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Farmers' Satisfaction with Extension Services in the Organization of Eastern Caribbean States

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Abstract

The economies of most countries in the Organization of Eastern Caribbean States (OECS) are dependent on farming, most of which is done mainly by small farmers in mixed cropping systems. The government is also the main provider of extension services. This study sought to assess farmers' satisfaction with the extensions services and identify areas for improvement. Some 462 farmers in five OECS countries were selected and surveyed in 2013. A farmers' satisfaction index was developed based on 26 statements in a Likert-type scale, and used as the dependent variable. Data were analyzed using STATA 9 and descriptive frequencies and multiple linear regression results were presented. Results showed that farmers' overall satisfaction with extension was moderate. Farmers' age, gender, education level, size of farm, number of parcels farmed, number of extension visits received, and whether farmers operated on a full time or part time basis significantly influenced farmers' level of satisfaction. Recommendations included: the redefinition of target farmers, as well as the scope of extension programs for intervention to meet these states' food security goals; the improvement of the technical capacities of extension officers; the expansion of group development work; and the increased use of ICTs for information dissemination and the provision of ICT hardware for extension staff.

Keywords*:* Satisfaction, Extension, Small Farmers, Caribbean

Introduction

Most countries across the English speaking Caribbean depend on agriculture to generate much needed foreign exchange, to provide a base for employment for citizens and to provide key food commodities for local consumption. Despite this reality, the importance of agriculture as a major economic sector has declined within the Caribbean over the last two decades (Ganpat, 2010). Governments, through the various Ministries of Agriculture, administer extension services to the farming communities. The scope of these services varies among countries. The organization of extension, its structure, and method of operation are based on the English model since most countries were once colonies of the British Empire. The main difference however, is that in addition to the provision of education services to farmers, agents of extension are also required to attend to a range of other non-agriculture related issues.

In spite of their financial constraints, governments are well aware of their responsibilities to pay attention to the needs of farmers and have been promoting diversification of the sector (Barker, 2009). If farming communities are satisfied with the efforts of the government, the economy will prosper and therefore, the entire OECS benefits. However, if farmers are not satisfied, the authorities need to determine the extent of farmers' dissatisfaction, and more importantly, the issues that give rise to such dissatisfaction. This should be the basis for any intervention. Indeed, at the regional level, the Caribbean Community of nations (CARICOM) has listed the strengthening of Research and Development, which includes extension services, across the Caribbean, as one of the main pillars for economic development (Private Sector Commission, 2004).

The Organization of Eastern Caribbean States (OECS) is a political union of seven full member Caribbean countries including Antigua and Barbuda, St Vincent and the Grenadines, Grenada, Dominica and St Lucia, St Kitts and Nevis and Montserrat. Two associate members are Anguilla and the British Virgin islands. These countries share: (a) a common historical background of plantation agriculture and the subsequent production of a single export crop, namely banana, for the European market, (b) a common currency, and (c) a common judicial system, just to name a few (Smith, 2010). In recent years, due to the decline in the banana market, there has been a shift away from production of such primary products to the production of a wider range of commodities for local consumption to an increasingly more sophisticated and discriminating consumer and for exports to niche markets overseas (Ganpat, 2014). This involves a shift to an expanded small-scale farming community (often less than 1 acre) thus increasing the size of small-farm populations in these countries. As these farmers seek to earn better incomes and improve their living standards, the provision of extension services is critical to them.

The level of training that extension staff in these countries possesses comes to the fore. Most extension staff are required to have at least Diploma-level training in agriculture. However, persons in these countries are required to travel and stay abroad to acquire such training. This is because this level of training is done in countries outside of the OECS (Trinidad, Jamaica and Guyana).The effort is thus expensive and a major obstacle to officers' career advancement, as well as governments' goals. As a result, over the years, as extension staff in these countries exit the system, some of the vacancies are filled with persons from the secondary level education system who may or may not have done agricultural science as a taught subject – an increasing action in recent times.

One consequence of this is that the knowledge and skills required to interact effectively with food producers and empower them with the key knowledge and skills necessary to make wise and appropriate food production decisions are inadequate. Farmers have recognized this and constantly complain about the inadequate service they receive in some areas. There are no extension specialists or extension researchers in OECS countries, and no reports or assessments have been done to investigate the issues related to farmers' satisfaction. For farmers to produce and earn decent livelihoods for themselves and their families, they require an extension service that satisfies their needs in a timely and effective manner.

Therefore, objectives of this study were to: (a) assess the level of satisfaction farmers have with the extension services, (b) describe the main sentiments that contribute to their satisfaction levels, (c) identify the set of demographic factors that are related to farmers' satisfaction levels, and (d) make recommendations for an improved service.

Literature Review

Clientele Satisfaction and Its Importance to Organizations

According to Rope & Pöllänen (as cited in Ihalainen, 2011), when an organization manages to serve its customers well enough and make them happy, they tend to create long-term, customer-satisfied relationships. Satisfied customers have a positive impact on the company's results and to a greater extent their image, as satisfied customers are more willing to tell others about the good service they received. Consequently, companies spend a fair amount of effort assessing their customers' satisfaction. When measuring customer satisfaction, it is important to get useful information from the company's customers, which can be used to improve the company and its services (Wilson & Peterson, 1992). This information allows management to acquire precise ideas of what customers want, which facilitates the development of targeted services. Therefore, measuring customer satisfaction should be a continuous process, and is regularly carried out, as the results will be more beneficial.

This research was done to assess client satisfaction (farmers) within a multidisciplinary organization (extension service) across a wide geographical region. Research goals were focused on capturing a better understanding of the level of service that prevails, as well as the gaps in service delivery.

In order to understand why service gaps exist in a public sector organization, and to identify ways of addressing or eliminating them, it is necessary for such organizations to have clear, meaningful input from their clients. One area that has been gaining significant attention within organizations is understanding client satisfaction. There are many different ways of gathering this information and it is common for organizations to design tools for specific client-input exercises. Many of the tools have been designed to gain information about expectations, experiences, and even needs from the organization.

According to Farris, Bendle, Pfeifer, and Reibstein (2010), client satisfaction is defined in terms of how products and services supplied by a company meet or surpass customer expectation. It is often used interchangeably with the term customer satisfaction, and it provides organizations with quantifiable numbers on customers, "whose reported experience with a firm, its products, or its services exceeds specified satisfaction goals" (Farris et al., 2010, p 154). Often times, businesses will use this information as a metric for measuring and making internal improvements" (Farris et al., 2010).

Client satisfaction is typically based on there being direct service or interaction between the client and the organization or its agents. While this is often the most common form of interaction to measure client satisfaction, the theory of customer satisfaction leadership may be more relevant. This theory posits that the customer does not necessarily have to buy anything or even be directly and personally in contact with the company; the customer needs to just be in contact with the company (Malhotra & Birks, 2007). The extension organization-farmer interaction is applicable to this theory.

One of the most important concepts in customer satisfaction leadership is contact surface. Contact surface (Rope & Pöllänen, as cited in Ihalainen, 2011) is the point of engagement of a certain company to the customer. They further explained that this contact surface includes all the following contacts, with examples from the field of agricultural extension: (a) personnel contacts, e.g. extension contact with farmer; (b) product contacts, e.g. information on technology and inputs; (c) support system contacts, e.g. help to access subsidies, incentives, and (d) ambience contacts, e.g. friendliness of the extension worker and cleanliness of the extension office

Assessing Satisfaction

When examining satisfaction, Rope & Pöllänen (as cited in Ihalainen, 2011) stated that there are two main counterparts: expectations and experiences. Level of expectations creates a basis and comparison base for experiences. As such, expectations are always a good starting point when building action. Four different factors which affect minimum expectations, these are: (a) situational factors, e.g. buying situation and surrounding situation; (b) customer's background factors, e.g. gender, income level, and education; (c) branch factors, e.g. location of office; and (d) company factors, e.g. business idea and marketing. All of these factors influence each other, and ultimately have an impact on how customers view the company (Ihalainen, 2011). In recent times, some agriculture-related service organizations, such as the extension service, have attempted to take a closer view of how their actions, information, and employees ultimately impact their clients, in this case the farmers. As such, similar factors were used in this study to examine the impact on farmers' satisfaction with the extension service.

Extension service providers are charged with the responsibility to ensure farmers are satisfied with the services being delivered. In enhancing farmers' loyalty and confidence, extension feedback is becoming increasingly paramount (Azikiwe et al., 2013). Customers' satisfaction, or as in this study, farmers' satisfaction, remains an essential domain that must be afforded proper attention and action. Based on the number of farmer satisfaction surveys that have been conducted across the globe, it is evident extension service providers have seen this as an important topic that needs attention (Birner et al., 2009; Moore, 1984; World Bank, 2007). Unfortunately in the Caribbean, in particular the OECS, this issue has not been adequately addressed.

One of the most comprehensive studies to be conducted to date by the Food and Agriculture Organization (FAO) managed to capture the satisfaction of farmers in 80 countries. This study assessed satisfaction and impacts on a large-scale emergency intervention on agriculture input distribution projects (FAO, 2008). A report by the Modernizing Extension and Advisory Services (MEAS) explored the significance of gender relations for the design, operation, and monitoring of agricultural extension and advisory services, all in an attempt to improve extension service performance

(MEAS, 2013). Case studies conducted by European, American, African, Asian, and Indian researchers have provided a highly diverse international perspective on extension services and farmers' satisfaction (Claro, Hagelaar, Kemp, & Omta, 2003; Duc, 2008; Hu, Cai, Chen, Cui, & Huang, 2010; Kokate, Kharde, Patil, & Deshmukh, 2009; Misrha & Swanson, 2009; Terry & Israel, 2004). The findings from these case studies demonstrated how factors such as gender, educational level, frequency of extension visits, types of information given, technology usage, relationship with other organizations, and size of land farmed influenced farmers' perceptions of the services rendered to them by the extension organizations. In addition to these factors, other factors such as the commercial orientation of farmers, farm structure, tenure arrangements, access to credit, farming practices, and youth involvement in agriculture are distinct to the Caribbean region and are seen as important factors which may possibly influence farmer-satisfaction.

In this study, an instrument was developed that recognized the cultural context of farmers in the region. It sought to capture the general feelings of farmers who use the extension services. Having a better understanding of these issues will contribute to the optimization of future extension programs and delivery systems.

The objectives of this study were to: (a) assess the level of satisfaction farmers have with the extension services, (b) describe the main sentiments that contribute to their satisfaction levels, (c) identify the set of demographic factors that are related to farmers' satisfaction levels, and (d) make recommendations for an improved service.

Methodology

A total of 467 farmers were randomly selected from lists of farmers practicing in the most populated farming areas in the five largest countries in the OECS. The lists were obtained from extension offices and the surveys were done during the period May-August 2013. The sample included farmers in Antigua (n = 59), Dominica (n = 102), St. Lucia (n = 100), St. Vincent (n = 106), and Grenada (n = 100). Personal interviews were conducted by final year agriculture students living in each of the five countries.

The survey instrument consisted mainly of 26 single-sentiment statements assembled into a Likert-type scale, which sought to assess farmers' satisfaction with extension services. Respondents were asked to indicate their agreement or disagreement to each statement. Responses to each statement were scored as follows: *strongly agree* = 4; *agree* = 3; *disagree* = 2; *strongly disagree* = 1. Cronbach Alpha (α) was used to assess the internal consistency of the scale. The scale appeared to have good internal consistency ($\alpha = .97$). Other information collected related to gender, age, education, farm size, number of farmed parcels of land, number of extension visits, farming status, type of production, preferred method of interacting with extension, access to other information sources, and participation in farmers' groups. Pre-testing was done with five (5) farmers from each country (n = 25) prior to finalization. The instrument was administered by pre-trained individuals (residents) of each country and took approximately 20 minutes to complete. Data analysis was done using STATA 9 and the results were presented as descriptive frequencies and multiple linear regression. An index to assess farmers' satisfaction was derived as follows:

Farmers' Satisfaction Index (FS_i) = $\frac{\sum R_i}{R_{max}} * 100$

R_i is the response to each statement of individual *i* and R_{max} are the maximum obtainable score (max obtainable score of 26 items = 104). The normalized index ranged from 25 to 100. Higher values indicate greater satisfaction with the extension services. The following hypothesized linear relationship was established (see Table 1 for descriptions of each variable) to assess the impact of study variables studied on farmers' satisfaction:

$$FS_i = f\,(Gen_i, Age_i, Edu_i, Size_i, Parc_i, Ext_i, Stat_i, Op_i, Int_i, Acc_i, Part_i)$$

As such, the regression model was fitted as follows:

$$FS_i = \beta_1 + \beta_2 Gen_i + \beta_3 Age_i + \beta_4 Edu_i + \beta_5 Size_i + \beta_6 Parc_i + \beta_7 Ext_i + \beta_8 Stat_i + \beta_9 Op_i + \beta_{10} Int_i + \beta_{11} Acc_i + \beta_{12} Part_i$$

For accuracy, outliers ($Z > 3.0$) were removed and the Variance Inflating Factor (VIF) was calculated for each variable to check for multicollinearity among independent variables.

Table 1

Description of Variables as Specified in the Regression Analysis

Variable	Type of Variable	Description
Gender (Gen_i)	Dummy	1 if male; 0 female
Age (Age_i)	Dummy	1 if 18-50; 0 otherwise
Education level (Edu_i)	Dummy	1 if Secondary/Tertiary; 0 otherwise
Farm size ($Size_i$)	Ordinal	<1; 1-5; 6-10; >10
Parcels of land in use ($Parc_i$)	Ordinal	1, 2, 3-4, >4
Extension visits (Ext_i)	Ordinal	Weekly (5); fortnightly (4); monthly (3); annually (2); never (1)
Farming status ($Stat_i$)	Dummy	1 if fulltime; 0 otherwise
Primary operation (Op_i)	Dummy	1 if crop farmer; 0 otherwise
Interaction preference (Int_i)	Dummy	1 if face to face; 0 otherwise
Access to other information sources (Acc_i)	Dummy	1 if yes; 0 otherwise
Participation in farmers' group ($Part_i$)	Dummy	1 if yes; 0 otherwise
Satisfaction (FS_i)	Scale	Self-computed Index (non-refined method): Range: 25-100

Results

Characteristics of the Sample

A descriptive analysis of the sample showed farmers were from Antigua (14%), Dominica (16%), St. Lucia (24%), St Vincent (25%) and Grenada (21%). The majority of respondents were males (73%). Over half of the sample (54%) was older than 50 years; 39% were 31-50 years old and a small percentage (7%) was 18-30 years old. Most farmers (58%) attained primary level education, 27% completed secondary education, 10% possessed tertiary education, and the minority (3%) attained certificate level education. Most respondents (80%) were full time farmers, while 20% engaged in agricultural activities on a part time basis. Almost all farmers (96%) were

primarily engaged in crop production. A significant portion of the sample (68%) owned 1-5 acres of land, 15% possessed less than 1 acre, 12% owned between 6-10 acres, while 5% owned more than 10 acres. Most farmers (45%) only actively used 1 parcel of their land, 20% used 2 parcels, another 20% used 3-4 parcels, and 15% used more than 4 parcels of land. With regards to extension visits, 25% of respondents reported they were never visited by extension officers, 35% reported monthly visits by extension officers, 26% experienced annual visits, 8% of farmers were visited on a fortnightly basis, and the minority (6%) was visited weekly by extension officers. A large portion of the sample (98%) stated they preferred the face-to-face interaction method with extension staff, while 2% preferred interactions via telephone. While most farmers (63%) stated that they had access to and used other sources of information, some 37% stated the extension service was their only information source. Finally, most farmers (77%) indicated they did not belong to any farmers' group, while the others (23%) indicated group membership.

Table 2

Description of Sample

Variables	Categories	Frequencies (%)
Country	Antigua	14
	Dominica	16
	St. Lucia	24
	St. Vincent	25
	Grenada	21
Gender	Male	73
	Female	27
Age	18-30	7
	31-50	39
	>50	54
Education level	Certificate	3
	Primary	58
	Secondary	27
	Tertiary	10
	None	2
Farming status	Full time	80
	Part time	20
Primary operation	Crop	96
	Livestock	4
Farm size	<1 ac	15
	1-5 ac	68
	6-10 ac	12
	>10 ac	5
Parcels of land in use	1	45
	2	20
	3-4	20
	>4	15

Extension visits	Weekly	6
	Fortnightly	8
	Annually	26
	Monthly	35
	Never	25
Interaction preference	Face to Face	98
	Phone	2
Access to and used other info sources	Yes	63
	Extension only	37
Participation in farmers' groups	Yes	23
	No	77
Satisfaction levels	Low (Score: 25-49)	22
	Moderate (Score: 50-69)	57
	High (Score: 70-100)	21

Satisfaction with Extension Services

Table 3 provides the percent responses to each statement aimed at capturing farmers' satisfaction of extension service. All statements were positively worded. Agreement to such statements would indicate satisfaction at some level and vice versa. With respect to overall level of satisfaction, mean frequencies suggested that 41% of farmers expressed some level of satisfaction (3% of farmers strongly agreed with the statements and 38% agreed with the statements), while 59% expressed some level of dissatisfaction (37% disagreed with the statements and 22% strongly disagreed). The statement which had the highest agreement level was, "I believe the extension service helps me without expecting anything in return" (59% of farmers were in agreement and 7% were in strong agreement). Also high in agreement was, "I like collaborating with the Extension service when possible" (with 56% of farmers agreeing and 5% strongly agreeing). On the other hand, there was a general disagreement with the statement, "I believe Extension treats all farmers fairly and equally." Most farmers (48%) disagreed with this statement and another 34% strongly disagreed. Similarly, farmers disagreed with the statement, "When the Extension officer makes a promise to me, it is always kept" (with 48% and 28% of the farmers disagreeing and strongly disagreeing, respectively). Some 73% of farmers disagreed that the quality of service offered was high. There were mixed levels of agreement with statements such as, "I enjoy dealing with the Extension service" and "I have a good working relationship with extension officers".

The final sample size after outliers were removed resulted in a sample size (n) of 453. As shown, mean FS_i was 60, suggesting that farmers' satisfaction of extension service was somewhat modest, and given the low standard deviation (.61) indicated this level of satisfaction was shared among most individuals of the sample. Further, there was little skewness and kurtosis suggesting that FS_i had a normal distribution.

Table 3

Frequencies of Individual Statements Associated With "Satisfaction"

Statements	SD	D	A	SA
I believe the extension service helps me without expecting anything in return	17	17	59	7
I like collaborating with the Extension service when possible	18	20	56	6
I would willingly recommend other farmers to the Extension service	16	23	55	6
I feel I am valuable to the Extension service	20	30	43	7
The services provided to me is vital to my farming	22	22	53	3
I believe Extension is guided by sound principles	19	29	48	4
When the Extension service wants to do something new or different, I know I will be asked to be part of the process	16	34	47	3
Extension officers value my opinion	19	34	44	3
I enjoy dealing with the Extension service	25	27	46	2
I have a good working relationship with Extension officers	24	33	39	4
The Extension service is my most preferred source of farming information	23	39	36	2
The Extension officer operates in a professional manner	23	32	42	3
Extension is known to be successful at the things it tries to do	20	39	39	2
In my time of need, the Extension service is always ready to assist me	20	43	34	3
The Extension service is concerned about my welfare and that of my family	23	48	24	5
The Extension service is always ready and willing to work with me	20	40	36	4
My expectations are held in high regard by the Extension service	21	46	31	2
Extension officers do their job to the best of their ability	26	38	34	2
Extension officers are easy to reach	30	33	35	2
I firmly believe that the advice from the Extension service is always true	17	50	31	2
I am pleased with the Extension service and will continue to depend on it	26	41	31	2
I am happy with this organization	26	41	31	2
Extension can be relied on to keep its promises	28	51	19	2
Extension offers a high quality service	27	46	26	1
When the Extension officer makes a promise to me, it is always kept	28	48	23	1
I believe Extension treats all farmers fairly and equally	34	48	17	1
Mean Satisfaction	22	37	38	3
Cronbach Alpha	0.97			

Variable	*n*	Mean (*SD*)	Min.	Max.	Skewness	(Excess) Kurtosis
FS_i	453	60 (.61)	25	82	-0.77	-0.12

Determinants of Farmers' Satisfaction

Results of the regression analysis (see Table 4) indicated that all variables taken together significantly affected the satisfaction index computed (F (11, 453) = 21.4, $p < 0.01$), and together these factors contributed 35% of the variation in FS_i (R^2 = 0.35). The Variance Inflating Factors (VIF) used to detect multi-collinearity among independent variables were less than 10, indicating that multi-collinearity was not a major problem in the model.

Individual *t*-tests indicated that the following variables significantly affected FS_i : gender, age, education level, farm size, parcels in use, extension visits, farming status, and participation in farmers' groups. With respect to gender, males were less

satisfied with extension than females (β = -2.48, t = 2.13, $p < 0.05$). With focus on farmers' age, younger farmers (< 50 yrs) were more satisfied with extension than older farmers (β = 2.63, t = 2.45, $p < 0.05$). Regarding education level, farmers who attained higher levels of education (secondary/tertiary) were less satisfied with extension than farmers with lower levels of education (β = -2.87, t = 2.49, $p < 0.05$). Results also showed farmers with larger land sizes were more satisfied with extension than those with smaller sized holdings (β = 2.34, t = 2.65, $p < 0.05$). Further, farmers with more land parcels in use were more satisfied with extension than others who farmed on fewer parcels (β = 1.45, t = 3.25, $p < 0.01$). With respect to extension visits, farmers who were more frequently visited by extension officers were more satisfied with extension than those visited less often (β = 4.17, t = 12.68, $p < 0.01$). Regarding farming status, full-time farmers were less satisfied with extension than part-time farmers (β = -2.27, t = 1.70, $p < 0.10$). Lastly, individuals that were members of farmers' groups were more satisfied with extension than those not belonging to any farmers' group (β = 2.41, t = 1.91, $p < 0.05$).

Table 4

Regression Model of Several Independent Variables on FS_i

Variables	VIF	Beta	SE	*t*	*p*-value
Gender (1 = male)	1.01	-2.48	1.16	2.13	0.03**
Age (1 = Young)	1.11	2.63	1.07	2.45	0.01**
Education level (1 = high)	1.24	-2.87	1.15	2.49	0.01**
Farm size	1.30	2.34	0.88	2.65	0.01**
Parcels in use	1.16	1.45	0.44	3.25	0.00***
Extension visits	1.08	4.17	0.32	12.68	0.00***
Farming status (1 = full time)	1.16	-2.27	1.34	1.70	0.09*
Primary operation (1 = crop)	1.08	0.03	2.53	0.01	0.99
Interaction preference (1 = face to face)	1.03	-3.85	7.01	0.55	0.58
Access to other sources (1 = Yes)	1.07	0.21	1.07	0.19	0.84
Participation in farmers' group (1 = Yes)	1.09	2.41	1.26	1.91	0.05**
Constant	-	47.73	7.53	6.33	0.00***
F (11, 453)			21.4***		
R^2			0.35		

Note. * = $p < 0.10$; ** = $p < 0.05$; *** = $p < 0.01$.

Discussion, Conclusions, and Recommendations

The findings of this study showed there is modest satisfaction with the extension service in the OECS. While this may be a good situation, it is clearly insufficient to move agriculture forward rapidly in the Eastern Caribbean. Farming is the backbone of most Caribbean countries and as such, it is important to agricultural development that most farmers are fully satisfied with the extension service. Fully satisfied farmers are likely to be more productive and more cooperative with government's plans and additionally, this could positively impact on food security and export.

The responses to the individual item statements in the satisfaction scale are enlightening. Farmers appeared to be satisfied with the general ideals of an extension service such as: *"helping them without asking for anything in return," "would recommend other farmers to extension," "I am valuable to the service,"* and *"the service is vital to my farming."* In these times, when cash-strapped OECS nations contemplate downsizing extension services, these findings validate the need for this essential support.

These generalized feelings however, have to be contrasted with the feelings of farmers to specific areas of the extension service. Farmers were dissatisfied with several key areas and their responses reflected this. Farmers generally were not pleased with several aspects of the service and also not happy with the present organization. They felt that the service is not reliable, extension officers do not keep their promises, the quality of the service offered is not high quality, and extension officers do not treat all farmers fairly. It is in these areas, as well as all the other areas, which attracted moderate levels of dissatisfaction to which governments need to pay much attention.

Even as governments continue to struggle to provide non-extension services to farmers that draw on their limited finances, they can take actions that will improve the image and level of service of extension among farmers. The personalized service that farmers prefer and have been accustomed to over the years cannot be sustained in the present situation. As such, staff needs to be retrained to work with farmers in groups. They will need new technical skills to: (a) promote groups, (b) organize farmers into such groups, and (c) understand group dynamics.

Concurrently, farmers need to be re-educated to have them understand this new approach, and to solicit its acceptance as the approach that will bring them an overall better level of service. The statement with the highest level of disagreement, *"that extension treats all farmers fairly and equally,"* supports these recommendations. A farmer feeling that he/she is not being visited, but instead his/her other farmer-friends are receiving service, engenders sentiments of neglect and inequity. In groups, farmers may have an opportunity to see otherwise and may form alternative opinions of the extension service. These areas are good starting points to build customer satisfaction (Rope & Pöllänen, as cited in Ihalainen, 2011).

The factors used in the regression analysis explained a fair 35% of the variation in farmers' satisfaction. Since this is the first empirical assessment of farmers' satisfaction in the region, several traditional factors were investigated. The factors determined in this study are similar to those determined by Israel and Galindo-Gonzalez (2009) in a study of customer satisfaction in Florida, USA. To identify the other 65% of the variation, a much more elaborate and deeper study is needed. However, this study established the contribution of these traditional, well accepted factors that are known to impact farming in the Caribbean. It is therefore a basis to start more vigorous attempts to uncover the other factors which impact farmers' satisfaction. Notwithstanding, the issues identified are in keeping with the customer satisfaction leadership theory as previously outlined in the literature.

The results also showed the complexity of the issues that interact to determine the levels of satisfaction farmers have with extension. Younger farmers were more satisfied than older farmers. This may be because these younger farmers do not place as much emphasis on extension officers' visits to them as the older farmers

who are very accustomed to this method, and may be disappointed when they do not receive this service as often as they would like. Given the aged farming population in the OECS, extension needs to build on these positive feelings by younger farmers who will be the future of farming.

On the other hand, the farmers with higher levels of education may be disappointed with the quality of technical advice received. In the OECS, Information and Communication Technology (ICT) infrastructure and services are fairly well developed, and more educated farmers are more comfortable using this technology to access and use information retrieved, unlike the less educated farmers. Extension staff is generally ill-equipped and ill-prepared at the work level to supply farmers with relevant, appropriate, modern technological solutions using ICTs because the employer has not provided them with the tools to perform in a modernized technology-driven environment. Therefore, governments should take steps to provide extension staff with the appropriate tools and training to empower them to operate in a modern communication environment. Ghamire and Martin (2011) noted staff development was critically important to help projects stay on the cutting edge of the development process. They further emphasized the need for the development of the soft skills of staff to properly deliver technologies to clients.

The findings that those farmers with larger total land sizes, whether a single parcel or several parcels, were more satisfied than those with smaller sizes of land, may be related to the commodity produced and extension service provided. Besides vegetables and root crops, banana is the other main crop grown, and is usually cultivated on larger size holdings. Therefore, banana farmers receive dedicated extension as this is an export crop and thus, these farmers may be more satisfied compared to the multitude of small farmers in mixed cropping systems that rely on the generalized extension service for support. In addition, extension officers tend to gravitate towards those mixed cropping farmers with larger size holdings for two major reasons: (a) they are easier to access, and (b) they are usually more innovative and entrepreneurial and therefore, are more willing to take extension advice. There is the opportunity for the reorganization of extension, such that while some officers continue to work with the many small farmers, others can be assigned to work specifically with those larger, more educated farmers who farm in a manner that supports national food security objectives.

As expected, farmers who receive more extension visits are more satisfied. This, however, is a wholly unsustainable action by the extension service. Given the insufficient human resources to deal with the many small farmers, many farmers go months without being visited by an extension officer. For the service to be provided to much more farmers, extension needs to redefine its scope, and also target which commodities and which farmers will get priority, as not all farmers who they presently seek to service will ever be able to move beyond the subsistence level without major government financial assistance. To support national food security objectives, the previous recommendation for the reorganization of national extension services, which focuses on groups to replace the individual visit approach, and places more emphasis on larger commodity–oriented farmers and the use of modern ICTs, is most applicable.

Implications

As governments in the OECS contemplate actions to meet national food security objectives, and at the same time grapple with the ever increasing impacts of

climate change on their small island nations, much more focus should be placed on improving their extension services. Failure to do so would result in an unhappy farming community and moreover, a demoralized extension work force. Therefore, extension services in the OECS should be reorganized to include: (a) clearer specifications of program scope, identify targets for priority extension activities and new program approaches, (b) training for staff to enable them to provide farmers with modern technology, (c) the use of group approaches to improve their reach among clients, and (d) equipping extension staff with modern communication technologies. Failure to take action in these areas could put food security goals in the OECS at risk.

References

Azikiwe Agholor, I., Monde, N., Obi, A., & Sunday, O. (2013). Quality of extension services: A case study of farmers in Amathole. *Journal of Agricultural Science*, *5*(2), 204. doi:10.5539/jas.v5n2p204

Barker, S. (2009). *Extension: A guide to conducting high impact programmes*. Department of Agricultural Economics and Extension, University of the West Indies: Trinidad.

Birner, R., Davis, K., Pender, J., Nkonya, E., Anandajayasekeram, P., Ekboir, J., . . . Cohen, M. (2009). From best practice to best fit: A framework for designing and analyzing pluralistic agricultural advisory services worldwide. *Journal of Agricultural Education and Extension, 15*(4), 341-355.

Claro, D. P., Hagelaar, G., Kemp, R., & Omta, S. W. F. (2003). The impact of downstream network subgroups on collaboration and performance: A survey of buyer-supplier relationships in the dutch flower sector. *The International Food and Agribusiness Management Review, 6*(2), 86-98.

Duc, N. M. (2008). Farmers' satisfaction with aquaculture - A logistic model in Vietnam. *Ecological Economics, 68*(1), 525-531.

Food and Agriculture Organization (FAO). (2008). *Workshop on small scale farming in the Caribbean*. Retrieved from: http://www.rlc.fao.org/fileadmin/templates/iniciativa/content/pdf/eventos/agric-fam-caribe-2012/report-workshop-small-scale-farming-caribbean.pdf

Farris, P. W., Bendle, N. T., Pfeifer, P. E., & Reibstein, D. J. (2010). *Marketing metrics: The definitive guide to measuring marketing performance*. New Jersey: Pearson FT Press.

Ganpat, W. & de Freitas, C (2010) Caribbean Nations. In R. Saravanan (Ed.), *ICTs for agricultural extension. Global experiments, innovations and experiences*. (pp. 45-82). New Delhi, India: New India Publishing Agency.

Ganpat, W. (2014). A model for postharvest extension in the Caribbean. *Acta Horticulturae, 1047*, 181-188.

Ghamire, N. & Martin, R. (2011). A project C development model: Implications for extension education. *Journal of International Agricultural and Extension Education, 18*(2), 5-17.

Hu, R., Cai, Y., Chen, K. Z., Cui, Y., & Huang, J. (2010). *Effects of inclusive public agricultural extension service: Results from a policy reform experiment in Western China.* Washington, DC: IFPRI, Development Strategy and Governance Division. Retrieved from:

http://www.ifpri.org/publication/effects-inclusive-public-agricultural-extension-service

Ihalainen, M. (2011). *Competitive advantage through customer satisfaction, Case: Koulutettujen Hierojien Liitto.* Degree Programme in Business Management, Laurea University of Applied Sciences, Finland.

Israel, G. D., & Galindo-Gonzalez, S. (2009). Diverse market segments and customer satisfaction: Does extension serve all clients well? *Journal of International Agricultural and Extension Education, 16*(1), 89-103.

Kokate, K. D., Kharde, P. B., Patil, S. S., & Deshmukh, B. A. (2009). Farmers-led extension: Experiences and road ahead. *Indian Research Journal of Extension Education, 9*(2), 18-21.

Malhotra, N. K., & Birks, D. F. (2007). *Marketing research: An applied approach.* London: Pearson Education Limited.

Mishra, S., & Swanson, B. E. (2009). *Extension's role in organizing producer groups: A case study from Orissa, India.* Paper presented at the 2009 Conference of the Association for International Agricultural Extension and Education, San Juan, Puerto Rico. Retrieved from: https://www.aiaee.org/proceedings/37-2009-san-juan-puerto-rico/631-extensions-role-in-organizing-producer-groups-a-case-study-from-orissa-india.html

Modernizing Extension and Advisory Services. (2013). *Reducing the gender gap in agricultural extension and advisory services.* Discussion Paper produced as part of the United States Agency for International Development (USAID) project. Retrieved from: http://www.culturalpractice.com/site/wp-content/uploads/2013/04/3-2012-39.pdf

Moore, M. (1984). Institutional development, the World Bank and India's new agricultural extension programme. *Journal of Development Studies, 20*(4), 303-317.

Private Sector Commission. (2004). *Jagdeo initiative-strengthening agriculture for sustainable development.* Guyana: Private Sector Commission.

Smith, S. (2010). *Fair trade bananas: A global assessment of impact*. UK: Institute of Development Studies, University of Sussex.

Terry, B. D., & Israel, G. D. (2004). Agent performance and customer satisfaction. *Journal of Extension, 42*(6). Retrieved from: http://www.joe.org/joe/2004december/a4.php

Wilson, W. R., & Peterson, R. A. (1992). Measuring customer satisfaction: Fact and artifact. *Journal of the Academy of Marketing Science, 20*(1), 61-71.

World Bank. (2007). *Enhancing agricultural innovation: How to go beyond the strengthening of research systems.* Washington, D.C: World Bank.