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The impact of farming systems extension on Caribbean small-farm agriculture: The case of St Kitts and St Vincent

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The impact of agricultural extension programmes over a 10-year period (1986-96) on small farmers in the Organization of Eastern Caribbean States (OECS) was studied. The study showed that adoption was followed by increased total production if action was taken to improve the quality of the frontline worker; intensify his support from Research and Technology generation; use farming systems principles in the conduct of extension work; involve personnel from agencies which support the agricultural sector in extension programming, and establish co-ordinating mechanisms at the district, region (zonal), and national levels. The best results were obtained in an environment of sound policy support and strong co-ordination.

Keywords: Farming systems extension; Small farmers; St Kitts; St Vincent

Generating an improved technology, and informing farmers about it, only creates a potential for change. To realize this potential, farmers require credit, markets for the additional produce, adequate transportation, access roads, and timely information (Berdeque, 1993). The role of extension is to create the conditions which could motivate farmers to change.

Extension strives to bring about changes by stimulating farmers (beneficiaries of extension programmes) to take action to address problems (Barker, 1992). A farmer will not generally undertake farming activities, which he perceives will risk the well-being of his family. or any activity which may damage his relationship with other farmers. Sociocultural forces are very important and may work in a way which prevents a farmer from changing his old practices.

There are opportunities or services other than agricultural information which are required by the entire community. The importance attached to these determines the diligence with which they are sought after, and subsequently influences farmers' adoption behaviour. They could be social, cultural, economic, political, climatic and (or) environmental, educational, communicative, or industrial (Leagans, 1961, 1985). They can lead to positive or negative outcomes, depending on their impact on farmers' lives. If the effects of the elements lead to a reduction or cessation in income they are said to have a negative effect. Thus, any element or set of elements which works against and neutralizes the negative effect is considered to be supportive because it creates opportunity for expanded activity and income generation.

When these support services are absent or deficient, the farmer makes the necessary adjustment to minimize any negative impact on his well-being. His response is manifested through a particular kind of behaviour.

Supportive policy can provide infrastructure (roads and water for irrigation) and (or) reduce tax on agricultural inputs, farm machinery, and equipment thus reducing the financial requirement by the farmer to initiate a farm project and probably allow the local farmers to produce at lower cost per unit of produce. However, the single most frequently mentioned constraint to the development of the small-farm business in the Caribbean is marketing (Barker et al. 1986; Campbell, 1986, Dolly and Young, 1990). Generally, marketing personnel are not invited to participate in extension programming.

Traditionally, participation in extension programmes includes the generators of technology. the disseminators, and the end users (Cohen and Uphoff, 1980: Cernea et al., 1985: Pickering, 1989: Cuyno, 1988). Correspondingly, the traditional extension linkages emphasized a triangular relationship between

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research. extension, and farmer. However, marketing agents, input suppliers, and credit institutions are also important (Mosher, 1969; Woods, 1988; Kaimowitz, 1990; Thomas, 1993). Their inclusion can benefit and support farm planning and enhance training and programme implementation and, according to Barker (1992), are called Support Systems. In spite of this demonstrated effect, extension programmes, for many reasons, are not making the expected significant impact.

The Problem

The majority of farms in the English-speaking Caribbean are less than 5 ha in size. Small-scale farming consists mainly of multiple-cropping systems, and research on this type of farming is still very new. Not only is technological information lacking for these small-scale farmers. but the socioeconomic and sociocultural factors are generally not well analysed prior to the development of programmes of change.

Frontline extension workers (FEWs) who have a diploma or certificate in general agricultural production and are in direct contact with the farmer are given the responsiblity for bringing about positive change in the farmers' standard of living. Given these problems and the limited scope of the FEW, very little impact has been achieved (Lightfoot and Noble, 1993).

Henderson (1970) indicated that the number of roles which the FEW is expected to perform leads to conflict. Similarly, the Caribbean Agricultural Extension Project (CAEP, 1980) found that FEWs had educational responsibilities as well as regulatory functions which very often did not foster good extension-farmer relationships.

Administrators and leaders of extension in the English-speaking Caribbean have tried many extension approaches in an attempt to achieve greater impact (Barker, 1994a), but some problems are rooted in the policy decisions, budgetary allocations, disbursement strategies. infrastructure, transportation, and other factors which are related to work conditions and motivation (Arnon, 1981, Seepersad, 1986).

A review of extension programmes indicates that they are not necessarily having the expected impact on the farmer's standard of living. There is some indication that there has been some progress where the FEW is supported by better trained agriculturist(s). Many territories, however, lack university-trained persons to work in the frontline and, where there are such graduates, they are most frequently in management positions and are very far removed from the field, with very little contact with the farmer. Thus, extension appears to have a low impact on farmers lives. There is no appreciable reduction in the Regional Food Import Bill which now stands in excess of E.C. $3 billion dollars (OECS Economic Reports 1986-1994; U.S. $1.00 E.C. $2.70).

The ineffectiveness of the agricultural sector persists in spite of the fact that there are national policies to pursue diversification, with agricultural extension leading in that effort. The agricultural successes achieved through the efforts of extension over the last decade are few. Extension programmes, which were supposed to bring about economic change in the beneficiaries, continue to have very little impact, or are failing in absolute terms, in spite of the fact that most of the components (available technology, input supply, agricultural services, credit, and marketing) necessary for the conduct of an effective agricultural programme are present in the farming community (Barker and Bishop, 1992). There is no co-ordination of the efforts or the resources which are supposed to be used to the benefit of the small farmer. Not only is the co-ordination function unattended by extension, but the work of the extension staff lacks direction and purpose. Their work is generally unfocussed and unsystematic (Henderson and Patton, 1985).

Objectives of the Study

The objectives of the study were (i) to identify and analyse recent agricultural extension programme initiatives, (ii) to make an assessment of the impact extension programmes were having on increasing total national agricultural production, and (iii) to make recommendations for the conduct of future extension programmes.

Methodolody

The research methodology involved the use of a survey, the testing of specific extension efforts on a group of farmers in Antigua (the control), and the monitoring of extension programmes over a 10-year period in St Kitts - Nevis, and St Vincent and the Grenadines (SVG).

Grambling and Freudenburg (1992) suggest that programme impact is best observed over the long

run. This study was conducted from a period 1986 to 1996 and was facilitated through the CAEP Work Programme and later the Faculty of Agriculture's Research Fund of The University of the West Indies (U.W.I.). In SVG, an evaluation was done of the Diversification Programme which included land reform (Barker and Bishop, 1992; Barker, 1994b). In Antigua, an evaluation was conducted on the fruits and vegetable production programme. In St Kitts - Nevis, the vegetable production programme was evaluated.

Research Methods

The support of at least one Agronomist and three Extensionists at each research site was secured. Rapid Reconnaissance Surveys (RRS) were carried out, and on-farm interviews were conducted with farmers and their representatives. Focus group meetings, consultation meetings. and interviews using structured questionnaires were conducted with farmers, extension officers. and agricultural administrators and (or) policy makers. In-depth consultations were carried out with researchers and agricultural specialists in the plant, livestock, and soils disciplines. Similar interviews were carried out with personnel in credit, marketing, and input supply agencies or institutions as well as other non-governmental organizations (NGOs) working in the research area.

Based on the findings, efforts were made to collaborate with the Ministries of Agriculture personnel in developing district and national extension programmes. Training was provided for extension staff at the local and regional levels. The researcher and other U.W.I.-CAEP staff became an integral part of the programme implementation thrust. The programme implementation utilized farming systems principles.

In Antigua, a multidisciplinary team was responsible for all extension activities at the frontline. In St Kitts, similar teams were developed along commodity lines and included marketing and input supply representatives. In St Vincent, the programme was implemented by the individual district extension worker and did not follow farming systems extension (FSE) principles, but that of a traditional approach.

Initially, 30 farmers were used to demonstrate the extension process to extension staff and to demonstrate to farmers that they can benefit from their collaboration.

Farmers were taught farm business management, and co-operating extension officers received intense training from the U.W.I.-CAEP Extension and Farm Management specialists. Baseline data were collected on each farm prior to the interventions.

Based on the evaluations made at the end of the research activity and (or) intervention, the CAEP was extended to include all farmers in each island. It officially came to an end in 1989 and the continuing activities were incorporated into the Agricultural Research Extension Project (AREP). The monitoring of the impact of the extension programmes continued for six years after the end of U.W.I.-CAEP initiatives.

Findings of the Field Survey and Discussion

The interventions made by U.W.I. and the Caribbean Agriculture Research and Development Institute (CARDI) tried to remove some of the constraints to successful small-farmers' agricultural production with a hope of fostering a better quality of life for them. These efforts were made through the CARDI Farming System Research and Development (FSR/D) project; the CAEP and the AREP were funded by the United States Agency for International Development (US-AID), CAEP (Evaluation Report, 1989), and the AREP (Evaluation Report, 1994). One of the objectives was to use farming systems principles to enhance both the relevance of research and at the same time reduce the time taken for adoption of technologies. As a result, the U.W.I.-CAEP, in collaboration with the Ministry of Agriculture, field-tested the farm and home management extension (FHME) approach (Barker, 1994a), and, more recently, implementation strategies such as the task force (TF; Bailey et al., 1992) and joint focus programming (JFP; Campbell, 1992) have been used in the implementation phase. These efforts used farming systems concepts. The FHME and the TF represent the approaches which have demonstrated a high degree of impact among small producers of roots, tubers, and vegetables in Montserrat, St Kitts and Nevis, and Antigua.

Throughout the implementation of the CAEP. beneficiaries kept farm records which were analysed by a team of external evaluators. They also conducted interviews with the beneficiaries, extension specialists, researchers, farm management specialists, representatives of other collaborating agencies (e.g.. commodity associations and NGOs), and administrators of agriculture. Based on these findings, it was concluded that the extension activities

implemented through the CAEP have had an impact on both extension officers and farmers. Some of the more important results were the following:

1. Extension officers in the demonstration districts were much more knowledgeable about farm management and ways of working with farmers that will enhance their well-being.
2. Target farm families benefitted from the extension effort in the demonstration districts as evidenced by the fact that target farm families had increased enterprise-re-ceipts, farm and family earnings, and net worth in 1987 compared with 1986; had adopted a variety of new production and management practices; could offer their farms for use as demonstration farms to show the effects of improved practices; had greater knowledge of production and marketing; had improved attitudes toward farming and extension; made changes in enterprises that resulted in more diversification, more vegetable production, and production more suited to market needs; and contributed to meeting seasonal deficiencies and thereby helped meet some of the nutritional needs of their families and the region (CAEP Evaluation 2, 1989).

An analysis of the production data from a sample of OECS states indicated a decline in production in countries such as SVG where a traditional extension approach was pursued, and where the university graduates who supervised the extension zones had little farmer contact. In St Kitts - Nevis where the FSR-E approach was followed and where the university graduates formed part of the teams which worked directly with farmers, there was an increase in production (by volume) of approximately 100% over the 1986 level of production (Tables 1, 2, and 3).

Generally speaking, there was a tendency for the extension systems in Antigua to revert to the traditional method when the CAEP ended (i.e., no major focus; one-on-one approach with minimal meaningful farmer involvement in planning, implementation, monitoring, and evaluation; a top-down style of management and programming;

Table 1 Annual yield of some selected commodities for St Vincent and the Grenadines ('000 kg)

	Year								
Commodity	1986	1987	1988	1989	1990	1991	1992	1993	1994
Cabbage	756.6	107.5	118.2	157.3	195.5	171.1	195.9	371.0	76.5
Carrot	—	—	—	80.5	54.8	49.5	16.9	13.4	55.8
Hot pepper	108.4	579.3	97.9	79.0	61.0	67.1	61.0	4.0	5.2
Sweet pepper	21.5	18.3	19.2	20.1	18.0	16.5	18.0	2.5	2.5
Tomato	98.6	47.0	59.2	124.1	63.6	55.8	63.6	125.9	125.9
Total	985.1	752.1	294.5	461.0	392.9	360.0	355.4	516.8	265.9

Source: Agricultural Planning Unit of the Ministry of Agriculture, Kingstown, St Vincent and the Grenadines

Table 2 Annual yield of some selected commodities for St Kitts ('000 kg)

	Year								
Commodity	1986	1987	1988	1989	1990	1991	1992	1993	1994
Cabbage	22.7	18.1	45.4	56.7	27.2	39.5	102.1	73.0	114.0
Carrot	22.7	34.0	45.4	59.4	56.7	45.4	66.0	38.7	52.0
Onion	2.3	2.3	4.5	4.5	4.5	13.6	27.8	39.9	115.0
Tomato	45.4	54.4	68.0	77.1	68.0	89.4	106.3	109.6	100.0
Sweet pepper	11.8	11.8	9.1	22.7	11.3	9.1	8.3	10.7	23.0
Watermelon	18.1	34.0	36.6	31.8	45.4	55.0	57.0	68.0	73.0
Total	123.0	154.6	209.0	252.2	213.1	252.0	367.5	339.9	477.0

Source: Notes from Dr Jerome Thomas, Ministry of Agriculture, Basseterre, St Kitts and Nevis

Table 3 Annual yield of some commodities for Antigua and Barbuda (‘000 kg)

Commodity	Year						
	1989	1990	1991	1992	1993	1994	1995
Tomato	161.6	188.4	114.9	173.9	361.9	168.7	143.2
Carrot	153.7	269.2	106.1	175.2	249.8	203.5	130.2
Onion	119.3	296.6	95.3	276.2	190.4	214.7	180.8
Cabbage	32.0	54.7	37.5	29.1	94.1	108.1	96.4
Sweet pepper	18.8	95.0	28.7	40.2	44.3	14.6	12.9
Total	485.4	903.9	382.5	694.6	940.5	709.6	563.5

Source: Notes from Mrs M. Forde, Ministry of Agriculture, St John's, Antigua and Barbuda

emphasis on services rather than on teaching and education; and no real effort to involve personnel from NGOs. credit, marketing, and input supply agencies, or academic institutions.

In Antigua and SVG, a number of agencies which had a mandate to support the agricultural sector could be identified, but they had no meaningful relationship with extension and with each other, and their efforts were not effectively reaching the small farmer. In SVG, in particular, policy support. technology generation, credit, marketing, academic and other public institutions, land reform, input suppliers, agricul-tural services, farmer organizations, NGOs, and community services were all present but their efforts were not co-ordinated and they did not contribute significantly to the national objective to have more productive farmers.

A number of crops were identified, researched, and developed to a point where they were ready for full commercialization in SVG, but the supporting elements, including extension, did not allow such to happen. Actually, some initiatives such as onion and passion fruit production showed no increase in area planted, and total production was still negligible (i.e. no production data was generated) after 10 years of inclusion in the extension programmes. Also, in 1995, the potential onion growers and the Ministry of Agriculture and the St Vincent Marketing Corporation (the main purchaser) could not agree on a working relationship to enable commercial production to take place. Not only has onion production not increased, but other vegetable crops were actually declining compared to the 1986 levels (Table 1).

On the other hand, St Kitts - Nevis had a number of linkages with the marketing, credit, input supply, technology generation, policy, trade, land development, and other private-sector agencies. The entire implementation process included all the sectors which could contribute to the successful outcome. As a consequence the total agricultural output in fruits, roots. and vegetables was on the increase (Table 2).

Antigua was used as the control. The FHME approach was used to work on a limited number of commodities which included toma-toes, cabbage. and carrot. The increases in the production levels were as a result of specific intense extension efforts supported by research. Greatest impact was achieved in tomato production, as indicated in Table 3. The same was evidenced in cabbage production, but the market demand limited the extent to which the crop could be expanded, while the drought of 1994 and the tropical storms of 1995 significantly reduced the production of tomatoes.

It must be argued that the extension team in Antigua has been able to demonstrate impact in vegetable production. This impact was achieved without the help of the Private Sector (marketing, credit, input suppliers, and providers of agricultural services such as engineering). But these levels were not sustained. Much more could be done if all activities directed to help the farmer were co-ordinated not unlike that in St Kitts - Nevis (Table 3).

Mechanisms were put in place to ensure that there was support from the agricultural specialists resident in the islands (St Kitts - Nevis and Antigua). This mechanism took the form of production co-ordination committees (PCC).

There was no such mechanism in SVG. In Antigua and Barbuda the life of the Production Coordination Unit was short-lived. As a result, linkages between extension, research, and the private sector were tenuous. Production gains on both islands (Antigua and SVG) were very erratic and sustainability in agricultural production was low. In Antigua. high levels of onion production could not be maintained because of the lack of support from the Central Marketing Corporation (CMC) and other private-sector agencies. This resulted in the loss of large quantities of the produce at the farm level due to the limited quantities bought by the CMC and a lack of proper storage. This experience led to a reduction in levels of production by the individual

farmers.

Conclusion

Policy-makers must ensure that the best trained, most proficient officers work with farmers. Even with improved manpower capability in the frontline, agriculture is not likely to bring about the changes which the policy-makers anticipate unless efforts are made to provide adequate working conditions, transportation, and supporting services to ensure the successful conduct of the extension programmes.

There is need to put in place mechanisms which would co-ordinate extension programmes at the frontline or district level and the functions of all collaborating agencies. A systems perspective should be observed in working with farmers as well as in managing and supporting extension programmes at the national, regional, and district levels.

A systems approach to the conduct of agri-cultural extension programmes provides the Third World's small farmers with the best opportunity for survival. But policy-makers must be strong enough to insist on the placement of better trained officers in the frontline and to insist on participation of those who can influence programme outcome at all levels.

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