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Biofuels: Promises and Implications for Food Security in China

These days, it seems as if China is on everyone's mind. With countless news articles debating China's potential to overtake the United States as a world power and magazines reporting on China's ever-growing economy, it is easy to see why. While many choose to focus on China's possible emergence as a dominant superpower, the complications that come with China's development are being ignored. Home to 1.3 billion people, China is the world's most populous country (China 1). Of the 1.3 billion, approximately 700 million are rural peasant farmers (Rural 1). Although many are leaving the countryside for urban areas, it is important that the remaining rural poor are not neglected. With the rapid urbanization and modernization of areas that were once rural, it is apparent that the government's focus is its development as a world power. With every passing day, the income gap between urban and rural areas increases. In order to curb this problem, it is critical that the Chinese government does not leave the rural poor behind while trying to establish China as a world power. Even though the urban population's quality of life continues to improve, life for many in rural areas remains stagnant. In addition to this growing problem, China also faces the daunting task of finding an alternative energy source because it lacks a large supply of indigenous oil. As the second largest consumer of oil in the world, China must look for other ways to keep up with the demand for fuel (Biofuels 1). On top of this, China may be the world's leading polluter, mainly due to inefficient energy use (Power 1). Consequently, a renewable energy source is crucial to China's development. One possible alternative energy source is biofuel. However, using biofuels as a main source of renewable energy is controversial. If biofuels are used, food security for rural subsistence farmers may be at risk. Therefore, it is necessary for rural subsistence farmers to have ways of securing their farmland, ways of receiving appropriate incomes for the crops used to produce biofuels, and solutions or plans to help manage the problems caused by China's development.

Before solutions can be given to tackle complications set before rural subsistence farm families, their background and needs must be established first. Even though policies in China have been effective in reducing the number of extremely poor citizens from 260 million to less than 25 million, around forty-six percent of the population still lives below US$2 a day (China 1). Rural subsistence farm families account for most of the population living below the national poverty line. China's average subsistence farm family usually consists of a mother, father, and one or two children. Due to China's one-child policy, which was put in effect in 1979 to restrict the population growth, couples are technically only allowed to have one child. However, due to the large preference for boys, some rural families can have a second child if their first is a girl (One-child 1). Rural subsistence farm families' diets vary depending on the location. Most diets are largely vegetarian by choice, although chicken and pork are eaten on occasion (Chinese 1). Some diets contain potatoes and noodles, while others consist of rice, red chilies, and corn. Red meat is rarely found in most Chinese diets, while fish is often eaten when available. One improvement to rural areas is the number of children who are able to receive an education. According to United Nations Educational, Scientific and Cultural Organization, ninety-nine percent (net) of children are enrolled in primary school. However, only seventy-three percent (gross) of both males and females are enrolled in secondary school (Statistics 1). Even though China has made some progress to lessen poverty in rural areas, the incomes for urban areas are three times higher than that of rural areas (China 1). The average rural farm families' income ranges from 1,800 to 2,500 RMB (US$225 to US$312)

(Women 1). One of the biggest obstacles preventing subsistence farmers from increasing their incomes is overpopulation, combined with a lack of available farmland. In fact, land acreage per capita is so low that only subsistence farming is possible in fourteen of China's twenty-seven provinces (Farmers 1). Most farmers grow corn, potatoes, rice, wheat, or soybeans on their farms, which are an average size of 0.25 hectares (Feed 1 & Agriculture 1). Other major barriers preventing farmers from reaching optimal crop yields are the agricultural practices used and ignorance about farming procedures. Approximately 900 million farmers still use old, traditional, mainly organic agricultural methods that are out-of-date compared to modern agricultural practices used in developed countries (Farmers 1). Also, farmers who use pesticides or fertilizers often have no idea how to use them properly, which can hurt yields, pollute the land, and make crops unsafe for consumption (Advances 1). Another major barrier to increasing farmers' incomes is the amount of corruption found in local governments. Because rural authorities blatantly ignore central government policies, rural farm families are being overtaxed and deprived of aid money. If the central government found a way to enforce its policies, then it would actually benefit rural subsistence farmers.

Because the overpopulation and shortage of farmable land are the main factors impeding farm families from producing enough crops to make a sufficient income, it is important that policies are created to help curb them. Due to overpopulation, there is not enough land for each family to farm and make a substantial living. It is estimated that as many as 500 million peasants are surplus to the required labor needed for farming (Farmers 1). In addition, many farmers are losing farmland owing to the rapid urbanization taking place throughout China. As more and more farmland is converted into cities and suburbs, the situation becomes more severe. In the past twenty years alone, 16 million acres of farmland have been converted to urban areas (Rural 1). There are already between 100 and 150 million rural farmers who have realized that they have no future on the land have already decided to move to urban areas in hope of finding a better job and a higher quality of life. Although some rural migrants do find a better life in urban areas, the transition is not easy, largely because of the discrimination towards the rural population that takes place across China.

Another problem that needs to be addressed is the mounting segregation between rural and urban areas. While China concentrates on the rapid urbanization that is taking place, it seems as if the obvious gap in the quality of life for rural areas compared to urban areas is being overlooked. China has one of the greatest inequalities between the rich and poor in the world (Poor 1). Urban areas are reported to have better healthcare, higher average incomes, superior schools, and better housing than the countryside (Rural 1). To make matters worse, rural authorities oftentimes are corrupt and take advantage of the rural poor. Even those who move from the countryside to cities find they are treated like second class citizens and are often denied many things available to the urban population. Those from the city view the rural people as subordinate. Rural migrants are denied the rights of an urban citizen; they are prohibited from urban housing, their children are blocked from urban schools, and the only work available is in factories or construction sites (Rural 1). The differences between the cities and the countryside are so great that something must be done before the problem gets worse. Currently, the growing unfairness just adds to the rising tension between urban and rural areas.

As previously mentioned, rural authorities are an underlying factor preventing farm families from increasing their incomes. Many rural authorities are corrupt and take advantage of the rural poor who already have very little. These local officials have been known to make poor farmers pay almost two-thirds of their income in tax, even though the central government told the rural poor they were exempt from paying taxes (Poor 1). Corrupt rural authorities often take money intended to aid the rural poor and use it for themselves. An example of this is the money being paid for farmland across China. Now, property developers are paying millions of dollars to local governments for land that will be developed. The local governments pocket basically force out the farmers and keep the money earned from the sale. The main problem does not lie with the central government. Oftentimes the central government creates good policies to help rural areas. The problem is, local governments either overlook these policies or abuse their power and use them for personal gain (Poor 1).

With the large-scale problems of overpopulation, a lack of farmland, the inequality between rural and urban areas, and corrupt rural authorities, it is clear that plans or policies are needed. The first place to start with is the corrupt rural authorities, because even if helpful policies are created, they are worthless if local governments don't correctly follow them. One solution would be for the central government to more closely monitor local governments. If local leaders are not following central government policies and are abusing their power, then the leader can be replaced. If the central government regularly checked up on local governments, they could make sure their policies were being carried out. If corruption is limited in local governments, the poor would pay less in taxes and aid would reach them, therefore increasing their incomes. This solution, however, does not address the other problems of overpopulation and a lack of farmland. Because there is not enough farmland for the number of farmers, it makes it extremely difficult for anything other than subsistence farming to exist. In other words, subsistence farmers can only grow enough for their families to eat and excess crops don't generate a substantial profit. Unfortunately, there isn't much that can be done to remedy the lack of farmland. However, there are still viable solutions to solve the problem of surplus farmers. One solution would be to provide a way for rural farm families to migrate to the cities. If access to jobs, urban housing, and urban schooling were available, then it would make the transition for rural families easier. If many families wanting to leave the countryside could start new lives in the city, then it would free up some of the farmland for remaining farmers. As a result, farmers could manage slightly larger farms, giving them bigger yields, which lead to a higher income. Another thing that would greatly help the remaining farmers would be education on agricultural techniques. It is estimated that only one-third of water used for irrigation actually reaches the crops (Kynge 147). Also, incorrect information or a lack of knowledge about pesticides and fertilizers leads to incorrect use of these chemicals. If farmers had access to more information on better irrigation techniques and proper use of pesticides and fertilizers, they could increase their yields, thus generating more profit.

As the situation stands today, farming is unsustainable, mainly due to the lack of farmland. Without a stable agriculture, using biofuels as a solution to China's fuel demand is not feasible. Since subsistence farm families barely have excess crops to make a profit, it would unwise to use large amounts of crops to produce biofuels. Even if public policies were successful in increasing agricultural yields for farmers, there would still not be enough to ensure food security and produce biofuels (Biofuel 1). In a nation with 1.3 billion people, a lesser food supply could have grave consequences. Not only could the production of biofuels threaten China's food security, the demand for crops to produce biofuels could dramatically increase food prices (Prices 1). Therefore, biofuels production could have extremely harmful outcomes for subsistence farm families. One exceedingly negative possibility is the prospect of huge biofuel companies buying out large areas of farmland from local governments and using the land to grow crops entirely for biofuels production. If local governments remain corrupt, then the money used to buy the land would stay in the hands of the authorities and the rural farmers would be forced off their farms. Even if this doesn't happen and farmers do receive a larger profit for crops sold for biofuels production, they would have to spend more of their income on food, thus leaving them no better off than before.

By studying the possible negative effects of biofuels production for subsistence farm families, biofuels is not a practical option at the moment. However, there are still some ways to implement biofuels production so that it is helpful and not harmful to subsistence farmers. One potential route is to produce biofuels from inedible crops. Japan is pursuing this option; they have already spent millions trying to make biofuel from rice straw and chaff (Price 1). Although the technology to make biofuel from inedible crops is still being developed, it would allow the production of biofuels without threatening China's food security. If the demand for inedible crops went up, rural farmers could sell their crops for more, which would greatly improve their income. The most ideal solution for subsistence farmers is making biofuel from inedible parts of crops, such as corn (Price 1). Even though this technology isn't developed yet, it has enormous potential for subsistence farmers. For example, a subsistence farmer growing corn would first sell the corn for consumption and receive a profit. Then the farmer could sell the inedible parts of the corn to a biofuel production company for an even greater profit. The farmer would have at least twice his normal income without threatening the food supply. In spite of this promising future for subsistence farmers and biofuels, the present situation is not the optimal time to implement biofuels production in China.

With China's rapid urbanization and growing economy, there are many complications that arise from development. Although the problems may seem numerous, if policies are created they can slowly improve the situation. Over time, public policies could eliminate or at least greatly reduce problems such as overpopulation in rural areas, corrupt local authorities, and the gap between rural and urban areas. Public policies may also help increase subsistence farmers' incomes and agricultural yields. One basic thing that can be done is educating rural farmers about proper insecticide and fertilizer use. If farmers can use fertilizers and insecticides correctly, then they can reach optimal yields. Correct fertilizer and pesticide use also greatly diminishes the pollution from these chemicals, making water sources safer. Another upcoming problem is China's demand for oil and the environmental degradation that results from rapid development. China may overtake the United States as the leading consumer in oil. Because China is the world's most populous country, its demand for oil may surpass its available supply. China needs to find an alternative fuel source, and biofuel is one option. At the same time, if the current food security and status of the subsistence farmers is taken into account, then biofuel is not a very wise option. Until the technology to produce biofuels from either inedible crops or inedible parts of crops, then mass biofuel production will threaten China's food security. If the technology to produce biofuel from the inedible parts of crops is produced, then China could produce biofuels for the benefit of increasing subsistence farmers' incomes and having a renewable energy source to help meet the demand for fuel. Until that day comes, China will have to search for another alternative energy source.

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