Rebuild a New Agricultural Education System: Based on the Actuality and Issues of the Agricultural Education in Contemporary China

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Abstract
As China's economy and society evolves through science innovations and educational reform, China's government is developing and implementing new strategies to build an innovation-oriented country. Since 1985, human resource development and education have been emphasized as the essential factors for building an innovation-oriented country. With an understanding of the need for a strong basic educational system, tremendous change has occurred in rural education, vocational & technical education and high agricultural education. However, challenges still exist within the contemporary agricultural education system. This paper focuses on six issues with the current agricultural education system. Utilizing investigative methodologies this paper presents an analysis of the current educational situation in China and proposes a new agricultural education system.

Keywords: China, nationwide survey, rural education, agricultural education, system
Introduction

Prior to 2004, 59.5 percent of China’s residents lived in rural areas (National Bureau of Statistics of China, 2004). The data shows the average number of years spent by this population in the educational system to be 7.6 years, three years less than their urban and suburban counterparts. Seventy-five (75) percent of China’s residents finished their formal education career with just nine years of education (1st-6th grade in elementary and 7th-9th grade in middle school) (Han, 2005). China’s current system for agricultural education includes: medium agricultural education (professional schools), high agricultural education (agricultural universities) and vocational & technical education in rural areas (short-term training). In this system, there is no basic agricultural education in rural and non-rural middle and high schools. With no formal agricultural educational system in rural China and the only training available being of a vocational and technical nature, the present system is weak when it comes to preparing and supporting career development and lifelong learning (Case & Whitaker, 1998). Furthermore, the present system is not creating a broader understanding and more systematic instruction about agriculture (Board on Agriculture and Natural Resources, 1988, p. 2). As a result, without analyzing and questioning the present rural agricultural educational system and providing alternative avenues, China’s exam-oriented educational system will continue to be futile (Shen, 2005). Scholars have indicated that China should reform the curriculum (Huang, 2004), from the present exam-oriented educational focus to one that encourages students to apply a deeper learning approach to master both Professional Technical Skills and Professional Practical Skills (Shen, p.35). However, current reform efforts and struggles cannot solve the essential issues: 1) creation of an agricultural literate population, 2) implementation of a quality-oriented education, and 3) employment for nearly 75 percent of the rural residents who are unable to attend high school and college.

In 1956, the Communist Party of China’s Central Committee initiated an effort to increase a focus on science through their call for "Anabasis to the Science." After 22 years, in 1978, Deng Xiaoping, chairman of China’s central government, stated "Kexue Jishu Shi Diyi Shengchanli" (Science and technology are the primary productive forces), which brought China into the "Kexue de Chuntian" (Scientific Spring). In 1995, China further emphasized the development of science and education by implementing the “Kejiao Xingguo” (Rejuvenating the country through science and education) strategy. After nine years, in 2004, China’s government implemented “Kexue Fazhanguan” (Scientific Development Concept), stressing “Zizhu Chuangxin” (Independent innovation) while building a “Chuangxinxing Guojia” (Innovation-oriented country) (Liao, 2006). Since 1980, China has focused on developing an educational system that will move China from a country with a human population to one with a strong “Human Resource” (Research Group of China Education and Human Resource Issues Program, 2003). Presently, China’s national educational system is composed of Basic Education, High Education, Vocational Education and Adult Education (Dou, 2003).

However, the current educational situation has increasingly become more and more unbalanced between China’s rural and urban areas. As this gap widens the ability of China’s rural educational system to meet the human development, utilization, economic development and social development needs of those residing in rural China is further stressed. Numerous experts including: Emily Hannum, a sociologist, from University of Pennsylvania; Meiyang Wang, from Institute of Population and Labor Economics, Chinese Academy of Social Sciences; and, Jennifer Adams, from School of Education, Stanford University (Fairbank Center for East Asia
Research, 2006), have researched and analyzed the growing gap in resources between those who live and work in rural areas of China and those who live and work in urban areas of China.

The agricultural educational movement has yet to be incorporated into China’s “basic education” system, the most common educational component in rural China. Although China’s “basic education” system has made enormous strides since 1949 (Hannum & Park, 2002), agricultural education in rural China is primarily limited to short-term training aimed at farmers and is not seen as a critical component of the 9-year compulsory education (Liu, 2004). The nearly 330 agricultural schools, distributed among the provinces, autonomous, and municipalities throughout China, being a governmental institution, have been protected from scrutiny and free market tests (Amberson, 1989). This has resulted in a curricula and teaching methodologies that have not been relevant to the developmental objectives of individual countries, the needs of farmers, or the labor market in general (FAO, 1997).

China’s central government, in 1991, recognizing the need for an improved agricultural educational system for rural China, decreed that the general rural secondary school systems had better establish an agricultural technology curriculum with the ultimate goal of improving the farmers’ science and technology quality (Central Government of China Communist Party, 1991). However, under the traditional exam-oriented education philosophy, most students produced by the education system are either “high score and low ability” or “low score and low ability” (Shen, 2005, p.33). Because of the focus centered on passing the final uniform examination, an exam devoid of agricultural educational content, agricultural education subject matter have been effectively been eliminated from the curriculum.

**Purpose**

The purpose of this paper is to present the current agricultural education system in China, discuss its strengths and weaknesses, and provide alternative approaches to rural agricultural education. Using survey data coupled with personal and work-related experiences the authors will: 1) suggest a new agricultural education system in China, 2) provide advice and insight learned from experiences and lessons to help others, not only in China, but in other developing or developed countries including the United States, and 3) recommend key enhancements to the current system in China.

**Methods and Data Sources**

This paper is based on six points: 1) lead author’s 20 years of living in rural areas of China, including receiving his education in a rural elementary school, middle school and high school; 2) review of the related literature; 3) lead author’s experience conducting research about agricultural education, rural human resource development and farmers’ continued education in China, including his undergraduate, master and doctoral studies since 1990; 4) lead author’s four years of work-related experience in China’s Ministry of Education, which provided the author with a thorough understanding of China’s national educational system and its policies; 5) lead author’s design and implementation of a nationwide questionnaire investigation about Rural Human Resource Development (2005); 6) co-author’s nearly 30 years of teaching and research experience in the United States. His focus has been on agricultural and technology education issues facing youth in both formal and informal educational settings. With a strong interest in international educational issues, especially those facing agricultural education in rural China, he has reviewed the related literature about China’s education system and its development issues.

The lead author, with assistance from 105 graduate students, conducted a nationwide survey of participants who ranged from 15-35 years of age and resided in 29 China provinces.
Data were inputted and analyzed through SPSS. From the beginning of concepts, the authors always emphasized the importance of human resource development being started at a very young age — childhood and middle school. Based on the results of the study recommendations were presented to the Chinese government to enhance the current agricultural educational system ultimately leading to a new agricultural education system in China.

**Finding and Results**

According to the survey conducted by the lead author, and research studies carried out by other Chinese research institutes, China's agricultural education reform has seen remarkable advancements. However, challenges still exist, especially in the following areas: 1) promotion of a 9-year compulsory education system with a strong suggestion that it be extended to a 12-year system, 2) lack of school-based agricultural education programs, 3) need for governmental funding, 4) challenges in implementing an agricultural education curriculum, 5) identifying and training agricultural education teachers, and 6) creation of youth development programs.

*Promotion of a 9-year compulsory education system with a strong suggestion that it be extended to a 12-year system*

The current educational status in rural China is: 1) educational level of rural labor has generally increased, 2) 9-year compulsory education is basically universal, 3) educational level of the rural Chinese population is still generally low; and, 4) mission is not only to consolidate the 9-year compulsory education, but also to promote the 12-year universal education.

According to the fifth national census, the educational level of China's rural labor force is still extremely low. The overwhelming majority of employees have a middle school education or below, nearly one third have a primary school education, 8 percent have no schooling or are illiterate and semiliterate, and a very small proportion of the population have graduated from high school, technical school and/or a 2-3 year college (Research Group of China Education and Human Resource Issues Program, 2003, p. 241).

Research conducted by the lead author in 2005 focused on “Investigation about Rural Human Resource Development” found that while middle (junior high) school education still is the mainstream, the number of individuals receiving either a secondary education and/or higher education degree remains low (Figure 1) (Dou, 2006).

Comparison of 2005 results with those found in a 1999 study of rural youth development issues conducted by the China Youth Research Center and resulting in the publishing of a book entitled “A New Span—Report of Rural Youth Development in Contemporary China (1999-2000)” (Xi, 2000) found that although the Chinese government began a new initiative to improve the rural basic education system, six years later the percentage of rural youth receiving a formal education remains relatively low. The most noticeable educational deficiency in rural areas is the low number of youth who receive 12 years of education.
Notes: A: elementary school (1-6); B: middle school (7-9); C: vocational Mid-school; D: technical secondary school; E: high school (10-12); F: 2-3 years college; G: 4 years college; H: illiterate.

**Figure 1.** The education status of rural youth.

*Lack of school-based agricultural education programs*

In the current Chinese educational system, agricultural education at the secondary educational and vocational & technical level has resulted in more rural farmers being trained, but agricultural education programs for youth in schools is still missing.

The present educational model for agricultural education involves three parts, hence the named “Three-Horse Carriage”, as shown in Figure 2.

**Figure 2.** The Three-Horse-Carriage system of agricultural education to rural youth.

Presently the central government provides considerable funding for the continued education and training of rural employees. However the quality of those programs provided through vocational & technical education, which involves career training for transferring, vocational & technical training, pre-employment skills training, are still weak (Li, 2005).

According to governmental statistical data, 183.1 million students received a 9-year compulsory education (National Bureau of Statistics of China, 2003), of which 55.3 percent (108.5 million) (Department of Development and Program of Ministry of Education, 2004) lived
in rural areas. Of those rural students, an elementary educational level is still the most predominant. Only one in 200 individuals -- 56.7 million people, 7.4 percent of the total rural population (768 million) received vocational skills training (Zhang, 2003). As a result, the current educational system in rural China (basic education, vocational education and continue education) cannot meet the challenge of improving the quality of the rural labor force and the orderly transfer of rural labor and rural urbanization. Moreover, due to limitations of the rural educational system, the current agricultural education program actually impedes the establishment of a new rural economic system, the rural science & technology extension system, and the adjustment and optimization of the rural industrial structure. As FAO indicated earlier, the current educational system has not sufficiently taken into account the special problems and needs of small farmers and fisher folk (SD-FAO, 1997). According to the vocational education system policy identified by the State Council of China in 2002 (The State Council of China, 2002), the current vocational educational system does not include agricultural education. Under the present exam-oriented educational system agricultural education still has not infiltrated into the school-based educational program.

Need for governmental funding
In present rural China, the level of funding for education has increased significantly, but it is still deficient resulting in poor teaching facilities and conditions.

Compared with developed countries the gap in funding by the Chinese government between rural and urban education is noticeable, with rural areas being grossly under funded. Research conducted by the Development Research Center of the State Council of China and reported in the report titled “County Finance and Burden of Farmers” found that funding for education in rural areas is comprised of 78 percent from villages and towns, 9 percent from county finances, and 2 percent from Provinces or Municipalities (Zhang, 2003). As indicated earlier, this policy creates a system where inequities exist based on the availability of local resources and further expands the gap between urban and rural education. In 2003, the Ministry of Agriculture reported that of the 480 million rural laborers throughout the country only 9.1 percent had received professional skills training (Zhang, 2004). It is estimated that the cost of providing professional skills training is about ¥200.00 ($25.00) per person. Using this figure it would cost about ¥77.6 billion ($9.7 billion) to train the 388 million (80.9 percent of 480 million rural labors who have no professional trainings) untrained rural laborers. Based on 2001 data only about 3.9 percent of the national annual revenue of 2 trillion RMB ($250 billion) or about 16.7 percent of the total nation's education investment (463.766 billion RMB or $57.958 billion) would be required to train all rural laborers (Ministry of Education, 2002). As shown above the investment in rural agricultural education by the Chinese government is presently inadequate to meet the needs of the rural labor force.

Challenges in implementing an agricultural education curriculum
Agricultural education is lacking in most middle and high schools. Although some schools have added it to their curriculum and developed curriculum tailored to local needs, in reality it exists in name only.

In 2005 when youth were asked the question “From a realistic point of view, the goal of rural primary and secondary schools should be ___?” just under 30 percent (28.2 percent) of the youth felt that rural primary and secondary schools should encourage youth to further their education by attending college (Figure 3).
Notes: A: encourage youth to attend college; B: develop more working labors with good skills; C: create more farming laborers competent in the latest knowledge and agricultural technology; D: teaches youth communication skills and how to succeed in life

Figure 3. What should be the goal of young people in rural schools?

However, in the current rural education system, the following key problems conflict with the above goals:

- the main goal for most high schools, middle schools and even elementary schools is to prepare youth for college (Liang, 2003). However, a large percentage of youth will never attend college, thus the local system is not in tune with what the majority of youth need.

- plans to implement the 9-year compulsory education in rural areas using unified teaching materials (only a handful of experimental schools use their own teaching materials), which are used in urban settings as well. Consequently, rural primary education, general secondary education and high school education programs all have same educational goal, educational program and teaching methods, which is named “one size fits all” (Allan & Clive, 2000).

- most students think “Xuehao Shulihua, Zoubian Tianxia Dou Bupa” (It’s no worry when you travel to the world, after better learning mathematics, physics and chemistry) and “Zouchu Jiamen, Tiaochu Nongmen” (Out of the house, jump out of the agricultural door) as their ultimate and supreme goal. Most of their parents also think so.

An analysis of a rural middle school in Gansu Province, found the school had bought the textbooks “Laboring Technology” (Volume I, II and III), but the “Laboring Technology” courses existed in name only, having been arranged such that students could not sign up for the classes. In this case it is clear that agricultural education has not really penetrated into the basic education system in rural schools. In fact, research conducted by the lead author has shown that rural youth would like to see more classes focused on preparing them to enter the labor force. Slightly over ¾ (75.9 percent) of all rural youth hope that “laboring technology” or other special vocational technology courses are added to their school’s curriculum. Only 7.9 percent are opposed to the addition of a labor focused curriculum while 16.9 percent did not care (Dou, 2006, p.108).
Identifying and training agricultural education teachers

Currently the quality of educators in rural China is not high and is unstable. Due to poor treatment and low salary, teachers in some public schools seek higher paying jobs in urban schools or leave the teaching profession for more lucrative jobs. With low salaries for teachers in rural China it is common for them to have part-time farm jobs as other professional-based employment is not readily available. A survey of teachers in Gansu and Shaaxi Provinces found that half the teachers were paid by local people. Teachers in these types of position are called “Daike Jiaoshi” or “Minban Jiaoshi” (temporary position and paid by local people) in China.

For example, a survey focused on teacher qualifications conducted by the Institute of Sociology Chinese Academy of Social Science in Shaanxi Province, Qinghai Province, Ningxia Hui Autonomous Region, and Xinjiang Uygur Autonomous Region showed that the most significant difference occurred between the four provinces and the whole nation (Chen, 2000). The study found that teachers working in rural China were less likely to be certified with only 56.6 percent certified which is 9.3 percentages lower than the national rate.

Under the current education system the resources necessary for employment of an agricultural education teacher in a school are essentially non-existent thus there is either no agricultural education program or if one exists it is weak. As a result, nearly all schooling still utilizes the exam-oriented education system. The basic educational system with a focus on quality education is still slowness (Li, 2006).

Creation of youth development programs

Youth development relies on the programs. Many scholars believed that middle school programs would serve as feeder programs to the high schools (Rossetti & McCaslin, 1994). In China, same as urban youth, most rural youth are not affiliated with a particular religion and are not members of any organizations. A study conducted by the lead author asked youth “what kind of organization or team did you take part in?” As showed in Figure 4 the largest percentage of youth reported they had never participated in an organization or on a team.

![Bar chart](image)

Notes: A: The Communist Party of China; B: the other democratic party; C: the Chinese Communist Youth League; D: Rural Youth Center; E: Technical Training class; F: farmers union and other rural economic cooperative organization; G: schoolmates union; H: forks art group; I: have not participate any organizational activities

Figure 4. What kind of organization or team did you take part in?
Just fewer than 40 percent (38.1 percent) of the youth surveyed reported they had never participated in any organizational activities. With a low standard of living level, a significant portion of rural youth has to assist in feeding their family members. They seek employment as a farm laborer or find jobs in other sectors of the rural labor market. Further complicating this picture is that with little to no education they often find jobs that pay very low wages. With all their time spend either in school and or working they have little to no time to participate in youth-based groups and/or organizations. The availability of appropriate youth organizations is another challenge. While there are some organizations geared for youth they have little to no attraction for rural youth.

**Conclusions**

Failure to establish an agricultural education program in rural China is not only an issue for farmers in rural China, which the Chinese government is working to resolve at present, but also one of the most significant and constraining factors for China's agricultural economic and rural social development. There are two fundamental reasons that cause these problems:

- the urban-rural dual structure, which leads to differences such as the economic and social management system, the institutions, and the concept of urban and rural areas (Puttermann, 1992). To eliminate the urban-rural dual structure, the Chinese central government established efforts to build a harmonious society and promoted urban-rural household registration system reform and other reforms to address those problems (CPCCG, 2003).

- the agricultural education system, especially the rural basic education system, involving it’s aim, contents and objects. Many experts have researched China’s basic education system and using that data the Chinese government implemented in 1985 the “Quality Education” initiative (CPCCG, 1985). However, until now, no agricultural education program has been created within the basic educational system.

The agricultural education system is a synthesis of not only the professional high agricultural education, rural education and vocational education, but also the agricultural education to students in secondary schools (7-12th grade), especially to middle school students (7-9th grade). In contemporary China, there is a formative system of rural education and vocational education, but no systemic and applied system of agricultural education.

A proposed new system emphasizing agricultural education is shown in Figure 5. Within this system, agricultural education starts at the basic educational level and cumulates at the farm and/or college level. In this system, the educational subjects involve in-school junior and senior school students both in urban and rural area schools (except private schools), agricultural colleges and universities’ students, and farmers in-home and out-home. The aim of this system is to create a workforce composed of researchers, educators, extension agents, officials, businessmen and new farmers who have a clear and complete understanding of modern science and technological knowledge that will lead to a better quality of life. As figure 5 shows, the new agricultural education system, a pyramid-shaped structure, is an entirely new and comprehensive system which covers agricultural education at all levels.
In contemporary China, a major goal is to increase the number of youth graduating from middle and high schools from the current levels as well as increase the numbers who attend vocational & technical educational programs. Rebuilding the new agricultural education system could play a significant role in solving many of the current problems resulting in more individuals being trained in agricultural science and technology areas. The proposed system puts a significant emphasis on secondary school education, which involves all public secondary schools both in urban and rural areas. The content of agricultural education programs should be focused on life skills education, understanding basic agricultural science and technology, and improving leadership capacity. Through this system, as Case and Whitaker indicated, all agricultural educators must play an integral role in preparing students for agricultural careers, aiding them in building an awareness of the agricultural industry and helping them develop leadership skills (Case and Whitaker, 1998, p.3). The challenges to moving from an educational system where agricultural education is weak to non-existent to one where agricultural education is a focus are great, but the potential rewards to individuals and the country are huge.

**Recommendations**

The need for agricultural education in rural China is significant as is the need for a strong basic rural educational system. The central government in partnership with local governments must take steps to reform the current educational system by creating a strong basic system, one that incorporates an agricultural education program with in-school and out-of-school components. To create an effective agricultural education system, four important issues must be considered: 1) establishing a new non-governmental agricultural education organization, 2) developing agricultural educational programs, in-school and out-of-school, 3) creating applied agricultural teaching materials, and 4) enhancing the extension of agricultural colleges and universities.

For China’s economy to prosper a strong agricultural sector is needed. A strong agricultural sector cannot be developed without skilled workers and skilled workers cannot be created without strong formal and informal-based agricultural science and technology education programs in rural China.
References


