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VIRGIN ISLANDS  
COOPERATIVE EXTENSION SERVICE:  
A MODEL FOR  
**TECHNOLOGY TRANSFER SYSTEMS  
IN THE CARIBBEAN**



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IN THE CARIBBEAN**

by  
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## CONTENTS

Foreword .....	Page 3
I. Introduction .....	5
II. Extension Teaching Methods .....	6
III. Organization Structure .....	6
IV. Functions .....	6
V. Meeting Community Needs .....	9
VI. The Essentials .....	9
VII. Common Challenges - Similar Goals .....	11

## TABLES

1. Extension Methods Classified According to Category of Contact .....	6
2. Extension Methods Grouped According to Form .....	6

## ILLUSTRATIONS

### Figure

1. The U.S. Virgin Islands in the Caribbean .....	4
2. The Extension Educational Process Polygon .....	5
3. Cooperative Extension Service - Organization .....	7
4. Extension Program Function - Reaching the Client .....	8
5. Relation Between Research Base, Extension Programs and Clientele .....	10

## FOREWORD

This publication describes an effective technology transfer system based on educational principles. The model presented in this bulletin addresses extension education with its special technique of problem solving and action-oriented education which instructs, demonstrates, and motivates.

The College of the Virgin Islands is a land-grant institution with an agricultural experiment station that seeks to serve as a technology development center for the tropical Caribbean. The transfer agency for this technology, developed through extensive research, is the college's extension service which is a part of the United States Department of Agriculture's Extension Service.

With these resources and its strategic location, the College of the Virgin Islands is in an excellent position to be the window of the United States in the eastern Caribbean region. In addition, there are cultural and familial links with other Caribbean islands which are of special significance in ensuring a successful sharing of technology and educational experience.

The United States government has recognized the College of the Virgin Islands as an Eastern

Caribbean Center for educational, cultural, technical and scientific interchange.

Sharing of technical resources among the nations of the Caribbean can strengthen the economic stability and guarantee a better standard of living for all the people of the region.

This publication does not presume to impose a United States system upon Caribbean nations. Instead, its objective is to provide insight into the educational principles of assisting people to help themselves through government-financed informal education that can effectively be used to transfer technology and have it adopted.

The college is pleased to provide assistance to our Caribbean neighbors. Results of our research efforts in agriculture are freely disseminated. Extension programs in plant and animal sciences, home economics, community resource development and youth development are available for all who are interested in them.

We also welcome inquiries about our Caribbean Research Institute, Bureau of Public Administration and Reichold Center for the Performing Arts, as well as our undergraduate and graduate academic programs.

Arthur A. Richards  
President  
College of the Virgin Islands

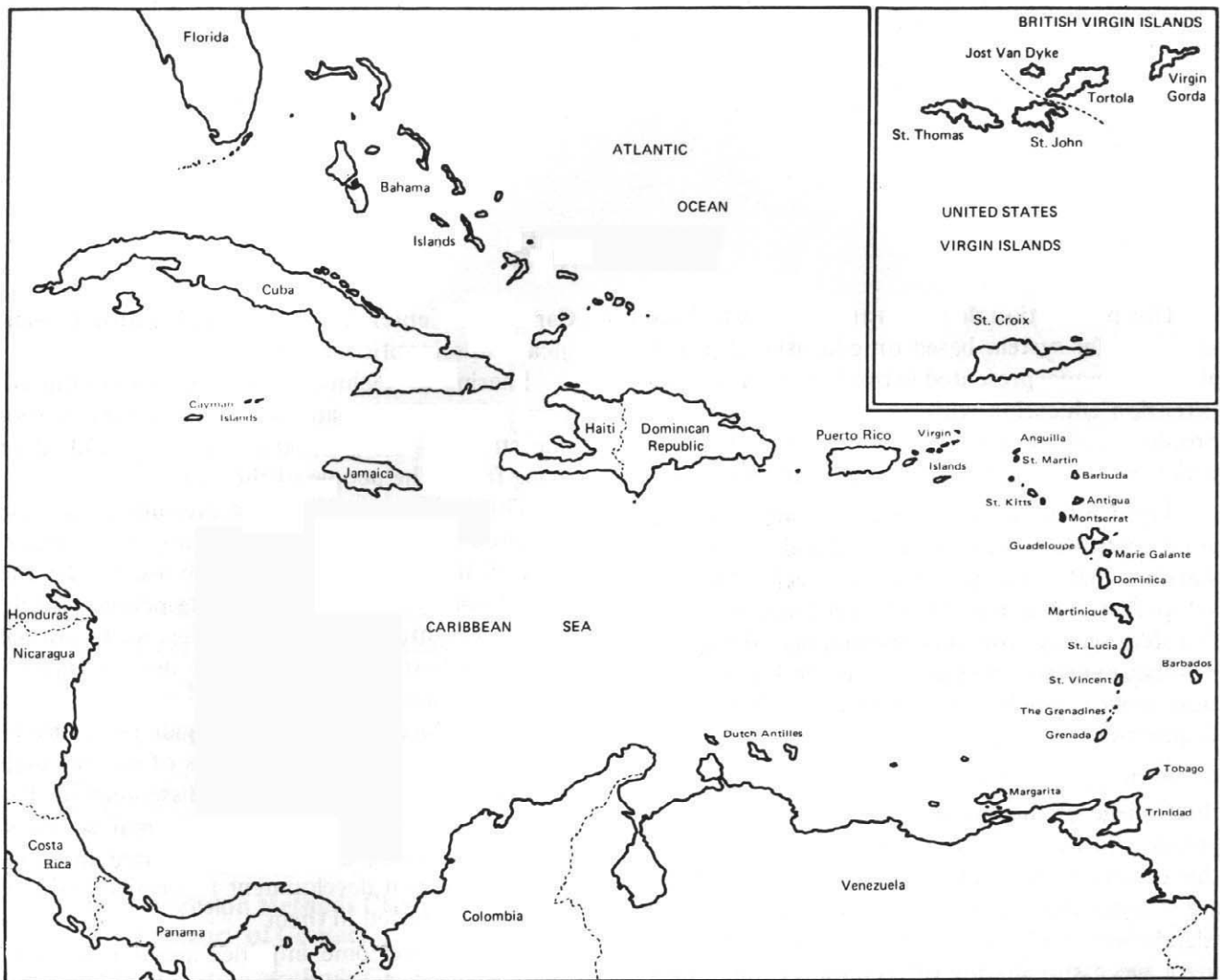


Fig. 1

## THE U.S. VIRGIN ISLANDS IN THE CARIBBEAN

The U.S. Virgin Islands are situated in the Lesser Antilles between 17°30' to 18°30' north latitude and 65°15' to 60°40' west longitude. The three major islands are St. Croix with 22,081 hectares (54,563 acres), St. Thomas with 7,278 hectares (17,984 acres) and St. John with 5,194 hectares (12,835 acres). The Virgin Islands are located approximately 1930 kilometers (1200 miles) southeast of Miami, about 2415 kilometers (1500 miles) south of New York, and about 64 kilometers (40 miles) east of Puerto Rico.

The rainfall in the islands depends primarily on topography and continual easterly tradewinds. The western part of St. Croix receives up to 60 inches annually while the eastern end only receives up to 30 inches. On St. Thomas the central portion of the island will register up to 50 inches of rainfall while the east and west ends receive no more than 40 inches annually. The monthly daytime temperature average varies from a low of 83°F (28°C) in January and February to a high of 89°F (32°C) in July, August and September.

# VIRGIN ISLANDS COOPERATIVE EXTENSION SERVICE: A MODEL FOR TECHNOLOGY TRANSFER SYSTEMS IN THE CARIBBEAN

## I. Introduction

The core of the United States Department of Agriculture has always been its research and extension education function. However, the role of colleges and universities in the development and transfer of technology in agriculture and home economics was mandated by the United States Congress through three well-known historic legislative acts: the Morrill Act created land-grant colleges in 1862 and in 1887 the Hatch Act established an agricultural experiment station at each land-grant college; in 1914 the Smith-Lever Act provided for the Cooperative Extension Service so that research information could be conveyed to potential users. The Smith-Lever Act served as the earliest recognition that public academic institutions should provide informal education as well as formal classroom instruction.

These three pieces of legislation created an educational system much emulated in the world today. The land-grant system assures a unified approach to research, classroom teaching, and extension education in agriculture, home economics, and other areas of rural and community development. In 1972 the College of the Virgin Islands became a part of this land-grant system.

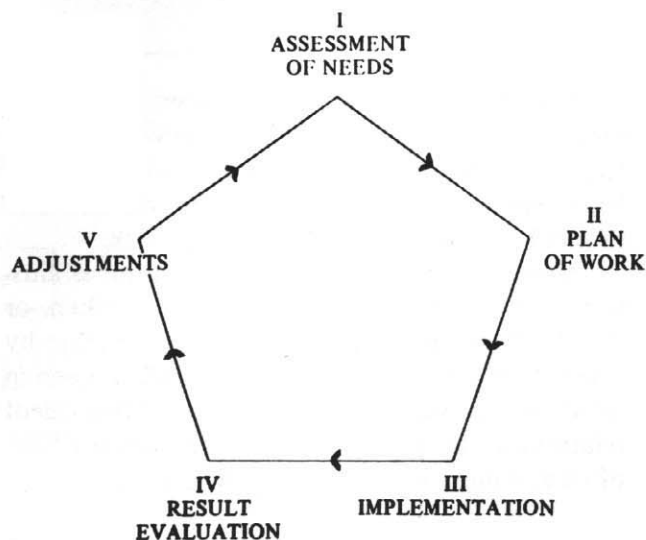
This publication addresses technology transfer as a process of extending technical knowledge, skills and research based information to targeted clientele. This is achieved through informal problem solving and action-oriented education that instructs, demonstrates and motivates the recipient.

The Cooperative Extension Service is a partnership between the government, the land-grant institutions, and the people. It is a continuing process which provides informal education for members of the community, families, homemakers, business persons and farmers. A main essence of the process is in helping clients apply the results of research and other resources to improve their lives and individual sense of fulfillment. This process also enables clients to more clearly define goals and learn skills to meet their most urgent needs now and in the future.

The basic principles of the Cooperative Extension Service are universally applicable. However, extension techniques and organizational structure need to be adapted to specific local conditions. In the Virgin Islands, the Cooperative Extension Service has been established to meet requirements unique to the islands' geographic location, microstate size, sociocultural patterns, and agro-climatic conditions.

The strength of the extension model lies in close interaction at all stages with the people being served. Since the extension educational process is a continuous one (see Fig. 2), it places strong emphasis on the professional staff working with the community to determine what the important needs are. These needs are then incorporated into a comprehensive Plan of Work for each fiscal year. Implementation is carried out in cooperation with the community which helped establish the objectives originally. Once the results have been evaluated and necessary adjustments made to insure that the problems identified were addressed and moved towards a solution, the process continues through the cycle again.

Fig. 2 THE EXTENSION EDUCATIONAL PROCESS POLYGON





## II. Extension Teaching Methods

The extension worker faces diverse teaching situations and needs, thus must choose extension activities accordingly. Teaching methods may be classified according to the categories of contacts used. Examples of extension methods classified according to categories of contacts are: individual contacts, group contacts, and mass contacts. In developing societies individual and group contacts are most important since they are personal in appeal and often result in a one-to-one communication. The "hands-on" approach is popular, for example, in such learning experiences as grafting workshops or actual demonstrations of food preparation techniques. By making these learning experiences highly visible they become more acceptable and authentic in appeal.

Table 1. EXTENSION METHODS CLASSIFIED ACCORDING TO CATEGORY OF CONTACT

Individual Contacts	Group Contacts	Mass Contacts
Site Visits	Club Meetings	Publications
Office/Lab Consultations	Leader Training Sessions	Radio and Newspapers
Telephone Calls	Clinics and Workshops	Television/Video
Letters	Seminars	Exhibits and Fairs
Result and Method Demonstrations	Field Tours	Documentary Films

The third category, that of mass contacts, is used to efficiently disseminate information to large numbers of people. Throughout the Caribbean especially, the use of radio is common and should be utilized fully in extension work.

Methods classified according to form, as illustrated in Table 2, are either written, spoken, or visual. Regardless of classification, whether by category of contact or form, it is well to keep in mind that in practice the extension worker-client relationship frequently involves the associated use of two or more kinds of extension methods.

Table 2. EXTENSION METHODS GROUPED ACCORDING TO FORM

Written	Spoken	Visual
Bulletins and Factsheets	Office Consultations	Result & Method Demonstrations
Leaflets	Site Visits	Charts
News Articles and Columns	Telephone Calls	Exhibits/Posters
Personal Letters	Seminars and Radio	Video/Television
Circular Letters and Newsletters	Conferences and Workshops	Slides, Films and Photographs

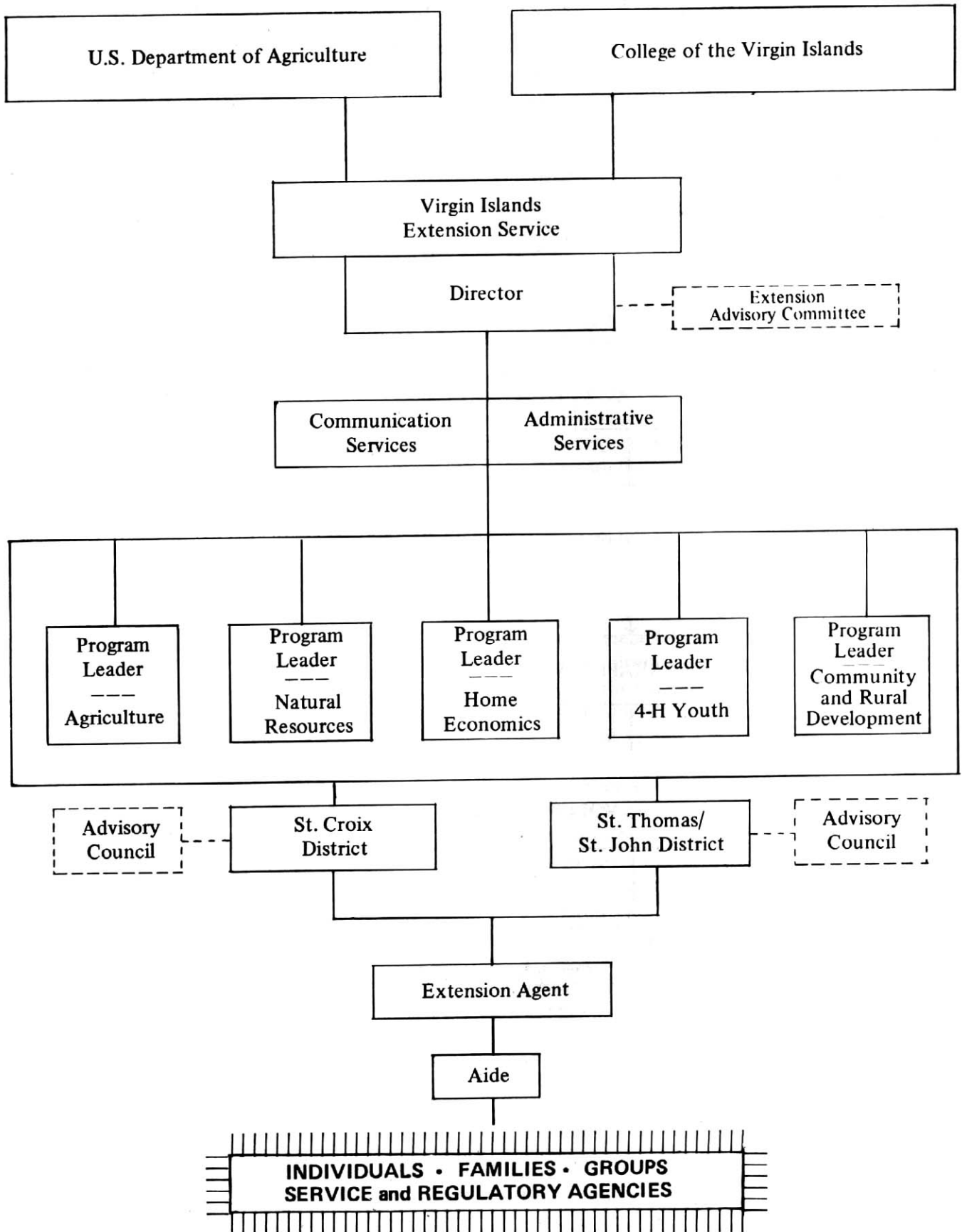
## III. Organizational Structure

The United States Virgin Islands is comprised of three major islands: St. Croix, St. Thomas, and St. John which make up the territory. In contrast to state counties in the continental United States, the territory is divided into districts. The overall organizational structure of the Virgin Islands Cooperative Extension Service is presented in Figure 3 and individual program function is depicted in Figure 4. Both can be adapted to other Caribbean islands due to similarities in biogeography, social structure and technological needs.

## IV. Functions

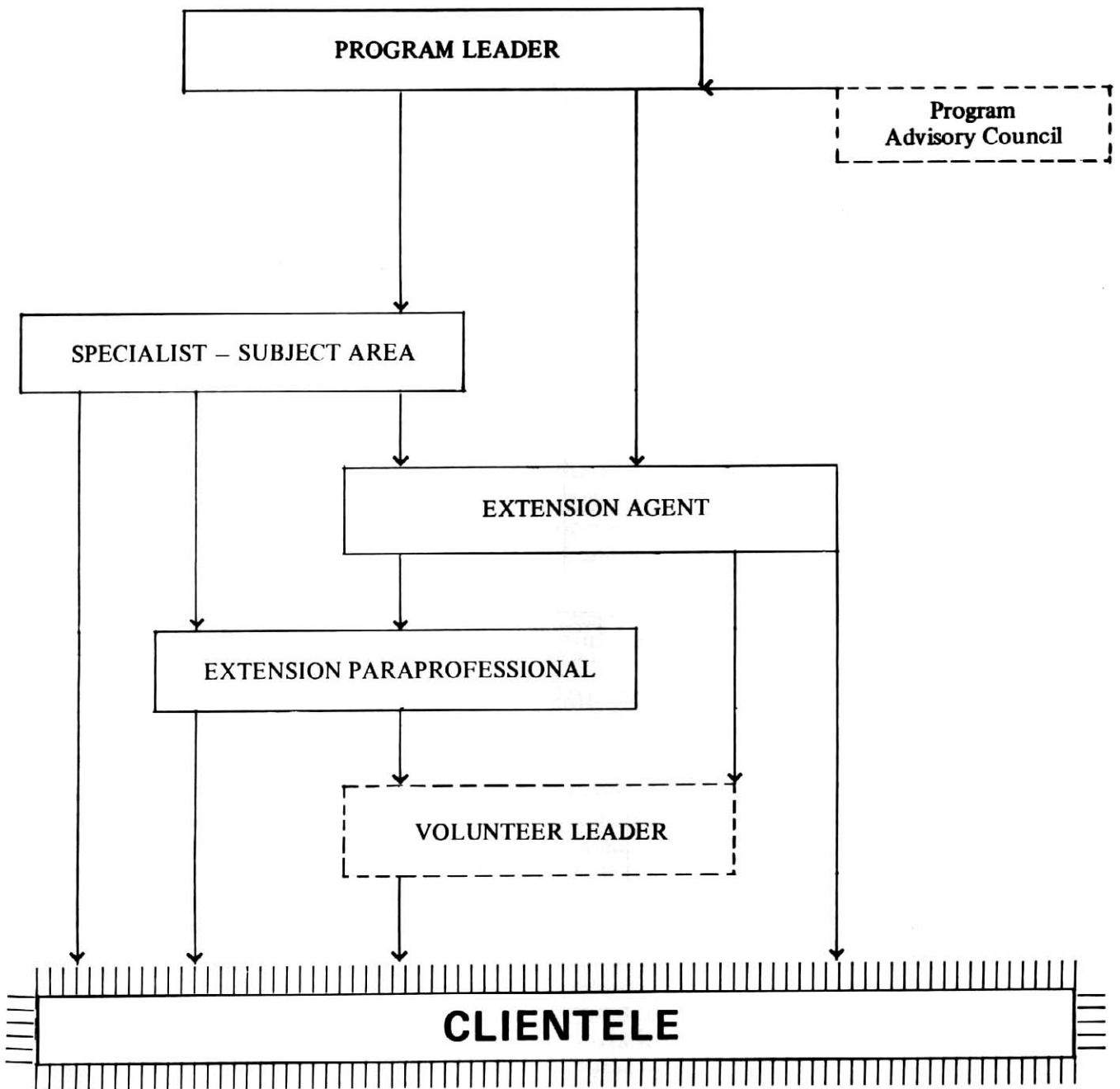
The overall functions of extension in the Virgin Islands covers a broad spectrum. Agricultural programs encourage local production through helping home gardeners, part-time producers, and commercial farmers. The community and rural development programs include education on the effective use of cooperatives, farm management systems and marketing strategies, along with the educational materials relating to economic development. Expansion and diversification of 4-H clubs in schools, housing projects and community centers is the main means by which the 4-H youth development component seeks to achieve its goals of providing skills and career-related experiences. The 4-H program also emphasizes the importance of advancing the cause of youth development in the Caribbean environment through Caribbean-wide youth conferences and exchanges. Home economics personnel teach human nutrition, family financial management, clothing construction and diverse use of local foods. The pest man-

Fig. 3 VIRGIN ISLANDS COOPERATIVE EXTENSION ORGANIZATION





**Fig. 4 EXTENSION PROGRAM FUNCTION**  
**– Reaching the Client –**



agement program focuses on public awareness of integrated pest management practices to provide the public with alternative means of pest control and to mitigate one of the main deterrents to food production. Educational materials on sand-fly control are being developed because this

biting fly is a significant nuisance both to residents and visitors. A comprehensive survey of pesticide use in the Virgin Islands and continuous training for certification of applicators of restricted-use pesticides is also conducted.

Most of these techniques and procedures dis-

cussed here could be applied to other islands in the Caribbean, with the realization that adjustments will undoubtedly be necessary according to agroclimatic conditions, levels of economic development, individual cultural patterns and expectations, and the current political scene.

#### V. Meeting Community Needs

Since its inception in 1972, the Virgin Islands Cooperative Extension Service has increasingly demonstrated that it provides a dynamic and challenging enrichment for the broad gamut of people it serves. Whether they are spouses of persons working at local industries, homemakers from housing projects, teenagers wanting to learn skills, youth looking for a neighborhood club experience, small home gardeners, cattle raisers, commercial farmers, storekeepers or aspiring business people – all are looking for additional expertise to enhance the quality of life. Evidence of this desire is dramatically demonstrated by the flourishing attendance at extension workshops, seminars, clinics and other informal learning sessions. That extension, with its commitment to research and its practical application through education, can be an exciting catalyst for a technology transfer system in the Caribbean is continually reinforced by the enthusiastic reception of its programs and transfer techniques.

#### VI. The Essentials

The effectiveness of the technology-information transfer process used by the Virgin Islands Cooperative Extension Service depends on two important features: the presence of a local technology development base which is the Agricultural Experiment Station and the utilization of local social and ecological conditions in the technology transfer. The relationship between the technology development base, extension outreach programs, and the clientele is represented in Fig. 5. It is important to point out that information flow takes place both ways. The extension worker serves as an interpreter and a conveyer of technical information from the research base to the users and conversely identifies the problems and provides feedback to the researchers for investigation of possible solutions.

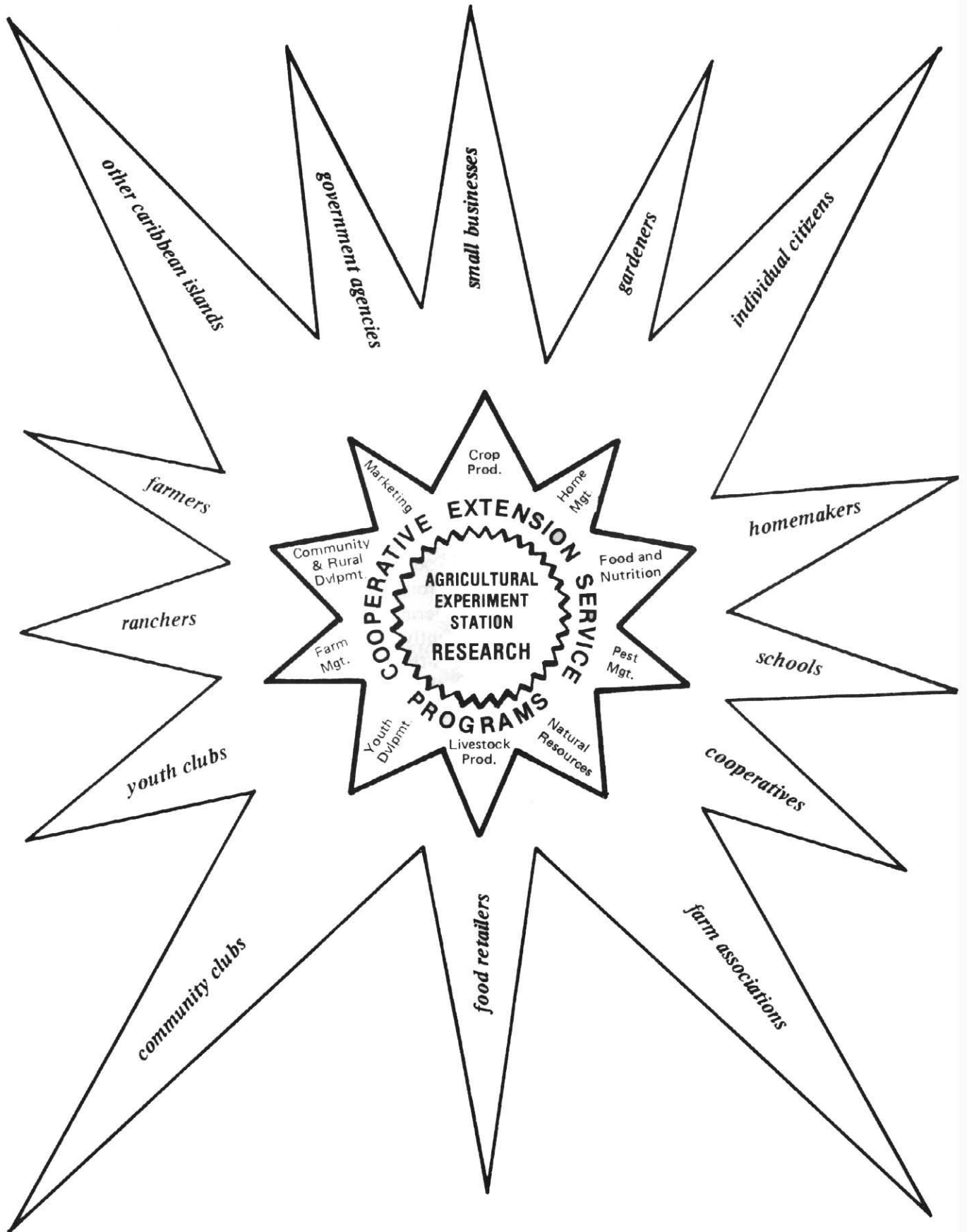
The Agricultural Experiment Station (AES) of the College of the Virgin Islands, through its

research projects in food and agriculture, serves as a continuous source of improved and adapted technology to be transferred to the Virgin Islands community by the Cooperative Extension Service. The goal of the AES is to develop food and feed production potentials of the Virgin Islands through applied scientific research based on conditions specific to the islands.

The seven areas in which the experiment station conducts research are agronomy, horticulture, irrigation technology, animal science, freshwater aquaculture, marine fish poisoning, pest and pesticide management. Agronomy research develops the potential of sorghum, forage grasses, and legumes as island-grown sources of high protein animal feeds and nutritious human food. Horticulture research involves both fruit and vegetable production studies with an emphasis on tropical crops and is designed to determine the best plant varieties and cultural practices necessary to encourage vegetable gardening and fruit culture in the Virgin Islands. The irrigation technology component addresses the development of information regarding the minimum water requirements for food crops and alternative watering schemes through irrigation and related agricultural engineering research. Animal science research is currently involved in characterizing Senepol cattle by on-the-farm performance testing and conducting other production research studies on cooperating farms such as cow, calf, and bull growth, cow efficiency, and carcass characteristics. Aquaculture researchers are developing freshwater pond fish culture systems and "back-yard" fish farming methods for the production of freshwater food fish to augment declining saltwater fish resources. The marine fish poisoning (ciguatera) program investigates the nature of ciguatoxin and seeks to define a reliable test for the ciguatoxicity of Virgin Islands marine fishes. Pest and pesticide management research is directed at diagnosing and solving pest problems with emphasis on alternative management strategies minimizing pesticide use. The benefits and risks of specific pesticides are evaluated, and the means are being developed to deal with pesticide and hazardous waste problems, applicator exposure, storage and disposal.

While the results of research projects conducted at the experiment station are disseminated to the public through the transfer mechanisms already noted, it should also be mentioned that

Fig. 5 RELATIONSHIP BETWEEN RESEARCH BASE, EXTENSION PROGRAMS AND CLIENTELE



research information is made available to the Virgin Islands Department of Agriculture as well as to other land-grant institutions throughout the United States.

The annual Agriculture and Food Fairs held on St. Croix, St. Thomas and St. John are excellent examples of the use of local social institutions as a means of imparting extension education outreach to a large audience. Carnivals and festive gatherings such as the food fairs are a vital part of the social fabric of Caribbean societies. Working together, the Cooperative Extension Service and the local Department of Agriculture each year present what is recognized as the most colorful and constructive agricultural and sociocultural event in the Virgin Islands – the three-day fair on St. Croix. A high-impact vehicle of technology transfer and educational stimulation for as many as 25,000 visitors annually, the fair features land-grant programs exhibits showing results of research on plants, livestock, aquaculture, irrigation technology and pest management methods which reflect months of creativity and hard work by the extension staff. Among the popular exhibits at recent fairs were a solar dryer for fruits and vegetables; displays on recognition of various locally important insects and how to cope with them in environmentally sound ways; bush teas of medicinal and commercial value along with homemade

bread and candies exhibited by home economics personnel; demonstrations of clothing fashions hand-created by homemakers; soybeans and other alternative feed and food crops of different varieties; appropriate minigardening methods; innovative drip irrigation technology; a hydroponic model for growing vegetables and fish in a unique combination which conserves water by recirculation and uses the fish waste as plant food; and more than 100 projects created by 4-H clubs.

#### VII. Common Challenges - Similar Goals

The food and agriculture issues facing the entire Caribbean are similar to those of the Virgin Islands. All islands in the Caribbean are striving to achieve increased food production and to find an acceptable balance between tourism, industrialization and agricultural development. All are working toward developing economic, social and educational programs to improve the quality of life for their citizens. The Virgin Islands Cooperative Extension Service conducts its public education programs to assist individual citizens as well as the community and government in achieving these goals.

Other Caribbean islands can also develop similar educational programs for the benefit of their people by adapting the Virgin Islands Cooperative Extension Service as a model.

## ACKNOWLEDGEMENT

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