Gwen Varley, Student Participant
West Central Valley High School
Stuart, IA

Sustainable Agriculture in Honduras

On March 8, 1968, William S. Gaud gave a speech before the Society for International Development at the Shoreham Hotel in Washington, D.C. He spoke of an exciting future for the world of agriculture. Indeed, astonishing events had recently come to pass. All over the world, countries were reporting record-shattering harvests. Poor farmers were sowing what must have seemed like magic seeds and reaping crops in abundance. Because of the work of a few scientists, millions were delivered the dream of a full stomach. It seemed the agricultural world was on the brink of something truly pivotal, and Gaud had a fittingly inspiring name for it – "the Green Revolution."

Today the world is a very different place than that of nearly forty years ago. Global warming is sending the environment on a tumultuous roller coaster ride. Populations are exploding unchecked. The relentless scourge of AIDs continues to torment entire nations. Cities are growing more densely populated as massive acreages are tended by a sparse few.

The Green Revolution, too, has had time to age, and it is not isolated from the influences that are changing our world. The predicted widespread resolution of hunger was seen in many places around the world, but more adverse effects have begun to appear, also. Through the acceptance of the tremendous benefits wrought by a few varieties of crops, farming has quickly become a monoculture with low tolerance for diversity. The soil which housed these new plants has begun to suffer, losing nutrients because of a lack of sufficient recovery time or fertilizer, and has been damaged by improper management of the irrigation demanded by these varieties. This is not to deny that the Green Revolution was a phenomenal leap forward in the path toward resolving world hunger. Rather, we wholeheartedly embraced the Green Revolution and all its promising visions, but it seems as though the honeymoon is over. We have come to realize fully the implications of the Green Revolution, and how we must live with them.

One of the most fundamental principles we must draw from the Green Revolution is that such a dramatic upheaval of agricultural techniques, and one that affects so many different ways of life, must be considered an exceptional phenomenon. We cannot wait for another all-encompassing solution to solve global hunger; indeed, focusing on such a philosophy would likely lead to Malthusian-style inefficiencies. One can continue to inject a culture with brand new technologies, radically developed methods; but unless there is a way to integrate improvements smoothly and create balance, we will forever be chasing that goal of a final solution, rendered unreachable by our own momentum.

In less abstract terms, this seems to point attention to the small subsistence farmers of the world. If the next Green Revolution is to occur, it will be a long road of small steps, working to create specialized systems tailored to the practices of subsistence farmers and the environment in which they exist, as well as balanced markets in which they can function. In this way we can both continue the scientific advances launched by the first Green Revolution and heal the wounds unintentionally caused by its brash entrance.

Understanding the complex systems which subsistence farmers are a part of requires studying many factors, including the ecology of the environment, potential breeding methods and genetic modification of crops, economic trends, political circumstances, and many other important aspects. However, no matter how many elements are considered and no matter how minutely they are studied, they are of no use unless accessible to the subsistence farmers of that region. In the crusade for

understanding the relationship between farmers and their land, we cannot forget the very important relationship between researcher and farmer.

The only way to truly understand the importance of this relationship is to take a close look at the existing circumstances of the poor subsistence farmers of the world. A prime place to start is the Central American country of Honduras. Located just south of the Yucatan peninsula, Honduras is deeply embedded in the lush mountains of tropical rain forest. Despite the ecological richness of its environment, Honduras suffers as the third poorest country in Central America ("Rural").

Honduras is a mostly rural country, with 53 % of the population living in rural areas ("Honduras Statistics"). Of those in rural areas, 80 % are living in poverty ("Rural"). As a relatively agricultural society, Honduras' progress as a developing country is greatly reflective of the quality of life of this demographic.

The average Honduran household is a large one by modern standards. The current lifetime births per woman (TFR) for Honduras is 4.1, according to the Population Reference Bureau. Granted, this is down from the 8.7 TFR seen in 1993 ("Honduras - Population"). Still, this high birth rate (which translates to a 2.8% increase in the population) is causing rapid growth. And the momentum carried by an astonishing 41% of the population under the age of fourteen will be felt long into the future ("Rural"). In general, Mr. and Mrs. Honduras will likely have four or more children and be the grandparents of an expanding generation.

The care of those children is largely left to the woman. This is not because the father is absent so much as that he is often detached from family life. It is not uncommon for men to have more than one family or mistress, although this is more of an anomaly in rural areas ("Honduras - Family"). More often, in rural households, the father usually leaves the home during the day to work on either his own or a larger farm, and leaves all domestic duties almost entirely up to the woman. For parts of the year, the mother may also be leaving to work in fields, and must handle this chore in conjunction with her other duties. In addition, homes are often isolated in the mountainous rural region, and women may not have convenient contact with neighbors (Harris).

Among her obligations as caretaker of the household, the mother must prepare food for her family. For rural Hondurans, this means creating meals from the crops grown on their own land (if they own any) and what food they can obtain from local markets. The staples of Honduran diet include maize tortillas, beans, cassava, plantains, rice and coffee. This is occasionally supplemented with whatever locally-grown fruits are available, and meat or fish ("Honduras - Rural"). Unfortunately, the variety of food is often grossly limited by the size of the family's land. The average family has five hectares of land or less, often too little to support a family (Poverty Portal). Then there are those who have no land at all, and depend only upon the small income they can earn by working on larger farms often owned by foreign corporations. As a result, roughly 22 % of Hondurans are undernourished ("World").

If not assisting their families on the farm, Honduran children usually have the option of attending school. Eleven years of schooling is the expected length of education for most Honduran children ("School"). Although 87% of children receive primary education, school is compulsory only for children ages 6-13. Also, the adult literacy rate is only 75%, a lower rate than all other Latin American countries except Nicaragua and Guatemala. In its favor, Honduras does have approximately an equal ratio of boys and girls attending school ("Education").

As mentioned previously, rural Hondurans do have subsistence family farms in the sense that they grow their own food, and this food comprises the staples of their diet. However, few have the amount of land required to fully support their family. Instead, much of the farming in Honduras is done

on large corporate plantations, owned by such companies as Dole and Chiquita, which employ rural Hondurans ("Honduras - Rural"). These farms commonly grow bananas and coffee, which are Honduras' top exports ("Rural").

Traditionally, farmers have practiced slash and burn techniques. This system is considered sustainable when the land is left fallow for several years between farming. However, overuse of the slash and burn system has been gradually depleting Honduras's arable land and rendered the method unsustainable (Altieri). It is estimated that as much as 85% of Honduras' land has been damaged by improper farming (Truitt). There is little knowledge of irrigation techniques, seed selection, or pest control.

The food that rural Hondurans buy is usually obtained at local markets. However, these markets are isolated and provide little economic interaction for farmers. They also do not have influence over the larger farms owned by foreign corporations, which control the prices of the exported bananas and coffee. This harms Hondurans' ability to return a profit on what goods they are able to deliver to market (Harris).

The agricultural methods used in Honduras could quickly be improved simply by introducing modern techniques. However, advancements of any kind seem out of reach of the poorest subsistence farmers, mostly because of the disconnectedness between rural families. If families were able to collaborate and sell their goods in cooperative markets, they would be better able to have influence over the prices they receive.

The lack of communication specifically harms women, since they are usually obligated to stay home and attend to their extensive duties. Another factor that limits the ability of farmers to provide enough food for their families is their lack of understanding of the environment in which they farm. Paradoxically, Honduras is an almost entirely marginal landscape, made up of steep mountains and dense forests that provide little readily arable land. It is not impossible to grow crops in this area, but when farming is done without proper understanding of the land, farming becomes a rather desperate enterprise.

Presently, Honduran women are among the most disadvantaged of poor farmers. All women shoulder double duty in the sense that they do the traditional family work of cooking, cleaning, and raising the children, but also participate in seasonal agricultural work. In addition, at least 17.8 percent of rural women are heads of their household. The actual number is almost certainly greater, since many single women deny that they are in charge, naming their eldest son or relatives as the head of the household (Truitt). The demand of these responsibilities quickly takes a toll on the women's health. There is often little relief between births, and constant breast-feeding leads to nutrient deficiency, particularly a lack of Vitamin A, which plagues 70% of women, and iron, which, on average, reaches only half of the recommended daily intake (Truitt). Of course, this undernourishment is also projected to the children.

The development of Honduras may be measured in a variety of ways, but in order to gauge the progress of subsistence farmers, it seems most logical to analyze their access to new technologies and improved farming practices. This is a difficult object to assess, but one may focus on specific aspects, such as the use of fertilizers, which saw a dramatic increase in the early 1990's. One may also consider the trends for education of Hondurans. For example, youth literacy has rose from 73% to 84% between 1980 and 2002 ("Country"). Although figures such as these do not give comprehensive views of the progress of Hondurans, they do seem to suggest that conditions are gradually improving.

But the problem of Honduras' poverty is not one that can be addressed broadly. The adversities that subsistence farmers face are rooted in the fact that they have been pushed into marginal situations,

both environmentally and economically. In order to escape these circumstances, Hondurans must learn how best to adapt to their environment and take full advantage of what resources they have.

One promising solution is the practice of agroforestry. This system of planting crops alongside trees is one that would be well-suited for the steep cropland that many farmers live on. The trees act as anchors on the soil, preventing erosion, and also help maintain a high nutrient content in the soil ("Havoc"). Agroforestry is closely related to the milpa system found north of Honduras, in Mexico, which generally involves planting corn and beans in the same field, alongside a variety of other plants, such as squash, melons, or tomatoes (Mann). The concept is to create a complex and complete ecosystem in which biodiversity is allowed to thrive and sustainability is achieved. Such a system in the tropical mountain forests of Honduras might include growing coffee and banana trees in the same plot of land as smaller fruit trees and other local crops, such as maize, beans, and sorghum.

The knowledge of how to develop a sustainable agroforestry system would be of great value to Honduran subsistence farmers. The variety of foods grown would improve the diet of the severely impoverished and allow them to take advantage of the limited land they have, without jeopardizing the longevity of the environment. This kind of specialized, low-impact farming is what must be sought after by those hoping to see the Green Revolution evolve into an era of widespread sustainable agriculture. However, it cannot take place without close analysis and intimate understanding of the region's environment and thorough education of subsistence farmers.

In addressing the specific needs of Honduran farmers, there are three venues of communication that must be opened up in order for efficient education to occur on all fronts. The first is the duty of scientists and researchers to apply all available knowledge of improved farming techniques known to be applicable to a specific area. In regards to the involvement of national government and private organizations, I would be in support of research grants given for testing the variables of agroforestry systems, including crop combinations, irrigation and tillage techniques, and cross-breeding. This process will be one of gradual improvement, as researchers learn the minute tendencies of specific regions. However, the knowledge gained will be all the more valuable, and far more likely to lay the foundation for truly sustainable agriculture.

Just as important as the flow of information from researcher to farmer is the involvement of farmer in relating his experiences back to the researcher. In the process of encouraging Hondurans to abandon the detrimental methods of slash and burn in favor of proposed agroforestry systems, the farmers cannot be viewed merely as vessels for new information, but active participants in the search for sustainable farming. One cannot forget that many of the techniques being embraced by researchers (including agroforestry) are based on traditional methods. And in the end, it is the farmers who make the final decision as to the usefulness of a technology, and who may find flaws in areas that outside researchers overlook. For this reason, farmers should be allowed to be involved in decisions about seed selection and plant breeding. One might dismiss this aspect of education as simply an attitude or philosophy versus a component of agricultural research, but I find it essential to efficient research and feel it must be included as a valued part of government programs.

The final contact that must be established in order for subsistence farmers to be fully educated is between other farmers of the area. Aside from their struggles with farming in harmony with their environment, one of the greatest challenges plaguing Honduran subsistence farmers is their inability to communicate with other locals and work in cooperation to create stable markets. In this area, national governments and private organizations can be of enormous influence. Subsistence farmers would benefit from learning to collaborate with other farmers through extension programs. This is especially needed for women farmers, who are significantly disadvantaged by isolation. National governments could also provide assistance to small farm cooperatives by setting regulations which will balance the presence of

corporate plantations and their economic influence and monopoly over the land. Otherwise, the subsistence farmers of Honduras will be left without a voice in the selling of their crops. Without access to and understanding of stable markets, farmers will be unable to sustain a livelihood through economic means, regardless of how efficient or environmentally sound their farming practices are.

These principles, of gaining as complete an understanding as possible of the environmental microcosms in which farmers operate and providing that information in full to farmers, are not ones that apply to Honduras alone. Indeed, they may be central to the success of the next Green Revolution. But the focus on the differences of farmers across the globe does not necessarily mean the isolation of farmers. Instead, it suggests a mentality of building from the bottom up. For many subsistence farmers, such as those in Honduras, solutions lie in rejuvenating local markets. This must be established before they may become viable in global markets. However, when that does occur, it will be a more balanced and diverse system, because farmers will be dependent first on local systems that they have created themselves, and are ideally suited for their needs, before the happenings in the international arena. Globalization does not mean simplification, if local communities are able to create stable environments which function independently as well as in cooperation with the rest of the world.

The international community may encourage this type of development by supporting research which is tailored to the needs of subsistence farmers and being quick to recognize the ways in which new technologies can be integrated into the lives of those farmers. Richard Manning describes it well in his book, Food's Frontier when he writes, "Our culture knows how to develop technology. We are at a loss to explain how it filters in to society... If science is weak in this area, government is a complete failure." The next Green Revolution will not be a matter of developing a miracle and then delivering it to the people. We must go to the roots of agriculture, to the lives that are built around it, and from there glean our miraculous solutions.

The future of a world in which none go hungry is just as promising as that day in 1968 when Gaud coined the term that has been applied to our hunt for sustainable agriculture. In some ways, we are sitting in the same position as we were forty years ago, when Gaud said, "To accelerate [the Green Revolution], to spread it, and to make it permanent, we need to understand how it started and what forces are driving it forward." Today we are doing just that - digging further into our understanding of how the world feeds itself and how technology manifests itself in society. If this can lead to the completion of the Green Revolution, then we may finally reach green reality that is available to all.

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