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# **THE ROLE OF EXTENSION IN THE TRANSFER OF AGRICULTURAL TECHNOLOGY IN TRINIDAD AND TOBAGO**

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## **ABSTRACT**

A population survey was conducted of Extension Officers in Trinidad to evaluate and determine the constraints to the transfer of technology through this channel. The results indicate that extension officers are well qualified and have a wealth of experience in agriculture, but are not well trained in extension techniques. Generally, they have a good interface with farmers, but their linkages with research and agricultural input suppliers are inadequate. Only 10 % of the technology transferred to farmers came from researchers or research institutions. Most of the technology disseminated was based on extension officers' perceptions of farmers' needs (39 %), farmers' requests (23 %) or government directive (17 %). Officers thought that farmers had the greatest technological needs in the areas of pest and disease control, soil conservation, post-harvest technology and marketing. The Ministry of Food Production is extension officers' main source of information, while officers felt that the Extension Division and other farmers supply most of the farmers' information. Lack of support resources, too many regulatory duties, limited avenues for staff development and poor availability of information were identified as the major constraints to the efficient transfer of technology.

## **RESUME**

### **LE ROLE DES VULGARISATEURS DANS LE TRANSFERT DE TECHNOLOGIE AGRICOLE A TRININAD ET TOBAGO**

Une étude (de population) sur les vulgarisateurs a été entreprise à Trinidad pour évaluer et déterminer les contraintes de transfert de technologie par ce canal. Les résultats montrent que les vulgarisateurs ont une bonne qualification et une vaste expérience en agriculture mais qu'ils ne sont pas bien formés aux techniques de vulgarisation. En général, ils ont un bon contact avec les exploitants mais leurs liaisons avec la recherche et les fournisseurs d'intrants agricoles sont inadéquats. Seulement 10 % de la technologie transférée aux exploitants venaient des chercheurs ou des institutions de recherche. La plus grande part de la technologie diffusée était basée sur la perception des besoins des agriculteurs par les vulgarisateurs (39%), sur les demandes des exploitants (23%) ou sur les directives du gouvernement (17%). Les vulgarisateurs ont pensé les plus grands besoins technologiques des exploitants sont dans les domaines de la lutte contre les ravageurs et les maladies, la conservation des sols, la technologie après récolte et la commercialisation. Le Ministère de la Production Agricole est la principale source d'information des vulgarisateurs alors qu'ils avaient l'impression que la division de la vulgarisation et d'autres exploitants fournissent la plus grande part de l'information des exploitants. Le manque de ressources de soutien, les trop nombreuses tâches réglementaires, les possibilités limitées d'extension du personnel et la faible disponibilité de l'information ont été identifiées comme les principales contraintes à un transfert efficace de la technologie.

## **INTRODUCTION**

### **Background**

The University of the West Indies, and the National Institute of Higher Education, Science and Technology (NIHERST), in collaboration with the Inter-American Institute for Cooperation on Agriculture (IICA), the Ministry of Food Production and Marine Exploitation, CARIRI and Caroni (1975) Limited., are currently conducting research on «Developing an appropriate methodology for monitoring and evaluation of investments and allocation resources in Agricultural research in Trinidad and Tobago». In the first phase of this project an overview was obtained of the status of the national agricultural research system in terms of financial, scientific personnel and technical resources allocated in the recent past (Singh et al., 1987). An ex-

post analysis was also completed of the impact of agricultural research, in the aggregate, on agricultural output.

The ex-post analysis showed no significant relationship between research investments and output. Consequently, a "system diagnosis" approach was adopted. In this approach, the agricultural research systems was subdivided into its constituent components. Then, each component was further investigated to determine the constraints to the transformation of research into output. This paper presents the findings of the Extension component.

## Objectives

The objectives of the study were :

- 1.To determine the professional resource capacity of the extension service in Trinidad
- 2.To identify the range of functions for extension personnel and assess the effective time allocated to front-line extension activities.
- 3.To determine the interface among Extension Officers and other components of the agricultural research system - researchers, farmers and agricultural input suppliers
- 4.To identify the constraints to the transfer of technology through this channel.

## METHODOLOGY

A population survey was conducted of all extension officers in Trinidad. Tobago was not included in this study because their Extension Division falls under the purview of the Tobago House of Assembly, rather than the Ministry of Food Production.

Questionnaires were distributed to extension officers in the 6 district offices (St. George, St Andrew/St. David, Caroni, St. Patrick, Victoria and Navira/ Mayaro) and collected two weeks after. At the time of distribution, members of the research team held discussions with the extension officers to explain the rationale for the study and to answer any queries the officers had about the questionnaire.

There were 7 sections in the questionnaire. Sections 1 to 3 dealt with general information about the officers - their training, education, functions, the time spent on those functions and the districts they served. Section 4 investigated the technological information going to and disseminated from the officers. Linkages between extension officers and farmers, researchers and

agricultural input suppliers were examined in Sections 5 and 6. For the interface with farmers, data were collected on the number of farmers serviced the frequency of contact and officers' evaluation of farmers' level of awareness and willingness to follow advice. To determine the linkages with researchers and input suppliers, the questionnaire examined the nature of the contacts and the type of information exchanged. In the last section, constraints to transfer of technology, extension officers were asked to identify the constraints and to rank them in order of importance.

Data were analyzed using the STATPAK program on the microcomputer.

## **RESULTS AND DISCUSSION**

Forty-nine front-line extension officers completed the questionnaire. This figure represents a response rate of approximately 80 % of all officers. The highest response rate was in county St. Andrew/St David where there 12 respondents, while the other counties ranged between 5 - 9.

All five levels of extension staff were represented in the survey. These included :

- Agricultural Officers (AOs) who are responsible for the administration of the office
- Agricultural Assistants (AAs), who are the main front-line extension officers
- Agricultural Extension Assistants (AEAs), who are the technical assistants of the AAs, and
- Plant Protection Assistants (PPAs), who are also technical assistants, but mainly in the area of plant protection

Seventy-four percent (74 %) of the respondents were AAs, 18 % AEAs, 2 % PPAs and 2 % AOs.

### **Training and Experience**

Among these officers, 82 % (all the AAs, one AEA and the AO) were graduates of the Eastern Caribbean Institute of Agriculture and Forestry (ECIAF), 55 % had O'levels, 21 % A'levels and 4 % had a B.Sc. degree in agriculture. Only 23 % of all respondents had specialist training in Extension. The majority of the officers had been in their present positions for between 6-15 years. These results indicate that extension officers in Trinidad generally have basic training in applied agriculture with many years experience. However, a very large percentage (77%) of extension personnel may be seriously handicapped in their delivery capability since they have not received specialist training in extension techniques and methods.

**Table 1 : Average Amount and Percentages of Extension Officers  
Time Spent on Different Functions**

FUNCTION	AVERAGE NO. OF DAYS/MONTHS	% OF TOTAL TIMES
<u>Knowledge Transfer</u>	11,1	38,7
Farm visits	6,8	23,5
Educational meetings	2,5	8,6
Other educational activities	1,9	6,6
<u>Non -Knowledge transfer</u>	8	27,3
Subsidies	1,6	5,5
Inspections (ADB, etc)	0,9	3,1
States lands	3,1	10,7
Gov't program	1,4	4,8
Data collection	0,9	3,1
<u>Planning and Support</u>	9,8	33,9
Preparation of reports	2,8	9,7
In-Servive training	5,3	18,3
Other support activies	1,7	5,9

**Table 2 : Farmers/Extension Officers Interaction Over Various Periods Of Time**

Interaction	County					
	Car.	N/M.	St. G	St. P.	St. A/D	Viv
	Average # Of Farmers					
Number of farmers / extension officer	360	135	128	268	173	288
Farmers extension officer can see : -						
Once/Year	170	90	360	100	498	167
Twice/year	73	64	200	105	494	113
Thrice/year	120	176	437	132	552	52
Regular farmers visited in a month	55	16	38	33	132	14
New farmers visited in a month	14	7	8	8	9	6
Farmers who routinely visit ext. officers every 2 mths	24	23	13	5	12	12
Farmers who seek advice at office monthly	3	9	5	18	11	12
Farmers who seek advice on farm monthly	5	18	22	48	25	47

## **Functions and Duties**

Officers claimed that on average, they spent most of their time (39 %) on knowledge transfer activities, 34 % on nonknowledge transfer activity and 27 % on planning and support activities. The main knowledge transfer support activity was farm visits (7 days/month), while state lands duties (3 days/month) and in-service training (5 days/month) were the principal non-transfer and planning and support activities, respectively (Table 1).

## **Interface With Farmers**

Table 2 indicates that the ratio of farmers to extension officers ranged from 128:1 in St. George to 360:1 in Caroni. Extension officers stated that they were able to visit farmers as often as 3 times per year. In St. Andrew/St. David and St. George in particular, officers stated that they visited an average of 552 and 437 farmers, respectively, 3 times per year. By contrast, officers in county Victoria could visit only 51 farmers 3 time per year.

The ratios of farmers to extension officers in St. Andrew/St. David and St. George (173:1 and 128:1, respectively) are among the lowest of all the counties. It is therefore possible that these officers are able to visit farmers in their district more frequently because they do not have as many farmers to service. By contrast, the ratios in St. Patrick and Victoria are among the highest (268:1 and 288:1, respectively) so extension officers in those districts were unable to service their farmers as often.

Most of the farmers visited wer regulars (i.e. farmers whom had been visited or who had visited the district extension office at least once before). For example, in St. Andrew/St. David, officers stated that they saw an average of 132 regular farmers/month as compared with 9 new farmers over the same time period (Table 2). Officers in Caroni saw the most new farmers (14/month) while those in Victoria saw the least (6). Extension officers in St. Andrew/St. David serviced the most regulars while Nariva/Mayaro serviced the least (16).

The number of new farmers visited in Caroni seems high especially when on considers that county had the highest ratio of farmers to extension officers. This ratio may be misleading, however, as the majority of farmers in Caroni are sugarcane farmers who consult extension officers of Caroni Limited rather than the Ministry of Food Production. Consequently, the actual ratio of farmers to extension officers from the Ministry may be considerably lower than 360:1, thereby allowing farmers to visit more new farmers. Moreover, with the current diversification thrust in Trinidad, farmers may be venturing away from sugarcane into new enterprises. Hence, the Ministry's extension



officers in Caroni would be interacting with more new farmers who are seeking advice on alternative enterprises.

The officers found that more farmers tended to seek advice during on-farm visits than at the office (Table 2). In St. Patrick, for example, on average, 48 farmers/month sought advice during on-farm visits while 18 did so at the office. This result is a bit surprising as one would expect that farmers actively seek advice by visiting the district office. On the other hand, some problems are best assessed in the field so the on-farm visit would be more appropriate.

Table 3 shows that 39 % of the officers felt that farmers who visited the district extension office were very receptive to advice while only 29 % believed that farmers who were visited on their farms were as receptive. Whereas most officers (73 %) felt that farmers were very important in the identification of technology, only 20 % thought that farmers were very aware of the technologies available. This finding signifies the need for educating the farmers on available technologies.

#### Interface with Researchers and Agricultural Input Suppliers

Table 4 indicates that most of the extension officers had contacts with local research institutions (65 %) and local extension related institutions (56 %). These contacts were primarily through seminars and visits where extension officers spent most of their time obtaining information on technology rather than relaying information on farmers' technological needs. This lack of feedback is further emphasised when we examine the origins of the technologies passed on to farmers. Twenty-three percent (23 %) of the extension officers said the technology disseminated was requested by farmers, 39 % said it was based on their perception of farmers' needs, 17 % were from government directives and less than 10 % stated that the technology came from researchers or research institutions.

These findings, as well as those in the previous section suggest that although extension officers are aware of the problems being faced by farmers, they are not transferring information on farmers' technological needs back to the researchers. There also seems to be very little transfer of information from research institutions to the extension officers.

Eighty percent (80 %) of the officers felt that farmers got the majority of their technological information from extension officers, 69 % thought they got it from other farmers, 65 % believed agricultural salesmen provided the information and 59 % cited the Ministry's Extension bulletins (Table 5). An interesting finding is that less than 15 % of the officers felt that the University was an important source of information to farmers. These results imply that

**Table 3 : Extension Officers Perceptions of Farmers Receptiveness to Advice Awareness and Importance in technology Identification**

CHARACTERISTIC	% of Extension Officers			
	VERY	MOD	POOR	NR
Receptiveness to advice (farmers who visit office)	39	56	0	2
Receptiveness to advice (farmers on -farm)	29	60	5	5
Awareness	20	58	12	10
Importance of farmers in technology id.	73	16	23	9

**Table 4 : Percentage of Extension Officers Having Contact With Various Research Institutions**

INSTITUTION	% of Extension Officers		
	YES	NO	NR
Research Institution : -			
Local	64,6	8,3	27,4
Regional	25	29,2	45,8
International	10,4	35,4	54,2
Extension Related Institution : -			
Local	56,3	4,2	39,6
Regional	14,6	31,3	54,2
International	6,3	39,6	54,2
Agribusiness	39,6	12,5	47,9

**Table 5 : Sources Of Information On Technology For Onward Dissemination To Farmers By Extension officers**

SOURCE	% OF EXTENSION OFFICERS
Extension Division (Ministry)	16,3
Planning Unit	18,4
CES	71,4
Livestock Division	30,6
Information Unit	59,2
Retail Outlets	40,8
Agents/Distributors	42,9
Manufacturers	16,3
Farmers	30,6
Other Extension Officers	59,2
Research Institutions (Local)	40,8
Research Institutions (Regional)	12,2
Personal contact with researchers	22,9
Journals/magazines	32,7
Radio	10,2
T.V	8,2

**CES : Central Experiment Station**

there are some linkages between extension officers and researchers in the Ministry of Food Production, but there is little contact with researchers in other institutions, for example the University. This finding has serious implications for the relevance of research being conducted at these institutions and raises questions on how research findings from these research institutions are disseminated to the farmers.

The interface between extension officers and agricultural input suppliers is of some concern. Only 40% of the officers had contacts with input suppliers (Table 4). Officers felt that farmers' main technological deficiencies were in the areas of pest and disease control and identification, chemical use and marketing. A previous study (Fletcher, et al, 1988) revealed that agricultural input suppliers play a significant role in the areas of pest and disease control and chemical use. There are strong linkages between farmers and suppliers as suppliers provide a wide range of material technologies, e.g. pesticides, fertilizers, equipment and machinery to farmers. The earlier study further showed that some of the technology being transferred through this channel may be inappropriate and even harmful to both farmers and consumers. In view of the importance of the input suppliers to farmers, there should be greater linkages between extension officers and input suppliers so that officers could (i) monitor the technologies being sold to farmers, and (ii) enhance extension's contact with farmers.

### **Constraints**

Respondents felt that the major constraints to their efficient transfer of technology were a lack of support services, too many regulatory duties, lack of direction or purpose, unavailability of knowledge and inadequate staff development and training.

These constraints reflect a need for improved institutional arrangements within the Extension Division as well as the Ministry. It is important to note that at the time of the survey the Ministry was undergoing a reorganization exercise which may have alleviated some of the problems identified above. There are now autonomous, regional officers in North and South Trinidad. Each regional office is responsible for a number of district offices and land matters are no longer handled by the Extension Division. There are also plans afoot to have Subject Matter Specialists and Farm Management Personnel to assist officers.

## CONCLUSIONS AND RECOMMENDATIONS

This study has shown that extension officers are well trained and experienced in agriculture but not in extension methodology. However, they believe that too much of their time is spent on regulatory duties and there are insufficient avenues for staff development and training. Some officers have been in the same position for as many as 25 years and undoubtedly feel stagnated and unmotivated in their jobs. The recent reorganization of the Ministry has eased the burden of regulatory duties, but the problem of staff motivation remains. It is suggested that regular staff meetings and training sessions be held, so that officers may get an opportunity to share their experiences be apprised of new developments in their field.

Generally, there is a good interface between extension officers and farmers, with officers being able to visit some farmers as often as 3 times per year. The extension officers are also well informed of farmers' needs. Unfortunately, there appears to be very little feedback of farmers' technological needs to the researchers. Furthermore, researchers in institutions other than the Ministry of Food Production seem to be isolated from both extension officers, but they may be using other methods to disseminate their research findings to farmers (e.g. direct contact with farmers). The establishment of better linkages among these institutions, the Extension Division and the Central Experimental Station of the Ministry could also enhance the transfer process. Multidisciplinary research teams could collaborate on joint research projects and the Ministry could facilitate the conduct of trials at their various experimental stations throughout the country. Furthermore, because of their contacts with farmers, extension officers could assist in identifying suitable farms to conduct of on-farm trials. This will promote a two-way flow of information among researchers, extension officers and farmers.

Another important finding in this study is that there is need for greater interface between extension officers and agricultural input suppliers. It is recommended that extension officers routinely visit the input suppliers in their respective districts to keep abreast of the new material technologies being sold. Officers should also assist suppliers in screening new products by offering the services of the research division of the Ministry. Suppliers could also be encouraged to participate in seminars which are run by the Extension Division. In addition, bulletins, fact sheets and pamphlets published by the Ministry or the research institutions, could be distributed to agoshops so that they are readily accessible to farmers. This would ensure that research emanating from the institutions reach their intended target - the farmers.

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