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AN ASSESSMENT OF THE MARKET AND OTHER INFORMATION NEEDS OF CROP FARMERS IN TRINIDAD AND TOBAGO

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ABSTRACT: The market and other types of information needs of farmers have increased in importance with the demand for food production worldwide. Agricultural Information can be important for the sustainability of farm production, since it can ensure farmers receive revenues, which can be reinvested into continued production. This paper investigates the market information needs of farmers in Trinidad and Tobago, to assess if it is being met and what information they consider most important. The Likert scale was employed to achieve this objective by rating the importance of various types of information. Point Score Analysis was used to determine the factors which were identified as important among vegetable crop farmers. Contrary to expectations, the study found that crop farmers ranked weather and climate information most important while market price information was ranked 11th. The study also highlighted the importance of other types of information which can potentially improve the sustainability of domestic crop production in Trinidad and Tobago.

Keywords: Market Information, Agricultural Information, Likert Scale, Point Score Analysis.

Introduction

Information asymmetry refers to the imbalance of information in markets, where one group has superior knowledge over the other which leads to markets becoming inefficient (Borooah 2012). In a study of sub-Saharan Africa (SSA) Tollens (2006) identified that this asymmetry occurred especially with poor farmers in remote areas. Middlemen or traders who operated in the traditional markets were aware of the prices while farmers who weren't aware were victims of unfair payments. This asymmetry can also affect consumers when they are not aware of the prices charged in all retail markets therefore reducing their purchasing power.

Eventually, to reduce asymmetry, the SSA governments invested in publicly operated marketing agencies to provide information to all stakeholders and therefore decrease and eventually remove asymmetry in the agricultural industry. Initially these systems mainly controlled prices by purchasing produce from farmers and reselling at a set price controlling the supply in markets while maintaining producer surplus. This centralized purchasing was not sustainable and was removed and market information systems (MIS) were introduced. A market information system is an organization that collects data, processes the data into market information and circulates the information to stakeholders (Kizito, 2011).

Although these systems provide many benefits to its stakeholders, they face sustainability issues. These issues occur since most systems are public goods and when governments remove public funding, the operations cannot continue as stakeholders do not pay for the information provided. For the operation of MIS, a cost is incurred for information collection, analysis and dissemination. These sustainability issues are more probable in economies where funding is limited and thus, to increase the lifespan of the MIS, the government will ensure that users benefit from its existence through increased food supply and stabilized food prices.

This study focuses on Trinidad and Tobago, where a market information system called the National Agricultural Marketing Information System (NAMIS) currently exists. This system is owned and operated by the National Agricultural Marketing and Development Corporation (NAMDEVCO) which provides market prices daily and market volumes for agricultural commodities traded in the wholesale market monthly (Iton, 2011). However, a preliminary investigation completed on NAMIS, the current crop market information system of Trinidad and Tobago, highlighted that approximately 44% of crop farmers used the local MIS (Iton, Simon, and Khan 2010).

Hypothesis

In order to undertake the study, the following hypotheses were developed:

1. Market information which are important to crop farmers:

H_0: Domestic market prices is the most important type of information required by crop farmers in Trinidad and Tobago.

H_1: Domestic market prices is not the most important type of information required by crop farmers in Trinidad and Tobago.

Please note that the decision rule used for the hypotheses below is if the P-value < alpha (α =.05) reject H_0 otherwise fail to reject H_0

2. Market information which are important to crop farmers:

H_0: Domestic market volumes is the most important type of information required by crop farmers in Trinidad and Tobago.

H_1: Domestic market volumes is not the most important type of information required by crop farmers in Trinidad and Tobago.
Please note that the decision rule used for the hypotheses below is if the P-value < alpha (α =.05) reject H_0 otherwise fail to reject H_0

Background

Market Information Systems can lead to the reduction in transaction costs, which comprises of the cost encountered in the movement of commodities from farms to final consumers (Kizito, 2009).These costs include those related to gathering, processing

and decision making and its reduction decreases the final cost to consumers. The lower cost also increases the competitiveness of commodities produced, and provides farmers with the potential to enter new markets. In addition, farmers would be able to benefit from new markets, since these markets would be already identified by MIS and would allow the potential for expansion of production systems. They would also have the choice of carrying their produce to the closest market or the most profitable. MIS provides markets within the domestic, regional and international markets along with the products traded in those markets (Kizito, 2009). These systems make farmers aware of new possibilities to increase their welfare either through market expansion or commodities produced.

Farmers are most times faced with uncertainty of prices which creates price risk, i.e., the risk that prices received would lead to production being unsustainable. Kizito (2009), stated that MIS reduces this risk through the circulation of prices and therefore allows for efficient allocation of resources which improves production systems. Planned production would also assist in this goal as crops would be harvested at periods when their market prices are forecasted to be high. This information would also have the potential to prevent market gluts and possibly stabilize market prices (Tschirley et al. 1995, 2). Another form of risk would be associated with the uncertainty of weather which has a direct impact on production given the open field nature of crop production. MIS can provide weather updates and allow farmers to identify the best times at which to conduct their farm practices (Kizito, 2011). Updates can also warn farmers of rainfall trends and allow them to forecast floods and drought thereby reduce the loss of crops for harvest.

Agricultural commodities are perishable products and therefore have a short shelf life. This tends to be disadvantageous to farmers when market supply is high, since farmers aim to get rid of goods before they start to deteriorate. Farmers sell at lower prices which maybe below their cost of production, which reduces their welfare. MIS provides farmers with market volumes and as a result farmers can store goods as opposed to carrying them to market at a loss. The decision to harvest can also be delayed to allow for time to get higher prices in the markets (Kizito, 2009). Shepherd (2011) stated another factor to consider would be production out of the established season to gain higher prices. MIS trend data provides such information, indicating the prices and volumes within a period. He also suggested the use of the advancements in modern techniques for out of season production via varieties that would lead to diversification, further increasing the profits of these producers.

Information Disseminated

Information is the main product of MIS but given the numerous factors involved in agricultural production, providers must ensure that the information which they provide adds value to farmers. Chomba et al., (2002) identified that farmers in Zambia needed agricultural information; (i) Cost of Production, (ii) Marketing Costs, (iii) Prices of commodities, and (iv) information on inputs.

Chomba et al., (2002) showed that cost of production information provides farmers with the ability to identify crops that would provide the highest returns and also negotiate for prices that would ensure profits. This type of information would require analysis, thus incurring a cost and should be limited to the number of commodities that are available free of charge. Market price information, which would also assist farmers in gaining a fair price for their commodities could be supplied free of charge. This information requires only collection and verification before it is distributed, attracting no major cost and therefore increasing the number of commodities which can be covered (Chomba et al., 2002).

Price minimum, averages and maximums can be offered in addition to daily prices but the delivery of this information will vary in frequency. In addition, historical prices can be provided upon request, which will allow for trend analysis and the forecasting of periods when prices would be at their highest or lowest (Shepherd, 2011).

Marketing costs, which includes handling, transportation, storage and processing of agricultural produce was identified by Chomba et al., (2002) as information which also assisted farmers in decision making. This material increases in importance in larger countries where farmers' proximity to markets, processing facilities and packing houses are greater allowing traders along with middlemen opportunities to disadvantage farm gate prices.

Shepherd (2011) indicated that the knowledge of markets, including locations, and buyers contact information (wholesalers and retailers) was required information that also provided farmers with options for sale of produce and eliminates the need of sale to one buyer. It will similarly be important for farmers to be aware of input prices, including chemicals, seeds and labour (Chomba et al., 2002). This would provide farmers with assistance in production planning and lead to price reduction since these costs affect the overall cost of production. The provision of market volumes or supplies also assists in production planning since farmers would be able to identify the most suitable times to harvest their crops (Chomba et al., 2002).

Agronomic practices such as, plant nutrient guides, information concerning pest and diseases have been shown to assist farmers in off season production (Shepherd, 2011). Both pest and disease have the potential to greatly impact available volumes for harvest. Robbins P. (n.d) stated that farmers who sell low quality goods have little bargaining power therefore the provision of agronomic techniques can assist farmers in this regard. These techniques used in production reduce the risk of infestation by pest and disease but can also increase the quality and quantities from production thereby increasing their bargaining power. Post-harvest handling activities and grading practices would also improve the quantity and quality of farmer output (Shepherd, 2011).

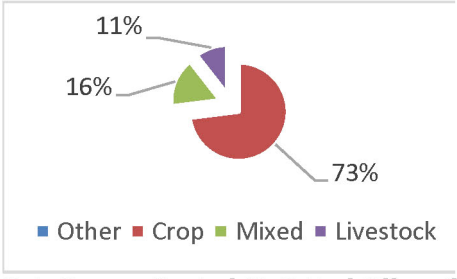
Tollens (2002) showed that in order for information to be useful it must be relevant, meaningful, reliable, promptly available, easily accessible and simple to ensure users benefit from its use. User need must be evaluated to ensure that the information provided bears importance and is timely. This includes locations and intervals. The

language used in relaying information must also take into account the literacy levels among the farmers and in multilingual countries where different tongues exist. Information must not be biased to favour one group over the other but be accessible to all who wish to acquire it, therefore eliminating asymmetry in the industry (Tollens, 2002).

Methodology

A total of 202 crop farmers were interviewed at farmers market located throughout the country during 2012. Crop farmers were selected because they represented the largest population of farmers in Trinidad and Tobago, shown by the 2004 Trinidad and Tobago Agricultural Census. Figure 1 shows the distribution of farmers in Trinidad and Tobago, where crop farmers accounting for the largest share (73%) followed by mixed production systems of livestock and crop farmers. It should be noted that livestock only farmers account for the smallest population in Trinidad and Tobago (Agricultural Census 2004 2012).

Figure 1: Distribution of farmers in Trinidad and Tobago



Data Source: Central Statistical Office of Trinidad and Tobago

Convenience sampling was used, for ease of collecting statistical data (Convenience sampling, 2012). Convenience sampling is defined as a non-probability sampling technique through which respondents are selected due to their accessibility and proximity to the researcher or enumerators. For this study Farmers' Markets are defined as regulated places of trade were only farmers are allowed to sell their harvested crops. These are located only in Trinidad and such Tobago was excluded from the study. It is anticipated that this method will not bias the study because farmers from various locations in Trinidad visit these markets to sell a range of fruits and vegetables. This was supported by NAMDEVCO (2012), which have reported that these markets have attracted 150 farmers, both small and medium sized weekly.

Map 1: Location of Farmer Markets in Trinidad

Enumeration was conducted during the times when Farmer Markets were in operation. This was done for the ease of capturing as many farmers as possible. It should be noted that, some crop farmers who did not have produce to trade during the period the survey was conducted would not have been captured. Map 1, shows the location of the markets in yellow, where farmers were interviewed.

In order to facilitate the rating of market information, the Likert Scale was used. Likert scales use fixed choice response formats and are designed to measure attitudes or opinions (McLeod, 2008). These scales allowed respondents to indicate the importance

of information, this ranged from being unimportant to very important. The five point scale was used in this study since Garland (1991) showed evidence that the exclusion of the midpoint value resulted in distortions in results. For each score on the Likert scale, a value is allocated which indicated its value to farmers, these values ranged from zero (0) to four (4), shown in table 1.

Table 1: Likert Scale ranking used in the study.

Label (level of importance)	Value used for
Unimportant	0
Low importance	1
Moderate importance	2
Important	3
Very Important	4

The Questionnaire

A structured questionnaire was used for the study (see appendix A3). In many cases a Likert scale was applied to allow a weight or rating of how farmers viewed the respective types of information. In addition, the frequency for information's delivery to farmers and the mediums farmers preferred was also included in the survey to help in the assessment of their needs.

The study separated market information in four groups:

(i) Buyer and Seller information: this included the listing for stakeholders in the industry, which were farmers, middlemen, wholesalers, retail outlets, international buyers, and agro-processors.

(ii) Trade information: information identified to be important to trade, which included market prices and volumes in the domestic and international markets, along with trade policies.

(iii) Agronomic information: the section included cost of production, weather and climate reports, pest and disease information and plant nutrition.

(iv) Market Reports: reports concerning population consumption, market trends, market forecasts, grades and standards along with information related to food safety procedures.

Farmers were asked if they would like to receive these information groups and then rated the importance of the respective subgroups using a Likert scale. The questionnaire also aimed to identify the level of technology that was available to farmers and how they currently received market information. The demographics of the sample population were also collected to assist in explaining information needs in their relation to various factors.

Point Score Analysis

To assess the market information most important to farmers, the point score analysis was applied. Point score is commonly used to quantify the decisions made by the sample populations, by allocating a value based on responses. The point score of each variable is calculated by the sum of the values selected by the number of respondents that choose the respective value. This formula is shown below:

$$\textbf{Point score} = \Sigma (i * w_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(1)}$$

Where,

i = value from chosen for market information……i = 0, 1, 2, 3, or 4
w = Number of respondents that choose the respective 'i'

Results

Information Needs of Farmers

Farmers were asked to indicate the types of market information they required with separate responses. A total of 69% wanted agronomic information, 59% wanted market reports, 58% were interested in buyer and seller information and 55% of the sample set selected trade information.

The mode of the farmer responses to the level of importance, gave domestic market prices a rank of high, while eight other information types, such as, list of farmers, and list of middlemen received higher rankings (Table A1). Given inability for the mode to rank the types of information among each other the point score was employed. It revealed that Weather and climate reports received the highest rank with a score of 473, while domestic market prices was ranked 11th with a score of 353 while domestic market volumes ranked 12th (Fig 2).

The remaining top five types of information were Pest and Disease information (444), Cost of production of crops (437), Plant Nutrition (435), and reports on Population Consumption (403). The lists of agro processors, retail outlets and farmers were shown to be the least important to crop farmers with score of 317, 312 and 298 respectively. It should be noted that crop farmers showed a preference for wholesalers and farmers since they were ranked higher than the aforementioned listings.

Reports of food safety, market trends, market forecasts, grades and standards and the listing of wholesale buyers were also ranked higher that market prices and volumes. These results led to the rejection of both null hypotheses which stated the importance of domestic prices and volumes.

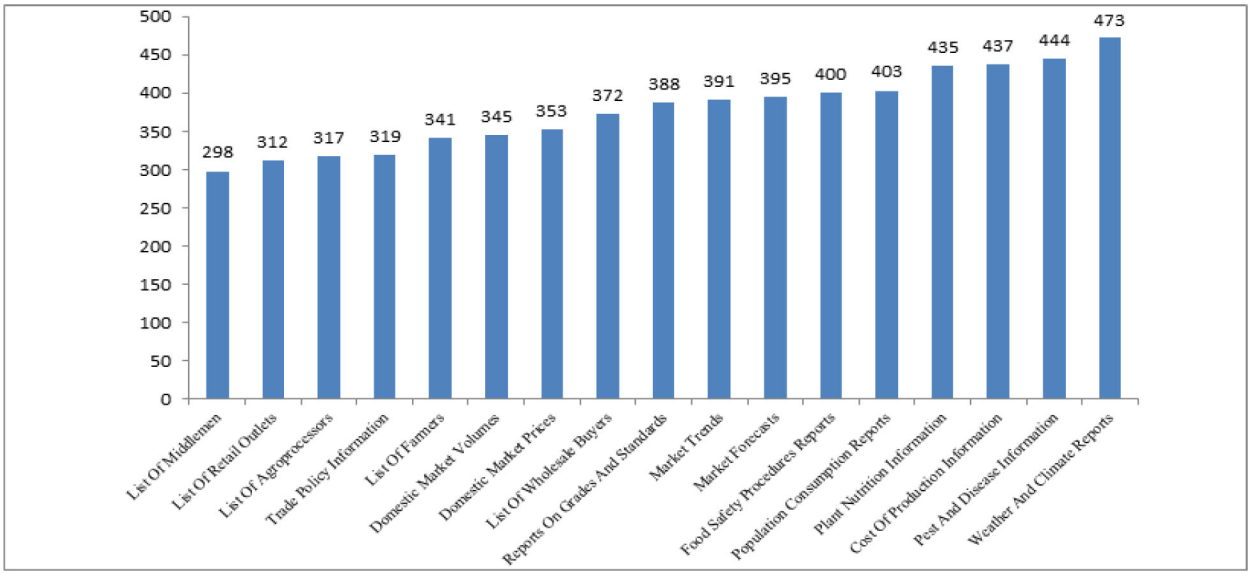


Figure 2: Rank of the Importance of Market Information reported by farmers in Trinidad and Tobago.

Conclusion and Recommendations

The results indicated that NAMIS currently provides information of lesser importance to farmers and should include information of greater importance. The study highlighted the importance of weather and climate information, pest and disease information, cost of production information and plant nutrition information. These were ranked the highest by farmers and therefore should increase their utilization of the NAMIS system.

It should also be noted that farmers also wanted market reports, such as Population consumption, market trends and forecasts, along with grades and standards. Although farmers ranked the stakeholder contacts lowest they are important and should also be supplied to farmers given the benefits in the choice among different markets.

This study has the potential to reduce the two key binding constraints identified by President Bharrat Jagdeo (2007), namely "(i) weak marketing systems, linkages and participation and (ii) weak and non-integrated information and intelligence systems". Therefore, it is recommended that the study be used to guide in the development and improvement of a MIS across the CARICOM region.

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Appendix

Table A1. Rating of information by farmers (mode of responses)

Market Information	Mode	Rating of importance
List of farmers	4	Very high
List of middlemen	4	Very high
List of wholesalers	4	Very high
List of retail outlets	4	Very high
List of agro processors	4	Very high
Population Consumption	4	Very high
Market Trends	4	Very high
Market Forecasts	4	Very high
Grades and Standards	4	Very high
Food safety procedures	4	Very high
Domestic market prices	3	High
Domestic market volumes	3	High
Trade policy	3	High
Cost of production	3	High
Weather and climate	3	High
Pest and disease	3	High
Plant nutrition	3	High
International market prices	0	Unimportant
International market volumes	0	Unimportant
List of international buyers	0	Unimportant