An Investigation into the Rural Economy, Farmer Problems and their ICT Based Solutions of Trinidad and Tobago

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1. INTRODUTION

Agricultural output in Trinidad and Tobago during the 1970's and 1980's was inversely proportional to the performance of the oil sector: it depressed during the oil boom and stimulated during oil's decline. Increasing wage costs, shortages of labor, and oil wealth all directly affects agricultural output. In the south of the country as most of its land based oil resources are found there. The trend was most pronounced in the 1970s, when the sharp increase in the price of oil exports discouraged traditional agricultural exports and encouraged the importation of food crops previously produced locally.

In the year 1997 the total agriculture GDP was 777.4 million TT dollars, it significantly declined to 466.6 million TT dollars throughout the years which indicated that there were problems associated with the agricultural sector. Agriculture contributed 2.2 percent of the total GDP in 1997, whereas in 2008 its' contribution drastically declined to 0.3 percent of the total GDP (Meditz et al. 1987).

As the oil industry's expansion, encouraged more Trinidadians to move to urban areas, the rural labor force declined by nearly 50 percent, representing only 10 percent of the total work force by 1980. The study captures the agricultural situation in the rural economy of south Trinidad. The initial purpose is to identify the problems face by the major stakeholders of the economy, small holder farmers and producers. Preliminary results will show which problems are most prominent than others and which ones greatly affect the farming community. The study will also provide them with ICT based solutions to the problems as indicated by the farmers in an order of effectiveness.

1.1 PROBLEM STATEMENT

Increasing problems are occurring among farmers in south Trinidad. Farmers constantly complain about these problems to the relevant authorities and to their disadvantage no responses are made. Complaints about extension officers not visiting the farmers and providing advice and support to them are often made. Also when farmers visits the extension officers at the respective ministries, they are not able to have one on one interactions with the officers due to the large number of farmers which may be present and the very few extension officers available.

As a result of these problems, these hinder the rate of production and it directly affects the supply of the goods on the market. This can lead to shortages of locally produced food that would be available at the retail and wholesale market and supermarket shelves as processors may not obtain the supply of goods they would have demanded.

This research will be identifying and ranking these problems and will determine to what extent the problems directly affects the farmers and which problems are needed to be resolved more readily than others. Therefore by ranking these issues stakeholders will be informed as to which problems are needed to be solved initially as all the problems cannot be addressed at once.

2. LITERATURE REVIEW

2.1 Problems Faced by farmers

Several studies have been done in different countries with regards to the problems in which farmers are faced. In an article named the "beginning farmers problems in Canada" by SébastienPouliot November 17, 2011……stated that that main drive for people exiting agriculture is the economic forces which they are faced. Some of the problems which were outlined by the writer in which farmers in rural areas in Canada are faced are difficulties in taking vacation especially during planting and harvesting period due to the long working hours. Also the risk of injury and stress associated with risk from price uncertainty and yield contribute to making the farming profession a less desirable occupation than others requiring similar skills.

2.2 Rankings of Problems faced by farmers

A study done in Dhaka, Bangladesh on the problem confrontations farmers' face towards seed potato production indicated that potato being the second largest crop in Bangladesh adds tremendously to the nation's food security (NaimulArif 2011). The problem which was ranked first among the farmers were lack of quality seed potato with a problem confrontation index (PCI) of 256 (Kh. ZulfikarHossain 2011). Whereas the problem with the second rank had a PCI of 215 and farmers found to be diseases to the crops (Rayhan 2011). The third and fourth ranking of the problems the farmers faced towards see potato production are insects' problem and high price of quality seed potato respectively (Hossain et al. 2011).
Another study titled the Problem Confrontation of Coastal Youth In Undertaking Selected Agricultural Activities in Two Villages Under Bhola District in Bangladesh, indicated that their highest ranked problems held a PCI of 287 (Alam 2010);youth felt it was risky to undertake large agricultural activities due to natural calamity was ranked number 1. Barriers in fish cultivation due to joint ownership of the pond were ranked number 2 of PCI 275, whereas parent lack cash and operational land was ranked third with PCI 232. With regards to the fourth ranking of PCI 231 was the lack of required draft power (Rashid 2010).

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3. METHODOLOGIES

3.1 Data Collection

A survey was conducted mainly among tree crop and vegetable crop farmers, focused on identifying the problems faced in their agricultural operations. Prior to conducting the survey via questionnaires, the researcher conducted various interviews with farmers in south Trinidad to develop a list of problems that affects their agricultural activities in order that they be ranked when the survey is completed. Simultaneously these interviews were also done to collect the five (5) listing solutions which farmers think should be implemented to eliminate some of their major problems in undertaking agricultural activities. An ICT based tool or strategy was assigned tool to each solution. These interviews were done during the month of September 2012, and were used as the basis of information in order to build the dependent variables for the research. The population of famers in south Trinidad is approximately 10,000

of which 100 were selected randomly for the study.Data were collected during the months of October-November 2012 by the use of questionnaires that were given out to the farmers.

3.2 Measurement used to Rank Problems and Solutions

Problem Confrontation Index (PCI) was used to analyze the ranking of the problems, and determine which problem affects most farmers and to what extent. The dependent variable in the study was the problem confrontation of the farmers in south Trinidad. To measure and determine the problem confrontation of the farmers, 23 problems were presented and they were asked to respond as to how greatly each problem affects them by using a 4 point option of high, medium, low and not at all. The SPSS V.18 software program was used to obtain frequencies for each problem in order to determine how many farmers had a high, medium, low or no response to each problem. A rank order of each problem was therefore done by developing a Problem confrontation index (PCI). The PCI is determined as follows:

Problem Confrontation Index

$(PCI) = P_{hpc}X3 + P_{mpc}X2 + P_{lpc}X1 + P_{npc}X0$

P_{hpc} – Percentage of south farmers with high problem confrontation.

P_{mpc} - Percentage of south farmers with medium problem confrontation.

P_{lpc} - Percentage of south farmers with low problem confrontation.

P_{npc} - Percentage of south farmers with no problem confrontation.

For each problem the formulae was applied and the rank of the problem was determined based on the PCI value. Similarly for the other dependent variable which was the solutions, an order of implementation from 1^{st} to 5^{th} was given in the questionnaires and farmers were instructed to choose the order in which they think the solutions should be implemented by the relevant authorities. The solution with the highest frequency for each stage from 1^{st} to 5^{th} was determined and placed as the solution to be implemented at that particular step.

4. RESULTS

4.1 Ranked Order of Problems

Table 1.0 shows the problem confrontation index (PCI) to the problems and the rank order in which they were derived. The problem with the first rank order had a PCI of 268 and this was the high cost of input supplies. Secondly in rank order was the shortage in labor to work on farms, with PCI of 228, whereas the problem with rank order number 3 had a PCI of 217 and this was the problem with no encouragement for youths to enter into agriculture. Lack of agricultural infrastructure had a PCI of 210 which resulted as the fourth rank order.

Table 1.0 Rank order of problems faced by farmers in south Trinidad (N=100)

Statement Of Problems	Problem confrontation Index (PCI)	Rank Order
High cost for input supplies	268	1
Shortage in labor to work on farms	228	2
No encouragement for youths to enter into agriculture.	217	3
Lack of agricultural infrastructure.eg roadways drains etc.	210	4
People not appreciating the hard work farmers do and the significant contribution they make to society.	203	5
Plant health and diseases.	197	6
Lack of farming schools in South Trinidad.	180	7
Lack of proper extension programs.	169	8
Praedial Larceny	167	9
Imported goods in the market, causing high prices of locally produced goods.	164	10
Unavailability of Credit.	163	11
Lack of startup cash and operational land	162	12
Difficulties in acquiring loan due to lack of ownership of land.	155	13
Difficulties in marketing agricultural products.	153	14
Lack of Information communication technologies (ICT's) programs available.	151	15

No response from law officials when praedial larceny reports are made.	148	16
Plants/seeds being non accessible.	141	17
Discrimination with regards to women in Agriculture.	135	18
Lack of farmer training programs available in South Trinidad.	135	18
Difficulties in acquiring farmers badge due to lack of ownership of land.	132	20
Risky to undertake large agricultural operations due to land tenure.	126	21
No representatives of farmers from south Trinidad on agricultural state boards.	120	22
Risky to undertake large agricultural operations due to natural disasters	113	23

4.2 Ranked Order of Solutions

Table 1.1 shows that the solution to provide skilled labor for farmers was of frequency 42 with rank order 1, whereas the lowering of the cost of input supplies had a frequency of 50 with the second rank order. Subsequently providing greater incentives and credit for farmers had a frequency of 27 for the 3rd rank order and the 4th rank order had a frequency of 18 which was a plan to eliminate Praedial Larceny. Finally the training programs made more readily available and easily accessible to farmers by the government was shown in the table to have the 5th rank order and a frequency of 72.

Table 2.0 showing solutions in a rank order of effectiveness

Solutions	Frequency in respective order	Rank in an order of effectives
Providing skilled labor for farmers.	42	1
Lowering the cost of input supplies.	50	2
Providing greater incentives and credit for farmers.	27	3
Plan to eliminate Praedial Larceny.	18	4
Training programs made more readily available and easily accessible to farmers by the government	72	5

5 DISCUSSION / CONCLUSION

5.1 The farmers' problem towards agriculture in south Trinidad.

Problems regarding agriculture in south Trinidad were ranked and the extent to which these problems affected the farmers was identified in table 2.0. The problem confrontation index ranged from 113 to 268 for the problems. As shown in table 2.0 the high cost of input supplies was ranked first with PCI 268. This remains a major problem in Trinidad's agricultural sector as farmers are expected to meet the high cost of machinery, also the price of fertilizers are rather expensive. This will result in a high cost of production and reduction of profit margins.

The second problem was shortage in skilled laborers to work on farms which scored a PCI of 228. Agricultural labor issues has been a problem in the rural economy, for quite some time as farmers are not able to meet the maximum operational productivity on their farms due to a lack of labor. This issue depends on the ability of the worker to perform his/her duties properly. As such farm managers are not willing to pay large amounts to workers due to their level of skill. Another problem high in rank at order 4 with a PCI 210 was the lack of agricultural infrastructure.eg roadways, drains etc.

5.2 The ICT Based Solutions.

The solution of highest rank order was that of providing skilled labor for farmers. This can be achieved using ICT‘s by merging farmers together and using smart phones applications to help their workers demonstrate different techniques and practices which would improve the labor situation. This will occur by having those skilled laborers utilize smart phones to teach unskilled laborers. Such training can take place on the field during operations and at an individual basis/ small group- this would act as an introduction to technical/ vocational training with the use of ICT’s e.g.logframer application. Lowering the cost of input supplies had the second rank order and similarly this can be achieved by a system called Farmforce which is a cloud-based mobile platform that focuses on the agricultural “last mile” and specifically the management of out grower schemes involving rural small holders in the developing world.Farmforce gives agricultural businesses, who work with groups of out growers the ability to provide the real-time operational capabilities through a centralized IT platform.

Providing greater incentives and credit for farmers by forming a mobile banking service, whereby the bank can go to the farmers instead of the farmers going to the bank will greatly benefit the agricultural sector. As for the plan to eliminate praedial larceny, security devices such as cameras can be placed on the farms and monitoring systems to detect when intruders enter.

Finally the training programs made more readily available and easily accessible to farmers by the government can be done by four ICT base programs: - 1) Voice Information Delivery Services 2) Radio: Dial-up (Agricultural Information on Demand) and Regular Radio Broadcast, 3) Extension Services Based on Mobile Phone and Database Monitoring and 4) e-Learning for Basic Skills, Agricultural Education and Video-Based Approaches.

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