Evaluation of Management Skills and Training among Horticultural Farmers in Botswana

Som Pal Baliyan (Corresponding author)
Department of Agricultural Economics, Education and Extension
Botswana University of Agriculture and Natural Resources
Gaborone, Botswana
Email: baliyansom@gmail.com

Tshepo Oitsile
Department of Agricultural Economics, Education and Extension
Botswana University of Agriculture and Natural Resources
Gaborone, Botswana

Comfort Motlhabane
Department of Agricultural Economics, Education and Extension
Botswana University of Agriculture and Natural Resources
Gaborone, Botswana

Abstract

This quantitative study aimed to determine the level of management skills and training among small scale horticultural farmers in Botswana. The study adopted an exploratory and descriptive survey research design. A valid and reliable questionnaire was used to collect data through a survey of forty (n=40) purposively sampled small scale horticultural farmers in Botswana. A six-point Likerts' scale ranging from 0=No skill to 5=very high skill was used to measure the level of eight areas of farm management skills and training namely; planning and goal setting skills, accounting and financial management skills, communication skills, productivity management skills, product procurement and marketing skills, decision making skills, risk management skills, and technical skills. Mean and standard deviations for each of the farm management skills were calculated and, tested for their significance using a Chi Square test. Findings revealed that farmers had an overall high level of farm management skills and training. Communication skill was the only skill which the farmers had at a very high level. Farmers had high skills levels in the technical skills, product procurement and marketing management skills, planning and goal setting skills and, decision-making skills. Farmers had a low skill levels in risk management skills followed by accounting and financial management skills and, production and productivity management skills. Therefore, the

farmers need to be adequately trained in skill areas of risk management, production and productivity management skills and, accounting and financial management. Specific and important recommendations include formulation and implementation of effective agricultural insurance policies; inculcate the adoption of appropriate farm technologies, leadership and cooperation skills among farmers and, training of farmers in the areas of scientific production techniques, plant protection and record keeping. To prioritize the areas for effective and time bound improvement in the farm management skills among horticultural farmers, further study can be conducted to determine the influence of socio-economic characteristics of farmers on the level of their farm management skills.

Keywords: Farm management, fruit and vegetable production, horticultural farming, management skills, small scale farmers, Botswana

1. Introduction

Horticulture is the science and art of producing and marketing of fruits, vegetables, flowers, and ornamental plants (American Society for Horticultural Science, 2015). Fruits and vegetables are not only important component of traditional food in villages, but also central to healthy diets of modern urban population (Ali, 2008; Thomas, 2013). Fruit is commonly defined as the sweet, fleshy, edible part of plants that contains seed(s) but botanically fruit is the ripened ovary of a seed-bearing plant that contains the seed(s) (Vainio, & Weiderpass, 2006). By this definition, tomatoes, pepper, green pods, papaya, mangoes, and even seed pods of deciduous trees are fruit. Vegetables are broadly defined as the edible portion of a plant (excluding fruit and seeds) such as the roots, tubers, stems, and leaves. Horticultural sector includes all the activities dealing with the production and marketing of horticultural products and inputs including their processing and storage. In this study, horticultural sector refers to all the practices involved in the production and marketing of fruits and vegetables.

Horticulture sub-sector plays an important role in creating employment and investment opportunities in the African countries (MFDP, 2010; Weinberger & Lumpkin, 2007) and therefore, it is one of the priority areas in Botswana for diversification not only the agricultural sector but also overall economy of the country. Horticulture also impacts lives of people on a daily basis by providing them nutritious fruits and vegetables, offering visual enjoyment, and promoting recreational activities. Horticulture production in Botswana is largely practiced among small-scale farmers who mostly rely upon for family support through employment and income generation (Statistics Botswana, 2016). As horticultural farmers in Botswana are still unable to meet the local demand and consequently, they are equated with low productivity, commercialization level, income, subsistence farm enterprise with little or no use of modern advanced technology (Kirsten & Van Zyl, 2010) and management skills. Consequently, Horticulture sector in Botswana is still undeveloped and fragmented which leads to poor horticultural production. It is estimated that local horticultural production accounts for about 30 percent of the national demand and rest of the requirement being met from imports. Botswana imports nearly 70 percent of the fruit and vegetable demand from South Africa and other neighboring countries (Mongwa, 2007) and, which leads to import burden on the economy of the country. Botswana faces a serious deficiency in local

horticultural production which translated to about P400 million on imports mainly from South Africa (Pelontle, 2015). P refers to Pula, the currency of Botswana and 1P = 0.9 USD.

The governments' efforts to increase horticultural production in Botswana is constrained by, among other factors, endemic drought, poor soils, shortage of water, insufficient infrastructure, occurrence of pest and disease, lack of skills, poor technologies and their adoption and, lack of marketing skills (Baliyan & Kgathi, 2009; Baliyan, 2012; Baliyan, 2014). Due to the perishable nature of fruits and vegetables, farmers have to take informed decision about the crops they want to grow. They should also be aware of the market requirements to aid them in planning their production (Agribusiness forum, 2014). Usually, small-scale farmers fail to benefit from the emerging market opportunities because of lack the resources, poor production, information and skills to meet the integrated market requirements. Farmers are relatively less integrated with markets however, with appropriate managerial, technological, financial, and information support, small farmers can be successfully organized to meet the emerging market challenges and requirements and thus, benefit from emerging opportunities (Ali, 2008). All these challenges and constraints can easily be minimized through effective farm management.

Farm management is a body of activities and procedures carried out by a farmer to perform farm operations. Management plays an important role in organizing and combining the other three factors of production namely; land, labor and capital; so as to run the enterprise smoothly and profitably. Good management has significant impact on organizational performance, both in the immediate and longer term (Armstrong, 2015). Possession of appropriate managerial skills help the farmers to maximize returns by taking informed decisions about what to produce, by what method, when and how much to produce and for whom (AL-Rimawi et al., 2006). Incorrect decisions are mostly related to the weakness of production factors management and lack of farmer's awareness, information, and technical skills (Yaghobi et al., 2009). Weak management of production factors can lead to poor farm production and income which small scale producers usually face. Thus, one of the most important criteria for having effective managers is competency and managers are required to ensure that organizations achieve their objectives (Veliu & Manxhari, 2017). Moreover, transition from the conventional farmer as price taker, which requires appropriate technical and managerial competency, towards that of price maker, which calls for broader entrepreneurial competencies (Phelan, 2014). The required level of farm management skill depends on factors including cropping systems, required investment, labor and other intensive inputs used on farm (Thomas, 2013).

Horticulture farming particularly vegetables and fruits are associated with a high level of management in production and use of financial and human resources; making it input intensive enterprise. Likewise other enterprises, management plays a crucial role in making horticultural production a success. Farm manager using his/her management skills manipulates the resources and situations in trying to achieve the business goals (Day, 2006). Therefore, management must have the ability to interact and motivate workers, pose knowledge and proficiency in operations and have the ability to understand concepts, develop ideas and implement strategies to achieve stipulated goal. Farmers need management skills to

be able and survive in a highly competitive business environment (Al-Rimawi et al., 2004, Rottger, 2004). A skill is an ability to do something expertly well (Egbe, 2005; Yaaghubi et al., 2009). To cope with the complex process of farming and the developments and changes in agricultural production, farmers need not only to develop but also equip themselves with all the managerial skills (Franks, 2006; Kay et al., 2008). Nuthall (2005) argued that despite the extensive investment in developing infrastructure, the other approach to improving farm production and efficiency is the development of training packages designed to improve farmers' management skills. The first step in developing this approach involves determining the current level of management skills and training among farmers so as to determine the training needs for improving the required skills.

1.1 Statement of the problem

Management is a dynamic process and involves various skills. In order to run farm enterprise profitably, the operator should acquire good managerial knowledge and skills in the activities involved in managing the farm. Therefore, producers should have a high level of management skills and ability to operate their farms efficiently for maximizing profitable production. Poor horticultural production in Botswana calls for appropriate acquisition and up gradation of farm management skills by the farmers. Upgrading management skills among small scale horticultural farmers' may enable them to run their farm more efficiently and profitably. It is therefore, important to have information on the current level of farm management skills and training so as to determine the management skill areas in which the farmers need to be upgraded. There has been no evidence reporting on the current level of management skills among small scale horticultural farmers in Botswana. Therefore, this study was conducted to determine and describe the level of various farm management skills and training among small horticultural farmers in the country.

1.2. Significance of study

The findings of this study will provide vital information to the stakeholders including farmers, investors and policy makers on the current level of farm management skills among horticultural farmers. The findings thus, will provide help in identification of the specific skills that need to be improved for effective farm management. Policy makers can make better decisions on formulating effective policies for improving the existing level of management skills among small-scale farmers. This study will also add to existing literature on farm management skills, particularly on horticultural farm management.

2. Methodology

The methodology describes the research design, sampling and sample, instrumentation, data collection and data analysis procedure used in the study.

2.1 Research design

This quantitative study adopted an exploratory and descriptive survey research design. This study aimed to determine and describe the level of farm management skills and training among small scale horticultural farmers based on their perceptions, thus making the study

design an exploratory and descriptive in nature. According to Gray et al., (2006) exploratory studies seek to examine what is happening at the moment through enquiring about it. Descriptive research studies are designed to obtain information concerning the current status of phenomena which direct the researchers toward determining the nature of the situation as it exists at the time of the study. Descriptive research asks questions about the nature, incidence, or distribution of variables; it involves describing but not manipulating the variables (Ary, Jacobs & Razavieh, 2010). In this study, a survey was conducted to collect the information on the perception of farmers to determine the level of farm management skills among farmers. A survey entails the hidden truth and facts about any social aspect and, perception is a social aspect (Babbie, 2007, Cohen et al., 2007). Surveys have the potential to provide a lot of useful information from the subjects of the study and therefore, survey was considered the best method to explore the facts as the study was conducted to obtain the perception of horticultural farmers on their farm management skills.

2.2 Sampling and sample

The population of this study was the small scale horticultural farmers in Botswana who were actively involved in horticultural production activities at least for two years. Two districts of Botswana namely, South East district and Kweneng district were purposively selected for this study as these districts dominate in the horticultural farming activities in the country (Statistics Botswana, 2016). For data collection, 20 farmers from each of the selected district were selected purposively. Thus, a total of 40 small scale horticultural farmer (n=40) were purposively sampled for this study. Purposeful sampling helps researchers intentionally selection of individuals who learn or understand the phenomenon (Creswell, 2013). It was observed that a quite number of horticultural farmers were not actively involved in production and, the availability and accessibility of some farmers was also difficult. Therefore, the purposive sampling method was used in selection of the farmers based on two factors; the easy access and availability of the farmer and, active involvement in horticultural production.

2.3 Instrumentation

Based on the information from literature on horticulture and farm management, a questionnaire was constructed to collect the data on the current level of farm management skills among the horticultural farmers. The questionnaire composed of two sections. The first section had 11 items on demographic characteristics of the farmers. The second section had 52 close-ended items measuring farm management skills which were grouped into eight categories of farm management skills namely; communication skills, planning and goal setting skills, accounting and financial management skills, productivity management skills, product procurement and marketing skills, decision-making skills, risk management skills, and technical skills. Each of the farm management skills contained items/components measuring the skill. A six point Likerts' scale was adopted to measure the level of farm management skills with a measuring scale ranging from 0=No skill, 1=very low skill, 2=low skill, 3=moderate skill, 4=high skill to 5=very high skill. A Likerts' scale was considered appropriate to measure the level of skill as it has been used in other studies measuring the

farm management skills (Allahyari, Saburi & Fatholah, 2011; Soraya, Ommani & Salmanzadeh, 2014). The validity of the questionnaire was accomplished by a panel of experts in farm management, agricultural economics and extension. A Chronbach Coefficient Alpha was calculated to ensure the reliability of the instrument as a measure of the internal consistency of the multi-item scale instrument. Reliability of the instrument was estimated at 0.96 which indicated that the instrument had very high reliability as it exceeded far above the minimum value of 0.70 (Creswell & Creswell, 2017; Saunders & Lewis (2012).

2.4 Data collection and analysis

As a part of the students' research projects, the data was collected between December 2015 and February 2016. A valid and reliable questionnaire was used to collect data through a survey of sampled small scale horticultural farmers in Botswana. Data was entered into the SPSS 23 software for the analysis whereby the levels of farm management skills were determined by calculating the means and standard deviation of various farm management skills. Means and Standard Deviations for each item under all the eight categories of farm management skills were calculated. Chi Square test was employed to test the significance of the means of each skill item. The skills items had mean values ranging from the lowest of 1 to the highest of 5 (M =1-5) indicating to very low skill to a very high skill level, respectively. Mean values less than 3 (M<3), between 3 and 4 (M ≥3<4) and, greater than 4 (M ≥4≤5) indicated to low skill, moderate/average skill and high skill levels. In other words, a mean value of less than 3 indicated to below average skill level while mean value of more than 3 indicated to above average skill level and Mean value of 3 indicated to a moderate/average skill level. Thus, based on the mean values of skill items, all the eight farm management skills were evaluated and ranked.

3. Results and Discussion

The purpose of this study was to determine and describe the level of various farm management skills and training among small scale horticultural farmers in Botswana. Means, Standard Deviations and the significance for each item under all the eight categories of farm management skills were calculated. The findings on levels of farm management skills are presented and discussed in the following subsections.

3.1 Planning and Goal Setting Skills

Planning is the process of setting goals, developing strategies, outlining tasks and schedules to accomplish the goals. In planning process, a plan is developed to achieve objectives and goals by setting up programs, interventions and procedures that will be implemented to measure whether or not the objectives are met (Ballard, 2010). Six items were used to measure the planning and goal setting skills among small-scale horticultural farmers and, their means, standard deviation and their significance are presented in Table 1.

Most of the items measuring this skill had mean above 3 (M>3) which indicated that horticultural farmers had high level of planning and goal setting skill. Five items measuring this skill were found significant namely; predict the required input over production period, develop horticulture production program, estimate production costs over a production period,

estimate income from production over a production period and, predicting production targets in short and long term. Table 1 revealed that the farmers had the highest skill in predicting the required input over production period (M=3.75, SD=1.25, p=<.01) followed by the skill to develop horticulture production program (M=3.70, SD=1.36, p=<.01). The farmers had the lowest skill in predicting production targets in short and long term (M=2.88, SD=1.20, p=<.05).

Table 1. Levels of various Planning and goal setting skills in small-scale horticultural producers

Skill items/components	Mean	SD
Predict the required input over production period	3.75**	1.25
Develop horticulture production program	3.70**	1.36
Estimate production costs over a production period	3.63*	1.72
Estimate income from production over a production period	3.53**	1.26
Understand loan and other government facilities for horticulture	3.00	1.77
Predict the production targets in short and long term	2.88*	1.20

* p<.05 ** p<.01

Table 1 reflected that no skill item measuring planning and goal setting skill indicated to a very high skill level and, all the skill items except predicting production target in short and long term, reflected to high skill level (M>3<4). The farmers had the highest ability in predicting the required input over production period with a high mean of 3.75 which indicated that farmer had a significant knowledge and understanding on the importance and quantity required of inputs in horticultural farming. The farmers also had high skill (M=3.70) to develop horticulture production program. On the other hand, farmers had moderate levels of skills in predicting production targets in short and long run which may have implication on the wrong prediction on the required inputs which may, in turn, impact adversely on production and marketing plan of the farm. Thus, there is a need to train farmers on predicting skills enabling them to predict their farm production efficiently.

3.2 Accounting and Financial Management Skills

Accounting and financial management skills involve understanding the flow of money in the farm operations and maintaining proper records thereof to analyse the overall performance of the farm. Six items were used to measure and determine level of accounting and financial management skills and, their means, standard deviation and their significance are presented in Table 2.

Most of the items measuring this skill had mean below 3 (M<3) which indicated that horticultural farmers had moderate level of accounting and financial management skills. Only three items measuring this skill were found significant namely; calculate and record amount of initial capital used in production, calculate and record profit and loss in production and, keep proper farm records. Table 2 reveal that respondents had the highest skill in calculating and recording amount of initial capital used in production (M=3.28, SD=1.84, p=<.01). The farmers had the lowest significant ability to keep proper farm records (M=2.60, SD=1.33, p=<.01) followed by the skill to calculate and record profit and loss in horticultural production (M=2.68, SD=1.27, p=<.01).

Table 2. Levels of various accounting and financial management skills in small-scale horticultural producers

Skill items/ components	Mean	SD
Calculate and record amount of initial capital in production	3.28**	1.84
Purchase needed inputs to enjoy discount prices	3.00	1.78
Effectively use financial and credit from various sources	2.75	1.89
Calculate and record profit and loss in horticultural production	2.68**	1.27
Keep proper farm records	2.60**	1.33
Record consumed inputs in horticultural enterprise	2.48	1.43

* p<.05 ** p<.01

Table 2 reflected that no skill item measuring accounting and financial skills indicated to very high skill level and majority of the skill items reflected a moderate level of skills which conclusively indicate that the farmers are poor in record keeping. Record keeping is crucial for effective management as it provides manager the ideas of all the inputs, output and other records and thus helps a manager in timely understanding the requirement of inputs, calculating profit and loss. Therefore, there is a need to train farmers in accounting and financial skills specially, in record keeping of consumed inputs on the farm.

3.3 Product procurement and marketing skills

Product procurement and marketing skills links up production and distribution of horticultural products and therefore, are important to maximize farm productivity. Eight items were used to measure the level of this skill. The means, standard deviation and their significance are presented in Table 3. Most of the items measuring this skill had mean above 3 (M>3) which indicated that horticultural farmers had moderate level of product procurement and marketing skills. Six items measuring this skill were found significant namely; familiarize with modern style of packaging products, analyse demand, supply and

price of horticultural produce, choose the best time to sell the products, evaluate alternative methods of selling such as group selling, evaluate alternative methods of products pricing such as future contracts and, analyse government policies on horticultural markets.

Table 3 reveal that farmers had the highest skill in familiarizing with modern style of packaging products (M=4.08, SD=1.14, p=<.01) followed by the skill to analyse demand, supply and price of horticultural produce (M=3.85, SD=1.42, p=<.01). The farmers had the lowest significant skill to analyze government policies on horticultural markets (M=3.10, SD=1.56, p=<.05) followed by evaluating alternative methods of products pricing such as future contracts (M=3.13, SD=1.59, p=<.05). Thus, farmers seem not to be adopting group purchasing methods which can reduce their cost of production and hence, increase the profit. Therefore, efforts should be made to inculcate the culture of cooperation among the farmers. It is suggested the government policies on horticultural marketing should be disseminated adequately, possibly through the extension officials.

Table 3. Levels of various product procurement and marketing skills in small-scale horticultural producers

Skill items/components	Mean	SD
Familiarize with modern style of packaging products	4.08**	1.14
Analyse demand, supply and price of horticultural produce	3.85**	1.42
Choose the best time to sell the products	3.70**	1.34
Evaluate alternative methods of selling such as group selling	3.40**	1.30
Develop strategies to ensure access to input and product markets	3.38	1.48
Evaluate alternative methods of products pricing eg. future contract	3.13*	1.59
Analyse government policies on horticultural markets	3.10*	1.56
Evaluate alternatives methods of purchasing (eg. group buying)	2.65	1.62

* p<.05 ** p<.01

3.4 Production and Productivity Management Skills

Productivity management skill is one of the most important competences of managers aiding in overseeing the production process. Seven items were used to measure production and productivity management skills among small scale horticultural farmers. The means, standard deviation and their significance of the items measuring this skill are presented in Table 4.

Table 4 indicated that most of the items measuring this skill had mean lower than 3 (M<3) which indicated that horticultural farmers had moderate level of production and productivity management skills. Six items measuring this skill were found significant namely; complete all production activities in a timely manner, evaluate alternative methods of acquiring production skills such as workshops, monitor stored chemicals and other inventories for their

quality maintenance, identify influence of production practices on quality and level of production, obtain a resource base to promote efficient production and, identify problems in production performance and take corrective measures. Table 4 reveal that respondents had the highest skill in completing all production activities in a timely manner (M=3.55, SD=1.15, p=<.01) followed by the skill in evaluating alternative methods of acquiring production skills such as workshops (M=3.20, SD=1.52, p=<.05). The farmers had the lowest significant and moderate level of skill in identifying problems in production performance and take corrective measures (M=2.75, SD=135, p=<.01).

Table 4. Levels of various production and productivity management skills in small-scale horticultural producers

Skill items/components	Mean	SD
Complete all production activities in a timely manner	3.55**	1.15
Evaluate alternative methods of acquiring production skills such as technology workshops	3.20*	1.52
Monitor stored chemicals and other inventories	2.93*	1.45
Identify influence of production practices on quality and level of production	2.83**	1.13
Obtain a resource base to ensure efficient production	2.80**	1.24
Select the technologies and methods to ensure efficient use of resources	2.80	1.42
Identify problems in production and take corrective measures	2.75**	1.35

* p<.05 ** p<.01

One possible explanation for a low ability to quickly identify problems in production performance and take corrective action can be that the farmers lack in basic aspects of production process which might increase the risk in the production. Interestingly however, the farmers seem to be trying to acquiring production skills through alternative methods such as technology workshops which indicate that farmers are interested in acquiring production skills. However, the farmers still need to be trained to understand the scientific production process of growing horticultural crops.

3.5 Decision-Making Skills

Decision–making is the most important task of managers while they are managing and supervising the production. Five skill items were used to measure the decision-making management skills among the small scale horticultural farmers. The means, standard deviations and their significance are presented in Table 5.

Table 5 indicated that most of the items measuring this skill had mean above 3 (M>3) which indicated that horticultural farmers had high level of decision-making skills. Only two items measuring decision making skill were found significant namely; ability to use best management operations in horticultural production (M=3.63, SD=1.42, p=<.01) and, ability to analyze and solve situations faced first time (M=3.53, SD=1.50, p=<.01). Farmers had moderate skills in making good decisions about the use of technology. Horticultural producers should strive through their decision to adopt and use technologies to enhance farm efficiency and therefore, the farmers should make sound decisions to adopt and use of appropriate technologies in farm operations.

Table 5. Levels of various decision-making management skills in small-scale horticultural producers

Skill items/components	Mean	SD
Use best management operations in horticultural production	3.63**	1.42
Analyze and solve situations faced first time	3.53**	1.50
Take timely decisions on acceptance of new technologies	3.23	1.57
Identify and solve production problems	3.15	1.49
Make good decision on technologies to use	2.85	1.64

* p<.05 ** p<.01

3.6 Risk Management Skill

Good farm management includes making efficient decisions to reduce vulnerability to possible risks in farming. Risks have a direct impact on the farm production and profitability. Risks and uncertainties are inherent to any projects specially farming and appropriate action need to be taken to prevent major losses. Seven items were used to measure the risk management skills among the small-scale horticultural farmers. The means, standard deviation and their significance of the items measuring risk management skill are presented in Table 6.

Table 6. Levels of various risk oriented management skills in small-scale horticultural producers

Skill items/components	Mean	SD
Manage price risks in buying inputs in horticultural production	3.38**	1.49
Evaluate the riskiness of a new venture	3.20	1.34
Manage the financial and production risks	2.68**	1.27
Predict and develop strategies for facing any adverse condition	2.58*	1.35
Manage price risks in selling of horticultural products	2.40*	1.35
Maintain financial reserves for any eventuality in enterprise	2.10	1.28
Use agricultural insurance schemes properly	1.35*	1.29

* $p < .05$ ** $p < .01$

Most of the items measuring this skill had mean less than 3 ($M < 3$) which indicates that horticultural farmers had moderate level of risk management skills. Horticultural farming is a risky enterprise as it mostly depends on the climatic and environmental conditions therefore farmers need to quip themselves with risk management skills so as to minimize the adverse effects of any possible risk in horticultural farming. Five items measuring this skill were found significant namely; manage price risks in buying inputs in horticultural production, manage the financial and production risks, predict and develop strategies for facing any adverse condition, manage price risks in selling of horticultural products and, use agricultural insurance schemes properly. Table 6 reveal that respondents had the highest skill in managing price risks in buying inputs in horticultural production ($M=3.38$, $SD=1.49$, $p=<.01$) followed by the skill to manage the financial and production risks ($M=2.68$, $SD=1.27$, $p=<.01$). The farmers had the lowest significant skill in using agricultural insurance schemes properly ($M=1.35.$, $SD=1.29$, $p=<.05$). These findings revealed that farmers had a moderate level of skill to manage price risks in buying inputs in horticultural production but very poor in using agricultural insurance schemes properly. It may be possible that farmers were not taking risk prevention measures due to lack of knowledge of risk minimizing strategies. Moreover, agricultural insurance schemes and services may not be widely available throughout the country. Therefore, government should formulate clear and effective agricultural insurance schemes and availed to the farmers.

3.7 Communicative Skills

Communication skills refer to the skills which help manager to establish ideal and effective communication with others. Communication is a key factor in a successful farming operation, through discipline, training employees, motivating a work force and implementing new technology or practice the job can gets done. Seven items were used to measure the communication skills among small-scale horticultural farmers. The means, standard deviation and their significance are presented in Table 7.

All the items measuring this skill either had mean above 3 (M>3) or mean above 4 (M>4) which indicates that horticultural farmers had high level to very high level of communicative skill. Five items measuring this skill were found significant namely; develop positive relationship with buyers, establish clear and honest communication with others, develop positive relationship with suppliers, reach out others to provide opinions and, continue development of leadership skills. Table 7 reveal that respondents had the highest skill in developing positive relationship with buyers (M=4.40, SD=.70, p=<.01). The farmers had the lowest significant skill in continuous development of leadership skills (M=3.80., SD=1.24, p=<.01) followed by to reach out others to provide opinions (M=3.85., SD=1.02, p=<.01).

Table 7. Levels of various communicative skills in small-scale horticultural producers

Skill items/components	Mean	SD
Develop positive relationship with buyers	4.40**	.70
Consider the views of others	4.18	.81
Communicate with others on problems until solved	4.13	1.04
Establish clear and honest communication with others	4.10**	.77
Develop positive relationship with suppliers	3.93**	1.31
Reach out others to provide opinions	3.85**	1.02
Continuous development of leadership skills	3.80**	1.24

* p<.05 ** p<.01

Although the farmers had moderate level skill in continuous development of leadership skills however it was the lowest ranked item measuring the communicative skills. The constraints in the continuity to development of leadership skills in farms may possibly be due to the complexity of adaptive mindset, poor vision, weave ecosystems for human engagement, poor network and collaboration among farmers and workers. Good leadership and management can have a truly significant impact on organizational performance, both in the immediate and longer term (Armstrong, 2015). Therefore, efforts should be made to enhance leadership skills among the farmers.

3.8 Technical Skills

Technical skills are the knowledge and capabilities of a farmer and worker poses to perform specialized tasks in production such as preparing field and developing seedlings. Six items were used to measure the technical skills in small-scale horticultural producers. The means, standard deviation and their significance are presented in Table 8.

Most of the items measuring this skill had mean above 3 (M>3) which indicated that horticultural farmers had high level of technical skills. All the six items measuring this skill were found significant namely; prepare the field for planting, manage and develop seedlings,

maintain soil fertility, manage irrigation system effectively, identify pests and control them effectively and, identify diseases and control them effectively. Table 8 reveal that farmers had the highest skill in preparing field for planting (M=4.58, SD=.67, p=<.01) followed by in maintaining soil fertility (M=4.40, SD=.98, p=<.01). The farmers had the lowest significant skill in identifying diseases and their effective control (M=2.35, SD=.73, p=<.01) followed by in identifying pests and their effective control (M=2.98, SD=1.49, p=<.01). These findings indicated that the horticultural farmers are not well equipped with skills in plant protection as they had low skills in identifying pests and diseases and their control. Therefore, there is a need to train farmers in the field of plant protection.

Table 8. Levels of various technical management skills in small-scale horticultural producers

Skill items/components	Mean	SD
Prepare the field for planting	4.58**	.67
Manage and develop seedlings	4.40**	.98
Maintain soil fertility	3.48**	1.24
Manage irrigation system effectively	3.18*	1.50
Identify pests and control them effectively	2.98**	1.49
Identify diseases and control them effectively	2.35**	.73

* p<.05   ** p<.01

3.9 Average Level of Various Farm Management Skills

In order to compare and rank various farm management skills, average mean level of all the eight management skills were calculated and are presented in Table 9. Most of the farm management skills had mean above 3 (M>3) which indicated that horticultural farmers had moderate level of farm management skills. Based on the average mean level of skills, eight farm management skills under study are divided into three categories of skills namely; very high skill, high skill and low skill. The communication skills was the only skill which had average mean higher than 4 (M= 4.05) indicated that the farmers had very high level of communication skill. Second group of skill category in which farmers had moderate skill levels were; technical skills (M= 3.49), marketing management skills (M= 3.41), planning and goal setting skills (M= 3.29) and decision-making skills (M= 3.28).

Table 9. Average level of various farm management skills in small scale horticultural producers

Farm management skills	Mean	Skill level	Skill Rank
Communication skills	4.05	Very High	1
Technical skills	3.49	High	2
Product procurement and Marketing skills	3.41	High	3
Planning and goal setting Skills	3.29	High	4
Decision-making skills	3.28	High	5
Production and productivity management skills	2.98	Low	6
Accounting and financial management skills	2.79	Low	7
Risk management skills	2.52	Low	8
Overall Farm Management Skills	3.23	High	-

Table 9 further indicated that the third group of skill category in which farmers had low skill levels included; production and productivity management skills (M= 2.98), accounting and financial management skills (M=2.79) and, risk management skills (M=2.52). These findings indicated that farmers had communication skills as top ranking skills followed by marketing management skills. On the other hand, risk management skills ranked as the lowest skill followed by accounting and financial management skills. The average mean of all the eight farm management skills was also calculated to be 3.23 which indicated that horticultural farmers had an overall high level of farm management skills. However, there is a need to improve the skills in risk management, accounting and financial management and, production and productivity management.

4. Conclusion and Recommendations

The study has determined and described the level of farm management skills and training among small scale horticultural farmers in Botswana. The levels of farm management skills were evaluated under eight categories of skills namely; planning and goal setting skills, accounting and financial management skills, communication skills, productivity management skills, product procurement and marketing skills, decision making skills, risk management skills, and technical skills. The results indicated that communication skill was the only skill which the farmers had at a very high level. Farmers had high skills levels in the technical skills, product procurement and marketing management skills, planning and goal setting skills and, decision-making skills. Findings also revealed farmers had a low skill levels in the risk management skills followed by accounting and financial management skills and, production and productivity management skills. Based on the mean of each farm management skill, all the eight farm management skills were ranked in descending order of their skill level as communication skills, technical skills, product procurement and marketing skills, planning skills, decision making skills procurement and production management skills, accounting and financial management skills and, risk management skills.

Although, horticultural farmers had an overall a high level of farm management skills yet, they had low skill in risk management followed by production and productivity management skills and accounting and financial management skills. The low levels of farm management skills in these three crucial skills may have implications on the productivity and sustainability of horticultural production in the country. Therefore, in order to improve productivity and sustainability of small scale horticultural production in the country, it is recommended that the farmers should be adequately trained in skill areas of risk management, production and productivity management skills and, accounting and financial management. Agricultural extension services should intensify their efforts to make their services more functional so that farmers can get useful information to enhance their skills in these three management skills.

Furthermore, some specific recommendations are also made. There is a need to train farmers on predicting skills enabling them to predict their farm production efficiently. Farmers should be trained in record keeping on the farm especially, of consumed inputs. Efforts should also be made to inculcate the culture of cooperation among farmers so as to perform farm activities in groups such as buying inputs and selling products as a cost reducing measure. It is suggested the government policies on horticultural marketing should be disseminated to the farmers adequately, probably through the extension officials. Farmers need to be trained on the scientific production techniques in horticultural crops. Farmers should make sound decisions to adopt and use of appropriate technologies in their farm operation as it improves farm efficiency. Government should formulate effective agricultural insurance schemes and, ensure their easy access to the farmers. Efforts should be made to enhance the leadership skills among the farmers. Finally, but importantly, farmers should be trained in the field of plant protection as they lack skills in identifying pests and diseases and their control.

Further study should be conducted to determine the influence of socio-economic characteristics of horticultural farmers on the level of their farm management skills and training. The findings of such study can help in prioritizing the areas for effective and time bound improvement in managerial skills to enhance the productivity of small scale horticultural farms in Botswana.

References

Ali, M. (2006). *Horticulture revolution for the poor: nature, challenges and opportunities*. Washington, DC: World Bank.

Allahyari, M. S., Saburi, M. S., & Keshavarz, F. (2011). Analyzing Farm Management Skills in Poultry Production Enterprises in Iran. *Life Science Journal*, *8*(1), 61-67.

Al-Rimawi, A. S., Karablieh, E. K., & Al-Kadi, A. S. (2004). An investigation into the perceived farm management and marketing educational needs of farm operators in Jordan. *Journal of Agricultural Education*, *45*(3), 34-43.

Al-Rimawi, A.S., Karablieh, E. K., Al-Qadi, A. S., & Al-Qudah, H. F. (2006). Farmers' Attitudes and Skills of Farm Business Management in Jordan. *Journal of Agricultural Education and Extension*, *12*(3), 165-177.

American Society for Horticultural Science (2015). *Science for Specialty Crops: What is Horticulture*. Retrieved from http://www.ashs.org/?page=horticulture.

Armstrong, A., & Page, N. (2015). Creativity and constraint: leadership and management in the UK creative industries. *Creative skill set*.

Ary, D., Jacobs, L. C., & Razavieh, A. (2010). *Introduction to research in education* (8th ed.). Wardswoth Cengage Learning. Canada: Nelson Education Ltd Exotic Classic.

Babbie, E. (2007). *The practice of social research* (11th Ed.). Singapore: Thomson Wadsworth.

Baliyan, S. P. (2012). Constraints in the growth of horticulture sector in Botswana. *Journal of Social and Economic Policy, 9*(1), 1-15.

Baliyan, S. P., & Kgathi, D. L. (2009, June). Production and marketing problems in small scale horticultural farming in Botswana. In *XVI International Symposium on Horticultural Economics and Management, 831*, 31-40.

Baliyan, S.P. (2014). Improving Sustainable Vegetable Production and Income through Net Shading: A Case Study of Botswana. *Journal of Agriculture and Sustainability, 5*(1), 70-103.

Ballard, T., Bllo, T. K., & Dall, F. D. (2010). *Monitoring and Evaluation Toolkit for Junior Farmer field and life schools*. Food and Agriculture Organization, Rome, Italy.

Cohen, L. Manion, L. & Morris, K. (2007). *Research methods in education* (6th ed). London: Routledge Falmer.

Cresswell, J. (2013). *Research Design: qualitative, quantitative, and mixed methods approach* (4th ed), Sage: Thousand Oaks.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Day, P. (2006). Horticulture Natural Resource Management Strategy, Retrieved from http://www.treesforlife.org.au/sites/default/files/Horticulture-NRM-strategy.pdf

Egbe, B. O. (2005). Assessment of Effectiveness of Skill Acquisition Centres in Training Youths for Occupations in Ebonyi State. *Ebonyi Technical and Vocational Education Journal, 1*(1), 16-22.

Franks, J. (2006). The Value of Farm Management Research: A Farm Manager Perspective. Seminar paper on Nordic Association of Agricultural Scientist, Seminar 375, Farm risk management, 14-16 June 2006, Oslo, Norway.

Gay, L. R., Mills, G. E., & Airasian, P. (2006). *Educational research: Competences for analysis and applications*. Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.

Kay, R. D., Edwards, W. M., & Duffy, P. A. (2008). Farm Management (6th Ed). McGraw Hill.

Kirsten, J. F., & Van Zyl, J. (1998). Defining small-scale farmers in the South African context. *Agrekon*, *37*(4), 551-562.

Ministry of Finance and Development Planning (MFDP). (2010). National Development Plan 10. Government Printers, Gaborone, Botswana.

Mongwa, T. (2007, July). Botswana imports vegetables. *Daily News*. Retrieved from https://palapye.wordpress.com/2007/07/25/botswana-imports-vegetables/.

Nuthall, P. L. (2006). Determining the important management skill competencies: The case of family farm business in New Zealand. *Agricultural Systems*, *88*(2-3), 429-450.

Phelan, C. J. (2014). *Understanding the farmer: An analysis of the entrepreneurial competencies required for diversification to farm tourism* (Doctoral dissertation, University of Central Lancashire). Retrieved from http://clok.uclan.ac.uk/10588/3/Phelan.pdf

Rottger, A. (2004). Strengthening farm-agribusiness linkages in Africa. Proceedings of Expert Consultation, Nairobi, 24-27 March 2003. *AGSF Working Document (FAO)*. Retrieved from ftp://ftp.fao.org/docrep/fao/008/y5785e/y5785e00.pdf.

Saunders, M. N. & Lewis, P. (2012) *Doing Research in Business & Management: An Essential Guide to Planning Your Project*, Pearson.

Soraya, M., Ommani, A.R., & Salmanzadeh, S. (2014). Analysis of Farm Management Skills at Industrial Cattle Farms in Behbahan Township. *Indian Journal of Fundamental and Applied Life Sciences, 4*(S4), 355-1359.

Statistics Botswana. (2016). Annual agricultural survey report 2014. *Gaborone, Botswana*.

Thomas, B. (2013). *Horticulture Research in Europe*. Epso Horticulture Working Group. Retrieved from http://www.epsoweb.org/file/1447

Vainio, H., & Weiderpass, E. (2006). Fruit and vegetables in cancer prevention. *Nutrition and cancer*, *54*(1), 111-142.

Veliu, L., & Manxhari, M. (2017). The impact of managerial competencies on business performance: sme's in kosovo. *Journal of Management*, (1), 30.

Weinberger, K., & Lumpkin, T. A. (2007). Diversification into horticulture and poverty reduction: a research agenda. *World Development*, *35*(8), 1464-1480.

Yaaghubi, A., Chizari, M., Pezshkirad, G., & Foeli, S. (2009). Importance of farm management skills from the viewpoint of Wheat farmers in Tafresh Township. *Journal of Development and Agricultural Econ*omics, *17*(66), 99-114.

Yagobi, A., Chizari, M., & Fali, S. (2009). Agricultural products insurance: appropriate strategies in risk management. *Journal of Agricultural Economics and Development*, *2*(6), 19-28.

Copyright Disclaimer