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Research Article

ANALYSIS OF INSTITUTIONAL CONSTRAINTS TO PEACH PRODUCTION IN BUTHA-BUTHE

SEKOAI, T. and RANTLO, A.M.

Department of Agricultural Economics and Extension, National University of Lesotho

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ABSTRACT

The institutions are kinds of structures that matter most in the social realm, they make-up the stuff of social life. This study investigated the impact of some institutional constraints on peach production in Botha-Bothe. The study used the demographic and institutional data of 60 farmers purposively selected in Botha-Bothe. The descriptive analysis and probit model were used for data analysis. The analysis revealed that support services, motivation, access to production information were significant in peach production. It was therefore recommended that appropriate support services should be provided together with the most relevant information to peach production.

INTRODUCTION

Like many other countries, fruit production in Lesotho is highly a function of the favourable climatic conditions and therefore the production of fruits is confined to the Lowlands, Foothills and Senqu River valley. Production of peaches as one of deciduous fruits found in Lesotho is highly affected by cold winters and occasional late frost in spring together with other environmental conditions that vary in different parts of the country (Makosholo, 2005). The main activities in the production of peaches are undertaken by the households, heads of the families in most cases being in charge as usual (Bureau of Statistics, 2010), most of which produce peaches through natural methods, however, some organizations still assist certain groups people to engage on production by offering them equipment and other resources. Recent investigations gave a clear picture of the comparative advantage of peaches with other fruits under consideration in ecological zones within the country of Lesotho. That is, in Lowlands peaches show the bigger comparative advantage while in Foothills the apples and peaches have a comparative advantage of equal strength. Lastly, in the Senqu River Valley, the peaches have a comparative disadvantage (Makosholo, 2006). This analysis therefore brings us to the conclusion that there is a clear disparity in the scales of production in those different areas.

Corresponding autho: RANTLO, A.M.,
Department of Agricultural Economics and Extension, National University of Lesotho.

It has been observed through Lesotho Agricultural Census that peach trees were the most common fruit tree in all districts across the country with 75.9 percent of the total population of fruit trees (Bureau of Statistics, 2010).Currently Basotho generate income through the sales of dried peaches locally and also export them to South Africa while others sell canned peaches mostly in flea markets. Therefore it could be seen that the country of Lesotho has a greater potential of generating lot of income through production of peaches, decreasing poverty and unemployment among individuals. Like many other poor countries in southern Africa, Lesotho is also faced with technical and institutional constraints in production of fruits, peaches in particular. The majority of farmers in the developing countries lack enough skills to enhance the produce, inadequate finance, unavailability of implements and many other factors that limit them from meeting local and international demand of peaches (Makosholo, 2006) hence why the study is seeking to investigate the institutional constraints to peach production in Lesotho. In Lesotho, most areas are suitable for production of different peach varieties and most households have peach trees in the backyard (Bureau of Statistics in Lesotho, 2012). Production of peaches is influenced by both the institutional and technical environment (Chalwe, 2011). It is well documented that there is high demand of peaches in the country which is also evidenced by the large quantities of peach imports entering into this Lesotho (Makosholo, 2005). This shows that there is potential market for peaches in the country that should have enhanced peach production in the country.

This situation has led the study seeking to investigate the institutional factors affecting peach production in the country.

Objectives of the Study

- To identify institutional factors that affect peach production in Butha-Buthe.
- To determine the impact of these institutional factors on the production of peaches in Butha-Buthe.

MATERIALS AND METHODS

Description of the Study Area

Butha-Buthe district consist of about 5.8% of the total population in Lesotho (Bureau of Statistics, 2006), and about half of its territory is classified as mountainous while the other remaining half constitutes of 36% foothills and 14% lowlands. This district is located in the North of the country, about 125km from Maseru and has the total area of 1,789km2 of which 13,284ha (8.3%) is considered arable, while the remaining 91.7% is non-arable. In comparison with other districts, Butha-Buthe district is the wettest taking into consideration the rainfall distribution.

Letsie *et al* (2009) indicated that about 85% of Lesotho's rural population depends on agriculture as its main livelihood. Most of the households are subsistence farmers while a small number are commercial farmers of other agricultural products. Moreover most households practice crop and livestock farming, but they supplement this livelihood with other income-generating activities.

Research Design, Population and Sample

The peach producers within the country but more specifically those in Butha-Buthe are the main population of the study since the study is in the case of Butha-Buthe. These farmers will be selected considering those that have a minimum of 70 peach trees per Orchard and a sample size of 30 farmers will be used. Butha-Buthe district is chosen because of its proximity to the researcher and insufficient funds to extend the study to the entire country.

Instrumentation

Purposive Sampling will used since only the peach producers who have the stated number of peach trees will be included. As for primary data, questionnaire that consists of questions that demand all relevant information to the study will be prepared. Both open-ended and close-ended questions will be used with respect to the type of data needed as they allow the acquisition of more unbiased information due to unlimited response. Expects of tools used will be consulted to test their validity and Chronbanch's alpha formula will be used to test reliability.

Data Collection

Secondary data will be collected from the journals, the internet, books and wherever relevant information is accessible including agricultural institutes or organizations. A personally administered questionnaire will be used mainly because the interviewer could ensure that all questions will be answered and that there is high reliability of the data that could be obtained because the interviewer could probe with further questions if the respondents appeared to have misunderstood the question or appeared to be giving false information.

Method of Analysis

Descriptive analysis using frequencies, percentages and means as statistical indicators was used together with a probit model during the data analysis in this study.

Model Specification

In analysis of constraints to peach production, level of peach production would be the most important and appealing response variable whose variations the analysis would attempt to explain by means of a set of explanatory variables. The model that accommodated "production satisfaction" as a binary choice variable in a manner that a farmer's positive response is scored as one (1) while the negative response is scored as zero (0) will be used. The hypothesis to be tested is the probability that farmers are satisfied with level of production and this depend on several elements in the environment, of the farmers, and the institutional factors such as access to credit, support services, access to factors of production, coordination between farmers and other community members, motivation, training and development. The probit model is considered the most appropriate in this case.

$$Y_i = \beta_0 + \beta_1 AC + \beta_2 SV + B_3 AFP + \beta_4 C + \beta_5 M + \beta_6 TD + \beta_7 C + \beta_8 API + \beta_9 LS + \varepsilon_i$$

Y_i = Institutional factors affecting peach production
B_0 = production of peaches through natural methods

B_1, β_2, β_3, β_4, β_5, β_6 = each express the extent to which the corresponding explanatory variable affect peach production.

AC = access to credit.
SV = support services.
AFP = access to factors of production.
C = Coordination between farmers and other community members.
M = motivation.
TD = training and development.
C = Culture
API = Access to production Information
LS = Legal System
ε_i = takes care of variables that are not specified in the model.

The econometric software STATA 10 is able to calculate the probit coefficients and estimate maximum likelihood ratios based on which model validity can be ascertained. Marginal effects of the independent variables will also be calculated and interpreted.

RESULTS AND DISCUSSION

Introduction

The chapter begins with a description of the demographic and socio-economic factors of the respondents. It further articulates the institutional constraints that influence the production of peaches as identified from the study area.

The main idea of this chapter is to discuss the probit regression results obtained from the farmers and show the extent to which explanatory variables affect the stated dependent variable.

Demographic and socio-economic background of sample households in Botha-Bothe

Variables	Categories	Frequency	Percentages%
Gender	Male	45	75
	Female	25	25
Educational level	Primary	22	36.7
	Secondary	31	51.7
	Tertiary	7	11.7
Household sizes	0-10	45	75
	10-20	25	25
Income levels	3000	48	80
	>3000	12	20
Age	30-45	18	30
	>45	42	70

Gender

Differences in gender affect traditional agriculture as men and women also vary in their decision making with regard to farming (Mphahama, 2011). Moreover, men are capable of carry on activities that require lot of energy. Some families are headed by women due to deaths of their husbands or migration to the mines or urban areas in search of jobs hence leave women responsible for farming (Bureau of Statistics, 2010). There is high potential of producing peaches due to dominating number of men by 75% while 25% of respondents are women in charge.

Educational level

Formal education is a massive investment towards agricultural development since farmers acquire more skills, bring in new innovations and are also able to adopt technologies without difficulty (Gittinger, 1982). Educational levels respectively determine the capability of achieving better production and/or productivity since farmers apply the knowledge they have acquired and also become environmental hence stand a better chance of exposure to modern methods used in production (Panin, 1999). The results show that 51.1% of farmers studied at secondary schools hence assumed to be English literate in relation to delivery of information from different sources. About 11.7% studied at tertiary and are also assumed to be innovative and more educated thus implementing their knowledge towards development while the remaining 36.7% achieved primary level of education and they are less informed.

Household size

The size of the household could impact production of peaches positively and negatively. In situations whereby family members are many, farming becomes easier as there is more manpower, on the contrary, more people also consume more of the products hence the quantity of yields. Therefore it becomes difficult to commercialize since peach production is forced to be subsistence oriented as stated by Olayemi (2012). About 75% of respondents consists of families with members ranging from 1-10 hence high chances of little capital and labour while 25% of them have families that has more than 10 members.

Income level

The level of income per household influence farming in that, farmers with high income levels are able to finance the orchard activities hence development could easily take place (Gregory, 2006), however, income level could be high but used for other family matters such as school fees, etc. As for families with low income levels, it is difficult for them to develop in farming hence a need for financial support. The findings show that about 80% of respondents have income levels below M3000.00 and it's assumed to be difficult for them to finance their orchards while 20% of them stand a chance of improvement as they have income levels exceeding M3000.00

Age

Age in farming could determine how experienced the farmer is, therefore older people in most cases are experienced in farming and have the interest in production as compared to the younger people. Bembrigde (1986) also argued that older farmers are sometimes lazy and also resistant to change since it is difficult for them to adopt new technologies while young farmers are fast learners and flexible. From table 4.2, it seems as if older farmers by 70% partake more in production of peaches than the younger farmers with 30%. The impact in this case can be two sided.

INSTITUTIONAL FACTORS IN PEACH PRODUCTION

Access to credit

The availability of credit for production purposes allows growth in level of production with most farmers (Reyes, 2012). Credit of this kind is taken for improvements with the farm and could also be used to venture into a new enterprise. The results therefore shows that 53.3% of all the respondents have access to credit from the financial institutions while 46.7% of the respondents have no access to credit due to lack of information about money lenders. It is therefore clear that some farmers are faced with financial constraints while others have opportunity to access credit for improving production.

Access to production information

The farmer's ability to make informed decisions is also determined by the information he/she possess and that is also dependent on access to it together with the frequency of access to relevant information. Well informed farmers are likely to succeed in production due to application of advanced information (Chhachhar, 2014). The source of information also determines its quality. From the data collected, about 60% of all the respondents have access to information from various sources being radio, agricultural expects, books, internet, television programs and 40% of them have no access to information due to no exposure to sources of relevant information and they also live in remote places where there is no infrastructure.

Farmer's training and development

Farmer's training and development refers to informal education by means of extension visits, workshop participation and other such arrangements. This is essential in that farmers acquire information and training on different activities within the farm and other means of developing the farm and themselves with skills (Noor, 2011). The findings shows that half of the respondents are trained through the stated means and the other half never attend such gatherings due to limited time as they are also involved in other family activities, hence peach production is done on part time bases.

Variable	Frequency	Percentages%
Coordination	20	33.3
No Coordination	40	66.7
Total	60	100

Legal System

According to The Stationery Offce (2009), Perfect administration of the legal system in the communities allows farmers to venture in to peach production with a clear conscience in relation to their property protection. Communal and personal properties are also used efficiently and carefully for the benefit of this generation and the coming generation. The findings showed that about 46.7% of all the respondents seemed to be satisfied with the legal system, however, about 53.3% had complains regarding theft towards produce, their trees being grazed by other people's animals and fair judgment is not made when conflicts arise hence their properties are not secure.

Coordination between farmers

It is very much important for individual farmers to come together with all they have as they get in to production. As it was also argued by Krejci (2013) that in this case, all the resources are pulled together hence a better chance of improved production of peaches. These could also be done during marketing so as to meet the demand of the market with regard to the quantity demanded, furthermore, according to the theory of economies of scale, production costs are reduced when production is in large scales.

Table: Distribution of responses on coordination between farmers

Only 33.3% of the peach producers come together in production and marketing of peaches and those were found to be family members while the remaining percent constitute the farmers who are independent in all farming activities due to lack of trust in other farmers, unavailability of other peach producers closer, some have not experienced such situations.

Support Services

It was stated by Food and Agriculture Organization (2007) that the availability and accessibility of support services improves the performance of the already existing enterprises. This is done through provision of capital of different kinds to the farmers from the production stage to the market stage. Relevant training together with acquisition more information also comes through the support services.

Variable	Frequency	Percentages %
Support Services Available	26	43.3
No Support Services	34	56.7
Total	60	100

The above table shows that 26 of all the respondents have access to the support services through organizations such as Send the Cow, SADP, they provide them with various inputs such as green house, trees and many more. The remaining 34 respondents were independent in almost everything related to their orchard, some farmers had no knowledge of such support services while some were reluctant to approach them.

Access to Factors of Production

The availability of all factors of production in adequate measures contributes towards the success of the farm business whereas a shortage in any of them results in poor production, low quality and/or quantity, also supported by (Pender, 2003). More farmers are willing and able to engage in production of peaches but most of them are constrained by factors of production. It was found that 55% of the respondents had access to all factors of production although they were not adequate. And 45% of them did not have access to all factors of production and the major one being capital and labour.

Motivation

Motivated farmers usually put more effort towards the success of their production, however, there are number of variables contributing to motivation of peach producers and those include good market, availability of all necessary inputs, potential to yield more of the products, preference of peach production, encouragement and many other variables (Uematsu, 2011). It was found that some farmers (56.7%) are motivated by the sales of peaches to other people for further processing such as drying, canning, who also sell in the neighboring country. Other people sell those peaches in town through street vending. The remaining percent is of farmers who are now demotivated for a number of reasons including poor products, low market demand, low peach prices and many more.

Culture

Many effective innovations are generated and implemented in the local communities based on the knowledge and expertise of indigenous and local communities rather than on formal scientific researches (Gupta, 1992). In most cases, traditional farmers contribute more on biodiversity conservation, however their produce does not come in large quantities due to changing environmental conditions. It is cheaper to produce traditionally but the outcome is low as compared to other methods of production. About 70% of the respondents are traditional farmers while 30% of them are not traditional. Most farmers had no knowledge of other means of producing peaches.

RESULTS

Marginal Effects of institutional factors constraining peach production Botha-Bothe

It is revealed in the results, that the probit model proved to be more significant and a good fit was also suggested by it hence the explanatory variables had enough influence in determining the farmer's satisfaction on the level of production of peaches. All the farmers the questionnaire was posed to responded, and the chi2 means that jointly independent variables explained the dependent variable. Pseudo R2 explains that about 42% of the predicted values of the dependent variables are equal to the actual value. From the above results in table 5.2, it comes to our realisation that when the support services are present to the farmers, then the probability of farmers being satisfied with the level of production of peaches increases by about 0.3286783 or by 33 percent.

variable dy/dx	Std. Err.	z	P>z	[95%	C.I.]	X
ss* .3286783	.15169	2.17	0.030	.03137	.625987	.433333
afp* -.0278845	.04748	-0.59	0.557	-.120952	.065183	.55
cbf* -.0231056	.03999	-0.58	0.563	-.101482	.055271	.333333
m* .2170188	.10028	2.16	0.030	.020479	.413559	.566667
td* .1314859	.08334	1.58	0.115	-.031863	.294835	.466667
ls* -.371205	.14414	-2.58	0.010	-.653711	-.088699	.5
api* -.1229674	.06764	-1.82	0.069	-.255541	.009606	.366667
c* .0141746	.04695	0.30	0.763	-.077852	.106201	.7
ac* -.0343905	.05248	-0.66	0.512	-.137252	.068471	.466667

Probit regression — Number of obs = 60; LR chi2(9) = 25.23; Prob > chi2 = 0.0027; Log likelihood = -17.406968; Pseudo R2 = 0.4202

This implies that support services are significant in explaining farmer's satisfaction with the levels of production as they provide several inputs including trees in Botha-Bothe hence they contribute positively towards development of peach production. Rate and measure of investment in production of peaches is also determined by motivation of the farmer. The results obtained show that the chances of motivated farmers being satisfied with the level of their production increases by 22 percent. This is brought by the fact that motivated farmers invest more for advanced peach production as they strive towards achieving their set goals hence motivation was also found significant in explaining peach production in Botha-Bothe district. Farmers were found to be motivated to the stated extend due to income generated through sales hence they invest the little they could afford for development.

In the analysis the impact of legal system on production of peaches, the results show that when the legal system is transparent, the probability of farmer's being satisfied with production level decreases by 0.371205 or by 37 percent. This emerges from various reasons such as reluctance to pay money for being licensed as it will lead to regular assessment of farmers' performance in production. Most farmers Botha-Bothe did not want the legal sector to intervene with their farming as they will be required to pay tax when producing in larger quantities for sales. Access to production information was also found to be a predictor in explaining satisfaction in levels of peach production in that, having access to production information increases the chances of farmers being satisfied with levels of production by 0.1229674 or by 12 percent. This is because farmers receive relevant information to be employed in relation to the prevailing conditions in their orchards. As argued by Chhachhar (2014), the scope for acquiring production inputs to start agricultural production is quite limited. Most farmers in Botha-Bothe lack knowledge on how to produce peaches of good quality in larger quantities hence it is difficult for them to be profitable.

In accordance to the obtained results, access to all factors of production was found to be insignificant in Botha-Bothe with the magnitude of 0.0278845 since most farmers are endowed with natural and human resources and get capital in the form of assets from the support services. This situation also caters for access to credit together with training and development with the magnitude of 0.0343905 and 0.131489 respectively as they were also to be insignificant due to the donations and services the farmers receive from the support services together with the government. However Mphahama (2011), found them significant when analyzing the institutional constraints to horticultural production in Lesotho.

The coefficient of culture was found to be 0.763 and it is also greater than 0.01, 0.05 and 0.1 levels of significance hence insignificant. These results arise because of no cultural practises employed in production of peaches, however, several farmers practised traditional peach production. The majority of peach producers within the district of Bothe-Bothe are also scattered hence making it difficult for them to coordinate as it would mean additional costs and these has also been proved by the magnitude of 0.0231056 of coordination between farmers.

Conclusions and Recomendation

Introduction

This chapter presents the conclusions and recommendations made with regard to the descriptive and econometric results obtained in Botha-Bothe district. The recommendations are provided for the enhancement of peach production in the area of study.

Conclusion

Since the purpose of this study was to determine institutional constraints to peach production in Botha-Bothe, it can therefore be indicated that not all tested institutional factors were found significant in constraining peach production. For instance coordination between farmers, culture, and access to credit were not significant in production of peaches in Botha-Bothe. This means that peach production does not really matter if farmers coordinate or not, have access to credit or not and also culture does not influence production of peaches. However, some other institutional factors proved to be significant and major constraints of peach production and such as support services of which unavailability lead to decrease in the levels of satisfaction of the farmers with regard to the out levels. Low motivation of farmers also decrease the chance of farmers being satisfied with the level of output since they are less eager to invest more in production of peaches leading to decreased output levels. Difficulty in acquisition of most relevant production information also constrained peach production.

Recommendations

Sales of large quantity and a good quality of peaches produced within the country contribute more to the development of the economy. By taking this into consideration, agricultural policy makers and concerned stakeholders should formulate and implement policies that promote production of peaches in large quantities and of good quality amongst farmers and see to it that farmers are provided with appropriate services.

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