector, donor projects and NGOs have a great role to play in the wake of promoting onion as the choice of women producers.

Table 12: Production cycle.

Season	Frequency	Percentage (%)
Not mentioned	3	1.6
All year round	14	7.7
Dry season	161	88.0
Wet season	5	2.7
Total	183	100

Table 13: Type of labour for onion production.

Labour	Frequency	Percentage (%)
Not mentioned	1	0.5
Hired labour	5	2.7
Family labour	172	94.0
Communuallabour	5	2.7
Total	183	100

Table 14: Production cost.

Cost	Frequency	Percentage (%)
< D1500	45	24.6
D1500	60	32.8
D2000	10	5.5
D2500	6	3.3
D3000	8	4.4
D3500	15	8.2
D4000	7	3.8
D4500	2	1.1
D5000	6	3.3
D5500	2	1.1
D6000	22	12.0
Total	183	100

Table 15: Number of beds cultivated.

Beds	Frequency	Percentage (%)
<5beds ($5m^2$)	1	0.5
5beds ($5m^2$)	17	9.3
10beds ($5m^2$)	24	13.1
15beds ($5m^2$)	23	12.6
20beds ($5m^2$)	26	14.2
Others (specify)	92	50.3
Total	183	100

Table 16: Yield obtained in bags.

Kilogram	Frequency	Percentage (%)
5-10 bags	4	2.2
11-15 bags	59	32.2
16-20 bags	25	13.7
21-25 bags	19	10.4
26-30 bags	9	4.9
>30 bags	67	36.6
Total	183	100

The promotion of onion promotion en-masse would result to selling of the produce to market, since all cannot be consumed at household level. This would require training through the generation and utilization of marketing technologies by women producers. The result in Table 17 showed that 51.9% of the women producers were found selling onion at 0-5yrs. Furthermore, the number of years selling onion at different markets is equally important because it will foster customer relationship management between the producers and customers. This is clearly manifested in the results, 23.5 and 16.4% were found to be selling onion for a long period of time while 7.7% of the respondents have longer years of selling onion.

Indeed, the aim of marketing activity is to make product sufficiently different from the product of competitors so as to achieve some ability to set a price (that is, a price maker) different from the price that sellers of undifferentiated product face (that is, the price taker). The latter is always the case where the women producer lacks the knowledge and skills to set their own price but prices are always influenced by the traders against their own desire. This is clearly in Table 18 were 82.0% of the respondent bargain price with traders while 23% of the price influenced by traders. In addition, only 5.5% of the total population was found to determine their own price through the group committee. Price determination or setting by group committee were said to be brilliant approach and can be a policy initiative by the ministry of agriculture. Such a policy initiative would go a long way in helping producers to have better price of their onions thus increasing their income levels. The most important thing in price determination is for producers to come together as groups to discuss, negotiate and agree on better premium.

In a real market situation or conditions it is daunting to have fixed price of agricultural commodities due to market forces of demand and supply. In the process of marketing mix, it is only price that do not incur cost rather it determines the profit of an enterprise. The survey result in Table 19 showed better selling prices was found to 2.2% of D1000 thus resulting low supply of onion to the market over high demand. Succinctly, at such a better extension workers would assist the producers to overcome their cost and increase their profit. Furthermore, another better price of onion in the study area was found at D900 representing 8.2% while lowest price was D500 dalasi only. Notably during the peak of the season where there is plenty of onion, farmers do not have choice instead they sell at giveaway prices thus losing more profits. However, on average the best ceiling price of onion was found at D700 considering the break even analysis.

Table 17: Selling of onion.

Number of years	Frequency	Percentage (%)
< 0-5yrs	1	0.5
0-5yrs	95	51.9
6-10yrs	43	23.5
11-15yrs	30	16.4
>15yrs	14	7.7
Total	183	100

Table 18: Price determination of onion.

Determination	Frequency	Percentage (%)
Group committee	10	5.5
Bargain with traders	150	82.0
Traders	23	12.6
Total	183	100

Table 19: Price of onion bag in dalasi.

Price Frequency	Percentage (%)	
D500	32	17.5
D600	50	27.3
D700	53	29.0
D800	29	15.8
D900	15	8.2
D1000	4	2.2
Total	183	100

Table 20: Kilogram sold per bag.

Kilogram	Frequency	Percentage (%)
25kg 109	59.6	
50kg 44	24.0	
75kg 11	6.0	
80kg 12	6.6	
Others (specify)	7	3.8
Total	183	100

In preparation of selling onion at different markets it is imperative to quantify produce indifferent categories of kilograms using weighing scale. The result in Table 20 showed that 59.6% were found to be selling 25 kilogram bag of onion at a minimum price of D700. However, women producers selling a bag of 50kg, 75kg and 80kg at a price of D700-D800 may be running at lost. Therefore, standardization in terms of uniformity, size and quantity is essential for better sales.

In any social research three parameters such as income, yield and household are very important to determine the livelihood of farmers. The result in Table 21 reveals that reveals that, 30.1% of the producers earned an income of >D10, 000 while on average 16.4% were found to earned D6000 respectively. The onion production as income generating activities can be very

Table 21: Income obtained.

Income	Frequency	Percentage (%)
D2000	17	9.3
D4000	27	14.8
D6000	30	16.4
D8000	46	25.1
D10,000	8	4.4
D>10,000	55	30.1
Total	183	100

Table 22: Characteristics of onion on demand.

Characters	Frequency	Percentage (%)
Color	6	3.3
Dryness	49	21.9
Size 32	17.5	
Quality	92	50.3
Others(specify)	13	7.1
Total	183	100

Table 23: Method of marketing.

Marketing	Frequency	Percentage (%)
Individual	105	57.4
Collective	78	42.6
Total	183	100

Table 24: Marketing channels.

Intermediaries	Frequency	Percentage (%)
Bana-Banas	120	65.6
Producer groups	43	10.9
Retailers	20	23.5
Total	183	100

Table 25: Types of market.

Market	Frequency	Percentage (%)
Urban cities	35	19.1
Lumo	80	43.7
Village	50	27.3
Farm gate	15	8.2
Others(specify)	3	1.6
Total	183	100

lucrative enterprise provided the women producers have support from the government, NGOs and private sector in terms of production inputs, knowledge and skills and appropriate use of agricultural technologies.

The demand of a product depends on certain characteristic appealing or attractive to potential buyers or customers in a given market. The result in Table 22 showed that 50.3% of onion producers were found to be more conscious of quality while the lowest was 3.3% respectively. According to literature, quality and price have direct relationship that is, all move towards the same direction. Primarily, the more women producers inject the market with quality onions the better the price thereby increasing their income.

Onion producers need to improve on their economic of scale by succinctly maximizing their production resources for profit. The result in Table 23 showed that 57.4% were engaged in individual marketing while 42.6% for collective marketing. Importantly, onion producers need massive sensitization to go in for collective marketing as this will bring more dividends in terms of bulk buying, reduce transport cost and negotiations for better price. Therefore, the most successful strategies for collective marketing include co-operation with the task of selling the goods and a high degree of collective marketing throughout the production season. However, to achieve the principles of economic of scale would be difficult using individual marketing method.

The movement of agricultural produce from location to location is important in the production and promotion of onions. The distribution onions to the market can either be direct or indirect marketing. The survey result in Table 24 showed that, 65.5% of the respondents used “Bana-banas” as their gate way to sell their onions while 23.5% of respondents sell through retailers. Generally, women producers rarely sell their produce directly to the consumer. Instead, their produce tends to change hands several times through different stages before being consumed.

The market intermediaries operate in a range of different market outlets or locations. The result in Table 25 showed that 43.7% of onion producers transport their onions to the ‘lumos while 35% send their onion to urban areas because cities attract better prices compare to other markets. Therefore, to be successful in the market place, rural communities particularly onion producers need to adopt new technologies, access new types of information and again new enterprise skills so that they are in a position to evaluate and invest in new opportunities as they arise. The implication of the study is that, the government, NHMSP, NGOs and donor agencies need to support the producers by creating more market outlets and develop marketing skills from medium to long term approach.Traders who buy onion before they are harvested exploit farmers by offering them lower prices [10].

A major cause of marketing problems often lies in the limited availability and poor road conditions, especially in remote areas that are difficult to reach. From the result in Table 26 showed that only 54 out of 183 were found to transport their onion produce using gelly-gelly as means of transportation while 49 respondents used animal drawn carts as another alternative of transportation representing 29.5 and 26.8% respectively.

Table 26: Transport to market.

Transport	Frequency	Percentage (%)
Mini truck	19	10.4
Mini vans	32	17.5
Gelly-gelly	54	29.5
Animal drawn carts	49	26.8
Others (specify)	29	15.8
Total	183	100

Table 27: Distance to market (Km).

Kilometer	Frequency	Percentage (%)
5km 57	31.1	
10km	61	33.3
15km	34	18.6
20km	17	9.3
Others(specify)	14	7.7
Total	183	100

Table 28: Cost of bag to market.

Cost Frequency	Percentage (%)	
D10 59	32.2	
D25 52	28.4	
D30 19	10.4	
D35 4	2.2	
D40 7	3.8	
D45 5	2.7	
Others(specify)	37	20.2
Total	183	100

Table 29: Sources of market information.

Information	Frequency	Percentage (%)
Traders	62	33.9
Farmers	67	36.6
Extension agent	20	10.9
Radio	4	2.2
Middle-men	30	16.4
Total	183	100

Proximity to the market is very important and more cost effective for producers than those far away from the market. The result from Table 27 showed that 33.3 and 31.1% of onion producers are closer to market of 5km and 10km respectively. In addition, women farmers far away from the market of 20km would find it difficult to move their produce to markets. Moreover, produce has to retain its quality while being transported and has to arrive at the market on time, so that the product does not get damaged during transport. Furthermore, the government needs to embark on road maintenance and re-constructions of roads in the remote areas for easy movement of goods and services.

The transportation of produce to the market offers a range of different modes and prices. Women farmers should find the most effective means of transporting their onion and constantly review markets in order to find the cost efficient means. The analysis in Table 28 showed that 59% of the producer pays D10 per bag to ferry their produce to markets while 28.4% of producers pay D25% per bag. The women producers need to be careful of cost most especially transportation as it will determine profit or loss.

Market information is essential for decision making, reducing transaction costs and risks enabling efficient storage and facilitating the flow of goods from production to consumption areas. Access to information reduces business risk and allows market participant to explore profitable opportunities to meet consumer needs [4]. The survey result in Table 29 showed that 36.6% of the onion producers indicate farmers as their source of information followed by traders and middle-men representing 33.9 and 16.4% respectively. The major source of information to onion producers was from their own women producers, as more reliable information than other agents. However, traders will even collude with each other so that all the traders offer the farmer the same low price. In other words, farmers lose money because they lack information about the market. The implication of the study is that, more effort is needed to strengthen, improve and co-ordinate the provision of market information in the six agricultural region of the Gambia.

Markets have different prices of various commodities and women producers wants to get more information particularly the commodity that is on high demand [18]. The results in Table 30 showed that, 58.5% of the producers obtained information about the price of onion then followed by price of inputs depicting 21.3% respectively. It is equally important for the women producers to have an idea of input sources and price, current product prices, price volatility at different markets, the best time of the day to sell, price trends and seasonality.

In a business set-up the use of communication tools such as telephone, mobile phones and word of mouth are critical for the smooth information flow and low-cost transactions along the market chain. The result in Table 31 showed that 73.8% of the respondents used mobile phone as a major communication tools to acquire information followed by radio users of 21.9%. The increasing availability of mobile phones in the regions particularly women producers can have major impact on the efficiency of marketing systems for many market actors. The mobile phones are the most effective means of communication. For example, the FAO-FSCA project in 2011-2012 academic years supplied mobile phones to women

Table 30: Type of information obtained.

Information obtained	Frequency	Percentage (%)
Price of inputs	39	21.3
Price of onion	107	58.5
Price change	12	6.6
Different price	22	12.0
Others (specify)	3	1.6
Total	183	100

Table 31: Communication tools used to obtain information.

Communication tools	Frequency	Percentage (%)
Radio	40	21.9
Mobile phone	135	73.8
Television	3	1.6
Others (specify)	5	2.7
Total	183	100

Table 32: Methods of value addition.

Methods	Frequency	Percentage (%)
Grading	107	58.5
Sorting	63	34.4
Packaging	5	2.7
Labelling	6	3.3
Weighing	2	1.1
Total	183	100

Table 33: Method of storage.

Methods	Frequency	Percentage (%)
Bare floor with sand	133	75.7
Ventilated house	47	72.7
Others (specify)	3	1.6
Total	183	100

producers across the country to ease communication amongst the producers. The uses of mobile phones nowadays can link buyers to suppliers that have mobile phone to complete business transaction as evident among the women onion producers.

The modern techniques of farming in developed and developing countries for small holder farmers are focusing more on value chain and value addition approach. The value chain concept which can be simply described as the entire range of activities required to bring a product from the initial input-supply stage, through various phases of production, to its final market destination. The concept stresses the importance of value addition at each stage, thereby treating production as one of several value-adding components of the chain. There were set of activities used by onion producers to improve on the quality of their product as shown in the table. The result in Table 32 showed that 58.5% of farmers were found grading their produce followed by sorting of 34.4% respectively. The lowest methods of value addition were found to be weighing depicting 1.1% of producers. The rationale for sorting and grading is to differentiate produce according to certain attributes including varieties, size, colour, shape, degree of impurity and ripeness. However, weighing is the biggest challenge that needs immediate attention in a shortest possible period of time, because women producers do not weigh their produce during the processing of selling. Therefore, it is important that standards weights and measures to be introduced to make onion trading more efficient, so that buyers and sellers are at the same level playing field of business transactions.

The best way to avoid price slumps and reduce post- harvest losses in the agricultural regions of Gambia, storage facilities are needed at various stages of the supply chain. The survey result in Table 33 showed that 75.7and 72.7% were found to be storing their onion on bare floor covered with sand and ventilated house respectively. Storing onions is important because it allows the producers to sell their onions later, when the prices are higher. Unfortunately, there is no guarantee that the prices will indeed increase. The producers lack modern facilities to store their onion rather using traditional method of storage. Women involvement in onion value chain development activities were anticipated to help in forming up both horizontal and vertical bonding networks with other upstream chain actors. However, this study found that, women were more likely to join horizontal networks in the form of farmer and women groups. Therefore, it is important for women producers in any case to make sure that the quality of their produce does not decrease during storage.

The prices of agricultural goods change day by day or week to week because prices are usually affected by changing patterns of supply and demand. The result in Table 34 showed that price fluctuations are said to be major risk indicated by women producers representing 85% followed by perishability of 13.1%. Prices are generally higher in big cities than countryside because many people in cities have more money to spend than rural inhabitants and it costs a lot of money to transport products from the countryside to the town. In other words, if supply increases or demand for a particular product falls, the price falls. If supplies are limited or demand increases, the price goes up. There are many factors affecting the price of a particular product and impossible to predict whether prices will go up or down in the future.

Table 35 showed constraints affecting production and marketing of onions in the six agricultural region -of the Gambia and severity of constraints differs from

Table 34: Marketing risk.

Risk	Frequency	Percentage (%)
Poor road condition	8	4.4
Price fluctuation	85	46.4
Change in weather	15	8.2
Seasonality	19	10.4
Perishability	24	13.1
Competition	12	6.6
Unreliable information	20	10.9
Total	183	100

Table 35: Production constraints.

Constraints	Frequency	Percentage (%)
High cost of seeds and fertilizer	20	10.9
Inadequate market outlets	38	20.8
Inadequate production technologies	2	1.1
Inadequate credit facilities	8	4.4
Expired seeds from commercial vendors	10	5.5
Low market prices	22	12.0
Lack of storage facilities	47	25.7
Others (specify)	36	19.7
Total	183	100

parameter to parameter. The two major production constraints are lack of storage facilities and inadequate market outlets alluded by respondents representing 25.7% and 20.8% respectively while the lowest is production technologies in Table 35. The issue of storage facilities is a major problem that needs immediate attention by the government, NGOs and donor agencies to build modern storage facilities at strategy location of the country. Women's time constraints and restriction on movement placed by their husbands or partners and social norms regarding interactions between men and women was also reported to hinder effective women participation in marketing agricultural crops [22].

The implication will be at harvest when there is large volume of onion or when the market cannot absorb all, surplus it can be stored in modern storage facilities. This will help the producers to maintain the self-life of the onion, quality and fetch better price to increase profit margin.

CONCLUSIONS

The Gambia is small country that heavily depends on agriculture as a main source economic growth and one important indicator to determine economic enhancement. The production of onion is attracting more attention by women producers across the six agricultural regions of the Gambia. The research finding focuses on the value chain approach i.e. from planting through harvest to consumption by end-users. The issue of gender equity in agricultural production especially onion is not clearly evident in the six agricultural region of The Gambia. The horticulture sub-sector, women are the drivers of onion production and marketing. The number of females engaged in vegetable production outweighs their male counterpart representing 96.2 and 3.8% respectively. In terms of age composition, the results from table 5 below showed that there was more youthful age involved in the production of onion from the six agricultural (26-35 years and 36-45 years) 26.2 and 22.4% respectively.

Importantly, in a real market situation or conditions it is daunting to have fixed price of agricultural commodities due to market forces. In marketing mix, it is only price that do not incur cost rather it determines the profit of an enterprise. The survey result in Table 19 showed better selling prices of onion were found to be 2.2% of D1000 thus resulting to low supply of onion at market against high demand.Succinctly, at such a better prices extension workers should assist the producers to overcome their cost and increase their profit. However, on average the best ceiling price of onion were found at D700 considering the break even analysis.

In preparation of selling onion at different markets it is imperative to quantify produce in different categories of kilograms using weighing scale. The result in Table 20 showed that 59.6% were found to be selling 25 kilogram bag of onion at a minimum price of D700. However, women producers selling a bag of 50kg, 75kg and 80kg at a price of D700-D800 may be running at lost. Therefore, standardization in terms of uniformity, size and quantity is essential for better sales. In any social research two parameters such as income and yield are very important to determine the livelihood of farmers. The result in Table 21 reveals that 30.1% of the producers earned an income of >D10, 000 while on average 16.4% were found to earned D6000 respectively. Onion production as income generating activities can be very lucrative enterprise provided the women producers have support from the government, NGOs and private sector in terms of production inputs, knowledge and skills and appropriate use of agricultural technologies.

The movement of agricultural produce from location to location is important in the production and promotion of onions. The distribution of onions to markets can either be direct or indirect marketing. The survey result in table 24 showed that, 65.5% of the respondents use "Bana-banas" as a gate way to sell their onions while 23.5% of respondents sell through retailers. The market intermediaries operate in a range of different market

outlets or locations. The result in Table 25 showed that 43.7% of onion producers transport their onions to the 'lumos while 35% send their onion to urban areas because cities attract better prices compare to rural areas.

Proximity to the market is very important and more cost effective for producers closer than those far away from the market. The result from Table 27 showed that 33.3 and 31.1% of onion producers are closer to market of 5km and 10km respectively. In addition, women farmers far away from the market of 20km would find it difficult to move their produce to markets. Market information is essential for decision making, reducing transaction costs and risks enabling efficient storage and facilitating the flow of goods from production to consumption areas. Access to information reduces business risk and allows market participant to explore profitable opportunities to meet consumer needs.

Agricultural markets have different commodity prices and women producers' wants to get more information particularly the commodity that is on high demand. The results in table 30 showed that, 58.5% of the producers obtained information about the price of onion. In a business set-up the use of communication tools such as telephone, mobile phones and word of mouth are critical for the smooth information flow and low-cost transactions along the market value chain. The use of mobile phones nowadays can link buyers to suppliers that have mobile phone to complete business transaction as evident among the women onion producers. The modern techniques of farming in developed and developing countries for small holder farmers were focusing more on value chain and value addition approach. The value chain concept which can be simply described as the entire range of activities required to bring a product from the initial input-supply stage, through various phases of production, to its final market destination. The concept highlighted the importance of value addition at each stage, thereby treating production as one of several value-adding components of the chain. The prices of agricultural commodities change on daily or weekly basis, because prices are usually affected by climate change, supply and demand. The result in table 34 showed that price fluctuations are said to be major risk indicated by women producers representing 85% followed by perishability of 13.1%. Prices are generally higher in big cities than countryside because many people in cities have more money to spend than rural inhabitants and it costs a lot of money to transport products from the countryside to the town. There are numerous production constraints affecting production and marketing of onions in the six agricultural region of the Gambia and severity of constraints differs from parameter to parameter. The two major production constraints are lack of storage facilities and inadequate market outlets alluded by respondents representing 25.7 and 20.8% respectively while the lowest is production technologies in table 35. In other words, if supply increases or demand for a particular product falls, the price falls. If supplies are limited or demand increases, the price goes up. There are many factors affecting the price of a particular product, it impossible to predict whether prices will go up or down in the future. In conclusion, value chain approach was proved to be most effective and efficient of producing onions. Therefore recommends, the government, NGOs and private sector to support women in their wake of improving livelihood. Furthermore, agricultural department and National agricultural research institute should act as a catalyst in providing knowledge and skills in production technologies to farmers so that better prices can be obtained by producers. The government of the Gambia should provide market and preservation techniques for producers and create storage facilities to reduce post-harvest losses of onion. In addition, establishment of terminal markets at strategy locations within the country would go a long way in providing onion growers a closer outlet for their produce and at the same lowering marketing cost.

Policy Implications: The diversity of agricultural policies of the Gambia can be helpful to review policy needs from the view point of producer requirements. For women onion producers to operate successfully, a producer needs three basic things i.e. adequate incentives to produce, a secured resource base (farmland and water) and access to markets for outputs and inputs, including technology. Accordingly, the agricultural policy of the Gambia comprises the following two broad components (i) Resource policy, including land tenure policy and policies for management of resources (land, water, forests and fisheries). (ii).Access policy, including access to agricultural inputs, output markets and technology. Hence, rural financial policy is an important part of access policy, since finance in many cases is a pre-requisite for obtaining inputs and marketing products. Therefore, the following few points are recommended for due consideration to policy makers.

- Increase the availability of imported seeds for red onion to farmers in all the six regions.
- Raise the yield of both imported and local seed by improving red onion farming practices and proper seed selection.
- Improve rural financial institution, so that affordable of soft loans would be readily available to allow red onion farmer to buy imported seeds and cover the costs of other inputs.
- Facilitate the linkage of producers to relevant markets regionally, nationally and internationally.
- Develop policy regulatory frame work to promote massive local onion production to fill the gap of onion importation.
- Develop guarantee price systems by the government for producers to have better income of their onion produce.

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