THE ROLE OF EXTENSION EDUCATION AND THE CUBAN AGRICULTURAL KNOWLEDGE AND INFORMATION SYSTEM

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Abstract

This paper examines the case of the Cuban Agricultural Knowledge and Information System (AKIS) and its contributions to food security in that country. Specifically, the role of extension within Cuba's AKIS is described.

Cuba was selected purposefully as an important case to examine because 1) Cuba has pioneered a unique people-centered development model to deal with obstacles of economic scarcity, 2) the Cuban approach to extension has undergone a rapid and radical change to adjust to an external shock, 3) in terms of development indicators, Cuba compares very favorably with other Latin American and Caribbean countries, and 4) the Cuban case may have important implications for sustainable agriculture and food security in other countries.

The AKIS developed by Cuba is one in which farmers, extension services, educational centers, and research institutes interact together in a logical and coordinated manner. Such a model might appropriately be called a centrally coordinated agricultural knowledge and information system.
Introduction

Cuba is an interesting case for studying the role of extension education in food security. Due to its historical and political background, Cuba has evolved according to a unique development model. Its rapid development after the Revolution of 1959, its economic collapse after the dissolution of the Soviet Union in 1989, and the nation's subsequent struggle to become more self-sufficient created a unique situation from which much can be learned (Lane, 1999).

Food First, in its report entitled "Cultivating Havana: Urban Agriculture and Food Security in the Years of Crisis" (1999), stated that the fall of the Soviet Union in 1989 pushed Cuba into the worst economic crisis of its history. The nation was faced with the dual challenge of doubling food production with half the previous inputs such as fertilizers, pesticides and farming equipment. According to Deere (1993), during the late 1980’s, Cuba was importing from the Soviet Union 44 - 57% of its per capita caloric intake, 48% of its manufactured fertilizers, and 82% of its pesticides and herbicides. The period of 1989 - present is frequently referred to as the Special Period.

The first years of the Special Period, as stated by Moskow (1996), were extremely difficult. As food availability decreased, average daily per capita calorie consumption dropped from 2,845 to 2,275 during the period of 1989 to 1992.

Cuba made significant changes in its AKIS and government policies in response to the Special Period. As a result, in spite of having been economically challenged, Cuba has experienced an improvement in quality of life in terms of nutritional status. Also, rates of adult literacy, life expectancy at birth, and GDP per year are relatively high, and the infant mortality rate is low. The following table displays five development indicators for Cuba.

<table>
<thead>
<tr>
<th>Nutrition Rate</th>
<th>Infant mortality rate</th>
<th>Adult Literacy</th>
<th>Life expectancy at birth</th>
<th>GDP per capita**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily per capita supply of calories</td>
<td>(per 1,000 live births)</td>
<td>Rate</td>
<td></td>
<td>1998 est.</td>
</tr>
<tr>
<td>1996*</td>
<td>1997*</td>
<td>1999*</td>
<td>1977*</td>
<td>$1,560</td>
</tr>
</tbody>
</table>

| 2,357 | 7 | 98% | 75.7 | $1,560 |

**CIA- 1999 The World Factbook.

The Food and Agriculture Organization (FAO) of the United Nations, in its report "The State of Food Insecurity in the World 1999," said that, in spite of its problems, Cuba remains prosperous and well fed compared to other countries in the Caribbean and Central America. More than half of the country's roads are paved and 90% of the population have access to safe water. These percentages are higher than those in Central America. For instance, in Honduras 20% of the roads are paved and 60% of the population has access to safe water (Chavez, 2001). In Costa Rica, one of the region’s most developed countries, 75% of its population has access to safe water.

Food First (1999) adds to this discussion that urban agriculture has been a key part of this effort. The growth of this type of agriculture is due to Cuba’s commitment to supporting aspiring urban farmers by making unused urban and suburban land and other
agricultural resources available to them. This unique model of development has important implications for sustainable agriculture and may serve as a lesson for other countries seeking to achieve food security and sustainability through the planned and efficient use of both human and agricultural resources.

**Purpose of Paper**

The purpose of this paper is to describe the role of extension in the Cuban Agricultural Knowledge and Information System (AKIS). It addresses the general area of effectiveness of the AKIS in contributing to Cuba's food security.

Cuba was purposefully selected as an important case to examine because 1) Cuba has pioneered a unique people-centered development model to deal with obstacles of economic scarcity; 2) the Cuban approach to extension has undergone a rapid and radical change to adjust to an external shock; 3) in terms of development indicators, Cuba compares very favorably with other Latin American and Caribbean countries; and 4) the Cuban case may have important implications for sustainable agriculture and food security in other countries.

The role of extension education within the framework of the AKIS is of critical importance as we work to understand how best to serve societal needs. This study addresses several questions:

1) How is the role of extension conceptualized in Cuba?
2) Who provides extension services and how are they organized?
3) How does extension relate to other components of the AKIS?

**Theoretical Framework**

**Agricultural Knowledge and Information Systems**

According to Senge and Lannon-Kim (1990), systems thinking is a discipline for seeing wholes, recognizing patterns and interrelationships, and learning how to structure them in more efficient ways. Röling and Engel (1990) introduce and describe the importance of the recognition of the agricultural knowledge and information system as a means of understanding and improving the development and transfer of technology and information to be used by agriculturists. The phrase agricultural knowledge and information system is defined as the set of organizations and/or persons, and the links and interactions between them that are engaged in, or manage such processes as the anticipation, generation, transformation, transmission, storage, retrieval, integration, diffusion, and utilization of agricultural knowledge and information (Röling, 1990).

**Extension Education**

According to Röling (1990), the extension education concept has different definitions depending on the context and culture where it is applied. This makes its definition and usage ambiguous and imprecise. For instance, in the United Kingdom, Germany, and Scandinavia, the focus of extension is on advisory work, i.e., on solving specific problems, while in the United States, extension traditionally has used an educational approach to teach people to solve problems by extending information.
In the Netherlands, the term *voorlichting* is used in extension. It means to keep the light in front of someone to allow him or her to find the way. In France, the term *vulgarisation* is utilized to indicate that extension attempts to simplify information so that it is understandable by the ordinary people or "vulgus." Reactions against the "top down" implication of these definitions have led to many "counter-terms" such as those introduced by Freire in 1973 (e.g., "animation," "mobilization," and "conscientization").

As pointed out by Röling, differences in terminology are not the only source of confusion. Political and other traditions have made a considerable contribution. Extension is expected to achieve different purposes depending on the policy tradition in which it functions. Informative extension, for instance, is used in a conservative traditional context. In this form, extension is seen as an instrument for helping people make considered choices among alternatives which extension has provided to make optimal decisions with respect to achieving their own goals. People are free to use or not to use the extension service.

On the other hand, in the socialist and Christian tradition, extension is seen as an instrument to achieve emancipation and an uplifting of the poor. Paolo Freire has called it emancipatory extension, or "a pedagogy of the oppressed." In this paradigm, extension is utilized for achievement of societal objectives and for correcting structural problems. In both traditions, there is a considerable emphasis on the use of extension for the development of the human being. This could be called "formative" extension or "human resources development." Governments have also used extension as a policy instrument ("persuasive" extension), to achieve societal objectives, inducing preventive behaviors related to the environment, health, and crime. In countries where persuasive extension is utilized, it often serves as an instrument to achieve policy and export goals, national food security, and inexpensive food supplies for urban workers.

After analyzing these different approaches, Röling tries to integrate points or descriptions where these approaches coincide. He defines extension as a professional intervention deployed by an institution to induce change in voluntary behaviors with a presumed public or collective utility (Röling, 1990, pp 36-38).

Engel (2000) in his article "Facilitando el desarrollo sostenible: Hacia una extension moderna?" also recognizes that extension has different interpretations depending on the audience and the geographical region. He mentions that the Inter-American Institute for Cooperation on Agriculture (IICA) in 1997, defined the universe of technical services as "The Technology Transfer, Technical Assistance and Agricultural Extension Complex," suggesting that there are many different connotations to the word "extension."

FAO (1998) also provides a description of eight different approaches to the same agricultural extension phenomenon. Although each of these approaches are different, they share some characteristics such as: all function through non-formal education, all have content related to agriculture, all use communication techniques and aids, and all seek to improve the capabilities of rural people.

**Methods and Data Sources**

This paper is based on field research conducted in 2000 and 2001. To conduct the study, a qualitative research methodology was utilized to understand the role of extension.
in Cuba's AKIS. Specifically, a case study methodology was utilized. A literature review preceded focus group and individual interviews with persons engaged in the Cuban AKIS, including farmers, educators, and government and non-governmental staff. Interviews were audio tape-recorded and transcribed. This paper is an initial research product.

Results and Conclusions

How is the Role of Extension Conceptualized in Cuba?

In defining the word extension, interviewees stated that there are a number of terms that refer to this concept. Some of these are technical assistance, training, extension plan, and introduction of achievements. For most interviewees, the semantics are not important; what really matters is the essence of the extension work. There was general consensus that the aim of agricultural extension is to improve agricultural production to feed the Cuban population. As such, the role of the extension service is to provide information and training to all levels of agricultural producers. Particular attention has been placed on the Province of Havana City, where the worst food crisis was felt in 1993. But, services are also offered to Basic Units of Cooperative Production (UBPC), individual farmers, Cooperatives of Credit and Service, hospitals and to all the individuals involved in these organizations. These levels of organization were created and encouraged by the Government as a way to make agricultural production more efficient. Producers at each level learn how to produce nutritious food utilizing low levels of inputs, manure, worms, and adapted varieties.

Who Provides Extension Services, How is the System Organized, and How Do the Various Organizations Relate?

To achieve the goal of food security, many actors are involved as mentioned above. Extension services in Cuba are provided by research centers, educational centers (agrarian universities and polytechnic institutes), the Ministry of Agriculture, agricultural stores, and non-governmental organizations.

For instance, research centers such as the Institute of Basic Research for Tropical Agriculture (INIFAT), and the Pastures and Forages Research Institute consider that their mission is accomplished when they extend their research findings to technicians and farmers through workshops, field days and demonstrations. They believe that their job is not complete until this extension phase is finished. INIFAT scientists consider that conducting extension activities does not present an obstacle to pursuing their research agenda. They feel that by engaging in extension activities they obtain direct feedback in regard to their findings from farmers and agricultural entities. This feedback guides their current and future research activities, ensuring greater relevance and efficiency.

There are research institutes that have recently become aware of the need to direct their research activities to solve particular problems of the community. This is the case with the Forestry Research Institute. This institute is very interested in learning about participatory methods to detect needs in the communities, and to become engaged in the AKIS. Other institutes and organizations also share this desire to learn more about extension and participatory community approaches. Since urban agriculture is a relatively
new way of farming, some research institutes are in the process of developing programs for
cities. For example, the Soil Research Institute will implement a soil conservation plan for
Havana City to avoid degradation of this resource. Also, most of the research centers’ scientists
are adjunct professors of agrarian universities. This is a very important link, because these
scientists are able to share current issues with their students.

The Ministry of Agriculture is the entity that organizes, regulates, and systematizes the
extension services through its Directorate of Science and Technology office. This approach is
relatively new, and was born out of necessity to provide a well-planned service to producers,
and to avoid misunderstandings in regard to technical advice and decision making.

In November, 2000, the National Commission for Extension Education was officially
initiated. This Commission integrates the majority of research centers, some educational
institutions, some Cuban NGO's, and the Directorate of Science and Technology. The
Commission established a new framework in which greater interaction among those providing
extension services is expected and in which the Commission serves as a regulator of the whole
system. However, as stated by one of the interviewees, Cuba has had many extension models
before, and the organizers of this new system should consider these previous experiences.
He/she feels that more discussion is needed to obtain an agreement among the members of the
National Commission. Besides, as observed by the researcher, some NGO’s, farmers’
representatives, and universities did not attend the meeting where the Commission was
inaugurated.

In the 1990’s, the National Group for Urban Agriculture was created to support
agriculture in the cities with a special focus on the populated area of the Province of Havana
City. This National Group is coordinated by the Institute of Basic Research for Tropical
Agriculture. This institute has also trained farmers and technicians in other regions of Cuba.

One of the National Group's programs consists of determining what types of vegetables
need to be consumed to improve the diet of the Cuban population. The goal is that Cubans will
not only consume the 300g of vegetables daily as suggested by FAO specialists, but also a
healthier diet composed of a variety of vitamins and minerals. The National Group is jointly
working with the Ministry of Public Health to achieve this goal. When they finish this
investigation, they will share their findings with extension workers, as well as with the rest of the
population, so the growth and consumption of these vegetables can be implemented. Scientists
are aware of the need to change some food habits among the population. For instance, many
Cubans do not like to consume broccoli, a vegetable with considerable nutritional value. They
plan to start with a national campaign to teach the population about the nutritional content of
foods, and methods to cook and preserve them.

The Ministry of Agriculture has also created 23 agricultural and livestock sub-programs.
The objective of these programs is to encourage agriculture and animal production in the cities.
There is also a forestry program called "Mi Programa Verde" (My Green Program). The
government selected this name to promote ownership of the program, and to encourage people
to really get involved and develop an awareness of the need for a better and cleaner
environment.
It is important to point out that the Cuban AKIS has opened itself to new ideas and components. For instance, as a representative of a religious NGO pointed out, it was not until the crisis began that the participation of this organization was accepted by both the Government and the rest of the population. It was hard for Cubans to accept that churches can also play an active role in the AKIS. This NGO has provided many training courses and workshops and has produced educational material used by farmers and technicians. Its participation has helped to strengthen the agricultural system.

Ironically, even though extension services are provided by many institutions and involve many people as staff members in these institutions, there are not very many people trained in the specialization of extension education. Currently, extension graduate courses are not being formally taught at universities. However, bachelor’s degree students do gain some practical extension experience during their last two years of schoolwork. These students develop and implement, along with farmers, some community projects as a way to carry out outreach activities to improve agricultural production in both rural and urban areas.

Moreover, the experience of the Special Period has shown that extension activities are not easy to sustain without personnel specialized in extension education. In the year 2000, and as a response to this need, the Agrarian University of Havana graduated its first three undergraduate professionals specialized in extension topics (all of them are women). The program was specially designed for them. These professionals are currently working in different regions within the country. Also, undergraduate and graduate programs have been reviewed and updated to include topics that can prepare professionals to deal with current agricultural issues.

The role of farmers in the AKIS is fascinating. They also have an important and an active role in extension activities, not only as recipients of ideas and technologies, and as producers, but also as promoters of their experiences. They share these experiences with other farmers through visits, demonstrations and workshops in their own places.

Summary

When the Soviet Union collapsed, Cuba’s economic well-being and national security were seriously challenged. Nevertheless, the commitment of its citizens has been one of the reasons the population has survived and shown improvement in key indicators, as confirmed through interviews and a review of external and internal reports. Furthermore, the high level of education and creativity of its population, along with its awareness of the necessity of having a system where every element works in an interactive way, have helped Cubans to find alternatives to efficient food production. Interviewees shared that it has not been easy to succeed during the Special Period. There are still many challenges to be solved. They have learned that they need to have a well-organized extension system and an efficiently functioning communication system to be able to improve their economic well being and food security. Keeping an open mind is also important to allow other actors to become engaged in the AKIS.

The AKIS developed by Cuba is one in which farmers (with their indigenous knowledge, experience and willingness to share their thoughts and ideas), extension
services, educational centers, and research institutes interact together in a logical and coordinated manner. The Cuban model of extension does not really fit any of the models suggested in the literature. This type of integrated agricultural and information system represents a model to be considered by the rest of the world to help promote environmental sustainability and food security. Such a model might aptly be termed a Centrally Coordinated AKIS Model.

The Cuban extension system has proven to be flexible and proactive in adapting to changing trends. It responded to an external shock and rapidly adapted to new circumstances. The system has also benefitted from support from government policy makers, open and continuous communication among all the members of the AKIS, and active participation by citizens in contributing to the country’s food security system. Particularly impressive is the level of commitment that the Cuban government has shown toward maintaining the well-being of its population through its response to the Special Period.

**Bibliography**


