

Strategies for Enhancing Productivity and Profitability of Irish Potato in Mbeya District, Tanzania

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ABSTRACT

This study investigated strategies for enhancing productivity and profitability of Irish potato in the Mbeya District, Tanzania. A cross-sectional research design was employed whereby data were collected through interviews, survey questionnaire, and documentary reviews. Data from a sample of 192 smallholder farmers were analysed by employing descriptive and inferential statistics. Findings indicated that the average farm size under Irish potato production was about 1 acre. A majority of smallholder had poor agronomic practices and used local varieties. The average yield was 6,853 kg of Irish potato per acre (6.85 tons per acre). The gross return per acre was TZS 4,690,022, while the total variable cost was TZS 1,926,402 making the gross margin of TZS 2,763,620 per acre. Although this profit margin seems low it is, in fact, higher than expected mainly because data was collected during low season when farm gate prices were relatively high. Education level of a farmer, access to credit, membership in farmers' groups, farm size, and household size significantly ($p < 0.05$) influenced Irish potato profitability among smallholder farmers. The strategies for enhancing productivity included distribution of improved potato varieties, training smallholders on good agronomic practices (GAP), and sensitizing smallholders to form or join farmer groups or associations for collective marketing.

Keywords: *Factors, Irish potato, profitability, smallholder farmers*

1.0 INTRODUCTION

Irish potato (*Solanum tuberosum*) is a seasonal crop grown in temperate zones all over the world, but primarily in the northern hemisphere (FAO, 2012). The potato is the world's fourth most important food crop after maize, wheat, and rice (Mpogole, 2013; FAO, 2017). It is the main root and tuber crop, which grows in over 189 countries, and is consumed by over a billion people (Mpogole, 2013). Hundreds of millions of people in developing countries depend on potato for their survival. Potato cultivation is expanding strongly in the developing world, where the potato's ease of cultivation and nutritive content has made it valuable food security and cash crop for millions of farmers. Developing countries are now the world's biggest producers and distributors of potato and potato products (FAO, 2017). Annual production exceeds 388 million tons, where China, which is the world's biggest producer of round potato, produces over 99 million tons a year (Mpogole, 2013; FAOSTAT, 2017). Both production and consumption of the crop have been increasing gradually. For example, Irish potato production in the world is increasing at an annual rate of 4.5% and area planted at 2.4% (CIP, 2008; FAOSTAT, 2008). Tanzania is one of the big producers of potato in Sub-Saharan Africa. For the year 2017 Tanzania produced 1,749,213 tons of Irish potato, and almost all these were coming from smallholder farmers from the Southern Highlands of Tanzania (FAO, 2017).

Studies have shown that Irish potato produces significant quantities of calories comparable to cereals and that it is more profitable than many other food crops (Scott *et al.*, 2000; CIP, 2008). In the southern highlands of Tanzania, Irish potato is the third most important starchy food and cash crop after maize and rice. Moreover, the crop has great potential in both national and regional markets due to the growing demand for chips and snacks/crisps (Anderson, 2008). This growth in demand can be attributed to many factors including increasing economic activities, urbanisation, tourism, and changing lifestyles, all of which are shifting consumer food preferences towards easy to cook and processed foods (CIP, 2008; FAOSTAT, 2008; Mpogole, 2013).

The importance of potato for food as well for income cannot be overemphasized. Once harvested, potato can be used for a variety of purposes: as a source of food for cooking, as raw material for processing into other food products, food ingredients, starch, and alcohol, as

feed for animals, and as seed tubers for growing the next season's crop. Despite this potential, studies such as Mpogole (2013), Mpogole and Kadigi (2012), and Mpogole *et al.* (2012) show that the productivity of the crop is still lower than the possible level that would be possible with good agronomic practices (GAP). Due to this, it was vital to determine effective strategies to enhance productivity and profitability of the crop amid the reported the negative impact of climate change (FAO, 2008; Manyatsi *et al.*, 2010; Oseni and Masarirambi, 2011; Manyatsi *et al.*, 2013). Therefore, this study assessed the determinants of potato production in Mbeya District with a view of identifying strategies for enhancing productivity and profitability of the crop. Specifically, study aimed to determine the socio-economic characteristics of smallholder farmers, to determine the status of potato production, and to examine factors affecting the profitability of the crop in the study areas.

2.0 METHODOLOGY

2.1 Description of the Study Area

This study was conducted in Mbeya District in Southern Highlands of Tanzania. The District is located in the Southern part of Tanzania at latitude 8° 30"-9° 30" South of Equator and longitude 32° 045"-33° 045" East of Greenwich. It has a mean annual rainfall ranges from 650 mm to 2700 mm while the mean annual temperature ranging from a mean minimum of 12°C and a mean maximum of 30°C. The District has a total land area of 2,432.0 square kilometres of which 1,898.2 square kilometres is arable land ideal for agricultural production (URT, 2003).

Mbeya District was purposively selected because it is one of the main producers of potato in Tanzania (Mpogole, 2013; MAFSC, 2019). For instance, in 2018/2019 production season Mbeya Region was the leading producer of potato as it accounted for about 50% of the total production in the country. The District has good climatic conditions that favour the production of different varieties of potato. Concurrently, the Mbeya district was the major contributor to that share. Despite this high production, productivity of the crop remained relatively low (Mpogole, 2013). Two Wards of Iziwa and Iganjo were purposively because they were considered as the main producers of potato in Mbeya District. Other economic

activities in the two Wards include farming of other food and cash crops such as maize, beans, sweet potato, and pyrethrum and livestock keeping.

2.2 Study Design and Data Collection

This study used a cross-sectional survey of smallholder potato farmers in the two Wards. In each Ward, 96 households of smallholders were selected using systematic random sampling procedures making the total number of households involved in the study being 192. Data from households were collected using a pre-tested survey questionnaire and interview guide. Heads of households dealing with potato production were purposively involved in the study because they are at the hub of decision making at the household level (Kisinja *et al.*, 2008). The questionnaire was designed to gather information on socio-demographic characteristics of a household head, potato varieties produced, production costs per acre, potato output, selling price of the last season, and factors perceived to influence potato profitability. In-depth interviews with extension officers at District and Ward levels were also carried out to gather more relevant data related to the study. Additionally, documentary reviews were conducted to gather important information related to potato production in the study areas.

2.3 Data Analysis

Data was analysed using descriptive statistics, gross margin and linear regression in Statistical Product Service Solution (IBM-SPSS) version 20. Gross margin per acre was used as a proxy for profitability. Evaluation of the factors affecting the profitability of potato farmers was conducted using multiple linear regression analysis. The model was specified as follows:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \mu_i$$

Where: Y_i is the profitability of potato measured by gross margins per acre; β_0 is the constant; β_i is the estimated coefficients of the explanatory variables; X_1 - X_8 are explanatory variables; and, μ_i is the stochastic error term.

The description of the explanatory variables and their expected relationships with the dependent variable are presented in Table 1.

Table 1: Summary of variables on factors affecting the profitability of Irish potato

Variable	Description	Variable Type	Expected Effect
X ₁ =Education level	The education level of the household head	Continuous	+
X ₂ = Sex	Sex of household head 1=male 0=female	Dummy	+
X ₃ =Farm size	Household farm size in acres	Continuous	+
X ₄ =Farming experience	Farming experience of the household head in years	Continuous	+
X ₅ =Access to credit	Access to credit 1 = Yes, 0 = No	Dummy	+
X ₆ =Membership to group	Membership to farmers' group 1 = Yes, 0 = No	Dummy	+
X ₇ =Family size	Household size (number of people in the household)	Continuous	+
X ₈ =Distance	Distance from farm to input market in km	Continuous	-

3.0 RESULTS AND DISCUSSIONS

3.1 Characteristics of Surveyed Potato farmers

In a sample of 192 Irish potato farmers, about 84.4% were males while 15.6% were females (Table 2). This can be inferred that the higher percentage of men in this study might be a reflection of the commercial nature of Irish potato production in the study area. This follows the fact that the majority of Irish potato farmers were doing so for commercial purposes, and more men would likely be involved in it, leaving women with other food crops for home consumption and other household activities. According to Kaaria *et al.* (2007) and World Bank, FAO, and IFAD (2008) in Africa, studies have shown that when a crop is perceived as commercial, men are more likely to take over from women. However, it can be noted that according to FAO, IFAD, and ILO (2010), in most developing countries like Tanzania, women provide about 80 % of the total labour force in farming activities and 54 % of the female intensity of agriculture.

Also, findings revealed that the majority (54.2%) of respondents were aged between 31 - 50 years, indicating that most of the respondents were of middle age; the age at which they are still energetic and hence can actively involve in production activities (Lupilya, 2007). Moreover, the study found that the majority (69.8%) of the respondents had attained primary education while 6.3% had secondary education, an indication that there was a good literacy level in the study area and hence expected reasonably to have good ability to process information (i.e. agricultural extension packages) by a good number of farmers as it has been observed in other studies (Deshmukh *et al.*, 2007; Junge *et al.*, 2009). Household size by the majority (53.1%) of respondents was between 3- 5 members with an average of 4.7, which is close to the national average of 4.8 (URT, 2012), implying that they have reasonable labour for farm activities (Okoedo-Okojie and Onemolease, 2009).

Table 2: Respondents characteristics (N=192)

Variable	Percent
Sex	
Male	84.4
Female	15.6
Family size	
<3	22.9
3.00 - 5.00	53.1
6.00+	24.0
Marital Status	
Single	15.6
Married	75.5
Divorced	2.1
Widowed	6.8
Age	
<= 30.00	2.1
31.00 - 50.00	54.2
51.00 - 70.00	41.7
71.00+	2.1
Educational level	
No formal education	23.4
Primary education	69.8
Secondary education	6.3
Post-secondary	0.5

3.2 Status of Potato Production in Mbeya District

3.2.1 Size of land cultivated

Findings as presented in Figure 1 revealed that most of the respondents (92.7%) cultivated a farm size below or equal to 1 acre. Respondents who cultivated a farm size greater than 1 to 3 acres were 5.2% and those who cultivated a farm size above 3 acres were 2.1%. Also, findings indicated that the average farm size under Irish potato production was about 1 acre. These findings suggest that the majority of the farmers involving in Irish potato production are smallholder farmers, this is consistent with results from a previous study conducted by Mende *et al.* (2015) in another part of the Mbeya district who found that the majority (69%) of the households allocated land for potato production in sizes ranging between 0.2 and 1.0 acre.

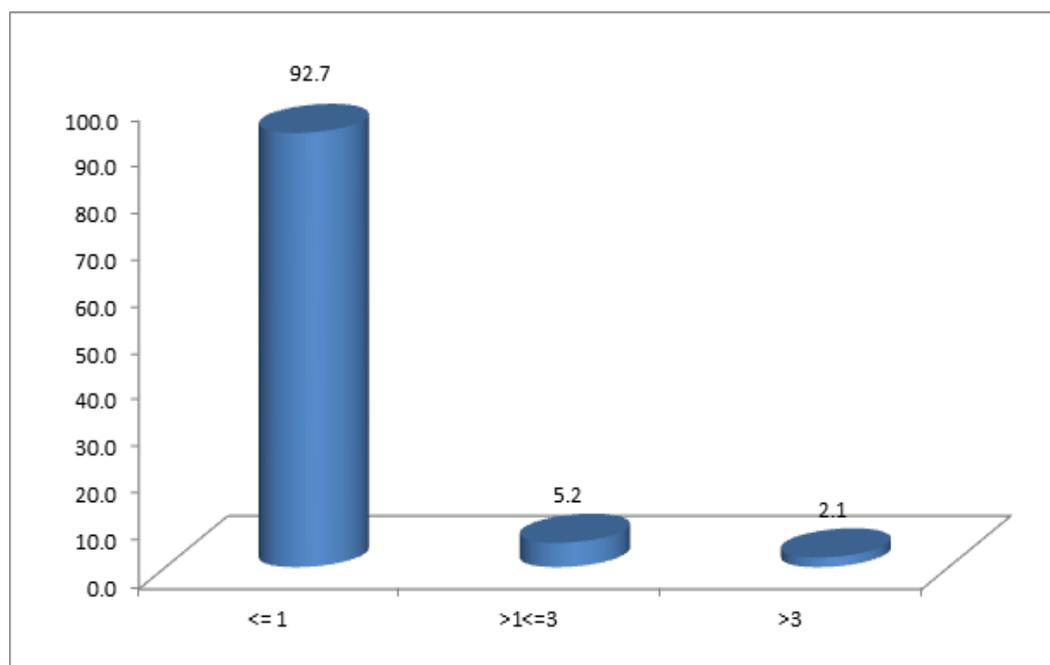


Figure 1: Size of land cultivated in acres

3.2.2 Potato productivity

Irish potato production is a very significant economic activity in the Mbeya district. Table 3 provides the average yield of Irish potato production in the study area. The findings revealed that the average yield was 6853 kg per acre (6.85 tons per acre). The mean yield obtained in

this study is higher than the ones reported by Mpogole and Kadigi (2012) in Mbeya District (3.3 tons per acre) and Njombe District (4.4 tons per acre). Similarly, in Ethiopia Agiro (2011) reported a lower yield (5.4 tons per acre) than the current study. The results further revealed that the majority (56.3%) of the farmers obtain 4401-7000 kg per acre, which indicates that the production of this crop has not been to its full potential. A study by Kabungo (2008) in Mbeya rural district revealed the average yield per acre for this crop to be 4.6 tons, instead of 10 - 12 tons per acre under optimal agronomic practices (Kanyeka *et al.*, 2007; Al-Dalain, 2009). According to key informants' interviews, most farmers do not follow proper agronomic practices and tend to use local varieties that have low yield comparing to improved varieties. Therefore, there is still an opportunity to improve production for this crop in the study area.

Table 3: Irish potato yields produced

Irish potato yield	Frequency	Percentage
Yield categories (kg)		
<= 3000	13	6.8
3001 – 4400	36	18.8
4401 – 7000	108	56.3
7001 – 8000	24	12.5
Above 8000	11	5.7
Total	192	100.0

3.2.3 Common varieties produced in the study areas

Common improved varieties produced in the study areas include *Asante* (2 %), *Sherekea* (13 %), *Meru* (6 %), and *Tengeru* (5 %) as indicated in Figure 2. While 74 % of farmers prefer to produce local varieties (*Arka* and *Kikondo*) that are not recommended by Tanzania Agricultural Research Institute-Uyole for commercial cultivation because they have the low yielding capacity. The *Meru* variety yields the highest (7,521kg/acre) while the local varieties had the lowest (5,383 kg/acre).

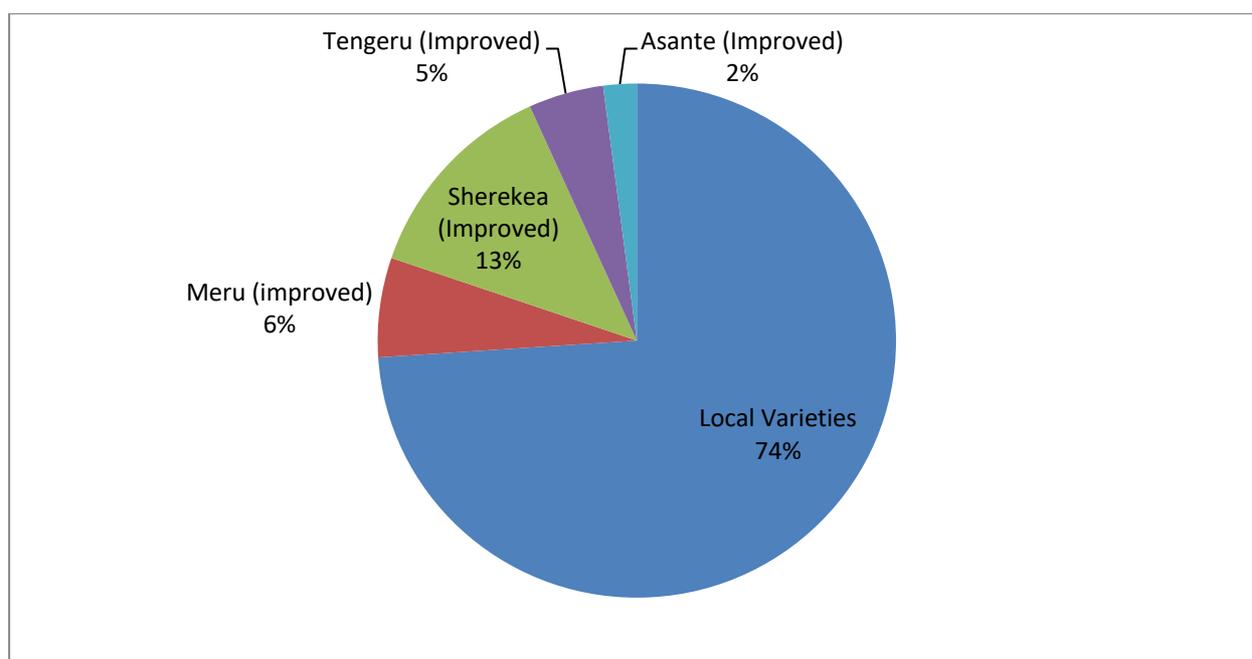


Figure 2: Potato varieties produced in the Mbeya District

3.4 Profitability of Potato Production

The profitability in Irish potato production depends to great extent on the quantity of Irish potato produced per acre. The gross return was computed by multiplying the yields per acre from the sampled farmers and the average price of Irish potato. The price for Irish potato varied considerably over time. However, the average Irish potato price for the farming season (2018/19) was TZS 68,437.50 per 100 kg bag of Irish potato which was used to compute gross return. The gross return was therefore TZS 4,690,021.88.

The gross margin represents the difference between the gross returns and the Total Variable Cost (TVC) which was TZS 1,926,401.63. Results from Gross Margin (GM) analysis indicated that Irish potato farmers earned a GM of TZS 2,763,620.25 per acre with a return per shilling invested (GM/TVC) of 1.43, implying that Irish potato production is profitable in the Mbeya District. The finding of GM is contrary to that of Mpogole and Kadigi (2012) and Mpogole (2013) that reported lower GM for Mbeya District (TZS 458,210.00), Njombe District (TZS 489,600.00), and Nkasi District (TZS 262,550.00), however, with higher return per shilling invested in Njombe District (TZS 1.72) and Nkasi District (TZS 5.08), while

Mbeya district had TZS 1.35. Correspondingly, Kabungo (2008) reported low profitability (returns per shilling invested of TZS 0.53) from the same district but different wards from this study. In the current study return per 100 kg bag harvested was TZS 43,327.16. Despite the different levels of returns per shilling invested, all studies realize that it is profitable to engage in Irish potato production. This is supported by Dlamini and Masuku (2013) and Musi *et al.* (2018) who affirmed that farming enterprises need to be profitable for farmers to be worthwhile. A comprehensive gross margin analysis for the current study is shown in Table 4.

Table 4: Gross margin analysis per acre of potato

Item	Unit	Quantity	Cost/price (TZS)	Total (TZS)
Gross returns				
Average yields (100kg bag /acre)	100 kg bag	68.53	68,437.50	4,690,021.88
Variable cost				
The hiring of a plot (TZS per acre)	Acre	1	100,000.00	100,000.00
Clearing	Man-day	2	13,027.39	26,054.77
Tillage (TZS per acre)	Acre	1	81,948.26	81,948.26
Seed buying (TZS per acre)	100 kg bag	7	75,174.79	526,223.50
Sowing	Man day	2	60,000.00	120,000.00
Fertilizer	Man-day	2	157,608.10	315,216.20
Pesticides and disease control	Acre	1	280,000.00	280,000.00
Weeding-phase I & II	Man-day	4	24,005.89x4= 96,023.57	96,023.57x2= 192,047.10
Harvesting	Acre	1	113,586.80	113,586.80
Carriage	100 kg bag	68.53	2,500.00	171,325.00
Total variable cost				1,926,401.63
Gross Margin				2,763,620.25
Return per shilling invested=GM/TVC (TZS)				1.43
Return per bag harvested (GM/ acre) (TZS)				43,327.16

3.5 Factors Affecting Profitability of Potato Production

To examine factors affecting the profitability of Irish potato among smallholder farmers, a multiple linear regression analysis was used. A gross margin per acre was used as a proxy for profitability. Table 5 indicates the results of regression analysis for the factors that were considered to account for the variations in the Irish potato profitability. The regression

analysis revealed that the presumed factors were reasonably good predictors in explaining Irish potato' profitability. The F-value was 41.58 with a p-value of 0.01, indicating that independent variables included in the model collectively had a significant influence on Irish potato' profitability. The value of R^2 was 0.64 meaning that 64% variability of the dependent variable (Irish potato profitability) was due to the explanatory variables included in the model. Thus, the regression model was adequate. Gujarati (2006) states that, in determining model adequacy, we look at some broad features of the results, such as the R^2 value and F-value. It can also be noted that the variance of inflation factor (VIF) shown in Table 5 ranges from 1.033 and 2.011. In multiple linear regressions, the VIF is used as an indicator of multi co linearity. Various recommendations for acceptable levels of VIF have been published in the literature. A recommended maximum VIF value of 5 (Rogerson, 2001) can be found in the literature.

Table 5: Regression analysis results on factors affecting Irish potato profitability

Variables	Un standardized Coefficients		Standardized Coefficients Beta	t	Sig.	Co linearity Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	1288355.959	234304.022		5.499	0.000***		
Educational level	271103.874	88248.415	0.145	3.072	0.002**	0.871	1.148
Farming experience	10821.734	7892.221	0.070	1.371	0.172	0.753	1.329
Farm size	47938.505	114199.322	0.019	0.420	0.675	0.968	1.033
Sex	1098.669	117753.675	0.000	0.009	0.993	0.899	1.112
Access to credit	1288013.272	129217.950	0.623	9.968	0.000***	0.497	2.011
Membership to farmers group	333113.639	125990.176	0.158	2.644	0.009**	0.545	1.835
Distance to inputs market	-13922.678	6399.411	-0.108	-2.176	0.030*	0.789	1.268
Family size	168748.911	60468.800	0.127	2.791	0.006**	0.933	1.072

Note: (*) Indicates significance at the 5% level, (**) indicates significance at the 1%, and (***) indicates significance at the 0.1% level.

$R = 0.80$, $R^2 = 0.64$, Adjusted $R^2 = 0.63$, $F = 41.58$ Significant at the 1% level

3.5.1 Educational level

Results showed that the educational level of the household head had significantly ($P < 0.01$) influenced potato profitability positively (Table 5), implying that that an additional year of education can increase profit margin of potato to the farmer. This finding is in agreement with the report of Bongiwe (2013) who investigated factors affecting productivity and profitability

of vegetable production, his study revealed that the educational level of the household head had significantly ($P < 0.05$) influenced profit of vegetables. Education helps to unlock the natural talents and inherent enterprising qualities of the farmers, thus making them more skilled and more responsive to risk-taking and change than the illiterate farmers (Nwaru, 2004).

3.5.2 Access to credit

Results in the Table 5 revealed that access to credit was statistically significant ($p < 0.001$) in potato profitability with a positive coefficient. This suggests that access to credit increases the chances of earning high profit margin among potato farmers. This finding is in agreement with that of Wairimu *et al.* (2015) who conducted a study on factors influencing the profitability of diversified cash crop farming among smallholder tea farmers in Gatanga district, Kenya. Findings from that study discovered that diversified cash crop farming is at least 63% more profitable than specialization in tea farming. Moreover, explanatory variable access to credit was found to be significantly influencing profit. Farmers having access to credit tends to perform better because credit allows them to buy inputs timely and also finance cash flow transactions at critical times.

Findings from the current study revealed that only 28.6 % of Irish potato farmers reported accessing credit from various sources. This is probably why 74 % of studied farmers failed to adopt new varieties which are coupled with a higher yield than local varieties. In Ethiopia, Agiro (2011) reported that 66 % of Irish potato farmers have access to credit mainly from informal credit providers like neighbours, relatives, or friends to fill financial resources to fill the gap which might affect production activities.

3.5.3 Membership to farmers' groups

Results in Table 5 indicated that membership in farmers' groups were statistically significantly ($p < 0.01$) influencing potato profitability positively. Being a member of farmer group or association increases the bargaining power of farmers to earn better prices thereby increasing their profit margins. This finding concurs with Dagada *et al.* (2015) who investigated factors influencing the profitability of fruits Tshakhuma and Khumbe Markets in

Limpopo Province of South Africa. Results showed that fruit profitability was influenced positively by the use of the farmers' group organizations. Moreover, Bachke (2009) recounted that there is a positive effect on small-scale farmers' income from being members of a farmers' organization. Besides membership in such organizations is considered to increase the level of agricultural production and yield economic benefit to farmers as well as promote their general welfare (Oyeyinka *et al.*, 2009; Mwaura, 2014). Furthermore, Toln *et al.* (2015) found that farmer groups can be an important institution for the transformation of smallholder farming, increase productivity and incomes thereby reducing poverty among smallholder Irish farmers in Guinea. When smallholders and other resource-poor agricultural producers work together it becomes easier to access farming inputs such as seeds, plant material, water, fertilizers and pesticides, and to aggregate produce to reach larger markets. Farmers are then able to reduce costs and improve their bargaining power. And when farmers thrive, they're better positioned to improve their food security and move out of poverty. Other players in food systems benefit too.

3.5.4 Distance to input market

The distance to the input market shows a negative coefficient and statistically significant ($p < 0.05$), suggesting that the increase in distance from farm to inputs market will decrease the profit margin of potato. This observation is consistent with the study conducted by Simtowe *et al.* (2012) who indicated that the coefficient for distance to an input market is negative and significant at 5% level. This suggests that farmer proximity to an input market increases the profit of agricultural production due to low transport costs. Also, Bongiwe (2013) analysing factors affecting the productivity and profitability of vegetable production in Swaziland (Eswatini) showed that distance to the input market significantly influencing the profitability of vegetables.

In this study, a majority (50%) of respondents accessed inputs within one to seven kilometres away from their farms as shown in Table 5. This has an implication on transportation costs which for most smallholder farmers cannot afford hence, failed to adapt to new production technologies. Correspondingly, Simtowe *et al.* (2012) expressed that distance significantly affected the adoption of improved pigeon pea varieties in Kenya. However, this observation contradicts the findings reported by Namwata *et al.* (2010) and Feleke & Zegeye (2006).

Table 5: Distance to the inputs market (n = 192)

Distance (km)	Percentage
1 – 7	50.0
7 – 12	25.0
12 – 15	18.2
>15	6.8
Total	100.0

3.6.5 Family size

The study revealed that family size was statistically significantly ($p < 0.01$) influenced Irish potato profitability with a positive coefficient (Table 5). These results imply that holding other factors constant, the larger the family the larger the profit margin earned in a household. This is attributed to the fact that in smallholder farming (or farming under peasantry system) the household is the major source of labour and therefore, the larger the household-size the more the labour force and therefore less cost of labour. This finding is in agreement with the report of Achike *et al.* (2012) who analysed profitability and yield determinants of cocoa farms evidence from Ondo state, Nigeria. Results from that study revealed that family size was a significant variable in influenced the profit of cocoa with a positive coefficient.

3.6.6 Sex of the household head

It was anticipated that due to differential access to productive resources and access to information, the male-headed households would report higher profitability than female-headed households. However, findings revealed that the sex of the households is insignificant ($p > 0.05$). This finding is inconsistent with that of Wairimu *et al.* (2015) who conducted a study on factors influencing the profitability of diversified cash crop farming among smallholder tea farmers in Gatanga District, Kenya. The findings revealed that the sex of the household head had significant effects on profit. Male-headed diversified farms make more profit from cash crops than their female-headed counterparts. Being a diversified male farmer leads to a KES 128,027 higher profit from cash crop farming activities compared to being a diversified female farmer.

3.6.7 Farming experience

It was expected that farmer who has farming experience will acquire more profit than a less experienced farmer because he/ she had a lot of exposure to challenges in Irish potato farming and this puts them on a better position to take appropriate measures to increase profit. However, findings revealed that farming experience was insignificant ($p > 0.05$). This finding is inconsistent with that of Wairimu *et al.* (2015) who reported that the farming experience of the household head had significant effects on profit.

3.6.8 Farm size

Farm size (acres) is an indicator of wealth (and perhaps a proxy for social status and influence within a community) and this study expected that farmers who own large farms will obtain higher profit. Contrary to prior expectations, this study revealed that farm size was not significant ($p > 0.05$) in influencing the profitability of Irish potato and had a negative coefficient. These observations contradict the finding of Hoque and Haque (2014) who examined the socio-economic factors influencing the profitability of rice seed production in the selected areas of Bangladesh. Their findings showed that farm size was significant and had a positive coefficient.

4.0 CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

4.1 Conclusion and Recommendations

The study established that productivity of potato farmers was relatively lower than would be possible if improved varieties and good agronomic practices were employed. Majority of smallholders used local varieties by recycling own tubers, some of which could be affected by fungal or bacterial diseases. Also, the study established that profitability of potato production was influenced by many factors including education level of farmers, access to credit, membership to farmer groups, farm size, and household size. Strategies to enhance productivity and profitability could focus on such factors that have shown to influence potato production. Such strategies for enhancing productivity should include access to affordable credit, distribution of improved potato varieties, training smallholders on good agronomic

practices (GAP), and sensitizing smallholders to form or join farmer groups or associations for collective marketing. Efforts to sensitize farmers on uptake of improved potato varieties, use of good agronomic practices and formation and strengthening of associations are encouraged.

4.2 Limitations of the Study

The results of the study may not be generalised mainly due to two reasons. First, the study was conducted in only two purposively selected Wards. Second, data for this study was collected during a low season in which case farm gate prices of potato were relatively high making the gross margins higher than were expected.

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