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Review Note

Promoting food security through education: Some examples from the Caribbean

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Introduction

World population is expected to reach nine billion by 2050. Most will be born in developing countries and in world rural areas. The rapid increase of the world's population brings a new set of issues, such as global food insecurity, while development institutions are called to take quick action for strengthening local food systems. In this framework, education can be used strategically in fighting food insecurity and dealing with other social issues. In the Caribbean, special agricultural education programs are considered a valid addition to traditional education in the primary, secondary and tertiary institutions. (Kelly and Pemberton 2016).

In the specific Caribbean reality, large imports of food; accelerated soil erosion; limited presence of precious natural resources such as fresh water; loss of traditional agricultural skills and loss of indigenous nutritious crops have been factors prolonging the agricultural under-development of this region (Kelly and Pemberton 2016). In this context, food security strategies offer a valid set of options that include agricultural education as an element. (Vallianatos, Gottlieb and Haase 2004; Webster, Ganpat and Banya 2008). This note is a brief review of three programs through which stakeholders acquire a practical knowledge of farming techniques, food policy, and nutrition issues.

Promoting agriculture and food security through education programs is trending in the Caribbean. Meanwhile, concerns about food insecurity have increased in Latin American and the Caribbean, in the last two to three decades. National governments and international organizations have helped address food security issues. Agricultural extension and advisory services in the Caribbean are a

still a necessity (Ganpat, Badrie, Walter, Roberts, Nandlal and Smith 2014). In addition, there is a renewed interest in the practice of agricultural education, as a strategic factor for food security.

Program 1: Agriculture and nutrition education in Nicaragua

Nicaragua is the second poorest country in the western hemisphere. The lifetime risk of maternal death in Nicaragua is high and the majority of Nicaragua's unprivileged live in rural communities, where the access to basic services is difficult, due to the distance from urban centers and facilities, such as schools and hospitals (van Lonkhuijzen, Stekelenburg and van Roosmalen 2009).

Women from rural Northern Nicaragua are served by maternity waiting homes. These government-funded health institutions provide temporary residence for high-risk pregnant women in the poorest regions in Nicaragua, with extremely high maternal mortality rates. The main goals of these institutions include:

- reducing maternal and infant mortality and allowing rural mothers with high-risk pregnancies to be closer to the regional hospital; and
- providing care, education, and accommodation, in the weeks before and after labor.

Thus, at these maternity waiting homes, expectant mothers are close to needed medical attention, which would be difficult to access from their rural family units. The program works on a volunteer basis (Pardo and Cortez 2012).

The majority of women who stay at maternity waiting homes are refugees or farmers working in cooperatives. The women come approximately one week before their due date and after their deliveries, they return for four to six days, to rest and learn more about newborn care. Maternity waiting homes offer women educational opportunity, via participatory and indirect learning. . While at the waiting homes, the pregnant women help with the cooking and gardening as part of the educational aspect of their stay. Maternity waiting homes offer courses on nutrition and basic agriculture, among others. This agricultural education program teaches women to grow food from seeds and prioritize fresh produce, as a part of a budget-friendly and healthy way to build food self-sufficiency for the family (Friedman 2008).

Program 2: Farm-to-School program in the U.S. Virgin Islands

The Farm-to-School program for children in Saint Croix, the U.S. Virgin Islands is the result of a partnership between the Department of Education, the Department of Agriculture and the Virgin Islands Good Food Coalition. Farm-to-School focuses on issues related to the nutrition of school-age children and local food security. The program includes food procurement, nutrition education and school-based gardens as educational tools (Larsen and Lilleor 2014).

The main driver of this program in the U.S. Virgin Islands was the need to strengthen and consolidate local food systems, as part of a strategy to increase food security in the Virgin Islands. This has a broad and non-traditional perspective. Farm-to-School is an instrument seeking to change consumption patterns by educating people to adopt a diet consisting of locally produced food, or to reduce diet-related health issues and boost economic development. Also, Farm-to-School is a tool to increase community awareness of the perils associated with living on islands that are vulnerable to climate change. (S. Sibilly-Brown, personal communication, May 2016).

Considering food security in light of environmental change could be the turning point for agricultural education programs in the U.S. Virgin Islands, which are subject to environmental risk, and sometimes cut off from basic food supply during tornadoes and droughts. This is important for islands which import 98 percent of their food, as they possess limited freshwater and land resources (Pelling and Uitto 2001; Giliberti and Lindner 2016). Major challenges of the program are funding and teacher buy-in (Goff, Lindner and Dolly 2008).

Program 3: Agricultural Education in the Bahamas

The Bahamas is a country composed of 700 islands. The largest among those islands is Andros. The island offers half of the acres of farmland throughout The Bahamas. The Government of The Bahamas is setting strategic goals for Bahamian sustainable development. The local economy is still dependent on revenues coming from the tourist industry. However, agriculture is seen as a strategic sector, which can impact local socio-economic development. The risks associated with food insecurity are paving the path toward a comprehensive re-thinking of the agricultural sector of the islands, which are almost entirely dependent on food imports (McElroy and Albuquerque 1990).

In such a context, governmental institutions are taking action toward setting the agenda for the nation's sustainable development. The path to sustainability will be enlightened by a set of agricultural policies, which include the reconsideration of agriculture as a strategic sector for the country's sustainable development. Being the largest among the islands of the archipelago, Andros will have a role in changing agriculture in The Bahamas. More specifically, Andros' farmland could be utilized to reduce the high cost of food security in the country (\$1 billion per year) (Ministry of Finance of the Commonwealth of the Bahamas 2017).

In order to implement the ambitious sustainability agenda, the Government of the Bahamas identified the need for funding education in agri-business in North Andros, by promoting an agricultural curriculum based upon participatory learning, and by encouraging interactions between high school students and the local institutions, such as the Bahamas Agricultural and Industrial Corporation. This developmental initiative was established as a business incubator that promotes business activities, sustainable land use practices and sustainable development of local agriculture. The Government of the Bahamas has funded North Andros High School, to lead a pilot agricultural education program. *The primary goal of the program at the North Andros High School is fighting food insecurity and malnutrition at the local level via creating, and preserving sustainable agricultural gardens* (Webster, Ganpat and Cester 2013). The gardening program, which has been in existence for over ten years, is growing due to international and regional support (from institutions such as the European Union, International Fund for Agricultural Development, Technical Centre for Agricultural and Rural Cooperation, Caribbean Community and the Caribbean Development Bank). This shows the vitality of the project, which is also showing an indisputable ability to attract funding and the necessary attention, that may contribute to the long-term sustainability of such an enterprise.

Discussions

Bahamian agricultural educators and practitioners will need to develop strategies which improve experiential learning and facilitate technology transfer between research centers, schools, farms and the community as a whole. The program's main goal of rethinking Bahamian agriculture via participatory endeavors may be achieved by adopting a strategy of informal education within the normal school curriculum. In this case, the school garden can be a place of encounter between different stakeholders interested in fighting food insecurity in the Bahamas.

Nicaragua's maternity waiting houses offer an opportunity for international education for U.S. students enrolled in agricultural education programs and for students of landscape architecture. The grounds of the maternity houses appear to be under-utilised, due lack of proper design. Usually the maternity waiting houses are established in a semi-rural area that provides enough space to grow a food garden. This garden can incorporate a playground, in which women can learn to grow their own food, while spending time with their children. Moreover, a maternity waiting house, and its garden, may be used to grow traditional crops that evoke the memory of the indigenous landscape.

In the case of The US Virgin Island's food security program, a more broad reading of the food security issue in light of environmental change may extend the scope and reach of the program, while favoring links between the program and supra-national development organizations.

The Nicaraguan program was specifically designed for adults, and it targets a specific vulnerable population. The program promotes health and nutritionally sustainable practices and education. The program in the Virgin Islands is designed for children. However, it promotes the idea that agricultural education is an agent for the development of the community as a whole. The Bahamian program targets high school students. The program focuses on the idea that agricultural education is an agent of economic development and that young agriculturalists are leaders capable of having significant roles in reshaping the local economy. The program stresses the importance of tightening the cooperation between national and supra-national development agencies, as well as local stakeholders' participation in the sustainable agricultural development process (Lindner and Dolly 2013).

In the most successful case among those here illustrated (the case of the U.S. Virgin Islands), the institutional presence has contributed to the linkage of the schools and farms via agricultural education. However this linkage has not been able to guarantee the sustainability of the program, whose future has been made uncertain, by the disinterest of teachers in incorporating the school garden into the school curriculum (S. Sibilly-Brown, personal communication, February, 2016).

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