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 China Factor 6: Sustainable Agriculture

China: Addressing The Coming Changes Posed by Desertification

China, for centuries, stood as the leading civilization. From the 1800s to early 1900s, China was plagued by civil unrest, major famines, military defeats, and foreign occupation (*The World Factbook: CHINA*). To maintain China's sovereignty, founder of the People's Republic of China, Mao Zedong established a system that imposed heavy restrictions over the lives of tens of millions of people. After 1978, Chairman Mao's successor Deng Xiaoping began to develop a market-oriented economy. By 2000, economic development had quadrupled. Since then, living standards have dramatically improved, however political control remains tight. China has now scaled up its participation and outreach in international organizations.

Now, China is faced with a new problem. China has repeatedly been battered by a multitude of sandstorms over the past eight years, which is prompting the country to step up efforts to effectively address desertification. China is losing hundreds of thousands of square kilometers of arable land to the deserts each year – the fastest rate in the world (*Ramirez, Luis*). Development has assisted many communities combat malnutrition but it still threatens the future of millions of rural Chinese families. Desertification is a global issue. Desertification is the extreme degradation of land. Desertification eliminate 75 billion tons of fertile soil annually (*Reesor*).

China is known for the booming population and the strict governmental efforts to restrict the numbers of new born. With a population of more than 1.3 billion people, China boasts the world's largest population (*China Country Strategic Plan*).

The Chinese government introduced the one-child policy in the 1970's to prevent over population. This decline to 3.97 members per household in 1990, is attributed to the one-child policy (*National Center for Biotechnology Information*).

An estimated 150.8 million people are malnourished (*China Country Strategic Plan*). The inconsistency in food and conditions for the Chinese is reflected in their statistics; the National Bureau of Statistics (NBS) reports the average life expectancy of the population increased from 67.8 years in 1981 to 76.3 years in 2015. The Bureau report that in "2000, there were six employed adults for every person aged over 60; by 2030 there will be barely two should current trends continue" (*China Country Strategic Plan*). The Chinese NBS estimated the poverty rate in rural areas at 7.2 percent in 2014 equating 70.17 million people. According to the NBS the most impoverished and malnourished are found in the remote and rural areas (*China Country Strategic Plan*). The National Bureau of Statistics for China reports that the per capital gross national income increased from 213.00 to 7,684.00 U.S. Dollars in 2014. Despite such growth, there are challenges in inequality large income disparities and gaps in nutritional status between rural and urban areas (*China Country Strategic Plan*).

In the past, China had more undernourished people than anywhere in the world, excluding India. Economic development has pulled many people out of poverty and hunger, but still, 150 million people, mainly rural, remain in this tragic state. Amongst 88 million children in the poor rural areas, approximately a third of those 88 million suffer from anemia. This anemia is believed to be the result of insufficient amounts of iron according to survey data. Unfortunately, this iron deficiency can stunt brain growth, which means the vast majority of these children will grow up at a disadvantage, making it harder for them to create more successful lives for themselves. "They are far behind compared with urban kids," says Lu Mai, secretary-general of China Development Research foundation (CDRF), a government-run

charity. Mr. Lu and along with other experts have been urging the government to scale up its efforts (*The Hungry and Forgotten*). The government subsidizes school lunches for 23 million children in the 680 poorest counties, in addition to nutritional supplements for hundreds of children. Sadly it is not enough.

China requires nine years of education and the enrollment rates clearly reflect the importance of education. The net rates of enrollment of school age boy and girls exceeded 99 percent in 2008. The national-level illiteracy rate was 4.1 percent in 2014, while illiteracy among adolescents was 1.0. It is important to note that China feeds the school aged, feeding 33.6 million in 2015 (*China Country Strategic Plan*).

China is the leading exporter of corn and various grains. As a leading exporter for U.S. agricultural products, their exports exceed that of Mexico, Japan and Canada. A reason for such high imports is land scarcity (*Gale, Fred, et al*). Prior to China's 2001 World Trade Organization (WTO) accession, farms in China primarily supported the family with small plots of land producing low quality grain (*Gale, Fred*). Some 200 million small farmers produce the majority of food in China. In addition to such a large population, land scarcity, the area is prone to disasters. It is estimated that droughts and floods affect 186 million people. These issues affecting the land reduce agricultural production by 20 million tons per year (*Gale, Fred*).

The cause of these dire circumstances happens to be desertification, centuries of overgrazing and forest clearing. Desertification is a serious problem in China, and government officials are eager to show off their efforts to combat it after receiving international criticism on how they've addressed the issue. These critics say the Chinese government is not addressing this dilemma effectively; they say methods like planting trees aren't productive at all. Unsustainable farming practices in northern China are leading to rapid desertification, the transformation of arable, and productive land to desert or unproductive land due to climate change or destructive land use (*Friedland, Andrew J., and Rick Relyea*). In 2012, researchers at the Earth Policy Institute warned that about 90% of China's grasslands are degraded and suffering from desertification. Since 1950, more than 24,000 Chinese villages have been abandoned because of spreading sands, and these lands are in danger of becoming desert (*Miller, G. Tyler, and Scott Spoolman*). So, is it possible to produce enough food to feed the world's population without destroying the land, polluting the environment or reducing? Yes, sustainable agriculture fulfills the need for food and fiber while enhancing the quality of the soil minimizing the use of nonrenewable resources, and allowing economic viability for the farmer (*Friedland, Andrew J., and Rick Relyea*). However, there is a major barrier facing the Chinese government, as populations increase, soil friendly forms of agriculture become less sustainable.

Malnutrition remains a problem in China, particularly in rural areas (*10 Facts About Nutrition in China*). Christopher Flavin, head of the Worldwatch Institute, traveled to China to discuss the challenges posed by environmental changes in the country. "Beijing will have no choice but to come up with a more effective approach. Environmental damage is going to become a major threat to economic development," says Flavin (*Ramirez, Luis*). This is an immense task for a nation struggling to feed itself. An example of this environmental damage is in Dzorge County. Dzorge County is one of the main crises in China. Expanding at 8 percent a year, the grassland in Dzorge County is now turning into a desert. In approximately 20 years, 200 lakes in Dzorge County have dried up to desertification (*Dundrub, Gongbo*). Shitso Lake has lost its diversity and is now disappearing. About 40 percent of the earth's land area is currently threatened by desertification (*Dundrub, Gongbo*). Like much of the world, desertification in China is expanding existing desert areas and creating new ones.

In Beijing springtime means sandstorms – these sandstorms serve as a reminder of the worsening situation. Scientists say the deserts of northern and western China are expanding by several hundred thousand square kilometers a year. Their data suggests that in a few years, Beijing could be covered with silt. Government officials fear much of the nation could like that unless they successfully stop the

advance of the deserts. And the correlation with agricultural productivity is real, in the past few years, China has gone from being an exporter of grain to an importer.

Current agricultural practices have serious consequences. In order to put an end to desertification, China has to use alternatives to industrial farming to reduce soil degradation. As problems with industrial agriculture become more apparent, alternatives are gaining more attention. China is working through many solutions from legislative initiatives to local on the ground initiatives. At the highest levels this matter has attention. The Chinese Government and the WFP signed a memorandum to reduce poverty recognizing that the climate and building capacity to grow crops is key to their success (*China Country Strategic Plan*).

China has to implement alternatives to conventional farming methods to ease pressure on the land. A variety of farming methods can be used improve agricultural yield and retain soil and nutrients. Sustainable agriculture practices such as intercropping, agroforestry, and contour plowing would all benefit the country. Intercropping is practice in which two or more crop species are planted in the same field at the same time to promote a synergistic interaction between them (*Friedland, Andrew J., and Rick Relyea*). Intercropping trees with vegetables – a practice called agroforestry – allows vegetation of different heights, including trees, to act as windbreaks and to catch soil that might otherwise be blown away, greatly reducing erosion (*Friedland, Andrew J., and Rick Relyea*). Another alternative method, contour plowing – plowing and harvesting parallel to the topographic contours of the land – helps prevent erosion by water while still allowing for the practical advantages of plowing (*Friedland, Andrew J., and Rick Relyea*).

The most recent innovation in Chinese agriculture is working with organic or sustainable agriculture (*Paull, John*). This rapid embrace of sustainable farming simultaneously serves multiple purposes, including food safety, health benefits and exports opportunities. The organic movement provides a better quality food. There is also a local financial upside. For those small farmers selling their product, organic agriculture will bring a price premium for the produce of rural communities. A better quality of food and life in the rural area will allow the adoption of organics to stem the migration of rural workers to the cities (*Paull, John*).

In the spring of 2010, the Tibetan Sustainable Environmental Resources for increased Economic Growth (TSERING) program, funded by USAID, responded to this urgent need through anti-desertification training and activities in co-operation with the Ruo'ergai Forestry Bureau and TSERING's partner, the Sichuan Grassland Research Institute (*Dundrub, Gongbo*). Villagers reacted positively to the project and expressed that they now feel more control over their conditions and that there are moves they can make to stop the desertification of their land. In light of the group felt ownership, villagers from all kinds of different backgrounds volunteered to help with the restoration; from a 4-year-old boy to an 80-year-old grandmother. The village community management committees are vital for the project's sustainability and for guaranteeing that the land is properly shielded from animals and other threats. Despite the hard work involved as part of this volunteer position, villager Gongbo Dundrub stated, "This is our own project. I'm willing to do the job." (*Dundrub, Gongbo*)

TSERING was successful because of community ownership. The staffed trained the locals to identify reasons for desertification and to consider solutions to resolve the matter. This project was in conjunction with the local government.

In 2010, the government offered emergency subsidies for irrigation in the amount of \$1 billion dollars. The funding was expected to address the drought problem by encouraging cloud seeding, funding irrigation, water diversion and well digging (*Bradsher, Keith*).

China's desert "Kubuqi," known as the "sea of death" has been transformed with the help of a private company Elion Resources Group and the Chinese government. The Kubuqi is China's 7th largest desert in China. The people who lived in the area were either doomed to a life of poverty or forced to relocate. The anti-desertification of the Kubuqi is attributed with raising 100,000 people from poverty. Elion is an ecological investment firm. The firm employs locals to plant trees in the desert. The result of the planting is an increase of precipitation by more than 11 inches. Elion has planted or "eco-restored" in excess of six-thousand trees over 18,000 square kilometers. Elion has also developed a special plant for Chinese traditional medicine, fruits and vegetables for consumption and commerce. The two items, which make this initiative a success, is the targeted development and growth of an environmental yet culturally sensitive plant and the support it provides to the local community. The United Nations is also supporting this project (*Daffae, Alpha*).

China is cognizant that desertification affects the way a large portion of their population lives. Desertification influences the amount and quality of food, in addition to the broader environment and community health. From grazing animals, weather conditions, and environmental hazards the Chinese people must use both costly technological advances like fast growing modified trees and irrigation projects to the simple solution of modifying grazing habits. The solution is both local and National. China's government must approach a solution cohesively. There are causes and affects; China's improved gross domestic product and income per household change the expectations that the Chinese people have for their quality of life. The demand for meat and grains to sustain that desire will continued to impact the environment if they do not take a holistic approach. There is no one solution. What is for certain, their population must eat.

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