

Use of storage facilities by small-scale farmers in the Lejweleputswa District Free State, South Africa

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Abstract: A descriptive research design was used to analyse use of storage facilities by small scale farmers in Lejweleputswa district of Free State. The population of study is all small scale farmers in Lejweleputswa district of Free State, South Africa. Simple random sampling technique was used to select 120 farmers representing five percent of the population and data were collected through the use of structured questionnaire that consist of socio-economic characteristics, types of storage facilities and purpose of storage. Data collected were analysed with statistical package for the Social science using frequencies, percentages and multiple regression analysis. The results show that most farmers are female; married; practised Christianity; having personally sourced agricultural land; farming full-time; not members of any agriculturally-oriented organization. Many farmers do not have both metal and cement silos. The main purposes for storing their produce was food security; the increase for the prices of their produce; house-hold consumption throughout the year; and lack of market accesses for their produce. Significant determinants of use of storage facilities were anticipated price increase, household consumption, preservation of planting materials, primary occupation and farming experience.

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Introduction

Agriculture is the livelihood of small-scale farmers and plays important roles in South Africa as it contributes to GDP, employment, rural development and food security. Small-scale farmers contribute to the development of South Africa through agricultural production. However, the literature reveals that small-scale farmers are faced with many production problems like poor or no storage facilities (World Bank, 2005); market inaccessibility and information (Wouterse, 2006:33); lack of infrastructure (e.g. roads, buildings) (UNAIDS, 2006:135); lack of capital (Pingali, Khwaja & Meijer, 2005:56); inaccessibility to extension services (Winters, McCulloch & McKay, 2004:93); inadequate land reform policies (Acemoglu, Johnson & Robinson, 2002:1252); inadequate government support (Ruben & van der Berg, 2000:35); lack of transportation (Rodrik, Subramanian, Trebbi, 2002:78); lack of resources (e.g. production inputs) (Sachs, 2001:930); lack of water (Johnson & Robinson, 2002:1252); and lack of finance (Aksoy, 2005:49) amongst many other problems.

In South Africa, produce from small-scale farmers is often lost after production due to spoilage during storage and inability of small-scale farmers to access storage facilities. This reduces small-scale farmer's ability to participate in formal market (Valdes & Foster, 2005:23). According to Tsangarides, Ghura & Leite (2000:15), poor storage facilities will often mean that farmers are forced to sell at peak times when prices are low. This is because farmers experience

losses due to damage to their produce because of lack of appropriate storage facilities (Reardon, Stamoulis, Cruz, Baliscan, Berdegue & Banks, 1998:21; Topouzis, 1999:33). Umali-Deiningner and Sur (2006:47) observed that although many tropical and sub-tropical regions have great potentials for food production because of the enabling climatic conditions, they have not been able to achieve food self-sufficiency because pests, diseases and other agents compete with humans in their struggle to ensure that adequate food is available to meet the population requirements. Efficient storage of farm produce plays a vital role in the attainment of food security. Efficient storage of produce depend on a number of factors one of which is the availability of the structures to hold the produce. There are a number of storage facilities and the choice depends on type of produce, volume of storage and technical and economic situations of the individual involved in the storage (Van den Meer, 2006).

Aksoy, (2005) reported on the impact of maize storage on rural household food security in Northern KwaZulu-Natal. This was based on the premise that the incidence of hunger is high among rural South African households (Labadarios, 2000:4-5). Transient hunger is partly attributed to seasonal production, especially of staple crops (maize in the case of KwaZulu-Natal). Effective storage plays an important role in stabilizing food supply at the household level by smoothing seasonal food production. However, despite significant advances in food storage methods, many African and South African

communities still rely on traditional storage methods for food, fodder and seed. Although relatively simple and inexpensive to construct and maintain, traditional storage systems lead to substantial post-harvest losses (Aksoy, 2005:49; UNAIDS, 2006:109). Inadequate post-harvest storage contributes significantly to food insecurity and more so in areas with high humidity as experienced in KwaZulu-Natal (Valdes & Foster, 2005:53). Storage facilities not only offer the opportunity to smooth hunger between staple crop harvests but farmers are possibly able to improve farm incomes by storing crops and selling at premium prices when demand outstrips supply later in the post-harvest period (Umali-Deininger & Sur, 2006:119). As quality is an important determination of crop retail prices (World Bank, 2005), effective storage is crucial to improve agricultural incomes and food security for small scale farmers. Grain storage practices in Nigeria vary according to climatic zones and socio-economic level of inhabitants (Igbeka and Olumeko 1996). Despite the desire to store maize, some farmers often sell a large proportion of their produce at harvest, when the price is low (Whitehead 1998). Strahan and Page (2003) observed that such farmers considered storage to be too costly in terms of time or too risky in terms of losses and unpredictability of future prices, or unprofitable in relation to an alternative investment. Meikle et al. (2002) reported that most farmers store maize using indigenous storage structures for the purpose of self-sustenance and household food security. These storage techniques are local and crude; some have been found to be functional, needing just a little improvement, whereas others are outdated and hazardous (Thamaga-Chitja et al. 2004). The main objective of this paper is to identify and analyse the use of storage facilities by small scale farmers in the Lejweleputswa District Free state, South Africa. The specific objectives of the study were to determine the socio-economic characteristics, identify types of storage facilities used, and purposes for storage. The study also explored the significant relationship between socio-economic characteristics and use of storage facilities among small scale farmers.

Materials and Methods

The study was conducted in the Lejweleputswa district in the Free State. Lejweleputswa district is located in the north of Free State province. The main activities in this district are mining and agriculture. The main types of agricultural farming in this area are mainly crop farming (e.g. maize, sunflower and wheat) and livestock farming. The weather in this area is mainly very cold in winter and with highly hot summers with high summer-rainfalls. A descriptive research design was used to analyse use of storage facilities by small scale farmers in Lejweleputswa district of Free State. The population

of study is all small scale farmers in Lejweleputswa district of Free State, South Africa. From the list obtained from the Lejweleputswa district Department of agriculture, Conservation, Environment and Rural Development, simple random sampling technique was used to select 120 farmers representing five percent of the population. Data were collected through the use of structured questionnaire that consist of socio-economic characteristics, types of storage facilities and purpose of storage. Data collected were analysed with statistical package for the Social science using frequencies, percentages and multiple regression analysis.

Results

Table 1 shows the socio-economic characteristics of farmers in Lejweleputswa district, Table 2 presents the types of storage facilities used by respondents, Table 3 states the purposes for storing among respondents and Table 4 presents the multiple regression analysis of relationship between socio-economic and use of storage facilities.

Discussions

Table 1 presents personal characteristics of the farmers in the Lejweleputswa district. The table shows that the majority of the respondents were female (56%); married (54%); practised Christianity (99%); having personal agricultural land (54%); farming full-time (77%); having high school education (48%); not members of any agricultural organization (56%) and having contacts with extension agents (71%). Also, the respondents were having less than 10 years farming experience (85%); having less than 9 persons as household size (96%); having less than 7 dependants (87%); having more females in their house-hold (97%); not engaged in non-farming activities (56%); practising mixed farming system (70%); and having farm income ranging between R45000-R80000. Mainly, the respondents aged from 42 to 60 years of age (49%); using hired labour (46%); and having storage facilities acquired through purchase (41%). It is pleasing to note that female form the majority of farmers in the Lejweleputswa district which is indicative of women empowerment. This could also be the result of sampled farmers' households consisting of more females than males and as a result that the male have moved from agricultural into the mining sector.

The use of hired labour could be linked to the involvement of majority women in farming activities and who seek support from hired labour. The age range of majority of farmers in Lejweleputswa District (42 to 60 years) is indicative of lack of involvement of youth in agricultural activities. The farmers do not have strong educational background with most them having high school education which could limit their adoption of innovations. It is also disturbing to note that farmers have to purchase storage facilities, which could create financial constraints for farmers intending to be

actively involved in farming. From the list of storage techniques listed in Table 2, only 3 out of 8 were prominently used by farmers.

Table 1 Socio-economic characteristics of farmers in Lejweleputswa district

Variable	Frequency	Percentage
Gender		
Male	53	45
Female	66	55
Age		
<40	43	34
42-60	55	49
Above 60	21	17
Marital status		
Single	40	34
Divorced	5	4
Married	64	54
Widow	10	8
Religion		
Christianity	118	99.2
Others	1	0.8
Educational level		
No formal education	2	2
Primary school	38	32
High school	57	48
Tertiary	22	18
Sources of land		
Personal	64	54
Rented	9	8
Allocated through land reform	46	38
Organizational membership		
Yes	52	44
No	66	56
Extension Contact		
Yes	84	71
No	34	29
Labour sources		
Self	26	22
Family	36	32
Hired	55	46
Farm Income		
8000-20000	17	14
22000-40000	18	15
45000-80000	26	22
83000-300000	21	17
Number of years farming		
<10	101	85
11-20	10	8
24-40	7	7
House hold size		
<9	114	96
10 above	4	4
Non-farming activities		
Yes	52	44
No	67	56
Farming system		
Crop based	27	23
Mixed	83	70
Grains based	9	7

The prominent storage facilities are use of ground/floor (45%) metal silos (33%) bags/sacks (31%) and metal/ plastic drums (28%). This result has

shown that there is high need for storage facilities among small scale farmers in the study area. This may be due to the fact that these are subsistence farmers without necessary support and facilities. The low scale of production associated with subsistence farming could be responsible for non-investment in storage facilities by farmers. The consequences of the lack of storage facilities would impact on food security in terms of produce availability particularly at off-season.

Table 2: Types of storage facilities used by respondents

Type of Storage	Frequency	Percent %
Metal Silo		
Yes	39	32.8
No	80	67.2
Cement Silo		
Yes	26	21.8
No	93	78.2
Metal/Plastic drums		
Yes	33	27.7
No	86	72.3
Bags/Sacks		
Yes	37	31.1
No	82	68.9
Solis wall Bins		
Yes	3	2.5
No	116	97.5
Storage on the ground/floor		
Yes	54	45.4
No	65	54.6
Under-ground		
Yes	26	21.8
No	93	78.2
Storage sacks		
Yes	2	1.7
No	117	98.3

Table 3: Purpose for storing among respondents

Purpose for storing	Frequency	Percent
Food security		
Yes	77	64.7
No	39	32.8
For prices of your produce to increase		
Yes	86	72.3
No	26	21.8
For household consumption through the year		
Yes	69	58
No	45	37.8
Lack of market accesses for your produce		
Yes	103	86.6
No	10	8.4
For future planning for drought		
Yes	81	68.1
No	31	26.1
To use next season as seed		
Yes	48	40.3
No	66	55.5

Table 4: Multiple regression analysis of relationship between socio-economic and use of storage facilities.

Model	Unstandardized coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	10.903	.793		13.743	.000
Constraints	.022	.013	.160	1.631	.106
Food security	-.101	.256	-.056	-.394	.695
Price increase of produce	.555	.220	.335	2.516	.013
Household consumption	.478	.261	.285	1.834	.070
Lack of market accesses	-.234	.220	-.122	-1.062	.291
Drought	.000	.198	.000	-.001	.999
Use as seed	-.524	.157	-.303	-3.339	.001
Age	.007	.007	.099	1.012	.314
Marital status	.120	.086	.129	1.407	.162
Religion	-.166	.215	-.063	-.772	.442
Occupation	-.309	.184	-.141	-1.679	.096
Organisation membership	-.140	.166	-.074	-.845	.400
Farm income	2.275E-6	.000	.118	1414	.161
Farming experience	-.043	.013	-.288	-3.237	.002
F	4.076				
Sig.	.000 ^a				
R	.597 ^a				
R Square	.356				

Table 3 shows that the purpose why farmers store their produce include food security (65%); for the prices of their produce to increase (72%); for household consumption throughout the year (58%); lack of market accesses for their produce (87%); proactive planning for drought (68%); and seed preservation (planting materials) (56%). This finding is consistent with Minot (2005) assertion that most storage is carried out by farmers in anticipation of future household needs. It was indicated that small-scale farmers store their produce for purposes of food security; for proactive investment for future prices increases; for availing sufficient food for their families throughout the year; and for proactive planning for the possibility of drought in the future. Most of South Africa is drought-prone, obliging farmers to develop coping responses to deal with the phenomenon (Myburgh, 1994). It is worrying though that farmers store their produce because of lack of market accesses for their products which could be frustrating and warrants the intervention of government and other big businesses. Bailey *et al.*, (1999) argue that many communities complain of insufficient access to traders' mainly due to traders that are reluctant to make trips because of high transaction costs they incur due to poor physical infrastructure such as roads and loading facilities, as well as distance to reach farmers.

The result of multiple regression analysis of the relationship between demographic characteristics

and use of storage facilities by small-scale farmers is presented in table 4. The independent variables were significantly related to use of storage facilities by small-scale farmers with an F value of 4.08. Also, an R value of 0.60 showed that there was a strong correlation between the independent variables and use of storage facilities by small-scale farmers. Significant determinants were use as seed ($t = -3.34$) and farming years ($t = -3.24$), anticipated increase ($t = 2.52$), household consumption ($t = 1.83$) and primary occupation ($t = -1.68$). This finding imply that, the longer the years farming and the more the produce are intended for use as seed in the next season, the higher the use of storage facilities. These findings highlight a great need for government involvement in helping small-scale farmers.

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