

Alice Huang  
Montville Township High School  
Montville, New Jersey 07045

## **Food Sustainability through Education**

Today, most political analysts regard the People's Republic of China (PROC) as an emerging superpower - a notion almost inconceivable nearly forty years ago when President Nixon first started the dialog between United States and China. Over the past two decades, the growth of the China has been staggering. Successful business and trade have spawned mass urbanization, initiating an Industrial Revolution, and created a middle-class in China virtually overnight. This past year alone, the Chinese government has estimated the economic growth to be 11.2% (BBC News 2009) amid the global recession. Despite the country's remarkable growth, the World Bank identifies China as a developing country due to its low Gross National Income (GNI) per capita of \$2010 (World Bank 2009). Unfortunately, China's current economic prosperity is unevenly distributed amongst its people to a major extent. While cities experience strong economic wealth, rural areas struggle to survive. One statistic estimates that factory workers in cities earn three times the income of the average farmer (Bristow 2007). Out of China's population of 1.3 billion, 57% live in rural regions who are mostly farmers. Of this 57%, 14% live below the poverty line, surviving on less than \$1 a day (CIA 2009). This means one to two out of every ten rural Chinese is facing extremely low living standard, which totaled 106 million Chinese. These poor are forced to pull their children from school, skip medical check-ups, and eat less, considering that 106 million is about one-third the population of the United States. To advance the economic situation of these poverty-stricken people and to solve the food insecurity problem, the government should provide necessary agricultural training to family farmers about methods to increase crop yield, sustainable farming techniques, finance and business knowledge, and means to apply this learning to the people's own farming business.

As in any research, before proposing solutions, it is important to examine the history of the subject. Before the People's Republic of China was established in 1949, China had been an agricultural society for over 4,000 years. By the early 20<sup>th</sup> century, China's farmer population was suffering from the Qing Dynasty's government corruption, heavy taxes from the country's chronic wars, and severe lack of resources. Under the PROC, a number of agricultural reforms were implemented between 1950s and 1980s in an attempt to increase agricultural productivity. The first of the reforms abolished the landlord-tenant system and changed the ownership of farm land to government. It creates a central government controlled commune organization system where each "commune" of an average of 5,400 households was required to produce a certain output of agricultural product as determined by the government. The reform became part of the "Great Leap Forward," a government campaign that sought to modernize industry and particularly, increase agricultural production. This system proved to be impractical because of its inflexibility and the government's unrealistic target productions. It was abolished after 25 years. The entire campaign ended in failure. Mismanagement of resources resulted in a widespread famine from 1960 to 1961 and caused millions of lives to be lost (Yao 1999). After this humiliating fiasco, the Chinese government relegated orders to put more emphasis on the industry sector rather. Consequently, over the course of half a century, China transitioned from a purely agricultural society to an industrialized nation. The farmers of China are viewing the consequences of these actions today, as agriculture is now a diminishing livelihood. The fear of poverty is a reality to the majority of the rural population. Because China's economic focus has already shifted away from agriculture, farmers must learn more effective farming techniques in order to survive in China's changing economical environment.

The majority of farmers in China grow multiple crops a year in order to sustain their basic living standard. Major crops include rice, cotton, tobacco, wheat, corn, millet, and tea. Several factors have made agriculture a difficult and unfavorable livelihood. The costs of seeds, fertilizer, and irrigation

maintenance have risen considerably, to the extent that these materials may cost more than the produce. In addition, the profit from farming is subjected to a good or bad season. Most farmers are only allocated a small piece of land by their village council. If a certain season is afflicted by poor weather, a farmer might see no profit for the year and he would easily sink into debt and poverty. Although Chinese government has taken steps to alleviate these concerns such as eliminating tax for farmers in 2005 and raising the selling prices of agricultural products, it is a short-term action and not sufficient. It's essential that government provides an economic support safety net to rural area farmer, such as offering subsidized loans to farmers who suffered from one bad crop season and need the fund to buy seeds and fertilizer for the next season. This safety net is important because it is the decisive factor for a farmer to continue to be a farmer or becoming a burden of the society when going bankrupt. Furthermore, government should also provide the training to equip the farmers with the knowledge managing their own finance. Encourage the creation of local cooperative organization to help market and sell the produce is an effective way for individual farmer to receive better market information, decide when to plant and harvest the crop to get a better price, and avoid market volatility.

In recent years, Chinese agricultural communities have seen a mass migration of the younger generation to the city factories. The young have few incentives to stay on the land. Farming is labor intensive and there is little reward. In contrast, an assembly-line factory job in the city promises employment, a regular paycheck that is higher than the income earned from working on a farm, and the possibility of entering the emerging middle-class of China. The current agricultural communities are maintained by the older generation. Few young people stay, wherein lays the question of the future of agriculture in China once the elderly generation retires. In order to remedy the situation, Chinese government needs to provide farmers training in new farming methods to increase the yield of crops whether through selecting better seeds, or through using the latest technology to manage water and soil fertility. Productivity increase is fundamental to the survival of the rural farms. If the economic output from the farm cannot compete with the factory output on a per capita basis, young people will continue to leave villages for cities in search for better lives. However, once the productivity in farming does increase, the same or higher income from farm work will attract young people to return to villages for farming career. There are many suggestions to increase farming productivity. In their paper "*Farm Technology and Technical Efficiency: Evidence from Four Regions in China*" (Chen et. al., 2006), the authors identified ways such as the application of machinery, reduction of land fragmentation, and lessened use of commercial fertilizer to increase farming efficiency and productivity.

In addition to the farm labor shortage in rural areas, China suffers from a lack of cultivatable land for all its consumption needs. Only 14.86% of China's land is arable (CIA 2009). Furthermore, in the past several years, millions of farmers have been relocated from their ancestral farming lands by the Chinese government due to national projects such as the Three Gorges Dam. These new relocation areas are often unfamiliar to the farmers, and even worse, the farmers might not even be relocated to areas with farmlands to work on. The reality is China must provide food for 1.3 billion people, about 22% of the world's population, using only 10% of the world's arable land (Ye et. el., 2009). Nowadays, a significant percentage of the arable lands are used for building factories to make industry exports, lowering the amount of food distributed within the country, thus raising the price of food. While an increased demand of food would benefit farmers, it is difficult for the farmers to afford higher price of food that they do not produce with their minimal incomes. Despite the attempt of deforestation to produce more cultivatable lands, these new areas are prone to floods. In the summer of 1998, because of deforestation, areas along the Yangtze River suffered from massive rains and flooding, resulting in the death of 3,656 farmers (NCDC 2009). The issue of limited land has also led to the loss of soil nutrients. Although crop rotation is a common practice, farmers are constantly cultivating the land to produce a maximum yield. Education should be provided to teach farmers how to sustain and conserve their resources to promise future harvests, especially limited ones such as land. For example, the flooding incident of 1998 could have been avoided or became less severe by planting of economical plants with deep roots and build proper drainage

systems to prevent soil erosion. This is vital knowledge that farmers were unaware of that the government must teach. If farmers had more knowledge about sustainable farming technique, less disasters and deaths would occur, and the land would remain cultivatable for future generations.

In spite of the importance of the agricultural education and training, the current level of training available to farmers in China's rural area is not sufficient. In the paper "*Improvement of rural training to suit Chinese farmers' needs*", two Sino-German projects that study rural agriculture education revealed that while 72% of farmers attended one training per year in the many area, in some villages, there was no agency, and no training was provided at all (Wang 2009). In comparison, farmers in the United States have vast opportunities to attend almost any training as needed from many institutes, including colleges and agricultural cooperative extension. In the U.S. college professors and cooperative extension technicians often provide farmers consultative services to help farmer solve emerging problems, which resulted more productive usage of land. Students participated in the project also benefit from the real-world experience and can readily apply the knowledge once they graduate and join the agricultural work force. China is in need of the kind of cooperative extension system where it has been so successfully implemented in the U.S. There are many cooperative extensions established in every state. In addition, the United States Department of Agriculture (USDA 2009) funds programs offered by the extension, which include farm safety, organic agriculture, sustainable farming, farm financial management, and more. It also offer research grants to solve current and future food related problems, such as identifying methods to solve community food shortage problems in low income areas and strengthening post-secondary agricultural education. China's current extension is at its early stage and has many problems. "First, the training farmers received is perceived to be too theoretical and not adapted to their local agricultural conditions. Second, the majority of the extension workers do not know what the farmers want to learn and what interests they have in common with the farmers. Third, cooperatives were established by government institutions and considered as instruments to implement government policies. Only in 2006 was there a new co-operative law published which states for the first time that co-operatives are self-help organizations of the farmers (Wang 2009)."

China is a critical economical and political partner of the United States. Today, China is United State's second largest international trade partner (USITC 2008). We need a partner who can maintain its social stability through the right means. A stable China is also important to the entire east and south Asia region to which we also maintain close trade relationship. Food insecurity is a major issue that could disrupt the stability of China. The farmers have always been the foundation class of the Chinese society. The ability to raise their living standard by producing sufficient food to feed 22% of the world's population is essential to the sustainable progress of the entire China. The challenge is also formidable. Chinese rural farmers are in desperate need of modern techniques to increase crop yield and develop sustainable farming, as well as the knowledge to manage finance and sell crops. In my view, the knowledge of farm management and scientific techniques is the basic success factor for China's agricultural future, and the basis to create a stable China. China needs to overhaul its agricultural system to put more emphasis on rural area farmers and provide them with more training options and support resources. The United States has the knowledge and experience that can help China achieve the goal. We have experts with the knowhow who can go to China to help them create an effective agriculture training system in China. By exporting our agricultural training knowledge product, not only can it help balance our trade deficit with China, but it can also help establish a long term positive relation with China and its farmer population, at the same time help solve the food insecurity problem that is endangering the developing countries. It is my hope that one day I can be a contributing member of this endeavor to help improve Chinese farmers' critical knowledge and living standard. Attending the 2009 World Food Prize Global Youth Institute is an important first step for me.

## Bibliography

Michael Bristow, "Chinese Farmers Battle the Elements" BBC News, 2007, accessed Sept. 2, 2009  
<http://chinadigitaltimes.net/2007/06/chinese-farmers-battle-the-elements-michael-bristow/>

World Bank, "China Data and Statistics." 2008, accessed Sept. 2, 2009  
<http://news.bbc.co.uk/2/hi/asia-pacific/7206174.stm>.

BBC News, "China Growth Reaches 13-Year High." 2009, accessed Sept. 2, 2009.  
<http://news.bbc.co.uk/2/hi/asia-pacific/7206174.stm>

Central Intelligence Agency, "CIA World Factbook", accessed Sept. 2, 2009.  
<https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html>  
[http://www.photius.com/rankings/geography/land\\_use\\_arable\\_land\\_2009\\_0.html](http://www.photius.com/rankings/geography/land_use_arable_land_2009_0.html)

Zhuo Chen, Wallace Huffman, and Scott Rozelle, "*Farm Technology and Technical Efficiency: Evidence from Four Regions in China*", Department of Economics, Working Paper Series, Ames, Iowa. May 2006

National Climate Data Center (NCDC), accessed Sept. 2, 2009  
<http://lwf.ncdc.noaa.gov/oa/reports/chinaflooding/chinaflooding.html>

United States International Trade Commission (USITC), accessed Sept. 2, 2009  
[http://dataweb.usitc.gov/scripts/cy\\_m3\\_run.asp](http://dataweb.usitc.gov/scripts/cy_m3_run.asp)

*Dehai Wang, "Improvement of rural training to suit Chinese farmers' needs", Rural 21 – 03/2009*

Shujie Yao, "A Note on the Causal Factors of China's Famine in 1959–1961", *Journal of Political Economy*, 1999, vol. 107, no. 6]

Jianping Ye, Zhengfeng Zhang, Zhenghong Wu, "*Current use of arable land in China, problems and perspectives*", Department of Land Management, Renmin University of China