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Panama: The Necessity of Extension in the Integration of Sustainable Agriculture & Technologies

Panama is a mountainous country located on the isthmus between Central and South America. Located between the Tropic of Cancer and the equator, Panama has many jungles and rainforests, as well as a large diversity of plants and animals. Traditionally, Panamanians have used slash and burn farming techniques for centuries. Slash and burn agriculture, when used for long periods, will lead to soil fertility loss, erosion, and a loss of biodiversity. These effects of slash and burn agriculture place a large burden on the smallholder farmers in Panama. Most Panamanian farmers are subsistence farmers; they only produce what their family will need, and what little they have left over they sell for a marginal profit. These farmers make decisions based on the needs of their families, and fell the risk of changing their farming practices. Many are not willing to risk the health and nutrition of their families for only a slight increase in production. Unfortunately, smallholders in Panama are starting to see the byproducts of slash and burn agriculture. As slash and burn techniques continue the fertility of the soil decreases, meaning decreased yields and less food for their families.

In 2000, the United Nations adopted the Millennium Declaration. This declaration of a series of eight goals is a commitment to better the lives of the one billion poor in the world. Of the eight, Panama has struggled to meet the demands for environmental sustainability (United Nations). One of the ways Panamanian can accomplish this goal is through sustainable agriculture.

Farmers in Panama, who are experiencing the ecological side effects of slash and burn, have the opportunity to increase their harvests and conserve their environment by integrating sustainable agriculture. Sustainable agriculture development is, as defined by the Food and Agriculture Organization of the United Nations, (FAO):

Sustainable Development is the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry, and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable (FAO).

Sustainable agriculture consists of many agricultural technologies. These technologies include, but are not limited to: agroforestry, rotational grazing, no-till, contour tillage, reduced tillage, cover crops, crop diversity, crop rotation, nutrient management, and weed management (Fischer and Vasseur 2002) (SARE (Sustainable Agriculture Research & Education (SARE))). Sustainable agriculture, when integrated correctly, will increase harvest yields, improve the local environment, and secure a future investment into the farmland for years to come (Cochran and Bonnell). Currently, many models for the successful implementation of sustainable agriculture have been proposed, but only one method stands out. The promoter or farmer-to-farmer method would benefit Panama the most because of the importance of family and friends in the Panamanian culture (Bunch) (Cochran and Bonnell). This model uses farmers that their communities view as influencers. Government and environmental agencies train these farmers in leadership, outreach, and multiple sustainable agriculture techniques that would benefit their specific communities and regions. Once their training is finished, the smallholder farmers return to their village and implement the sustainable strategy on a model farm. Then, the trained farmers will lend their knowledge to their neighbors through the spontaneous sharing of knowledge (Cochran and Bonnell).

Although the promoter method, as well as many others, is implemented in Panama, farmers in Panama are reluctant to switch to sustainable agriculture techniques (Tschakert, Coomes and Potvin) (Bunch). According to a study done by Cochran & Bonnell, 75 percent of farmers interviewed practiced slash and burn, while only 21 percent practiced only sustainable agriculture. The smallholder farmers have many reasons for this.

First, smallholders in Panama are reluctant to change. The Panamanians have used slash and burn, or related techniques, for centuries. Tradition is an important part of Panamanian culture. Farmers in Panama have been relying on relatively simple agriculture, and now that the population of Panama has been growing very rapidly, farmers are using the same techniques, just implementing them on a larger scale. Since farmers use land that was previously rainforest and jungle, they must clear larger fields from the forest. This in combination with the fact that most slash and burn farmers only use their fields for two and a half years (Cochran and Bonnell), leads to a faster deforestation rate in Panama. Ecological impact plays a huge part in providing for the malnourished; everything from food price to the demand on the food supply relies on how much food is produced and how economical it is to do it.

In addition to tradition, many Panamanian smallholders have misconceptions about sustainable agriculture. They believe that sustainable development is more work, more expensive, and requires more equipment. None of those misconceptions hold true. While sustainable agriculture may take more work initially, after using those techniques consistently, less work was required to maintain the yields and quality of crops seen the first year of using a new field. In addition, while it is true that some sustainable techniques require a start-up cost, very few of them carry a cost to continue using them.

Misconceptions like these turn farmers away from using sustainable agriculture techniques. When, in reality, sustainable agriculture is very beneficial to the farmers both financially and ecologically. The benefits produced by sustainable agriculture outweigh the drawbacks. Once sustainable techniques are integrated into smallholders' routines, the farmers will see increased crop production, increased nutritional value of the crops, and the immediate environment will be healthier. Farmers can integrate sustainable agriculture by rotating crops. Smallholders in Panama cultivate a wide variety of crops, for example, they farm corn, rice, bananas, sugarcane, and coffee (Central Intelligence Agency). It would be relatively easy for a farmer to create a field rotation with corn and sugarcane every other year. Agroforestry would be a more viable alternative to crop rotation because of the banana and coffee trees. Agroforestry is a process where farmers deliberately plant trees along side crops in the same field. The trees provide fertilizer, medicine, fuel, timber, and living fences for livestock. Trees also help retain the soil to prevent soil erosion (Fischer and Vasseur) (Bunch).

Some smallholders in Panama are making the switch to sustainable agriculture out of necessity. Land, in some regions, is scarce (Tschakert, Coomes and Potvin). The lack of farmland and the growing population puts pressure on farmers to produce crops more efficiently and effectively. Unfortunately, there is a lack of extension available to the public about sustainable agriculture. This creates a problem with smallholders. They must integrate sustainable agriculture techniques but the farmers do not know how. This is the one problem with the promoter, or farmer-to-farmer, method: only a few select farmers know the specifics of the techniques that agricultural specialists deemed beneficial to that region.

Since knowledge of sustainable agriculture techniques is limited, and Panamanian farmers rely heavily on tradition, smallholders are more likely to remain using slash and burn for their farming ventures. With this continuation of improper and inefficient techniques, farmers in Panama will not produce enough food for the entire population, leading to the import of staple foodstuffs, which Panamanians have already started (Central Intelligence Agency). Once the population begins to import food, it is very difficult for farmers to regain their market share.

One way to combat the lack of knowledge available to the farmers would be to create a supervisory board that distributes information on the application of sustainable techniques. This board would interview local smallholder farmers and address regional problems of agriculture. This would be a time and money-consuming venture, but it would greatly aid farmers in their sustainable agriculture ventures.

Farmers are faced with difficult decisions by trade. Questions like when and what to plant have plagued farmers for all of recent history. Agricultural extension currently plays a pivotal role in the lives of many American farmers. Extension programs provide farmers with powerful research that empowers farmers to make the best decisions possible (Iowa State University Extension). A national extension program would be extremely beneficial to the smallholders in Panama because it would provide vital agricultural information to the farmers, allowing them to make informed decisions on their farms.

For the extension program to be successful in the integration of sustainable agriculture, a few things are required. Extension programs are expensive, and the program must have the funding needed to finance specific projects. The Panamanian government would need to be involved with federal funding. In addition, a research body is very helpful in the experimentation and implementation of new sustainable agriculture techniques. A local university specializing in an agricultural field would be beneficial to the program. The University of Panama would be an ideal location for the extension. A board of agricultural experts must be involved with the program and its services to make it a viable and credible source. The board would direct the extension program in a direction where the program would be relatively independent of the university and of the Panamanian government, as not to create bias. However, it will take more staff than the experts to run the program. A well-equipped field staff is essential to the productivity of the extension program. This staff would be involved in the equipping of the local smallholder farmers and in the research of sustainable agriculture techniques ideal to an area. This staff should be experienced in agricultural production and trained in outreach and leadership skills. The extension program must also have local presence near the smallholders, where farmer training and information workshops would take place.

An extension program would allow international research organizations, such as the FAO or the Sustainable Agriculture and Rural Development (SARD), to perform research in a more organized and purposeful manner. The extension program would guide the research institutions in ways to best observe the smallholders; areas where the use of sustainable agriculture is relatively new and could assist the farmers.

To create such a program would require the collaboration of many important leaders and elected officials. The Panamanian government would play a key role in the creation of such a program. The extension program would benefit the government more than it would hinder it. The benefits of the program would be increased crop yields and a more sustainable environment. The time invested by the government would be an extremely worthwhile venture for the entire nation of Panama.

Another important venture for the increased use of sustainable agriculture would be the continuation of the promoter or farmer-to-farmer method of integration. The method, although it has its flaws of being available to a limited population, will continue to be a successful part of the initiative for environmental sustainability. Ways to improve the system would be to provide government funds and resources to the international agencies that provide the skills and are involved in the promoter model. In addition, more of the innovative farmers could be used in the program, increasing its capacity and widely spreading the use of sustainable agriculture and its techniques. In addition to this method, the introduction of an effective extension program would provide many opportunities for the smallholders of Panama to integrate sustainable agriculture techniques in their farms.

The importance of the introduction and continuation of these ideas would provide Panama with the ability to create a healthier environment on its own power. With the addition of these organizations the country of Panama would be well on its way to reaching the Millennium Development Goal of environmental sustainability.

The world today is founded on information. The key to the success of the integration of sustainable agriculture technologies is information and the access that local farmers have to it. The knowledge of sustainable agricultural techniques will determine how successful Panama will be in its quest for a sustainable environment. The creation of an extension program is vital to the efficiency of the smallholders in Panama.

Smallholder farmers in Panama will have the opportunity to integrate sustainable agriculture into their farms and lives with the help of the extension program and the farmer-to-farmer method of knowledge diffusion. The lives of the farmers and their families will vastly improve when they have fully integrated to sustainable agriculture because they will be producing more food at a lower cost and their environment will be cleaner, healthier, and more diverse. The amount of food produced in Panama will increase, providing economic stability. Sustainable agriculture will eventually be integrated into all farms in Panama. The aid of extension programs, international research organizations, and the Panamanian government will greatly speed this endeavor.

Smallholders in Panama have struggled to stay current on the technology and techniques they use on their farms, and the addition of extension programs will enable farmers to make informed decisions involving their farms. Farmers will be able to use sustainable agriculture techniques to develop their farms financially and environmentally. Their farms will become more stable and produce more food, and that food will have a higher nutritional content. Not only will the farmers be informed; the public will be as well. When a government takes on a project, the public is involved in every step of the process. The population in Panama will have a better understanding of local food production and the resources that make it necessary.

Panamanians are well on their way to achieving a sustainable environment. Nevertheless, this process will take time, and perseverance is necessary to see the integration of sustainable techniques take place on all farms in Panama. With the aid of international organizations and the Panamanian government, we can see this take place in time for the Millennium Goals to be achieved in Panama.

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