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Perceived Swazi Maize Farmer's Needs: A Case Study of Ludzeludze and Bhekinkosi Rural Development Areas

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Abstract

In Swaziland, maize is the staple food and grown by many smallholder farmers on Swazi Nation Land (SNL). While almost all households in SNL produce maize, the country has never reached self-sufficiency in maize production. A survey research was conducted to identify most important agricultural needs of small scale maize farmers in Ludzeludze and Bhekinkosi Rural Development Areas (RDAs). The study was descriptive and included all registered farmers (280) in the two RDAs. Data were collected using a valid and reliable (r=0.79) questionnaire. Descriptive statistics were used to analyse data. Findings of the study revealed that tractor hire service, fertilizer, subsidies, and high yielding seeds were rated with means scores 5.55≥M≤5.85; nine were rated 4.07≥M≤4.91; while the remaining needs were rated: 1.33≥M≤3.54. Farmers' category needs were ranked as follows: agricultural inputs, agricultural labour, agricultural credit, extension education, and marketing outlet. Farmers' demographic information revealed that, over half were males and less that 50 % were females; 35.6 % were between 42 and 58 years; a great majority had attained primary or high school education;155 had the largest family size, engaged 1-10 farm labourers; 65.5% of respondents had between 1-20 years farming experience and a great majority (77.7%) were married. The relationship between selected farmer demographic characteristics and perceived maize farming needs had varied associations. The highly associated included: age, agricultural labour, family size, and farming experience. It was concluded that major maize farmers' needs included: tractor hire services, fertilizer, subsidies, and high yielding seeds. Major category farmers' needs were all in agricultural production and information. The authors recommended that effort by the Ministry of Agriculture should be expended to improve agricultural extension which in turn could enhance farmers' ability to address the other category needs revealed by this study.

Key words: *Agricultural needs, descriptive, farmer needs, maize*

Introduction

Maize is one of the most important cereals crops grown globally, and is the third after wheat and rice in total food grain production (Anupama, Singh & Ranjit, 2005). Due to its high adaptability and productivity, the cultivation of maize spread rapidly around the globe and is currently being produced in most countries of the world.

In Swaziland, maize is the staple food and it is thus the main crop that is grown by a great majority of the smallholder farmers (Food Agriculture and Natural Resources Policy Analysis Network (FANRPAN) (2003). It is usually grown for subsistence purposes and it is the most predominantly grown crop on SNL. Maize occupies about 80 per cent of the total area under crop production and it grown on the SNL where most holdings are relatively small. However, in recent years, maize production has declined significantly (FANRPAN, 2003).

Maize production in Swaziland is divided into two, subsistence farming on Swazi Nation Land (SNL), and commercial farming on Title Deed Land (TDL). Maize production on SNL accounts for only 20 per cent of the total agricultural output in Swaziland. SNL makes up approximately 60 per cent of cultivated land. The population is dependent largely on subsistence farming and or livestock herding. While almost all households on SNL produce maize, the country has never reached self-sufficiency levels in maize production (Magagula, Dlamini and Mkhwanazi, 2007). For the past forty years, Swaziland has not been able to meet the population's maize requirements (National Maize Corporation, 2010). Literature indicates that the small scale farmers are often left out by Extension Agents, and crop researchers simple because they are unaware of the needs the farmers experience that could possible lead

to poor maize production in the country (Shikhulu & Keregero, 2005). The small scale farmers are the most difficult to reach. Yet, they are in need of extension services most and other resources to improve the agricultural productivity, food availability and the economy. Some of them are least educated, lack self - confidence to seek new information, have small and marginal land resources, and are located far from services and tend to be risk averse in trying new technologies (Schorosh *et al*., 2009). Even if a new variety of maize or any other agricultural crop can be developed that is drought tolerant and pest resistant, the farmers may not be aware of such modification since extension agents do not reach out to them. In this regard, the need to investigate the small scale farmer's needs had been initiated in order to provide innovations that could in turn serve as solutions to their agricultural needs to help improve the maize production.

Fullerton (2013) stated that one of the main constraints to maize production is related to financing. Due to the low producer prices, farmers are reluctant to sell and are retaining their produce in their homesteads instead of sending it to market. This limits their income considerably and that is why they are using low levels of farm inputs especially fertilizer or simply depending on farm-yard manure only.

Swaziland's small holder farmers face increasing difficulty in making a living with traditional methods of growing maize. With no programmes to subsidize inputs, many farmers who are unable to afford fertilizer, have seen their maize yields drop. Those who have received training in Conservation Agriculture (CA) and growing crops that are less rain dependent than maize, are faring better. However, they are constrained by lack of land and inability to raise capital, (Government of Swaziland, 2003).

Despite the support offered by Government to local maize producers, the industry is faced with a number of formidable challenges. The constraints to producing maize in Swaziland, were summarized by FANRPAN (2003) as follows:

(i) The average landholding size on Swazi Nation Land (SNL) is 1.7 ha, and land continues to be fragmented into even smaller units with time, due to population growth. This limits the area on which maize and other crops can be produced.
(ii) Rain has become very erratic with prolonged dry spells. This limits soil moisture and seriously affects maize yields.
(iii) Soil acidity or low pH reduces the availability of nutrients in the soil and causes root stunting. There is a high demand for tractors immediately after rains due to rain dependent production.
(iv) The escalating cost of production, mainly of fertiliser and seed, limits adequate supply of fertiliser and seed, leading to reduced maize yields. Since land is finite and land holdings are small, the only option to increase production lies in increasing productivity of each land unit. All fertilizer is imported and transported over long distances, further compounding production costs.
(v) Inadequacy of tractor hire services to assist farmers as most of them depend on draft power.

Food and Agricultural Organization (FAO) &World Food Programme (WFP) (2005) attributed the reduced maize harvest to poor rainfall and the high cost of fuel and inputs. However, the Swaziland National Agricultural Union (SNAU) blamed the shortage of functioning government tractors for hire to farmers. In Tikhuba, a farming community in the Lubombo District, reported that six (6) out of thirteen (13) Government tractors were in working condition. Through the Ministry of Agriculture, the Swaziland Government continues to provide a number of services aimed at improving maize production. These include extension and research services, subsidized tractor hire services and selected farm inputs (Dube & Dlamini, 1994).

Major services include provision of tractors for land preparation at subsidized rates. Government also provides free research and extension services to all farmers, including maize producers (Government of Swaziland, 2003). However, a study conducted by Dube & Dlamini (1994) revealed that farmers face many problems regarding tractor hire services. Some of the problems were: (i) limited number of tractors, (ii) very high tractor hiring rate, (iii) queuing for the tractor higher service, (iv) failure of services to operate on weekends, (v) the requirement that farmers pay before their fields are ploughed, (vi) low hiring rates only in the winter season, (vii) long waiting hours to pay for hiring a tractor and (viii) frequent tractor breakdown.

SNL maize farmers are hesitant to invest heavily on their farms because they do not actually own the land, and Chiefs have the right to take it from them as they see fit (Guma & Simelane, 1982). Even if the farmers are willing to invest in their land, financing is difficult to come by. Formal financing programs often leave small farmers out of the equation, so they do not have access to the necessary funds to invest in their land, thus, land accessibility is a great need to farmers (Fullerton, 2013). Dube, Mloza- Banda & Matarira (2010) quoted Stringer *et al*. (2007) to have stated that climate change in Swaziland affects different crops differently. As for maize, highest yields are attained when sowing is done in the first week of December than when planted in mid-October. Highest yields for maize are obtained in the middleveld than any other regions in Swaziland. This study was undertaken to determine maize grower's perceived needs of maize growers in Ludzedze and Bhekinkosi Rural Development Areas with objectives to: Identify the most important agricultural needs of small scale-maize farmers in the Ludzeludze and Bhekinkosi Rural Development Areas; Describe ways to address the needs of small scale-maize farmers to improve the level of maize production in Swaziland and Describe the relationship the dependent variable (agricultural needs of small-scale maize farmers and the independent variables (gender, age, educational level, family size, agricultural labour, farming experience, sources of fertilizer, use of pesticides and use of kraal manure.

Materials and Methods

A descriptive survey type of research using a valid and reliable (r=0.79) self-administered questionnaire was used to gather data. The target population of the study were all the small scale maize farmers who registered with Ludzeludze (n=80) and Bhekinkosi (n=280) Rural Development Areas in the Manzini region. These were selected as subjects of the study because they were in a better position to provide information required to achieve the research objectives of the study. The study was a census, and therefore sampling error was not a threat. Regarding ethical consideration, farmers were information that the survey was undertaken to meet University requirements for the award of a Bachelor of Science degree and contribute to knowledge on the production of maize in Swaziland. Also, farmers were asked to answer the questionnaire anonymously and that returned questionnaires would be analyzed and reported as group data. Data were analyzed using frequencies, percentages, ranks, means, standard deviations, and correlations.

Result and Discussion

The findings of the study are presented according to the objectives and discussed including suggested ways that can be applied to better address the needs of the small scale maize farmers.

Identifying the most important agricultural needs of small scale maize farmers in the Ludzeludze and Bhekinkosi Rural Development Areas.

Information regarding farmers' level of agreement with each one of the items on most important agricultural needs of small scale maize farmers is presented in Table 1. Overall, the findings revealed that the maize farmers perceived all the items as important farming needs in the two Rural Development Areas (μ=3.61, σ=1.10). The highly rated farmers' agricultural needs included: (i) tractor hire services, (ii) fertilizer, (iii) subsidies, (iv) high yielding seeds, (v) insecticides, (vi) irrigation systems, (vii) lime, (viii) labourer availability, (ix) physical fitness of labour, (x) farm credit loans, (xi) processing facilities, (xii) availability of extension officers, (xiii) extension officer to farmers contact and (xiv) satisfactory extension services. Surprisingly, the remaining farmer needs were rated between σ =1.33 and σ=3.02. These needs included (i) market availability, (ii) short loans, (iii) herbicides, (iv) appropriate selling price, (v) land levy rates, (vi) access to markets, (vii) transport to the market to sell maize and (viii) access to research information. These needs were said to be essential farmer needs to enable small-scale farmers to undertake their farm operations (Dankyi, Morris & Tripp, 2010; Goodwin, Jessica & Gouldthorpe, 2013; Uko & Miller, 1987, FARNPAN, 2003). FAO/WFP (2005), Carloni (1982), Guma & Simelane (1982) stated that the items that were lowly rated are pre-requisites to maximum production by small scale farmers.

Table 1. Most important needs of small-scale maize farmers in Ludzeludze and Bhekinkosi Rural Development Areas.

#	Item	Rank	μ	Sd
1.	Tractor hire services	1	5.85	0.53
2.	Fertilizer	2	5.66	0.67
3.	Subsidies	3	5.58	0.95
4.	High yielding seeds	4	5.55	0.62
5.	Insecticides	5	4.91	0.99
6.	Irrigation systems	6	4.76	1.65
7.	Lime	7	4.75	0.82
8.	Labourer availability	8	4.62	0.96
9.	Physical fitness	9	4.56	0.97
10.	Farm credit loans	10	4.47	1.82
11.	Processing facilities	11	4.13	1.69
12.	Availability of extension Officers	12	3.54	1.12
13.	Extension Officer to contact farmers	13	3.52	0.97
14.	Farmer satisfaction with extension services	14	3.51	0.88
15.	Market availability	15	3.02	1.33
16.	Short loans	16	2.68	1.53
17.	Herbicides	17	2.58	1403
18.	Appropriate selling price	18	2.51	1.15
19.	Levy rates	19	2.10	1.25
20.	Access to markets	20	2.00	0.97
21.	Transport to the market to sell maize	21	1.57	0.94
22.	Access to research information	22	1.33	0.70
Overall			**3.61**	**1.10**

Rating scale: 1=strongly agree, 2=disagree, 3=slightly disagree, 4=slightly agree, 5=agree, 6=strongly agree.

Identifying ways to address the needs of small scale maize farmers to improve the level of maize production in Swaziland

Farmers were asked to suggest ways to address the agricultural needs of small-scale farmers to improve the level of maize production. As can be observed in Table 2, overall, the ranking had μ =5.42 and sd=1.56. provision of (i) tractors for hire and (ii) loans with low

interest rate, (iii) Obtaining a supply source for high yielding maize varieties, (iv) subsidize farming inputs, (v) increase number of extension workers, (vi) government supplies transport means to extension workers, and (vii) avail research services at RDA level.

These findings were in line with literature. Carloni (1982) stated that farmers need to use farm machinery to address the need for labourers in the farm operation. Government of Swaziland (2003) concluded that small scale farmers among other things needed support in subsidies to purchase seeds and fertilizer as well subsidized tractor hire services. Guma and Simelane (1982) stated that farmer cooperatives could help farmers to have a strong bargaining power and even purchase in bulk as a group.

Table 2. Ways to address the agricultural needs of small scale maize farmers to improve the level of maize production in Swaziland (N=272)

#	Item	Rank	μ	Sd
1.	Provide more tractors during ploughing season	1	9.30	1.40
2.	Government provides farm loans as low interest rate	2	8.11	1.47
3.	Get supply of high yielding maize seeds	3	6.15	1.26
4,	Subsidize maize farming	4	5.97	1.32
5.	Increase number of extension officers	5	5.03	1.30
6.	Government should provide transport to extension workers	6	4.70	1.22
7.	Avail research services at Rural development area level	7	4.59	1.03
8.	Establish more farmer cooperatives	8	4.51	1.56
9.	Train farmers to process maize into secondary products	9	4.05	1.56
10.	Secure more maize markets	10	1.76	1.35

Ranking key: 1=least important,....10=most important

Relationship between independent variables and dependent variable

The relationship between the independent variables (gender, age, educational level, family size, agriculture labourer, source, farming experience, sources of fertilizer, use of herbicides, use of kraal manure) and the dependent variable (agricultural needs of small-scale maize farmers) is presented in Table 3. To interpret the magnitude of the relationship between the small-scale maize farmers demographic characteristics and their perceptions regarding small-scale farmers agricultural needs.

Co-efficient	Adjective
.70 or higher	Very high association
.50-.69	Substantial association
.30-.49	Moderate association
.10-.29	Low association
.01-.09	Negligible

As can be observed in Table 3, there was negligible association between sources of fertilizer (r_{pb}=-.05); use of herbicides (r_{pb}=-0.02); and use of kraal manure (r_{bp}=-.00) and perceived agricultural needs of maize small-scale farmers. There was also a low association between gender (r_{pb}=.18), educational level (r_s=-.10) and age (r_{pb}=.17) and perceived agricultural needs of maize small-scale farmers. Regarding the remaining demographic characteristics and perceived small-scale maize farmers needs, there was a very high association (age: r_s=0.93; family size: :r_s=0.79, agriculture labourer source : r_s=0.74 and farming experience: r_{bp}=0.92)

Table 3. Relationship between independent variables and dependent variable

	Y	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9
Y	**1.00**									
X^1	0.18	**1.00**								
X^2	0.93	0.17	**1.00**							
X^3	-0.10	-0.02	-0.07	**1.00**						
X4	0.79	0.12	0.61	-0.15	**1.00**					
X^5	0.74	0.07	0.53	-0.11	0.85	**1.00**				
X^6	0.92	0.15	0.82	-0.14	0.62	0.59	**1.00**			
X^7	-0.05	-0.09	-0.05	-0.07	-0.01	-0.05	-0.09	**1.00**		
X^8	-0.02	-0.10	-0.06	-0.01	0.00	-0.01	-0.01	0.08	**1.00**	
X^9	-0.00	-0.15	0.01	-0.03	-0.03	-0.03	-0.03	0.08	-0.12	**1.00**

Dependent variable: *Y=agricultural needs of small-scale maize farmers (interval : 1=strongly disagree, 2=disagree, 3=slightly disagree, 4=slightly agree, 5=agree, 6=strongly agree).*

Independent variable*: X^1=gender (nominal:1; Male:2); X^2=age (ratio); X^3=educational level (0rdinal –primary=1, high school=2 & Other=3); X^4=family size (ratio); X^5=agriculture labour (0rdinal); X^6=farming experience (ratio); X^7=sources of fertilizer(nominal-1=local markets, 2=friends); X^8=use of herbicides (nominal-1=yes, no=2); X^9=use of kraal manure (nominal-1=yes,2=no)*

Conclusion

Based on the findings of the study, the following conclusions were made:

1. Tractor hire services were the most important input and need hindering maize production in Ludzeludze and Bhekinkosi RDAs.
2. Small scale maize farmer's practise subsistence farming, hence marketing was rated least because they produced mainly for domestic purposes.
3. The farmers need increased provision of tractors during the ploughing season to plough early while the soils were wet enough for easy ploughing.

Implications of the study

The study sought to determine the agricultural needs of the small scale maize farmers in the Ludzeludze and Bhekinkosi RDAs. The findings of the study signified that small scale maize farmers have diverse agricultural needs that if met, can help improve the level of maize production and address the issues of food insecurity in Swaziland.

Recommendations

Based on the findings of the study, the following recommendations were made. The Government of Swaziland together with the Ministry of Agriculture should introduce and implement ways or solutions to address the agricultural needs of small scale maize farmers in the country. These should include:

1. There was a dire need to improve tractor hire services as the major source of farm power for maximum production of maize by small-scale maize farmers.
2. There was a need to increase the number of extension field workers to disseminate information to farmers and get a picture of what maize farmers need to produce sufficient maize.
3. There was a need to subsidize farming inputs like the tractor hire services (THS).
4. The small-scale maize producers expressed a need to increase farm credit loans so that they purchase adequate inputs for their maize production enterprise.
5. Farmers expressed the need for the supply of high yielding maize varieties.
6. A study to investigate the efficiency of tractor hire services (THS) should be conducted since THS is the major factor in the production of maize in Swaziland.
7. A study to investigate tractor owners' satisfaction with tractor rental to the Rural Development Areas should be conducted.

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