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A COMPARISON OF ESTIMATED MAIZE AND CABBAGE ENTERPRISE BUDGETS OF IDEAL SMALL-SCALE COMMERCIAL AND SUBSISTENCE FARMS IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA

Douglas Kibirige
Department of Agricultural Economics and Management
Faculty of Agriculture, University of Swaziland, Luyengo, Swaziland
kibirige@uniswa.sz

Abstract

Millions of people in rural South Africa depend on small-scale subsistence agriculture as their major source of livelihood. Subsistence farming is characterised by relatively low use of agro-inputs leading to relatively low yields. The information in this article presents an ideal situation of small-scale commercial farms compared to the actual subsistence crop production faced by small-scale farmers in Eastern Cape Province. Despite availability of established small-scale irrigation facilities in rural Eastern Cape, results presented indicate an observable diversion in yields, total variable costs and gross margins generated per hectare of an ideal small-scale commercial farm versus the small-scale subsistence farm given the same size of land. The low uses of inputs are translated into low production and gross margins. Thus, land owned by small-scale subsistence farmers seems to be under-utilised .This keeps the rural farmers in circles of poverty and higher risk of food insecurity. Results suggest recommendable increased use of agro-inputs by small-scale farmers in Eastern Cape Province through policies related to improved access to input credit services, input-subsidies, more decentralised input distribution in rural areas, and extension services geared towards optimal use of these inputs. These policies can catalyse commercialization of rural small-scale farming in Eastern Cape.

Keywords: Small-scale farmers, Enterprise budgets, agro-inputs, gross margins, Maize, Agricultural economics

INTRODUCTION

Based on the backward and forward linkages, agro-industrial sector remain one of the major contributors to South Africa's national Gross Domestic Product (12%) and provides employment to approximately 8.5 million people (Kibirige, 2013). Aliber *et al.* (2009) indicated that there are approximately 4 million smallholder farmers in South Africa and 92% are considered as subsistence/communal farmers who produce mainly to meet the household food security requirement. In the Eastern Cape Province, the agricultural sector contributes about 1.9% of the Provincial GDP. According to Statistic South Africa (2012), the 2011 census results revealed that the Eastern Cape Province's population was estimated at 6 562 053 people and 60% of this population derive their livelihood from smallholder subsistence farming (Kibirige, 2013). Smallholder farmers mainly grow crops field crops and vegetables likemaize and cabbage, respectively, and rear livestock for household food security and household income generation.

Both crop and livestock production systems are dependent on the botanical characteristics, environment, climate, and land size, location, inputs used, as well as other variables (Allemann and Young, 2008). For improved food security and household incomes, these factors and inputs need to be combined in the most efficient way, and reduce management gaps in terms of quality decision making regarding production, investment, financing, marketing and human relations aspects (Kibirige, 2013). One sure way of investigating proper use of inputs gainfully includes establishment of the profitability of these crops and livestock enterprises. This helps to establish the viability and sustainability of an enterprise. The estimated profitability (gross margins) was based on one hectare for each selected enterprise presented in this study (Norman *et al.,* 2002).

Prerequisites for Establishing a Sustainable Farm Enterprise

To establish a viable farm business project, essential production resources and requirements should be available. Land is one of these natural resources a prerequisite in farming. The conventional method is when planting crops and rearing animals is done on the open land, the common areas under production range from 0.25-2 hectares of land for communal subsistence farmers and 2 – 50ha for smallholder commercial ("emerging") farmers, but for a viable farm business project the area should be greater than one hectare (> 1 ha).

In South Africa, of the 12.5 km^3/year total available fresh water, 31% is used for domestic purposes, 6% is used in industrial and 63% is used in agricultural production (CIA, 2012; Kibirige, 2013). The 63% agricultural water use signifies its importance in crop and livestock production. Both most crops and livestock can hardly survive in water scarce areas

especially vegetables which require large quantities of water and they can only thrive under adequate soil moisture conditions (Kodua-Agyekum, 2009; Kibirige, 2013). For a sustainable farm business, there must be a reliable water supply source throughout the year including rivers, lakes, springs, dams, borehole or any other available source. The quality of water especially in terms of pH has a great influence on the type of crops to be grown. While some crops prefer acidic conditions, others thrive on neutral to alkaline environments. For optimal crop production aimed at profit maximization, it is crucial to strike a balance between the water and soil conditions.

In the face of scarce rainwater and extreme weather conditions, efficient use of irrigation systems in countries like South Africa would be the best option. Irrigation can be defined as the deliberate application of water by humans to the soil for the purpose of supplying moisture essential for plant growth (Kodua-Agyekum, 2009). In areas like most parts of the Eastern Cape Province in South Africa where the water is not adequate, reservoirs including dams could be constructed and used as buffer for a sustainable farm production.

In the Eastern Cape, different irrigation systems are being used by smallholder farmers to convey water in their gardens, and these include furrowing, sprinkler, hose pipe, bucket, and flooding and pivot irrigation systems (Kibirige, 2013).Use of sprinklers is the most common method of irrigation system employed by smallholder commercially oriented farmers and hose-pipe connected to water taps irrigation method is mainly practiced by communal subsistence farmers (Kodua-Agyekum, 2009; Kibirige, 2013).

A number of pumping units are used for drawing and pressurizing water into the system. The most commonly used are mono and centrifugal pumps. Considering the existence of a dam or river, the cost of a complete set of non-mechanized sprinkler irrigation and drip irrigation systems per hectare are estimated at R26100and R27144, respectively, (The Encyclopaedia of Earth, 2008), as shown in Table 1. Applicants are strongly advised to consult with irrigation officers for proper design of systems before purchasing irrigation equipment. The annual costs incurred by the farmer to pay for water, maintenance, and administration of the scheme, vary from R3132/ha to up to R13572/ha under exceptional circumstances. Location of the field, soil types, crops grown, type of irrigation system, and the time of year in use dictates the amount of water required per day.

Table 1: Estimated Costs for installation of the irrigation system in South Africa

#	Type of the Irrigation system	Installation Costs (Rand/ha)
1	Surface irrigation	940 - 11484
2	Non-mechanized sprinkler irrigation	5220 - 26100
3	Mechanized sprinkler irrigation	7308 - 21924
4	Micro irrigation and drip irrigation	9396 - 27144

Source: The Encyclopaedia of Earth, 2008 (updated in May 2012)

Note: Considered inflation rate at 16% and foreign exchange rate at US $1 ≈ R9.

Availability of labour within the locality is crucial reason being farm production in most cases is labour intensive and thus requires adequate manpower for all operations (Kibirige, 2010). At least 4 permanent workers are required per hectare, and during peak periods especially in crop production activities like planting, weeding and harvesting the demand increases in use of casual workers (Kibirige, 2010). In livestock, preparation and storage of animal feed for winter may call for more casual labour.

Market availability is crucial for all successful business initiatives, and thus establishment of a market for the business prior to production is essential (Kohlsand Uhl, 2002; Dunns *et al.,* 2006; Balunywa and Ntamu, 2012). Availability of market within the farm vicinity is crucial especially in reduction of transport costs of bulk produce. Therefore, soliciting or establishment of market for produce should be done at the onset of the business before drafting either a business or a cropping plan (Kohlsand Uhl, 2002). Market surety and inclusion in the business plan will guide all the farm operations, among others these include: types of enterprise; when to start planting crops/stock livestock; how much to grow/stock, and the resources needed for production (Dunns *et al.,* 2006; Balunywa and Ntamu, 2012).The different market channels include fresh produce markets, supermarkets, wholesalers, retailer, hotels, institutions (schools, hospitals, and government offices), hawkers and individuals. For better prices and increased market accessibility, improved post-harvest handling techniques and value addition is important (Kohlsand Uhl, 2002; Dunns *et al.,* 2006; Balunywa and Ntamu, 2012).

Financial capital is essential in farm business (Kohlsand Uhl, 2002). Appropriate forms of financial accessibility are extremely crucial in purchasing/acquisition of farm equipment and inputs for a more effective operation of a profitable farm business (Kibirige, 2013). Challenges faced by resource-poor smallholder farmers in regards to access to credit or financial support in most cases has been linked to low use of farm inputs leading to low farm yields (Kibirige, 2010). Therefore, this call for identification of potential fund sources in the initial stages of establishing a farm business. The different potential sources of funds include household incomes,

government agricultural grants (can be in form of assets or subsidies), Non-Governmental Organisations (NGOs), and agricultural loans from banks and micro-finance institutions (Kibirige, 2013).

Ostrom (1998), FAO (2000), Padilla-Fernandez and Nuthall (2001), and Kibirige (2013) defined human capital as the acquired knowledge and skills through education, training and experience that an individual brings to an activity. Many studies including Padilla-Fernandez and Nuthall (2001), and Kibirige (2013) have attested the efficacy of basic farming skills and experience for improved farm production and productivity. Farm production is a very labour intensive and requires both dedication and skill to maximize output and profits (kibirige, 2013). Therefore acquisition of farm knowledge through basic training in production and farm business principles or experience in the same field is very crucial. Acquisition of basic managerial skill is important and can enhance farmer's competitiveness in farm business. In instances where there is lacks of such skills and knowledge, both the owner of the farm and workers need to undertake trainings in farm production principles and farm business concepts to realize more output and profits (Ostrom, 1998, FAO, 2000; Kibirige, 2013).

Generally, a farmer needs substantial knowledge about the different crop varieties and cultivars, and livestock breeds (FAO, 2000). Proper and efficient use of agro-inputs like the Integrated Pest Management (IPM) control system is important for sustainable farm production, reduce risks of agro-chemical hazards related to humans and animals, and reduced negative impacts to the general environment (Kibirige, 2013). Other farm management practices include record keeping and these records are important to facilitate proper monitoring of the enterprise and support decision making for the whole farm operations. Among essential records include, farm inventory of fixed assets, total farm land under production, total variable inputs bought, total variable inputs used, yields, and diseases and causes.

Other key factors important for a transformation from subsistence to small-scale commercial farming are fixed assets including: permanent water source (water reservoirs, dams and boreholes), irrigation equipment, fencing, store rooms, net shade, protective clothing, garden tools, permanent labour and other assets related to livestock production. These can be categorised into farm machinery, fencing material, buildings, protective clothes and garden tools, and infrastructure. When establishing a 1 ha of crop production or 3 ha of livestock production ideally there is no need of owning heavy machinery. In this situation hired machinery can be used in a few farm activities like land preparation. The common machinery important in farm production include: tractor, planter, and harrow.

The location of the project will dictate the type of fencing material. Most smallholder farmer and communal farmers are located in rural area where most livestock is reared on a free

range system exposing crops to animal destruction. Therefore, fence with small animal proof material can be used to keep out small animals. The farmer may start with constructing less costly semi-permanent structures and after establishment the semi-permanent structures can be upgraded into permanent structures. These buildings may include net-shade, store-room, packaging shed, and livestock shed/kraal/pen among others. Construction of these buildings should be guided by technical personnel for safety, hygiene, and prevention of pests and disease spread. In terms of infrastructure, farmers' access to services like electricity, roads, markets and telecommunication are crucial in facilitating value addition and marketing of agricultural produce. Availability and access to electricity facilitates water pumping, cooling facilities and other farm amenities including lighting and agro-processes is key for small-scale commercial farming.

The widely used/applied variable inputs in crop production are pesticides, seeds, herbicides, fertilizers, protective clothing, and the post-harvest handling related inputs like packaging materials. In livestock production, feeds (supplementary and pastures) vaccination, veterinary drugs, acaricides, dewormers. Other variable inputs are found under financial projection. Some of these variable inputs can be sourced from agro-input stores. Amounts of inputs purchased and applied in the field vary based on targeted output, the intensity of soil infertility, the level pest invasion and disease infection, and level of maturity and growth rate of crops and livestock.

Like any other business, establishing and operating a farm business calls for financial capital from owners' equity (Contribution) and/or credit/loans and grants from various financial institutions and government programs. Among others, sources of support may include government development programmes, Non-Governmental Organisations (NGOs), private business company's community support programmes, banks and other micro-finance institutions (Kibirige, 2013). For a sustainable farm business project, the principal amount (initial/start-up capital) covers the entire project establishment and operational costs for 1 hectare for crops and at least 3 ha for livestock production within a period not exceeding 12 months. The initial capital outlay can be up based on the prevailing input costs and anticipated profits per enterprise. In this case, the estimated enterprise budget assumes that farmers have access to land as owner's contribution. The anticipated production levels and profits are based on key assumptions related to farm location, farm size, production costs, accessibility to loan and interest rates thereof, and input/output prices.

METHODOLOGY

Both primary and secondary data were used to estimate the profitability of enterprises under study. Primary data was collected from over 120 farmers in the Eastern Cape Province. A random sampling technique was used based on the available lists of farmers who were participating frequently in researches carried out by the Agricultural Rural Development and Research Institute (ARDRI)-housed by University of Fort Hare. According to Doll and Orazem (1984), and Tweeten (1979), profit can operationally be defined as the total revenue less total production costs and it is the basic economic measurement of profitability. In case of scarce information on fixed cost, profitability can be measured using and gross margin analysis. Gross margin is an appropriate measure to compare enterprises that place similar demands for limited resources like farmers and it is a good measure for short run and annual planning decisions (Castle *et al.,* 1987). Furthermore, gross margin is a simple but a realistic measure of the performance of enterprises. According to Norman *et al.* (2002), gross margin refers to the gross income minus the variable costs associated with an enterprise/activity.

Gross margins were evaluated by identifying and quantifying the Total Variable Costs (TVC) incurred by the farmers, and the Total Revenues (TR) realized in the production of selected enterprises per season. The *TR* is estimated as the prevailing market price of a given output (*Py*) multiplied by quantity of output sold (Q_{ys}) (P_y * Q_{ys}). Total variable costs is a summation of all input variable costs incurred by a given firm, and the input variable cost is estimated as the prevailing market price of a given input (P_{xi}) multiplied by quantity of the input used (Q_{xi}) (P_{xi} * Q_{xi}). Thus, $TVC = \sum_{i=1}^{n}(P_{xi} * Q_{xi})$. Gross margin for each enterprise is calculated as: $GM = (P_y * Q_{ys}) - \sum_{i=1}^{n}(P_{xi} * Q_{xi})$..... (1)

Enterprise Budget for One Hectare

A brief and systematic description of each of the selected enterprise and its budget are presented in the following sections. The selected enterprises were grouped into two categories including a field crop (maize), and vegetables (cabbage and carrots).

RESULTS AND DISCUSSIONS

Maize Enterprise

South Africa exhibit two maize production systems, the intensive commercial farming system and the resource-poor subsistence (communal) farming systems (FANRPAN, 2012; Kibirige, 2013). On average, there are approximately 9.2 million tonnes of maize produced per annum, of which 8 million tonnes is utilised in the country as food and fodder. Whereas commercial farms have access to and use recommended amounts of agricultural inputs and practice improved

post-harvest handling techniques, communal subsistence farmers lack the required resources to ensure efficient production and quality grain throughout the maize value chain(FANRPAN, 2012; Kibirige, 2013).Inefficient productivity of communal subsistence farmers may be due to insufficiency of hybrid seed, fertilisers and pesticides, poor soil fertility, fungal infections and pest damage(FANRPAN, 2012; Kibirige, 2013).Maize is a staple food for most parts of the Eastern Cape Province, and therefore, the crop is vital in enhancing household food security in these areas (Kodua-Agyekum, 2009; Kibirige, 2013).Maize grows well at temperatures ranging between 20 and 32, and growth slows down at temperatures below 12. Growth of maize is greatly affected by frost. The crop grows on a wide range of soil types, well drained and achieves best growth in the range of pH 5.6 - 7.5 (Department of Agriculture, 2003). Table 2 displays the seed rate (about 34kg/ha), growth period (approximately 100 to 130 days) and plant population (about 25 000 to 40000 plants/ha) in maize production.

Table 2: Seed rate, Growth period and Plant Population in Maize production

Seed rate	Growth period	Plant population
Approximately 34Kg	Plants reach maturity at least 100 to 130 days, dependon variety planted	Approximately 25 000 to 40 000 plants/ha

Among others, the possible pests and disease which can attack the maize in field include Beetles, Cutworms, Stalk borer, and these can be controlled by use of Gauchu, Cypermethrin and Bulldock, respectively.

Table 3: Pests in Maize Production

Pests & Disease	Control	Units	Quantity/ha	Unit price (Rand)	Total cost (Rand)
Pests	Gauchu	grams	60.00	2.23	133.80
Beetles	Cypermethrin	Litre	0.15	67.28	10.09
Cutworms	Bulldock	Litre	0.20	266.80	53.36
Stalk borer					

Source: Eastern Cape Department of Agriculture (2008)

On average, results indicate that there is an observed gap between the recommended commercial amount of pesticide per hectare used commercially (R200spent) and the actual pesticides used per hectare by rural small-scale famers (R33 spent)in Eastern Cape. These results presented in the Table 4 match with Kibirige (2013). Kibirige (2013) reported that the applied amount of fertilizer, pesticide and herbicides per hectare by smallholder irrigators were 58.03Kg/ha, 0.74L/ha, 0.64L/ha, respectively, whereas homestead food gardeners applied

fertilizer of 50Kg/ha, 0.73L/ha of pesticide and 0.40L/ha of herbicide, respectively. These figures suggest a relatively low use of agro-chemical by small-scale farmers in the Eastern Cape Province of South Africa. More specifically, the recommended fertiliser rates for irrigated maize vary depending on the yield potential, but can be as high as 220 kg/ha for a yield target of 10 tons/ha in South African (Fanadzo *et al.,* 2009; Kibirige, 2013). However, results in this article suggest that subsistence farmers apply far less fertilizer than the recommended rate and these findings are consistent with Kibirige (2013) and Fanadzo*et al.* (2009) studies.

Table 4: Estimated Crop Budget of Maize Production

Item	**Commercial Farming**			**Subsistence Farming**		
	Quantity/ha	**Unit price Rand**	**Total Rand**	**Quantity/ha**	**Unit price Rand**	**Total Rand**
Revenues (Gross incomes)						
Production (Kg)	8500	3.00	**25500**	2200	3.00	**6600**
Variable Inputs Costs						
Modified seeds (Kg)	22.5	26.00	585	18	26.00	468
Recycled/local seeds (Kg)				29	3.00	87
Fertilizer (Kg or L) 2:3:4	500	14.00	7000	100	14.00	1400
Fertilizer (LAN)	250	12.00	3000			
Herbicides (Litres)	1.5	95.00	145	0.21	40.00	8.40
Pesticide (Variety)			200	0.55	60.00	33.
Irrigation pump costs			165			
labour (Man-days)/Tractor						
Land preparation/plough	Tractor (1d)	650	650	21md	30.00	630
Planting	Tractor (1d)	590	590	10md	30.00	300
Fertilizer Application	Tractor (1d)	590	590	10md	30.00	300
Weeding	30md	30	900	30md	30.00	900
Spraying	Tractor (1d)	400	400	10md	30.00	300
Irrigation	10md	30	300			
Harvesting	Tractor (1d)	650	650	30md	30.00	900
Transport costs			200			200
Marketing costs			2000			
Total Variable Costs (TVC)			**17375**			**5576.4**
Gross Margin			**8125**			**1023.6**

Kg = Kilograms, L = Litre, 1d = one working day, md = man-day = 8 working hours per day.

According to Fanadzo *et al.* (2009), South Africa has the potential grain yields that can be obtained under irrigation farming range from 7 to 12 tons/ha. However, based on the results presented in Table 4, subsistence small-scale farmers' yields (2.2 tons/ha) far below the anticipated amount (between 7 and 12tons/ha) produced per hectare. These results do not differ

from Kibirige (2013) who indicated an average yield of about 1.8tons/ha harvested by small-scale farmers in the Eastern Cape Province of South Africa. Fanadzo*et al. (* 2009) also they recorded low yields on Zanyokwe Irrigation Scheme, Eastern Cape, South Africa. The low yields may be attributed to low fertilizer, pesticides and herbicides applications, among others (Kibirige, 2013). Further, the low use of these agro-chemicals may be due to lack of investment capital to purchase these inputs.

Cabbage Enterprise

Considering climatic conditions, cabbages grow well in cool and moist conditions with temperatures ranging between 5 and 24 °C, although they can survive at temperatures as low as -3°C. The crop attains its optimum growth at temperatures between 15 to 18 °C (Allemann and Young, 2008). South African farmers have adopted cabbage varieties that survive under different climatic conditions in regards to temperature. Green Star, Hercules, Star 3001 and others are considered to be heat tolerant, and Conquistador, Green Coronet among others are considered to be cold tolerant (Allemann and Young, 2008).Soils conditions/characteristics suitable for cabbage production are Deep, well-drained with a relative moisture content and loamy soil type. Heavier soils characterized by high fertility and moisture are preferred to light ones. Further, soils should have an optimum pH of 5.3 to 5.8 with saturated acid of less than 2 (Allemann and Young, 2008). Deep tillage is required for cabbages to attain an effective root system of depth of 600mm. Table 5 presents the seed rate, estimated growth period and plant population in cabbage production of South Africa.

Table: 5: Seed rate, Growth period and Plant population in Cabbage production

Seed rate	Growth period	Plant population
Approximately 300 g for seedbeds, 120 to 200 g for seed trays, and 500 to 2 000 g for direct seeding	Plants reach maturity within 90 to 130 days from time of transplanting, and vary based on varieties	Approximately 40 000 to 45 000 plants/ha

Source: Allemann and Young (2008)

The identified pests and diseases common in cabbage production include Cabbage looper, Diamond Back Moth, Cabbage Aphid, Bagradabug, American bollworm, Cutworm, Black rot, Downymildew. These pests and diseases can be treated by use of pesticides and other agro-chemicals which include Methomex, Bulldock, Confidor, Methamidifos, Manager/
Trimangol, Aquarite, respectively (Eastern Cape Department of Agriculture, 2008). This information is presented in Table 6.

Table 6: Pests and Diseases, and their Control in Cabbage Production

Pests & Disease	Control	Units	Quantity/ha	Unit price (Rand)	Total cost (Rand)
Pests Cabbage looper, Diamond Back Moth, Cabbage Aphid, Bagrada bug, American bollworm, Cutworm **Diseases** Black rot, Downy Mildew	Methomex	Kg	1.00	168.20	168.2
	Bulldock	Litre	0.30	266.80	80.04
	Confidor	Litre	0.50	614.80	307.4
	Methamidifos	Litre	3.20	75.40	241.28
	Manager/ Trimangol	Litre	12.00	40.60	487.2
	Aquarite	Litre	0.75	33.06	24.795

Source: Eastern Cape Department of Agriculture (2008)

Note: Unit prices were inflated by 16% to estimate the current prices

According to Allemann and Young (2008), the recommended amount of fertilizers to be applied in one hectare of Cabbage ranges between 500 and 1000Kg/ha in some parts of South Africa. However, results presented in Table 7 indicate far less fertilizers (150kgs/ha) applied by communal subsistence farmers.

Furthermore, communal farmers seem to be applying lesser pesticides when compare costs incurred in the purchase of the item by commercially oriented farmers (R309/ha) and communal subsistence farming (R160/ha). The results presented in this article do not differ much from a study carried out by Kibirige (2013) who indicated a relatively low fertilizer and pesticide application per hectare in cabbage production among small-scale farmers in Eastern Cape Province of South Africa. The study indicated that small-scale farmers were applying only 41.12kg/ha of fertilizer and 1.38liters/ha of pesticide.

Results in Table 7 indicate that communal subsistence farmer can only harvest yields of about 5000 heads of cabbages whereas in the ideal situation of a small-scale commercial farming can harvest over 32500 heads of cabbage per hectare. This indicates that communal subsistence farmers do not utilize all the available land to grow cabbages resulting in estimated low gross margins earned. Suboptimal utilization of land may be attributed to lack of funds to meet their operational costs including purchase of fertilizers and pesticides.

Table 7: Estimated Crop Budget for Cabbage Enterprise

	Commercial Farming			Subsistence Farming		
	Quantity/ ha	**Unit price Rand**	**Total Rand**	**Quantity/ha**	**Unit price Rand**	**Total Rand**
Revenues (Gross Returns)						
Production (heads)	32500	3.0	**97500**	5000	5.0	**25000**
Variable Inputs Costs						
Modified seeds (Kg)	3	130	390	1.4	130	182
Fertilizer (Kg) 2:3:4 (30)	500	14.00	7000	150	14	2100
Fertilizer (LAN) (Kg)	600	12.00	7200			
Pesticide (Various)			1309			160
Irrigation water (mm^3)	500	4.0	2000			
labour (Man-days or Tractor)						
Land preparation/plough	Tractor (1d)	650	650	38md	30.00	1140
Planting	Tractor (1d)	590	590	26md	30.00	780
Fertilizer Application	Tractor (1d)	590	590	10md	30.00	300
Weeding	47md	30	1410	47md	30.00	1410
Spraying	Tractor (1d)	400	400	14	30.00	420
Irrigation	40md	30	1200			
Harvesting	14md	30	420	14md	30.00	420
Transport costs			1500			500
Marketing costs			7000			
Total Variable Costs (TVC)			**35659**			**7412**
Gross Margin			**61841**			**17588**

Kg = Kilograms, L = Litre, 1d = one working day, md = man-day = 8 working hours days,

According to Allemann and Young (2008), the recommended cabbage yields in terms of number of cabbage plants per hectare ranges between 40 000 and 45 000 heads/ha. A study carried out by Kibirige (2013) indicated a low cabbage yield among small-scale farmers in the Eastern Cape Province with an average yield of 974.09 heads/ha. This indicates that subsistence farmers have a potential of expanding their production from the 5000 to 40 000 heads of cabbages per hectare and thus, increasing their gross margins.

CONCLUSIONS AND RECOMMENDATIONS

Results and discussions presented in this article suggest that small-scale farmers in the rural Eastern Cape Province of South Africa use low agricultural inputs compared to the ideal commercial farming in the same area. The low use of agro-inputs by rural subsistence small-scale farmers may be attributed to poor distribution channels of agro-inputs in rural communities, lack of funds to purchase or lack of knowledge about the optimal application of the inputs, among others. Low use of inputs limits farmers to realize higher yields and gross

margins in maize and cabbage production as reflected in the results. The observed gap between the ideal commercial farming and subsistence farming indicate that rural small-scale farmers have a potential of uplifting rural communities from low household incomes, food insecurity and abject poverty. Results suggest recommendable increased use of agro-inputs by small-scale farmers in rural Eastern Cape Province through establishment and catalysing policy implementations related to improved access to input credit services, input-subsidies, more decentralised input distribution in rural areas, and extension services geared towards optimal use of these inputs. Establishment and strengthening farmers' associations still plays a big role in pulling resources together including agro-inputs, lobbing for input-credit from financial institution, and easiness to train by extension workers from government, NGOs and private sector. The transformation of subsistence farming to small-scale commercial farming can be catalysed by a combination of these policy strategies. Deviating from the norms used in the colonial and post-colonial era, rural development policies should be participatory at all stages from initiation –implementing to evaluation.

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