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Biofuels: Promises and Implications for Food Security in Developing Countries

Biofuels may provide a solution and have great influence on the food security of developing nations such as those of Latin America and the Caribbean. Through careful development of programs and projects for the development of the poverty stricken rural areas can a difference in the lives of the rural farmers result. The need for educating the farmers using the research successfully completed in similar areas on increasing the agricultural yield and the sustainability of such methods may be very important to the elimination of such extreme poverty as experienced in rural Latin America and the Caribbean. All of the wonderful answers to poverty must also include as a pillar of importance the security of the food supply to such a population. Biofuels may one such sustainable project. However, this population of extremely poor farmers cannot be taken advantage of or enslaved to the owners of the biofuels products. It will be vitally important to not only teach the processes but to assist in implementation, the provision of equally distributed social services and equal wages for all of the biofuel employees and food security for these poor farmers.

The population division in Latin America and the Caribbean indicated that with a population of 121 million citizens, 77 million make up the rural population. (IFAD "Strategy for Rural Poverty") Those living below poverty line are reflected in an estimate of 64% of rural citizens. These citizens exist on less than \$7, 303 USD yearly. Statistics indicate that in the last two decades there has been an increase in poverty stricken rural population "both absolute and relative terms". (IFAD "Strategy for Rural Poverty") Of the 64% rural population, 47% are living in extreme poverty. (IFAD "Strategy for Rural Poverty") Extreme poverty is indicated by less than \$2,000 USD yearly income. (IFAD "Strategy for Rural Poverty")

Columbia is the only Latin American country that shares borders with both the Pacific Ocean and the Caribbean Sea. The country has three physical regions: lowlands, mountain ranges and llanos (grassy plains). 75% of the population lives in the fertile valleys between the cordilleras (parallel mountain ranges of the Andes). The country is famous for the coffee raised on more than 300,000 small farms. The Pacific side is mostly swampy with rain forest. In the South American Tropical area, Latin American farms consist of the father, mother, and children of all ages working together. When a couple marries they receive a small plot of land to farm. This may be as a tenant farmer (campesinos) or they may be given ownership by a wealthy land owner. As each child is born the work force is increased. It is not unusual to have a family of fourteen or more with a national average of six in a family. This increase in population appears necessary for the increased demand for production. The father wears simple pants that are loose fitting for the tropical heat and a loose type of a cloak to protect him for the sun. The women wear long loose fitting skirts that allow air to circulate through the skirt. They also wear a loose type of a cloak or long blouse that protects them from the sun. (Culture of Columbia Forum) The farms may consist of ten and one-half hectares (acres) of land. (Coomes) The parents may have reached only the 5th grade. Many programs are increasing the education of the poor. The literacy rate of rural Columbia's population is 67%. The non-rural population literacy rate is 92.8%.

These rural Columbian families may eat maize, plantains, and rice. However, the fact that they raise the crops does not mean they are well nourished. Most often they cannot raise enough to feed themselves because the focus is on financial productivity of the crop for the land owner. These farmers work as hard as they are able to without adequate nutrition and without any improvement possible. (Culture of Columbia Forum) The struggles with social inequality results in the poorest 20% of the population receiving 3% of all income while 20% of the wealthiest receive 75% of the income. (Culture

of Columbia Forum) As indicated, marketing of the crop is most often handled by the land owner. Labor laws are few and far between and are rarely enforced. The class system has the population divided into three divisions; the wealthiest, the middle class and the poorest. In the lower class there are few opportunities for social equality. There are some social programs, health, social security and pension, in Columbia, however, only 16% of the population is covered and the poorest are excluded. (Culture of Columbia Forum)

The indigenous farmers gather natural crops of the tropics. Such crops as the maize, cassava, rice, plantains, bananas, and tobacco are gathered. These farmers are in extreme states of malnutrition and live day to day in existence. However, they are not tied to a boss or land manager and sell their products in native markets and to brokers. (South America)(Travis Mathison)

The United Nations FAO Committee recently released a report from the committee meeting on World Food Security, June 18, 2007, where they stated that one of the factors in the food crisis is "large-scale public health challenges." (U.S. State on FAO Committee on Word Food Security) The FAO is focusing on "rural development, reduce malnutrition and eradicate poverty on a sustainable basis". (U.S. State on FAO Committee on Word Food Security) As described in their papers, "no country has ever become a sustainable democracy delivering stability and prosperity to its people without transforming the agricultural sector and developing its commodity and food markets." (U.S. State on FAO Committee on Word Food Security) In order to truly attack the hunger and malnutrition of the rural farmers in Latin America and the rest of the world we all must have a deep commitment to the solution. This is why the FAO committee's objectives are to work with the developing countries on poverty reduction through supplying an "infrastructure and technology, building effective market s." (U.S. State on FAO Committee on Word Food Security) Secondly, aiding these developing countries as they enter "the global challenges facing agriculture." is imperative. (U.S. State on FAO Committee on Word Food Security)

The stage has been set with the understanding of the horrible plight of the rural farmer in Latin America and the country of Columbia. Now it is time for a solution to be offered to work to help reduce the poverty and extreme living conditions. Knowledge of the condition does no one any good if a step towards eliminating this is not taken.

Many environmentalists and social scientists believe that biofuels is the answer for these developing countries. We will review this idea with the factor of food security for the rural substance farmers on our minds. Nations such as Venezuela disagree that biofuel production in Latin America will benefit the rural farmers. The Venezuelan officials state that biofuels will not reduce American drivers dependency on foreign petroleum. President Hugo Chavez "scoffed" at the idea that the United States Presidential efforts will benefit anyone but the United States. He refuses to allow his country to turn into a "factory for subsidy of the US drivers."

Biofuels are energy sources created from non-traditional products. Current publicity is based on ethanol and biodiesel. Ethanol is a liquid fuel generated from converting the carbohydrate portion of biomass into sugar and then fermenting the sugar." (International Food & Agricultural Trade Policy Council-IPC) Vehicles can be produced or older vehicles altered to run on ethanol combinations. I learned in chemistry last year about biodiesel and it is "produced through the transesterification of organically-derived oils or fats." (IPC) The ratio on biodiesel is most often prepared for commercial use with petroleum based diesel at 2/98, 5/95 or 20/80.

In order for developing countries to benefit from this newest industry, an infrastructure and educational system must be established in these countries. Long term stability must be established. It is not reasonable to swoop into the country, build these plants and ways to ship the products without stabilizing those who will produce the raw product. Stabilization must include reduction in the poverty

problems, increased social services and the availability to all citizens in the country. Reduction of poverty includes the guarantee of food sovereignty and security. All citizens must have adequate food sources at their disposal.

The tropical weather in Latin America provides a growing season that is extended and the weather conditions that are predictable. The length would increase the production of biomass growing season. There are examples of the production factory producing both exportable product and the electrical power to run itself. According to the Stockholm Environment Institute's Renewable Energy for Development Issue an article titled "Columbia Paving the Way in Renewable Fuels for Transport" the "vinasse that is the byproduct from the factory and distillery will not pose contaminate... to the surface water." They have created a way to utilize this contaminate by turning it in "biogas in anaerobic digesters." Beside the plant is a cogeneration unit which will provide enough energy to run the plant and to sell what is remaining. It will produce steam and electricity both of which create power.

The cost of this ethanol from sugarcane is estimated to be \$1.00 USD per gallon. It can be sold on the open market at a profit of \$.40 to \$.60USD per gallon. Taxes are always an evil part of the picture. The tax is said to be absorbed by the alcohol production company. The United States investment through both government and private industry is estimated to be \$400 million USD. The return is estimated to run around 20% for investors. (Stockholm Environment Institute's Renewable Energy for Development Issue)

In addition to the financial benefits, ethanol from sugarcane will reduce the CO and hydrocarbon emissions. This excites those environmentalists who study global warming issues. According to the Stockholm Environment Institute's Renewable Energy for Development, the reduction would be 27% reduction in Co and 20% in hydrocarbons which translates into a total reduction of "245 thousand tons per year". This program will provide the needed financial support for the program. The reduction in CO₂ is approximated to be nearly 6 million tons, thus creating fresher cleaner air to breath. (Stockholm Environment Institute's Renewable Energy for Development Issue) The actual plant has been built near Manuelita, in the Cauca valley. It uses the sugarcane grown throughout the area in irrigated fields. The government has mandated since 2003 that bio-alcohol must be used in all Columbian gasoline. (Stockholm Environment Institute's Renewable Energy for Development Issue)

So what is the real advantage to the rural farmer? New money will be available to help the industry develop which results eventually in new jobs for those in agriculture. Optimistically, these jobs will provide an increase in wages for the poorest in these nations. Promised improvement in social services such as health care and pensions would make a huge difference to this culture. Improved education for adults and children should also be provided. This technology is a hug improvement for rural farming.

In an interview with Alejandro Echeverry, a Columbian doctoral student at Texas Tech University, Lubbock, Texas, I learned that there are several ethanol based plants in Columbia. He believes that this is an excellent move for his home country. The sugarcane is used to produce the biofuel with the sugar still being usable as a sweetener in foods. According to Inforpress Centromericana, in March, 2007, "Inversiones Manuelita of Colombia and Guatemalan Sugar Holdings have joined together Inialco of Brazil to build a new refinery in Vale de Parana, Brazil." Production figures indicate "the processing of two million tons of sugarcane" will result in over 141,000 tons of sugar being produced. The biofuel production is estimated to be 90,000 cubic meters. The biofuel will be ethanol. Both food and energy are produced at the same plant. He believes that the food supply is safe and that the actual rural farmers are receiving increased benefits from such an industry. However, he did not see such success using corn or other subsistent based crops for energy.

There are however, those who disagree with the biofuels from the food supply idea. The Council on Foreign Relations has released an article entitled "How Biofuels Could Starve the Poor", in their May/June 2007 issue. One of the authors, C. Ford Runge is Distinguished McKnight University Professor of Applied Economics and Law and the Director of the Center for International Food and Agricultural Policy at the University of Minnesota. Interestingly, this article begins in 1974 with the difficulties created by the oil embargo. April 18, 1977, President Carter called the balancing of need for energy and that for food would be that of "moral equivalent of war."

The United States serves as a pattern for this article applying the information to developing countries journeys down the road to biofuel production. In the United States currently, corn is the food crop of choice for ethanol production. Corn is produced mostly in the Midwest of the United States. This year, corn was produced at the "third largest crop on record." (The Council on Foreign Relations) Yet, the inventories of available corn are the "lowest levels since 1995, which was a drought year." (The Council on Foreign Relations) Consider this, the more farmers in the United States produce the less there will be for food consumption. This just does not seem to make sense.

Research indicates that a SUV, using corn based biofuel needs approximately 450 pounds of corn to fill the 25 gallon tank once. In comparison, this same amount of corn would provide enough "calories to feed one person for a year!" (The Council on Foreign Relations) Now our food supply throughout the world is tied to energy production. In a nation of considerable wealth in comparison to a developing county this reality is frightening. They cannot afford to feed themselves and now the cost of food is tied to energy that they themselves do not use. Interestingly when American farmers could make more money growing corn for the biofuel industry, they turn fields normally used for wheat and rice to corn, resulting in the higher cost of the wheat and rice. If the price of fuel and food increase how will anyone afford food or energy? Remember those poor farmers in the developing countries have no way to buy food products today.

The solution lies in a dedicated energy world working with the food producers of the world to find a center or point of balance. Scientists understand the tragedy of an unbalanced ecosystem and economists understand the tragedy of an unbalanced economy. Everyone must meet in the middle as the saying goes.

This center I believe can be found in the utilization of land wisely, the resting of the land and cycling of the available land so that not all land is used continuously, the education of the farmers in the developing countries, food sources be used less for biofuels and be available to those who are malnourished, improvement of social services and availability, and the wisdom of saving our world for everyone, not at the exclusion of the poor.

The development and usage of cellulosic ethanol could help the food sources be secure. The lands that are not viable for food crops can be used for cellulosic energy crops. (Biofuels: Promises and Constraints) Cellulosic crops that could be grown are jatropha and castor beans. Neither of these crops is usable for food for humans or animals. In doing this, the land available for food production would not be involved with the energy production and consequently, not associated with the price of the energy. There is research using the switchgrass for energy production. The planting of "perennial grasses may have positive results on the wildlife providing the suitable habitats." (Biofuels: Promises and Constraints) The stubble from wheat and corn is also being considered for energy production. Recycling the trash is always a good idea.

The idea of a certification program to insure food security is one presented by "Biofuels: Promises and Constraints. " This certification will take into consideration the balance between the "arable land, the fuel demand, the chemicals used, land exhaustion, and food supply. "(Biofuels: Promises

and Constraints) Using this certification program would require all parties to be fair and all party representatives have equal say in the decisions.

My greatest concern is for those who have not voice in their government. They are the lowest on the ladder of society. I believe that the governments of the world nations can fairly represent these citizens and all citizens of the world. Research indicates that biofuels and food security can be balanced without the exclusion of the poorest of the world.

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