

CHARACTERIZING FARMERS BASED ON THEIR WILLINGNESS TO PAY FOR AGRICULTURAL EXTENSION SERVICES IN TRINIDAD

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Cash strapped governments in the region are finding it increasingly difficult to provide key agricultural services to farmers. One such service that is seeing diminished attention is agricultural extension; fewer resources are being provided. While extension is entirely state funded in the Caribbean, worldwide, governments has embraced other approaches to extension delivery such as privatization of extension, commodity based advisory systems and fee for service extension among other cost recovery methods.

This study sought to explore whether Trinidad farmers were willing to pay for extension services as well as to characterize those willing to pay and those not willing to pay, as well as the services for which payment may be considered. A convenience sample of 90 crop based farmers was surveyed using a structured survey instrument and multiple discriminant analysis was used to identify farmer characteristics; those willing to pay and those who are not.

Findings showed that 45% of farmers sampled were willing to pay some amount for extension services. Farmers were willing to pay for services such as pest and disease diagnosis, postharvest storage, marketing, increased subsidy offerings and technical assistance aimed at increasing production. Based on the derived discriminant function coefficients, those who were willing to pay were those with higher income levels, had greater access to information and were more satisfied with the time spent on the farm by the extension officer. Those not willing to pay were farmers who were not owners of the land that they farmed on, were part time farmers and possessed a smaller acreage.

Results suggest the scope for governments to vigorously pursue payment for some extension services; dedicated extension for commercially – oriented farmers could be the entry point.

Keywords – willing to pay, discriminate function analysis, extension, satisfaction, food security, Trinidad

Introduction

In the Caribbean region agricultural extension services are often administered by the public sector through the agricultural ministries. It has to be competent in agricultural skills and communicate efficiently with producers. To retain relevance, a public sector extension system has to improve knowledge of technology, prices, markets and policies (Sulaiman and Van den Ban 2003, 27).

Public extension systems are unable to cope with the dynamic demands of a modern agriculture system. These systems are viewed as out-dated, top – down and subject to bureaucratic inefficiencies (Qteshat 2011, 14). The emerging trend is towards a pluralistic, demand – driven concept of agricultural extension services as available in a number of developed countries (Ozor, Garforth and Madukwe 2013, 383) such as fee for service and voucher systems.

A study of this nature would enable policy makers to re-organize extension services in the region to adopt modern approaches to adequately support regional food security given the services economic constraints faced.

Objectives of the Study

The study examined commercially - oriented small scale farmers in Trinidad willing to pay for an improved agricultural extension system. The research sought to (a) investigate the willingness of vegetable farmers to pay for agricultural extension services (b) identify the variables that differentiate who are willing and not willing to pay for agricultural extension services and (c) outline the services for which farmers would be willing to pay.

Material and Methods

A list of variables was identified from literature review of common factors influencing the willingness to pay for agricultural extension services in differing parts of the world. A convenience sampling of 90 commercially – oriented small scale vegetable farmers was surveyed using structured survey instrument. The investigation was carried out in three farming districts of Trinidad; Victoria, St. George West and St. Patrick East. These counties were selected based on the high population of vegetable farmers derived from the farmer registration databases at the individual county offices.

To distinguish between farmers willing to pay and those not willing to pay, multiple discriminant analysis (equation 1) was employed. This estimated the weighted linear

combination of variables that influenced the willingness of farmers to pay for an improved agricultural extension system by categorizing farmers on the basis of differences in selected characteristics. The discriminant function developed was of the form;

$$Z = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9$$

(1)

Whereby Z is representative of the discriminant score for farmers willing to pay and not willing to pay for agricultural extension services and the variables investigated were age of farmer (in years); educational level; farming status; farm size; farm income; satisfaction with service time; access to extension information; land tenure and the number of dependents.

Main Findings

The majority of the sample (table 1) were male farmers (87%) and reflected an older group of (55%) with a secondary level of education (42%). Farmers surveyed were full-time (58%) and operated on farm lands of 2 – 5 acres (33%) with 41% of these farmers having ownership of the land cultivated. Thirty three percent of farmers earned less than \$2000 per month in farm income and 26% had an average household size of 3 family members.

Table 1 – Description of Variables

Variable	Description	Frequency; n (%)
Age	Age of the farmer (years)	
25 – 34 years		10 (11)
35 – 50 years		29 (32)
> 50 years		49 (55)
No response		2 (2)
Level of education	Years of formal education	
No formal education		3 (3)
Primary		24 (27)
Secondary		38 (42)
Tertiary		17 (19)
Vocational/Technical		6 (7)
No response		2 (2)
Farming status	= 1 if full-time, 0 otherwise	
Full-time		52 (58)
Part-time		35 (39)
No response		3 (3)
Size of farm	Total area (acres) under production	
<1 acre		4 (4)
1 – 2 acres		20 (22)
2 – 5 acres		30 (33)

Variable	Description	Frequency; n (%)
6 – 10 acres		19 (22)
>10 acres		17 (19)
Monthly farm income	Total monthly income earned from agricultural activities	
<\$2,000		30 (33)
\$2,500 - \$4,000		24 (27)
\$4,500 - \$6,000		17 (20)
\$6,500 - \$8,000		2 (2)
\$8,500 - \$10,000		2 (2)
>\$10,000		4 (4)
No response		11(12)
Satisfaction with time the extension officer spends on your farm	= 1 if Yes, 0 otherwise	
Yes		58 (65)
No		17 (19)
Not Applicable		15 (16)
Is the extension officer giving all information you need each visit	= 1 if Yes, 0 otherwise	
Yes		53 (59)
No		22 (25)
Sometimes		2 (2)
Not Applicable		13 (14)
Land tenure	Relationship with farmer with respect to land ownership	
Owned		37 (41)
Rented		11 (12)
Leased		25 (28)
Squatting		17 (19)
Number of dependents	Number of family members in the household	
1		12 (13)
2		15 (17)
3		23 (26)
4		15 (17)
5		17 (19)
>5		8 (9)

Forty five per cent of sampled farmers reported willingness to pay for receiving an improved agricultural extension service. Overall results showed that 85% of farmers expressed some level of agreement (50% of farmers agreed the statements provided were very important; 26% agreed the statements were important and 9% were in slight agreement) with the areas of importance for farm operations while 13% expressed disagreement with the statements. Improved crop protection and management, increased availability for subsidy offerings, technical assistance, marketing and pest and disease diagnosis; were the extension services for which the farmers were willing to pay some amount to access (table 2).

Table 2 – Level of importance of extension services

	Not at all important N (%)	Slightly important N (%)	Important N (%)	Very important N (%)
Crop protection and management [NR = 2 (2)]	4 (4)	4 (4)	22 (24)	58 (64)
Farm business management [NR = 1 (1)]	21 (23)	8 (9)	28 (31)	32 (36)
Postharvest Storage [NR=4(4)]	25 (27)	12 (13)	25 (28)	24 (27)
Subsidies [NR = 3 (3)]	5 (6)	10 (11)	21 (23)	51 (57)
Marketing [NR = 5 (6)]	8 (9)	5 (6)	21 (23)	51 (57)
Pest and Disease diagnoses[NR = 1 (1)]	6 (7)	8 (9)	18 (20)	57 (63)
Tech transfer for crop protection [NR = 3 (3)]	19 (21)	12 (13)	27 (30)	29 (32)
Agricultural Incentive programme [NR = 2 (2)]	5 (6)	4 (4)	24 (27)	55 (61)
Overall Importance (%)	13	9	26	50

Results of the discriminant analysis revealed age, education, farm size, monthly farm income, service time, land tenure and number of dependents were contributors in characterizing farmers into individuals willing and not willing to pay for extension services.

Variables with large coefficients stand out as strong characteristics that describe farmers willing to or not willing to pay for extension services. The relevant discriminant function was of the following form;

$$Z = (-0.981) + 0.379\text{age} + 0.192\text{ education} - 0.913\text{ farm status} + 0.088\text{ farm size} + 0.542\text{ farm income} + 0.413\text{ service time} - 0.583\text{ access to extension information} + 0.399\text{ land tenure} + 0.135\text{ number of dependents}$$

Table 3 – Results of Discriminant Function Analysis

Variables	Standardized Discriminant Function Coefficients	Wilks' Lambda
Age	.379	.976
Highest level of education	.192	1.000
Farming status	-.913	.973
Size of farm	.088	.997
Monthly farm income	.542	.981
Are you satisfied with the time the extension officer spends on your farm?	.413	.999
Is the extension officer giving all information you need each visit	-.583	.997

Variables	Standardized Discriminant Function Coefficients	Wilks' Lambda
Land tenure	.399	1.000
Number of dependents	.135	.999

The standardized discriminant function coefficients (table 3) specified farmers willing to pay for extension services were characterized by monthly farm income, satisfaction with the time spent on the farm by the extension officer, land tenure and to some extent the age of the farmer. The level of education gained, number of dependents and the acreage of the farm also categorized the farmers' willingness to pay for extension services. Farming status and decreased access to all information scores were less successful as characteristics of farmers willing to pay for these services.

Table 4 – Function Statistics

Eigenvalue	.106
Canonical correlation	.309
Wilks' Lambda	.496
Chi-Square	8.388
df	9

The null hypothesis is rejected as a result of Wilks' Lambda (.496) and the associated statistics; chi-square (8.388); df (9) and $p = <.001$ (table 4). The discriminating variables showed that overall 62.2% (table 5) of the respondents were correctly predicted into willing to pay or not willing to pay groups.

Table 5 – Results of Classification Analysis

		Willingness to pay to receive extension services	Predicted Group Membership	
			Yes	No
Original	Count	Yes	12	29
		No	5	44
	%	Yes	29.3	70.7
		No	10.2	89.8
Cross-validated ^a	Count	Yes	8	33
		No	7	42
	%	Yes	19.5	80.5
		No	14.3	85.7

Implications of the Research

The disposition of farmers to pay for extension services is an indication that the payment approach can be successfully introduced in Trinidad. The significant factors that influenced farmers' willingness to pay and the identified priority areas should be utilized

in piloting and implementing this agenda. All stakeholders; extension agents, research institutes, public sector administrators and farmers involved in extension delivery must be included in designing the scheme for financing of extension service in Trinidad.

Farmers selected should be more representative of the socio-economic environment so that more relevant advice can be delivered to different categories of farmers. The system must also take into account that farmers receive relatively low income from farming; hence cost of the fee based must be relative to the income earned to receive greater participation by farmers.

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