(RESEARCH ARTICLE)

Factors Influencing market access of green pomelo farmers in Ben Tre Province

Nguyen Quoc Nghi *, Le Kim Thanh and La Nguyen Thuy Dung

School of Economics, Can Tho University, Vietnam.

Abstract

The study goal is to determine factors affecting the market access of green pomelo farmers in Ben Tre Province. The study collected data from 148 households growing green pomelo in Chau Thanh, Mo Cay Bac, Giong Trom, and Cho Lach Districts. The study has demonstrated six impacting factors to the market access of pomelo farmers by the logit regression. They include age, training, telephone, connection, distance, and acreage. In particular, training is the most affecting factor to the market access of green pomelo growers in Ben Tre Province.

Keywords: Market access; Farmer; Gree pomelo; Ben Tre Province

1. Introduction

Green skin pomelo is one of the specialties and high-quality fruits in Ben Tre Province. In 2020, Ben Tre Province owns more than 7,200 hectares of green pomelo. In which, about 4,800 hectares of pomelo are bearing fruit. They produce 57,000 tons of pomelo/year, leading the productivity of the Mekong Delta region. Green pomelo trees are grown concentrated in districts such as Chau Thanh, Mo Cay Bac, Giong Trom, Cho Lach, and Ben Tre City. To develop this type of specialty tree, the province has built a planning map of green pomelo growing areas. The locality selected high-standard pomelo lines, built the brand "Ben Tre", and created a promotional website. Meanwhile, climate change and pests have threatened the yield and quality of green skin pomelo in recent years. Besides, the unstable output market and the competitive pressure of substitute products harm farmers' income sources. One of the main reasons for this situation is that farmers' accessibility to the market is limited. Therefore, this study is conducted to identify factors affecting farmers' market access, thereby proposing recommendations to improve the market accessibility for green pomelo growers in Ben Tre Province.

2. Theoretical Framework and Research Model

According to Kleih et al. (1999) [1], the market access reflects the resource capability of farmers to communicate with input providers and their ability to negotiate with buyers to sell products at a profitable rate. As presented by Cuong in 2005 [2], market access is the level of difficulty that farmers go deeply into the manufacturing input suppliers and the product output markets. Bly (2006) [3] said that market access is a process of finding, detecting, and evaluating the market demand, then making the production plan, seeking target markets, penetrating the market, and approaching customers to achieve business goals.

The literature review has shown that there have been many studies related to farmers' market access and factors affecting their accessibility. It can mention several authors such as Van Schalkwyk et al. (2007) [4], Yamano and Kijima (2011) [5], Amaya and Alwang (2011) [6], Kuma (2012) [7], Nghi and Nam (2014) [8]. Based on relevant studies

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combined with group discussions (nine farmers growing green pomelo), the model research on factors affecting market access of green pomelo farmers in Ben Tre Province is proposed below.
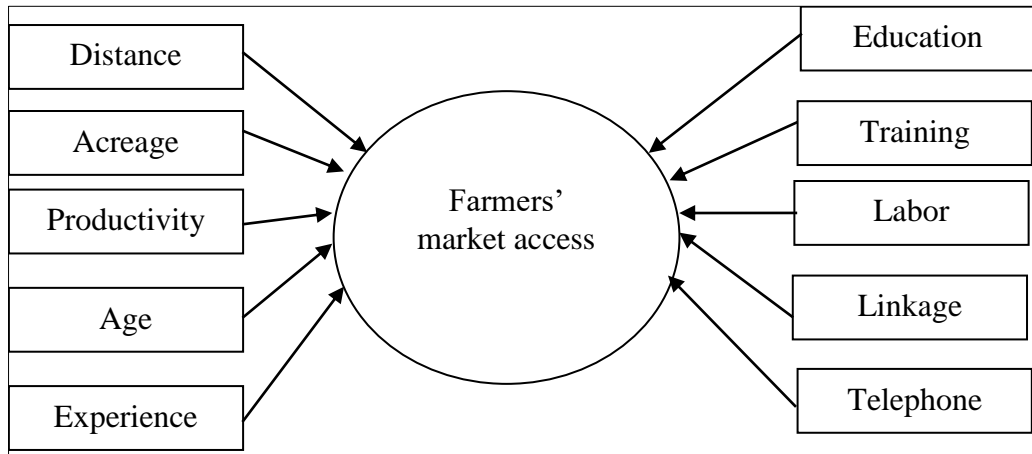

Figure 1 Proposed research model

To test the research model, the study applied the logit regression with the established equation as:

$$MA = \beta_0 + \beta_1 DIS + \beta_2 ACR + \beta_3 PRO + \beta_4 AGE + \beta_5 EXP + \beta_6 EDU + \beta_7 TRA + \beta_8 LAB + \beta_9 LIN + \beta_{10} TEL$$

In which, the measurement variable is MA. This variable measures the farmers' ability to access input and output markets. The MA variable receives the value 1 if the farmer has a high capability to access the market (updating market information continuously and grasping prices quickly). The MA variable takes the value 0 if the farmer's market access is low. The independent variables are explained in Table 1.

Table 1 Interpretation of independent variables in the research model

Variable	Calculation unit	Description	Expectation
AGE	Year	Age: taking the value of the direct producer's age, up to the study time	+
EDU	Year	Education attainment: taking the value of schooling years of the direct producer, up to the present	+
EXP	Year	Experience: taking the value of experience years of green pomelo direct producer, up to the present	+
ACR	m²	Acreage: taking the value of green pomelo cultivated land of the farmer	+
PRO	Kg/1000m²	Productivity: taking the value of the total output harvested in the studied crop	+
LIN	0/1	Linkage: receiving value 1 if the farmer participates in a cooperative and value 0 otherwise	+
TRA	0/1	Training: taking the value 1 if the farmer receives the training on pomelo growing techniques, and value 0 otherwise	+
DIS	Km	Distance: taking the value of the road length from the farmer's garden to the main road	-
TEL	People	Telephone: the number of people in the directory that provide the information related to green pomelo production and consumption	+
LAB	Percentage (%)	Labor: the proportion between direct employees and the total household members	+

3. Methodology

The logit regression is used to determine factors affecting the market access of green pomelo farmers in Ben Tre Province. Research data were collected using stratified random sampling. The authors used direct interviews to approach 148 pomelo farmers in districts of Chau Thanh, Mo Cay Bac, Giong Trom, and Cho Lach. The logit regression requires the minimum sample size following the formula n ≥ 50 + 8p (Tabachnick and Fidell, 2007) [9]. In which, n is the minimum sample size, p is the number of independent variables. Therefore, with 10 proposed independent variables, the ideal sample size is n ≥ 50 + 8*10 = 130 observations. So the actual sample size of 148 has ensured the research test requirement.

4. Research Results and Discussions

4.1. Information sources of market access

According to the survey result in table 2, farmers access to a variety of information sources. The most popular ones are relatives and neighbors (97.97%), merchants and collectors account for 90.54%. Relatives and neighbors are the groups that farmers have daily contact to exchange information and experiences, so farmers easily access them. Besides, merchants and collectors are farmers' major buyers. Thus, these are two significant sources of information that farmers can access in input and output markets. In addition to this, the information source from television and radio is popular with farmers (68.92%). However, farmers confirmed that the mass media source of information is for reference purposes only. It is because the purchase prices farmers receive are always lower than the forecasted price. Other market information sources that farmers access are websites, social networks, agricultural material agents, newspapers, magazines, and local extension workers.

Table 2 Market information sources of green pomelo farmers

Source of information	Frequency	Percentage (%)
Relatives, neighbors	145	97.97
Merchants, collectors	134	90.54
Mass media	102	68.92
Websites, social networks	88	59.46
Agricultural suppliers	45	30.41
Newspapers, magazines	42	28.38
Agricultural extension officers	34	22.97

4.2. The understanding level and the cooperation commitment to suppliers/ consumers

The statistical result in table 3 shows that farmers' level of understanding about input and output providers is relatively high. However, the linkage between the two parties is not sustainable, mostly through words or informal papers. The connection through contracts accounts for a low rate. Accordingly, farmers confirmed that they know well about seed, fertilizer, and pesticide suppliers. The rate of commitment between farmers and these units is 21.62%, 59.46%, and 57.43%, respectively. Most of the supplier owners live in the same area and have a long-term partnership with farmers, so they connect by verbal commitments. Farmers' understanding of machinery suppliers and merchants is at an average level. However, the level of commitment to the above subjects is high with the value of 72.97% and 86.49%. Normally, machines and equipment for the green pomelo cultivation process have a long-time usage and low rate of repeat purchase. This affects the understanding degree of farmers. Although the products have high value, farmers only consider the warranty and the brand reputation when making purchase decisions.

Table 3 Level of understanding and cooperation commitment to suppliers and consumers

Suppliers and consumes	Level of understanding		Cooperation commitment	
	Mean	Level	Frequency	Percentage (%)
Seed	4.19/5	Well, know	32	21.62
Fertilizer	3.48/5	Well, know	88	59.46
Pesticide	3.48/5	Well, know	85	57.43
Equipment	2.56/5	Average	106	72.97
Merchant	3.32/5	Average	127	86.49

Note: The 5-level Likert scale is used to assess the understanding level (from 1 - completely unfamiliar, to 5 - well known)

4.3. Factors affecting farmers' market access

According to the test result, the significance level (sig.) of the model is high (1%) and the percentage correct reaches 94.28%. Thus, the model of factors affecting green pomelo farmers' market access is satisfactory.

Table 4 Factors affecting market access

Factor	Dy/dx	P > |z|	Sig.
AGE	0.074	0.035	0.033
EDU	0.116	0.173	0.178
LAB	0.875	0.397	0.402
EXP	0.204	0.114	0.119
LIN	3.080	0.029	0.022
TRA	3.182	0.028	0.024
ACR	0.001	0.045	0.045
DIS	-0.488	0.016	0.017
TEL	0.212	0.028	0.034
PRO	0.001	0.231	0.245
Sig.			0.000
Percentage correct			94.28%

According to the result above, out of 10 variables included in the model, farmers' market access is affected by six factors including age, linkage, training, acreage, distance, telephone. The significance levels are all at 5%. Most of the factors positively impact farmers' market access, except for the "distance" factor. Training is the factor that has the strongest impact on market accessibility with an estimated coefficient of 3.182 and a significance level of 5%. Production techniques training programs provide market information to orient the most suitable production season for farmers. Training programs are regularly organized by the locality so the above finding is consistent with the reality

5. Conclusion and Policy Implications

In general, the market access of green pomelo farmers in Ben Tre Province is still limited. The major sources of information are relatives, neighbors, and collectors. The study has identified six factors affecting farmers' market access which include age, linkage, training, acreage, distance, and telephone. In which, training has the most positive and strong influence on farmers' market access. As a result, several policy implications are proposed to improve the accessibility to the market.

Firstly, the local authority should open training programs on farming techniques and market approaches for farmers. These programs not only help farmers improve farming skills, enhance productivity and product quality, but also help them be more proactive in access the market and cope with market risks.

Secondly, farmers need to strengthen the linkage with the green skin pomelo supply chain's members, especially the horizontal linkage in production. It can lead farmers to be able to exchange experiences, production techniques, and capital resources. Moreover, this offers farmers more sources of market information to avoid price squeezing. Also, the vertical linkage helps farmers build a commercial commitment in raw material supply and stable output.

Thirdly, farmers should actively learn and improve their market information accessibility from different sources such as the internet, telephone, media, etc. Accordingly, farmers need to study and apply information technology to the production and consumption process. Through the internet, farmers can promptly update the market news, price fluctuations, and manufacturing experiences. In addition to this, the information connection with suppliers and consumers in the directory plays an essential role in improving market access.

Fourthly, the local agriculture and information sector need to coordinate closely to strengthen the dissemination of market information on the mass media to provide official and reliable information for farmers so that they have an appropriate production orientation.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there are no competing or potential conflicts of interest

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