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Mexico: Improved Education to Increase Productivity and Well-being of Smallholder Farms

12-19% of Mexicans are defined as extremely poor. 56-64% of these extremely poor Mexicans live in rural areas. Although Mexico is projected to meet the Millennium Development Goal of eradicating extreme poverty and hunger by the year 2015, there is still much room for improvement (Pan American Health Organization). Mexico's smallholders struggle to hold their own in the agricultural economy against the bigger producers. Challenges facing smallholders include limited access to the market, inefficient technology and practices, and insufficient funds (Marsh). One way to address these issues is to further the availability of education of agricultural research and technology to the farmers. Education will inspire smallholder success and improve food quality and quantity because, armed with new tools and techniques, smallholders will be able to produce their crops and livestock more effectively. Smallholders will also become more competitive in local, national, and international markets. To improve food safety in Mexico through the success of smallholders, more organizations should be put into place that give smallholders a unified front and act as a source of information and instruction about new agricultural policies and techniques.

A typical subsistence smallholder family will compose of a nuclear family and often extended relatives (Marsh). Public education is accessible to most Mexican citizens so most Mexican's have 13 years of school (CIA– The World Factbook). Subsistence families have limited access to health care because they cannot afford social security and other similar insurance policies. The diets of most subsistence farmers consist mostly of corn and beans. The energy in their diet comes mostly from corn-based foods and sugar. Animal products are rarely consumed by agricultural families and animal product consumption decreases the poorer the farm family (Lopez).

Family members are often used as labor on most small farms, which can decrease smallholder costs and often improves quality of produce. Smallholders, on average, work about 10 hectares of farmland (Marsh). The main crops they produce are corn, wheat, soybeans, rice, beans, cotton, coffee, fruit, tomatoes, beef, poultry, dairy products, and wood products (CIA– The World Factbook). Farming techniques at present are outdated, but improving, through exposure to the United States through the North American Free Trade Agreement. The lack of new education for farmers leads to barriers such as inability to maneuver in the agricultural market, inefficient procedures and technologies, and limited access to funds for improving these setbacks (Burstein). The availability of agricultural markets to smallholder farmers is limited because the farmers do not know how to navigate the market and the transaction costs are such that companies will not reach out to smallholders. This presents a challenge to adequate nutrition because the lack of success of the smallholders means farmers do not have the means to purchase the foods that are necessary to complete their diet.

Improved implementation of agricultural research and technology will increase agricultural productivity due to the availability of smallholder access to more efficient technology and practices. Teaching farmers to handle their crops in order to gain maximum productivity will increase availability of agricultural markets because smallholders can often produce more crops per area than large farms (Marsh). If smallholders run their farms more efficiently, the success of small farms will increase and be able to play a larger role in the agriculture economy. Increasing the productivity and success of these rural farmers will, in turn, stimulate local societies and economies.

The current lack of education available to farmers prevents smallholders from getting ahead in the economy. Farmers are still producing the same crops with the same old techniques and are not producing the maximum amount of crops possible. Their inexperience and the difficulty of getting a foothold in the large scale economy prevents farmers from getting the best prices for their products and leaves them vulnerable to market fluctuations (Marsh). Making sure farmers have access to the new technology and practices will decrease production and transactions costs as well as increasing their productivity. Their income will increase as their productivity increases, resulting in higher well-being for the farmers. Smallholders' ability to produce effectively is critical to their ability to support themselves and their families above the poverty line. The more successful a smallholder becomes, the greater opportunity they have to increase the range in their diet, providing critical nutrient diversity. Thus, a smallholder's productivity is directly proportional to their ability to ensure food security for their family.

The present status of education used to help smallholders is still below where it needs to be. Agricultural research organizations and institutions exist but they are limited in their ability to help smallholders. If a smallholder can afford a consultation, they often cannot afford it for very long. This inhibits the success of the knowledge because long-term assistance is necessary to fully implement the new practices being taught (Marsh). The International Center for Tropical Research (CIAT) has participatory research projects established in many countries throughout the world. Local Agricultural Research Committees (CIAL) are controlled by farmers and their research is reported directly to the community. A small fund is available to offset the cost of the risks and research and a trained facilitator will remain with the organization until it has matured. The idea for CIALs began in Latin America but Mexico had no CIALs working within the country as of 1999 (Ashby). The rural poor are particularly disadvantaged by the lack of access to new research and technology because they are then restricted to reliance upon outdated practices, limiting their productivity. The reduced income from lack of productivity means that rural farmers cannot alleviate their situation and are no closer to food security or rising above the poverty level. Women running their own farms suffer disproportionately because they have a lower average productivity. Women are unable to succeed as well as their male competition, because they are viewed as disorganized and are lacking the power of a union (Lele). Offering agricultural research and technology to these minorities will put them on an even playing field in the agricultural economy. Equal education will lead to an increase in productivity for everyone and improve the lifestyles of more than one category of people.

The Millennium Development Goals mean that governments are making a greater effort to address the issues of poverty and hunger in their country. The World Health Organization measures success in eliminating the number of people who earn less than a dollar a day (Pan American Health Organization). Other measures of poverty and food insecurity deal with the number of people who receive the proper nutrition for their day-to-day exertions. Measures on the success of educational programs helping smallholders include number of organizations and increases in productivity and poverty reduction in areas where these new techniques are implemented. Agricultural research and technology is slowly improving as trade with the United States allows U.S. practices to be taught and adopted by the Mexican smallholders (Marsh). Smallholders are still struggling to become competitive in the agricultural market because they do not yet have the resources to do so. The trends for education are increasing as new, innovative ways of farming or using technology are invented that benefit farmers. As the world is struggling to compensate for the exponentially growing population, agriculture is becoming a major issue for most countries. These countries are responding with greater investments in farmers' welfare and research into agriculture. More and more institutes and organizations to aid farmers are being created to respond to the growing demand for food. The number of educational programs that are active in Mexico are still too few. Progress is being made but that should act as an incentive to invest more in research and technology instead of taking it as enough on its own.

Resolving the lack of education available to farmers would increase the amount of food. Smallholders would consequently manage their farms more effectively and quality would increase, because methods

and species of plants that were previously unavailable to the farmers can now be used to ensure more and better products for the agricultural market. Increasing farmers' knowledge about environmentally friendly practices would result in sustainable improvement for the environment. The success of smallholders will lead to a reduction in poverty because small farms stimulate the surrounding area in a way that large scale farms cannot (Rosset). Improved market maneuverability will allow smallholders to have more influence in the economy and ensure that the best prices are paid for the products.

Other major issues that affect the productivity and well-being of farmers are both natural and man-made. Natural factors that threaten farmers include water resources, pollution, and natural threats. Mexico suffers greatly from contaminated water sources, so much so that it has been declared a national security issue. Unclean water threatens the health of Mexican families as well as the health of crops. Pollution is also a major issue in Mexico, although more centralized around urban areas. Mexico also suffers from natural threats such as hurricanes and a dry climate that can have devastating effects on agriculture. More man-made threats to the productivity of agriculture include the population growth rate of 1.13% per year and the urbanization rate of 1.5% (CIA- The World Factbook). Emigration is also an issue in rural areas because 44% of Mexican emigrants are from rural areas (Burstein). Population growth could have an impact on the proportion of people living in poverty and increase the demand for food, as global population rises as well. Urbanization means that there is less of a work force to cultivate the fields and fewer smallholders to produce essential crops and stimulate their local economies. Farmers should deal with these challenges by investing in new techniques and research that will help protect their fields and livestock from these threats.

For smallholders to contribute to food security, they need to be able to produce their products more effectively and compete in the market. The best way for smallholders to accomplish this is for them to unite and form an organization that can represent the interests of smallholders in policies and economies. Through this organization, farmers should have access to new technology and research as it is made available. Furthermore, aid should be provided to those farmers to help them utilize the new research and technology effectively. Long-term consultations should be available to farmers so that the new policies and procedures can take root effectively and change the outdated practices that have been engrained for so long. One organization that can offer these benefits to smallholders is a CIAL supported by CIAT. Areas in which CIALs have been effectively established have had better success in adapting new technologies and techniques, applying new research, and reducing costs (Ashby). These organizations give farmers in the community direct access to new research and stimulate interest in new technologies and procedures to increase productivity. Local committees also give organization to rural areas, allowing them to have a more cooperative effort in increasing food productivity and reducing rural poverty. Improving farmers' education and understanding of new research and equipment will result in sustainable agricultural practices, increased productivity, and an increase in food security for rural farmers.

CIAT and the Consultative Group on International Agricultural Research should retain connections with the CIAL organizations. This will ensure up-to-date information and continued organization within the committee. The local committees cannot survive on their own without contributions from other local organizations. Universities and other research institutes such as the International Maize and Wheat Improvement Center should work with local farmers to increase access to new farm technology and equipment. Companies should make a larger effort to reach out to smallholders to give them the credit and beginning support they need. These initiatives by companies will give smallholders the resources they need to make their farms successful and competitive in the agricultural market.

Mexico is an excellent example of a country that could be extremely successful with more investments in agricultural research and smallholder interests. The current levels of rural poverty and food insecurity can be alleviated if more research and technology is made accessible to farmers so smallholders can be more productive. The best way to increase research and technology applications in rural areas is through local

agricultural research committees that directly involve the smallholders. This ensures that farmers will trust the new techniques and there will not be a delay in the information reaching the farmers who need it. This cooperation will generate faster productivity for the farmers, benefitting society and the farmers themselves. Education giving smallholders the tools they need to produce more effectively will increase income for these farmers and stimulate the rural communities they make up. The success of these rural areas not only will reduce poverty levels, but also produce food security for people who suffered from hunger previously. Improved investment in education institutions needs to be expanded even further so that food supply can meet the increasing demand over the next few years. More research and technology is the answer to almost every major problem that threatens food productivity. The more research and information that those in the food industry possess, the better able they will be to face a wide variety of challenges. Using local organizations to make information more accessible to smallholders is not only a necessary strategy to improve the livelihoods of rural farmers in Mexico, but the entire world could benefit from improved knowledge and technology.

Works Cited

- Burstein, John. *US-Mexico Agricultural Trade and Rural Poverty in Mexico*. Rep. Woodrow Wilson International Center for Scholars, 13 Apr. 2007. Web. 15 Sept. 2010.
<http://wilsoncenter.org/topics/pubs/Mexico_Agriculture_rpt_English1.pdf>.
- "CIA - The World Factbook." *Central Intelligence Agency*. Central Intelligence Agency, Sept. 2010. Web. 10 Sept. 2010. <<https://www.cia.gov/library/publications/the-world-factbook/geos/mx.html>>.
- Lele, Uma, Jules Pretty, Eugene Terry, and Eduardo Trigo. *Transforming Agricultural Research for Development*. Rep. no. 6.0. Global Conference on Agricultural Research and Development, 11 May 2010. Web. 27 Sept. 2010.
<http://www.ciat.cgiar.org/cgiar/documents/transforming_agricultural_research_11mar10.pdf>.
- Lopez, Hector, Hector Perez, Magdiel Flores, and Michael Fuller. *Social Inequalities and Health in Rural Chiapas*. Rep. 261st ed. El Colegio De La Frontera Sur, 1999. Web. 25 Sept. 2010.
<<http://www.scielo.br/pdf/csp/v15n2/0311.pdf>>.
- Marsh, Robin R., and David Runsten. *The Potential for Small-Holder Fruit and Vegetable*. Rep. 1996. Google. Web. 9 Sept. 2010.
- Pan American Health Organization. *Agriculture and Health: Synergy for Local Development*. Proc. of 14th Inter-American Meeting, at the Ministerial Level, on Health and Agriculture, Mexico, Mexico City. 1-314. Google. Web. 28 Aug. 2010.
- Ashby, Jacqueline, Braun, Anne, Garcia, Teresa, etc. "Investing in Farmers as Researchers." *International Center for Tropical Agriculture*. CGIAR. Web. 26 Sept. 2010.
<http://www.ciat.cgiar.org/work/latinamerica/Pages/participatory_research_lac.aspx>.
- Rosset, Peter. "On the Benefits of Small Farms | Food First/Institute for Food and Development Policy." *Food First/Institute for Food and Development Policy | Institute for Food and Development Policy*. Institute for Food and Development Policy, 8 Feb. 1999. Web. 11 Sept. 2010.
<<http://www.foodfirst.org/pubs/policybs/pb4.html>>.