International Journal of Rural Development, Environment and Health Research
[Vol-8, Issue-2, Apr-Jun, 2024]
Issue DOI: https://dx.doi.org/10.22161/ijreh.8.2
Article DOI: https://dx.doi.org/10.22161/ijreh.8.2.7
ISSN: 2456-8678 ©2023 IJREH Journal

Assessing the impact of off-season vegetable farming on farmers in the Savelugu Municipality in the Northern Region of Ghana

Yakubu Jacob Fuseini

Bagabaga College of Education Box E/R 35, Tamale-Ghana.

Received: 12 Mar 2023; Received in revised form: 17 Apr 2024; Accepted: 26 Apr 2024; Available online: 05 May 2024

Abstract— *The purpose of the study is to assess the impact of off-season vegetable farming on farmers in the Savelugu Municipality in the Northern Region. The study population consisted of respondents who were into off-season vegetable farming in the Savelugu Municipality in five selected communities in the Municipality. Purposive sampling technique was used for a sample size of fifty (50) off season farmers in the selected communities. Interview guide and questionnaire were used to solicit data for the study. The data were analyse in a step-by-step thematic analysis that included reading the transcriptions, coding, reviewing and naming themes. Thereafter, descriptive statistics namely frequency, means, and percentages were used to analyze the data in MS-Excel. Off-Season vegetable production technology can be practiced by maintaining or adjusting planting time, selecting of varieties, creating artificial and controlled environment through use of tunnels, polytene house, glass houses, hot bed etc. Moreso, Off-Season vegetable helps to get income showed the highest rank with the overall mean score of 1. Nearly all the trained farmers said that their main constraint was the high incidence of pests and diseases. It is evident that off-season cultivation is profitable and has significant impact on the consumption expenditure and food security status of the farmers. The policy implication of this study is that providing improved and modern agricultural inputs to off season farmers is essential in agriculture for rural development.*

Keywords— ***Off-season vegetable farming, Savelugu Municipality, Impact assessment, Agricultural technology, Rural development***

I. INTRODUCTION

Vegetable farming is an extensive input enterprise. In recent years, there has been a growing trend in the practice of off-season vegetable production in the country. Taking into account, the modest profit margins in off-season farmers are inclined to produce vegetables in the off-season. This is attributed to the fact that; farmers expect that vegetable produced in the off-season is likely to fetch a better price than those which are grown the normal growing seasons. It has also been observed that in the normal growing season crop require excessive use of pesticides and studies have shown that the use of such chemicals has increased by 70 percent (Tariq, 2002) and the use of pesticides results in residue accumulation in crops (Kavitha *et al.*, 2007). It has further increased the cost of production and has reduced farmers' revenues. Experience has shown that off-season vegetable production requires less frequent use of pesticides and other chemicals than normal season vegetable production. Studies have also shown the uses of pesticides are related with the farmers' attitudes and behaviour (Matthews, 2008; Ntow *et al.*, 2006).

Off-season farming has a lot of impact to the farmers and the society at large. It is observed to be where many famers do not realize its impact to them and the

general society at large. Off-season vegetable farming refers to the production of fresh vegetables outside of their typical cropping cycle, i.e. when supply is low and prices are high. The concept of off-season vegetable growing is new to the farmers, and they don't know everything about off season farming. This is one of the modern practices which can give farmers higher profit and satisfy the requirement of consumers at anytime, anywhere with more choices.

Regional Advisory Information and Network Systems (RAINS) is a Non-Governmental Organization (NGO) which realized the importance and the impact of off season farming to farmers and society as a whole. They have chosen five (5) village communities, which include: Koduhizegu, Kuldanali, Libga, Kpalung and Dipale under the jurisdiction of Savelugu Municipality to start with at this initial state. The criterion the NGO used in choosing these communities is that those villages are close to rivers and Dams which serve as a source of water for the farming. Although, one of these villages is already into this farming for some years now of which the benefits the farmers in that village will serve as an example to back this idea before the people in the other communities to be emulated.

It is aim at producing and supplying the vegetables to the market during their lean period. Keeping the farmers employed all year, which helps to tackle the problem of the unemployment. Farmers can study particular vegetable production techniques, which expands their knowledge and enthusiasm in that field. Also, the NGO came into realization that farmers at the off-season period avail themselves at various pavilions to have partisan politics discussions without being engage with things that will benefit them. With this, they sometimes end up by disagreement and other disputes that retrogress them and the society as well in their life endeavours. Again, most farmers usually engage themselves in hunting through bush burning which may cause some important animal and plant extinction, but with the help of RAINS these farmers are able to engage in off season farming in order to preserve these wild life animals.

Vegetables are an integral part of human food. They are an important source of vitamins, minerals, carbohydrates, and proteins that are required for good human health. During off season farming, the NGO observed that, majority of the farmers in Northern Ghana have nothing doing than to engage themselves in hunting through bush burning, sitting under pavilions having unnecessary discussions like partisan politics, unnecessary quarrying which sometimes leads to fight among themselves. Looking at the importance and benefits of off-season farming, the NGO took it upon itself to engage the farmers in off season farming. It has been empirically established that crop yield varies across different field conditions and regions (Bamire and Oke, 2004). As farmers are becoming aware of the benefits of the off-season crop production and the increasing demand of certain types of vegetables in the market when the supply of such vegetable declines from other areas, they are adopting the cultivation of off-season vegetable. Over the last couple of years, farmers have switched to the off-season vegetable production across the country. Like many other parts of the country, in the Savelugu Municipality in the Northern Region, there is an increasing trend of off-season vegetable production in the Savelugu Municipality. Taking into account, the economic significance of off-season vegetable production and its contribution to the farmers' income, this research was designed to assess the impact of off-season vegetable farming to farmers in the Savelugu Municipality in the Northern Region of Ghana.

Vegetable farming has become important part of agriculture in the surrounding of cities (De Zeeuw, Van Veenhuizen, & Dubbeling, 2011). It has supported the livelihood of farmers through household subsistence farming to commercial scale (Van Veenhuizen & Danso, 2007). Vegetable farming in the surrounding of city areas has been increased due to continuous rural to urban migration (Bryld, 2003).

In an area where agriculture is the occupation for livelihood and cash income, vegetable farming appears as one of the productive enterprises for cash generation (Rai *et al.,* 2019). According to the report of MoAD (2017), the area, production and yield of vegetable is in increasing trend. Vegetable farming has become important sector of urban agriculture and regular income source for farmer practicing agriculture even in a small plot of land (Bhatta & Doppler, 2010; De Zeeuw *et al.,* 2011).

Vegetable production provides a source of livelihood for about 30% of all crop-producing households in Ghana and represents approximately 32% of the total crop sales for the producing households (Ghana Statistical Service [GSS] 2012). Furthermore, Ghana's favourable

agronomic conditions for vegetable cultivation, coupled with its proximity to, and bilateral relations with, the European Union (EU), position the country at an advantage to benefit from vegetable exports. However, this advantage has not been fully exploited over the years, inter alia due to low productivity. Official statistics put annual EU vegetable imports from Ghana at around $9 million for 2008 to 2013. However, for the same period, whilst the value of pepper (*Capsicum* sp.) and eggplant (*Solanum melongena*) exports to the EU declined by 10% and 11% annually respectively, that of all vegetables declined by 10.5%. While most Ghanaian vegetables are not exported (only 2.3% are), statistics also indicate that domestic production was 23% below consumption for 2002 to 2013, and this deficit has grown annually by 22%. Consequently, 4,000 tons of vegetables are imported to make up for the consumption deficit in Ghana (FAO 2019). The divergence in production and consumption can be attributed to low yields, as will be shown in this paper, and to increased food demand due to population growth, urbanisation, and changing consumer preferences (Ministry of Food and Agriculture [MOFA] 2009).

Off season vegetable cultivation refers to the production of fresh vegetables outside of their typical cropping cycle, i.e., when supply is low and prices are high. The concept of off-season vegetable growing is new to the growers, and they don't know everything about it. This is one of the modern practices which can give farmer higher profit and satisfy the requirement of consumers at any time anywhere with more choices. The main objective of off-season vegetable cultivation is to produce and supply the vegetables to the market during their lean period (Rai *et al.*, 2019).

Off-Season vegetable production means a type of agricultural technology in which vegetables are cultivated and produced fresh before or after their normal season. There may be delay or early production in terms of days, weeks and also months. This Off-Season vegetable production technology can be gained by using different agro climatic regions, maintaining or adjusting planting time, selecting of varieties, creating artificial and controlled environment through use of tunnels, polythene house, glass houses, hot bed etc. Vegetable farming with its higher farm- gate values and productivity stand as an important sector in agribusiness (Mariyono, 2017). It has supported the livelihood of farmers through household subsistence farming to commercial scale (Van Veenhuizen & Danso, 2007).

Main objective of Off-Season vegetable production is to produce and supply vegetables to consumers at lean period of supply and best prices for products. This technology offers higher prices to farmers. Also, this technology ensures food security during peak period to promote timely certain employment. Off-Season vegetable farming is the best source of income from others and an effective means for the reduction of poverty, unemployment and malnutrition which continually exists. Commercial vegetable farming has played a vital role contributing to enhancement of economic status of the farmer and provides regular employment and income to the marginal farmers and their family members throughout the year by bringing economic gains (Panta, 2001). Mainly major crops like tomato, cauliflower, cabbage, onion, green peas, radish, carrot, brinjal etc. are grown as Off-Season vegetables. Previous studies have shown that the adoption of improved vegetable technologies can lead to dramatic improvements in economic well-being (Weinberger and Genova II, 2005). Altitudes from 400m to 2000 meters are considered as fit and suitable for off- season vegetable production.

Main challenge for producing off season vegetable production is temperature, so to maintain temperature different types of structures are used.

II. METHODOLOGY

Explanatory and descriptive research designs were used for the conduct of this study. This study follows a descriptive research design and data were collected via interview and open-ended questionnaires and analyzed by the help of descriptive coding and thematic analysis.

The study population includes all respondents who are into off season vegetable farming in the Savelugu Municipality in five selected communities.

A sample is a selected part of a population from which characteristics of the whole are estimated (Baker, 1999). The sampling techniques used for the research are purposive sampling technique and convenient sample technique. Given the nature of the study, and the sort of data needed to realize the purposes of this study, it is essential to source information from respondents and key off season farmers, who are involved in actual farming business. Thus the choice to

settle on purposive sampling. Purposive sampling is a technique which researchers purposely choose respondents who in their opinion are thought to be related to the research topic in this regard, the researchers select cases that are judge to typify the view of the group. The sample size of the study is fifty (50) respondents of off-season farmers in the selected communities.

Interview guide and questionnaire of closed ended was used to solicit data for the purpose of drawing conclusion from the findings. This allows for a large amount of data to be collected within a short period of time (Creswell, 2009).

III. RESULTS AND DISCUSSIONS

This deals with the presentation and analysis of data collected in the villages with the sample size of 50 comprising of off-season vegetable farmers in the Savelugu Municipality in the Northern Region of Ghana. Specifically, the presentations are narrowed to the demographic data, the Production technology of the off-season vegetables farming to the farmers, the Economic Gains of Off-Season Vegetables farming to farmers and the Constraints of off-season vegetable farming to the farmers.

Demographic Data of Respondents

As part of the study, the researchers sought to find out the background information of respondents. This was done in order to understand the characteristics of the respondents and also to gain a better insight into the responses provided. Data sought included gender, age and educational level. An analysis of these variables is presented in the section that follows.

Gender Distribution of Respondents

The gender distribution of the respondents was categorized into males and females. The males were majority as presented in Table 1.

Table 1: Gender Distribution of Respondents

Gender	Frequency	Percentage %
Male	45	90
Female	5	10
Total	**50**	**100**

Source: Field Survey (2023)

Table 1 shows the gender distribution of the respondents. Out of 50 respondents 45 were males representing 90% whiles 5 were female representing 10% respondents. This means that there were more males in the questionnaire administering to the off-season farmers.

Age Distribution of Respondents

Table 2 shows age group of respondents. The age group that forms majority of the study was the 21-51 years.

Table 2: Age Distribution of Respondents

Age	Frequency	Percentage (%)
21- 30 years	9	18
31- 50 years	31	62
51 years and above	5	10
Total	**50**	**100**

Source: Field Survey, 2023

In an attempt to determine the age distribution of respondents of the rural women farmers, it is observed that majority 62% of respondents are between 31 to 50 years which represent 31 respondents. 9 representing 18% of the respondents said they are within 21 to 30 years, 5 representing 10% of the respondents were within 51 years and above. These outcomes mean that majority of respondents are fully matured in the sense that they can handle issues concerning the off-season farming.

Table 3: Educational Attainment of Respondents

Educational attained	Frequency	Percentage (%)
Certificate	2	4
Diploma	8	16
No formal	40	80
Total	**50**	**100**

Source: Field Survey, 2023

From Table 3, it can be inferred that 4% of the respondents had certificates followed by 16% of respondents had attained diploma and 80% of the respondents had no formal education. It can be seen from the Table that those who had no formal education were the majority meaning they did not understand and cannot make good decision on the off-season farming.

Table 4: Years of Farming of Respondents

Years of Service	Frequency	Percentage (%)
0-5	7	14
6-10	38	76
11-15	3	6
Above 20	2	4
TOTAL	**50**	**100**

Source: Field Survey 2023

Most of the respondents' years of farming are in the category of (0 to 5 years) of 7 with a percentage of 14%, followed by respondents with a farming of (6 years to 10years) of 38 with a percentage of 76%, followed by respondents with a farming of (11to 15 years) of 3 with a percentage of 6%. Finally, the respondents with farming of (20 years or more) of 2 with the percentage of 4%. From the study respondents from the category of (0 to 5 years) years of farming are the majority. This implies that the respondents are knowledgeable and experienced of farming in the Savelugu Municipality.

The Production Technology of the Off-Season Vegetables Farming to the Farmers

For those farmers continuing off-season production technology, nearly all applied all six components of the technology package, including the heat tolerant variety, seedling nursery, raised planting beds, chemical fertilizers, rain shelters, and plant growth regulators. One farmer did not use a seedling nursery and raised planting beds, while another farmer did not apply plant growth regulator.

Off-Season vegetable production technology can be gained by using different agro climatic regions, maintaining or adjusting planting time, selecting of varieties, creating artificial and controlled environment through use of tunnels, polytene house, glass houses, hot bed etc.

Access to mechanization, quality and improved seeds, fertilizers, technology packages and technical services, is considered as prerequisite for enhanced technology adaptation that is necessary for transformation of subsistence agriculture. Therefore, providing improved and modern agricultural inputs to farmers is essential in using agriculture for rural development.

Economic Gains of Off-Season Vegetables Farming to Farmers

In Appendix 1, the economic gains of off-season vegetables farming to farmers were assessed. Among these gains, Off-Season vegetable helps famer to get income showed the highest rank with the overall mean score of 1. This was followed by it is a great source of preventive food that also contributes to nutritional security and if production will be qualitative and massive then there is chance of exports in foreign countries, providing year around employment opportunity and high earning ranked 2nd with mean of 0.91, It instills confidence in farmers that make vegetable farming their main profession ranked 3rd with mean value of 0.68, the last is Consumers can have fresh products throughout the whole year even in Off-Season and Farmers can build their knowledge; learn ideas and specific techniques develop confidence so that they can start this technology in commercial scale ranked 4th with mean score of 0.2 respectively. A farmer-based organization can empower farmers and advantage to overcome the exploitation of farmers from the prospective buyers (Darkey, Dzoemku, Okorley, Gyimah, & Bluwey, 2014). The provision for possible support and training to the farmers can lead systematic farming with concerning food security (Asongwe *et al.*, 2014).

The Constraints of Off-Season Vegetable Farming to the Farmers

The interviews that were held with respondents indicated that off season farmers were confronted with a myriad of problems.

Nearly all the trained farmers said that their main constraint was the high incidence of pests and diseases. They felt that they had to spend a lot of money on pesticides and some were concerned about the impact on their health. Farmers also mentioned the high investment costs on rain shelters and lack of access to quality tomato seed. Many farmers felt that off-season tomato production required a lot of their time when they were already occupied with other crops. Many farmers also felt that profits were lower than what they had expected because yields were disappointing and costs were higher than anticipated.

Likewise, the accessibility of road network for transportation from farmland to market centre and irrigation are added value for the farmers whereas a study conducted by Paudel and Adhikari (2018) in

Dhading district revealed that lack of transportation facility emerges as main constraints of vegetable marketing.

Meanwhile, the vegetable diseases tend to be another notable constraint in vegetable farming with losses in production and depriving farmers from expected profits. Vegetable diseases have also become a major challenge which discrete farmers from good returns (Shrestha, 2018; Shrestha, Prajapati & Mahato, 2014). According to Joosten, Dijkxhoorn, Sertse, & Ruben (2015) the vegetable diseases are one of the key challenges which resulted in maximum pre-harvest loss. The increase in farming inputs is significantly associated with the emergence of diseases which added extra financial burdens to the farmers. In accord to the study by Jha et al., (2016) lack of proper irrigation system has also impacted in the agricultural returns and agreeing with the finding of Timalsina and Shivakoti (2018), deficient in supply of quality seeds are also the constricting factor for vegetable production.

Common voices of farmers with regards to constraints of vegetable farming are follows:

Vegetable price are very unpredictable, especially tomato which we cultivate more as commercial vegetable. Even if we have good production we are not benefited as middleman does. They can earn more than five times; a farmer can earn annually. On the other side, vegetable diseases lowered the production and sometimes the condition remains unmanageable to have the expected returns.

Limited access to land is still a major constraint to farmer's full participation in off season. Available evidence indicates that the distribution of land ownership is heavily skewed toward men (FAO/World Bank, 2009) and most men usually do not have ownership of land and assets because traditionally only sons inherit the family land.

Heilbrunn (2014) points out that 90% of business start-ups that failed did so because of the lack of management skills of the owners. Similarly, the lack of financial resources, shortfall in marketing and management expertise, weaknesses in external information and linkages are factors that limit their competitiveness. These problems have been affecting all those operating within Ghana's informal sector with women being most affected. Often, they also have more limited access to family labor and lack the resources to hire labor for their farming and other economic activities. In addition, their time constraints make it difficult for them to benefit from skills training, health programs, and other development activities.

IV. CONCLUSIONS

It is evident that off-season cultivation is profitable and has significant impact on the consumption expenditure and food security status of the farmers. Based on the results, a number of policy implications can be drawn. More investment in research and development is needed from both donor and government agencies to develop resistant varieties of off-season vegetables since the farmers reported that frequent attack of insects and diseases was the main constraint of off-season vegetable cultivation. Efforts are needed to disseminate the off-season cultivation technique to different parts of the country. Cost of production is higher for off-season cultivation compared to raining season cultivation. Steps to diversify sources of income as well as access to low interest credit can increase the availability of capital. Higher income may have a positive effect on reducing poverty in the country. Higher consumption expenditure and food security status may play a vital role in reducing malnutrition. Thus, there is a need for promoting off-season cultivation in anti-poverty programs, especially in developing countries like Ghana.

ACKNOWLEDGEMENTS

I acknowledge the Municipal directorate of Food and Agriculture in the Savelugu Municipality for the support for this study. It also goes to the field staff of Regional Advisory Information and Network Systems (RAINS), a Non-Governmental Organization (NGO) located in Tamale for the exposure and permission to use their farmers for this study.

REFERENCES

[1] Bryld, E. (2003). Potentials, problems, and policy implications for urban agriculture in developing countries. *Agriculture and Human Values*, 20(1):79-86.

[2] Bhatta, G. D., & Doppler, W. (2016). Smallholder peri-urban organic farming in Nepal: A comparative analysis of farming systems. *Journal of Agriculture, Food Systems, and Community Development*, 1(3): 163-180.

[3] Bhatta, G. D., & Doppler, W. (2010). Socio-economic and environmental aspects of farming practices in the peri-

urban hinterlands of Nepal. *Journal of Agriculture and Environment,* 11: 26-39.

[4] De Zeeuw, H., Van Veenhuizen, R., & Dubbeling, M. (2011). The role of urban agriculture in building resilient cities in developing countries. *The Journal of Agricultural Science,* 149(1): 153-163.

[5] FAO/Food and Agriculture Organization. The state of food and agriculture 2010±2011. Women in agriculture: Closing the gender gap for development. Rome: FAO; 2011.

[6] Heilbrunn, S. (2014). Impact of gender on difficulties faced by entrepreneurs. International Journal of Entrepreneurship and Innovation, 5, 159-165.

[7] Jha, A. K., Malla, R., Sharma, M., Panthi, J., Lakhankar, T., Krakauer, N. Y., Pradhanang, S. N., Dahal, P., Shrestha, M. N. (2016). Impact of irrigation method on water use efficiency and productivity of fodder crops in Nepal. *Climate,* 4 (1): 4.

[8] Paudel, P., & Adhikari, R. K. (2018). Economic analysis of tomato farming under different production system in Dhading district of Nepal. *Nepalese Journal of Agricultural Sciences,* 16: 217-224.

[9] Joosten, F., Dijkxhoorn, Y., Sertse, Y., & Ruben, R. (2015). *How does the fruit and vegetable sector contribute to food and nutrition security?* LEI Wageningen: the Netherlands.

[10] MoAD (2017). *Statistical information of Nepalese Agriculture, 2015/16.* Kathmandu Ministry of Agricultural Development, Monitoring, Evaluation and Statistics Division Agri Statistics Section, Singh Durbar.

[11] Mariyono, J. (2017). Profitability and determinants of smallholder commercial vegetable production. *International Journal of Vegetable Science*, 24(3): 274-288.

[12] Panta, S. (2001). Final Report on Commercial Off-Season Vegetable Production and Marketing.

[13] Shrestha, S., Ojha, R. B., Pradhan, N. G., & Joshi, B. D. (2018). Performance of tomato with organic manures in plastic tunnel. *Journal of Nepal Agricultural Research Council,* 4(28): 1-6.

[14] Shrestha, G., Prajapati, S., & Mahato, B.N. (2014). Plant diseases and their management practices in commercial organic and conventional vegetable farms in Kathmandu valley. *Nepalese Journal of Agricultural Sciences,* 12: 129-141.

[15] Van, V. R ., & Danso, G. (2007). Profitability and sustainability of urban and peri urban agriculture (Vol. 19): *Food & Agriculture Organization* . Rome, Italy.

[16] Weinberger, K., Genova II, C.A., (2005). Vegetable production in Bangladesh Commercialization and rural livelihoods. Technical Bulletin No. 33 (AVRDC Publication # 05-621), *AVRDC – The World Vegetable Center*, Shanhua, Taiwan

[17] World Bank. (2007). World Development Report 2008: Agriculture for Development Washington, D.C.: World Bank Publications.