

Reduce Poverty by Offering Quality Education to Rural China

Agricultural Economist ZHANG Linxiu and Her Research Team's Efforts

By SONG Jianlan (Staff Reporter)



Prof. Dr. ZHANG Linxiu, influential agricultural economist and Deputy Director of the Center for Chinese Agricultural Policy, the Institute of Geographic Sciences and Natural Resources Research, CAS. (Photo by courtesy of Dr. ZHANG)

When she greeted the author in her office amid the warm sunshine and fresh blossoms of early April Beijing, Dr. ZHANG Linxiu was just back from her field work in mountainous Guizhou, a remote province of southwestern China which is known to have been lagged behind China's powerful economic chariot and hence suffering from poverty. "We went there to check whether our research design, which involves a study on reducing parasitic infection of kids, is feasible," introduced the agricultural economist: "This is just like calibrating your experiment design derived from theoretical analyses with tentative observations, to see if it is practically 'right'."

Earlier on March 8, ZHANG was crowned the honorable title "2013 Excellent Woman Scientist" of CAS together with other nine women scientists, in recognition of her outstanding contributions to development economics, as well as her ardent, effective efforts to reduce poverty and close the gap between China's rural and urban areas. Towards this end, ZHANG has been endeavored to enhance human capital of western China via providing quality education opportunities to rural people, via her academic activities and beyond.

"Addressing parasitic infection is part of our research

focusing on kids' healthy development and education," ZHANG explained. In her previous research, ZHANG found a causal relationship between the poor nutritional conditions of kids in western China and their school performance. Therefore her research has been embracing three key words: health, education and human capital, which intertwine with each other in a circle in her dreams to reduce poverty in western China.

Close the Gap

Had not for the saddening topic — parasitic infection — familiar only for elder generations in urban China and seldom heard of in the developed world, one would have no clues about China's poverty, sitting in a well-organized office of a top scientific institution of China like the Institute of Geographic Sciences and Natural Resources Research, host of ZHANG's Center for Chinese Agricultural Policy (CCAP). But it does exist. According to data from the Center for Disease Control and Prevention, the latest documented infection of intestinal worms occurred in 1998 — for sanitarians, it is a bygone issue having "disappeared" from the view of the public. However this is reality for rural



people living in the western China: ZHANG's team found out in an earlier survey performed in Sichuan and Guizhou that the infection rate ranges from 35~40%.

"Can you image how large a percentage of kids in northwestern China are suffering from anemia?" ZHANG asked the author, tone turning serious. After a moment of silence she continued to narrate: "At worst almost 70%. And this percentage is almost zero in urban areas." Her team found out this striking fact in a village of Shannxi, a northwest province of China. The unexpected discovery prompted her to start another project to examine factors in play, which will inform further policy suggestions.

Now ZHANG is trying to recruit over 150 surveyors from students of the Guizhou University of Finance and Economics and also Guiyang Vocational College for Nursing Care to perform a precursory survey to find out infection rate of intestinal worms in that region and, to identify possible correlations between this disease and the local circumstance or lifestyle of the kids. "In cooperation with the university we offer the recruited students with exposure to knowledge and experience of real research at an early stage of their academic career, which is rarely available for students in local higher educational institutions," continued ZHANG, lightened up with



A scene from lab tests of stool samples collected from rural children on worm infection. Dr. ZHANG's team is working with local partners on a project to control parasitic infection of kids in rural Guizhou, a province of southwestern China. (Photo by courtesy of Dr. ZHANG)

brilliance of happiness: "and we will share the data for free with the university."

After the survey ZHANG's team will move on to address possible problems popping up from the survey and design a series of intervention measures, which also serve as a kind of experiments aimed at effective solutions and might yield data and suggestions for policy-makers. Seems that Zhang has put her economic policy research in broad connections with different aspects of the society, and in so doing she is hitting many birds with one stone. At the center of these many "birds" seated her major research interests and social concerns expressed in three key words: health, education and human capital.

Leverage Poverty Reduction via Human Capital Building

"At my early stages of research I addressed the issue of poverty and found that people in rural areas not only earned much less income compared with those in urban areas, but also suffered from inequality in other forms, including poorer sanitation facilities, bad nutritional status and, most strikingly, much poorer education. Even worse, the gap is still expanding," ZHANG recalled when asked what has first raised her concern about education opportunity equality in rural China.

Subsequently she found that quality education is most effective among many factors having favorable impacts on poverty reduction, as it directly helps the poor to find well-paid jobs in urban areas. Kids of rural families, however, leave school and start working at much earlier ages than those in urban areas, with many dropouts aged 15 or less from junior high school.

Therefore how to keep kids in school becomes an issue for ZHANG and her team, and they initiated a series of studies that might inform future policy designs. Noting that schooling is expensive for poor rural families and to delay the day their kids begin to earn money — however meager are their wages in the eye of urban people — could mean a lot to them, the team is trying to see whether substantial compensation would work as an offset. Based on scientific calculation of gross cost of schooling, including tuition fees and other expenses, combined with future benefits they design intervention strategies of conditional cash transfer (CCT) to find out the critical value of compensation at which the best cost-efficiency could be achieved.

For example, they reached an agreement with these poor families, which specifies that if the kids stayed in school one year longer, they would receive a sum of ¥1500 (less than USD 250) as compensation.

“As a result, the rate of dropping out is reduced by 60%. It is a pleasure to see how ¥1500 could change a kid’s trajectory of education. For the time being we are simultaneously doing intervention experiments for both junior and senior high schooling,” ZHANG introduced. “We are also looking at other possible factors that do not relate to money, for example lack of information or foresight of future development. Also we offer psychological counseling to the kids, out of the worries that the dropping out might be related to low self-esteem or self-confidence.”

According to ZHANG, her team is mainly focused on the issue of education equality across rural and urban areas of China, aiming at closing the gap in economic development. “All our projects evolve around longer schooling, more knowledge of kids of rural areas and upgraded human capital. Currently we are doing about one dozen projects, and since the founding of this programme eight years ago, it has conducted several dozens of projects, addressing topics along three themes: first along the theme of nutrition, health and education, projects are conducted to improve nutrition status and health of kids, targeting better school performance; second, along the theme of S&T and human capital, studies are made to examine influence of early exposure to advanced information technologies, as well as that of computer assisted learning ; and the third class of projects aims to keep kids in school, involving CCT, psychological counseling and professional advisory,

with commitment to strengthen the kids’ competitiveness in employment and reduce dropping out.”

Concerning CCT, ZHANG explained that in the field of economics, no agreement has been reached about whether conditional or unconditional cash transfer is better. “Still ongoing are disputes and examinations. Anyway, giving out cash is not the ultimate goal — what we are concerned about is the capacity buildup of the local people necessary for changing their own fates,” ZHANG stressed: “What we need is not the illusion and vanity of being seen as the Savior. We must be very clear about our object when working on these projects.”

“Senior High School Shall Be Part of Compulsory Education”

To better keep kids in school and to help better upgrade the country’s human capital and secure its sources of labor forces in one or two decades, ZHANG proposed to extend China’s compulsory education to cover high school education. “We proposed this suggestion based on our investigation across different countries; especially those that have successfully changed their development mode and shifted from economies dominated by labor-intensive industries to ones dominated by intelligence-intensive industries,” she insisted: “When these countries, for example South Korea and Japan, were experiencing a similar stage

ZHANG is seen visiting a student’s family and talking to the mother in rural Gansu, a province of northwestern China. This forth grader received free eyeglasses from the Vision Care Project, an effort of her team aimed at improving eyesight for better school performance. (Photo by courtesy of Dr. ZHANG)





on the economic development trajectory as China does, they attached a lot of importance to education. Their labor forces, regardless rural or urban, mostly had finished education equivalent to or better than senior high school.”

“Yet we have not formally lodged any policy suggestion to the government. We still need more evidence as our projects on this issue are still going on,” she added.

To a large extent ZHANG considers this suggestion out of worries about the human capital buildup of rural China, which has supplied most labor forces for eastern China’s large industrial production lines. “We might suffer labor shortage in 10 or 20 years if we do not take immediate actions to improve literacy of our rural people, as very likely they will not meet the requirements of future jobs. New generation of industries will need skillful workers competent of operating on computer systems, communicating with customers or clients in English, and dealing with orders with better mathematical skills — and what one can get from junior high school will no way be enough for developing such skills,” ZHANG asserted.

Another reason why senior high school should be put under the framework of compulsory education is, ZHANG said, it is way too expensive for the poor in rural areas. “From the view of equality, this bar will deprive kids from poor families of opportunities to get quality education. Therefore, either from the angle of development, human capital, equality or poverty reduction, we strongly suggest including it into the category of compulsory education.”

Further, ZHANG advocated that this stage of education should be paid by the central government from the public financial account, rather than by local governments of different regions. It is an investment on human capital, which will benefit the whole population rather than only the native land of certain people, she argued. More importantly, in a country of imbalanced economic development like China, local governments of poor regions might not be able to afford this expense, and hence will lead to further deterioration of the imbalance. “It is unfair to leave people in a despairing determinism where one’s fate is shaped by the place he/she is born, rather than his/her own personality or ability. For sake of opportunity equality, this bill should be paid by the central government,” ZHANG insists.

Dual Role of “REAP”

ZHANG has been endeavored to close the saddening gap between rural and urban by promoting education opportunity equality, especially, offering quality education to rural people, to a large extent through the Rural Education Action Program (REAP), a program jointly

initiated by CCAP and Stanford University of USA, her long-term collaborator. The program is a platform for both research and “actions” aimed at helping rural kids harvest their education dreams and ultimately at poverty alleviation.

“At first glance one might be confused why it is called an ‘action’ program,” ZHANG smiled: “Here the word ‘action’ means we do not stop at investigation and research; we take actions instead to make a difference via the research itself.”

“Typically, first we identify the problems at fieldwork, collect information and find out possible factors as well as correlations; then we design a series of strategies for simulated interventions to test these possible factors and confirm causal factors. After experiments we will know which intervention strategies are most effective. After evaluation of their effectiveness we can reach optimized solutions and probably informed policy design and suggestions. Sometimes we also need to consider how we can make these interventions practical enough so that the governments would implement them with ease,” ZHANG introduced.

For example, ZHANG said, doing fieldwork in Shannxi, her team found that the school kids had limited, nonnutritive food for lunch. Could they have anemia? They suspected, and immediately conducted a survey involving 4,000 kids. “This is tragic!” Reynaldo Martorell, a nutritionist with the team was shocked on finding that on average one third of the subjects had anemia.

“It is hard to accept this situation, given China’s excellent performance of economic growth,” continued ZHANG: “and studies have demonstrated that anemia could hinder school kids from focusing their attention, hence have negative influence on their schoolwork.” From then on, the team conducted 8 more projects trying to explore options to combat anemia in rural schools. In total, they have tested more than 42,000 kids.

Right now, over 100 enumerators were sent to rural Shannxi to conduct randomized controlled trials on nutrition intervention among infants, aiming to find out the best way to improve their nutritional situation and hence help them develop healthily. Intervention was performed among infants because according to nutritionists, it would be most effective if began early in babyhood. The intervention strategies were carefully designed based on scientific analyses and in accordance with principles of ethical conduct in academic research. “All our intervention strategies are approved by authorities for academic ethics,” she stressed.

Through the intervention ZHANG’s team distributed nutrition kits containing trace mineral supplement and



A group photo at an international workshop and training on rigorous impact evaluation organized by REAP team. (Photo by courtesy of Dr. ZHANG)

vitamins. They are not stopping there, however. From their on-the-site observations they discovered that although infants are anemic in a proportion as large as about 50%, their mothers are in much better nutritional conditions — percentage of anemia rate among the mothers was only slightly over 20%, much better than the babies. “This means, it might not have been solely caused by poverty; some other factors are working,” ZHANG analyzed: “for example, rural families might lack scientific knowledge about how to feed babies properly.” Therefore the team also designed a series of strategies for simulated policy intervention and implemented them in different combinations.

Indeed, the dynamic operation of REAP, from identification of problems, factors and correlations to design of intervention strategies, to the implementation of the intervention, and further to proposing policy models or suggestions, embodies the concept of “action”: in the process the program makes efforts to intervene behavior of the actors, to influence policy-making, and hence helps improve the situation.

Clearly what ZHANG and her team have sowed is growing and their efforts to help poor people to “reap” from the human capital building are rewarding. Over the past four years they lodged a total of 14 suggestions to policy makers of the State aimed at offering quality education to rural people. All the suggestions were accepted by the central government and so far 12 out of the 14 received echoes

from related State leaders and educational authorities. More encouragingly, some are actually influencing the policy design of the State. In response to their suggestions, for example, Chinese central government announced in October 2011 to launch a program aimed at improving the nutritional status of the kids in rural areas. Impacts are also seen in other aspects, including new policies on preschool education, aids for high school students from poor families, and schools in urban areas for children of immigrant labors from rural areas.

“We thought about this for a long time before we really launched the ‘REAP’,” ZHANG introduced: “Now we all agree it is a great idea,” she smiled.

Gender Gap in Education: Complicated Issue

When asked whether she has seen apparent difference in education opportunity available for boys and girls during her research in rural areas, ZHANG said they found very little gender difference in enrollments at early stages of education, including primary school and high school, but they did see an expanding trend of the gap towards higher education, and typically top universities of China are dominated by male students from rich urban families. Things are complicated there, however, as gender imbalance varies across disciplines in universities: some subjects are dominated by women students rather than men. Also, we are



seeing more women postgraduate students as they failed to find jobs on graduation of college and choose to evade the thorny issue of employment by two years or even longer. “In short, better no conclusion if no careful examination,” ZHANG warned: “We did not delve in this issue very sophisticatedly therefore I’d better not give any explanation of these phenomena.”

ZHANG’s team also found signs of gender gap in aspects other than education in western China, for example nutrition status. Their investigation of anemia showed that in adults of poor families, men are rarely malnutrition or anemic; their wives, however, are much more likely to be anemic. Notably this difference narrows down when resources are less scarce, for example in richer families neither the husbands nor the wives are likely to be victims of such health problems. It seems that when resources are limited, men are favored over women.

However, analyzing gender gap in nutrition status one needs to be careful again as it is complicated and not necessarily totally caused by discrimination, ZHANG warned. It could be intertwined with other factors, like women’s virtue of altruism: they would be the last to have meals in the family so as to secure that their men and kids got enough food. They would also save the best, the most nutritional food for others. This cultural phenomena itself demands analysis to see its gender meaning, but one must stay cautious and not jump to easy, simplified conclusions, she emphasized.

I Am Not an “Iron Lady”!

When the conversation moved on to representation of women in science, the newly crowned “Excellent Woman Scientist” explained that personally a top woman scientist might not feel discrimination against her gender in interacting with their male colleagues for academic affairs. “It is basically a gender-blinded process. On a whole, however, women must make much more efforts than men to reach the same position or make the same achievement,” she confirmed: “The glass ceiling is real.”

“When two candidates compete for the same position, generally the male would be preferred, if the two are equally excellent. In a mature society, however, the opposite will happen because it is understood that the female has gone through a rockier way to arrive at the same level — it needs an offset.”

Professional women in China are over-stretched having shouldered too many responsibilities other than their career. However successful they might be in a sector, say, science, they are expected to spend much more time and energy than their husbands doing housework and taking care of kids.

Talking about the obvious fact that in CAS membership only very few women could be found, ZHANG gave a well-informed answer to the question what she thought had contributed to this under representation of women in the scientific circle of China.

“Women and men are equally smart,” she said. “There was a study conducted by physiologic experts some years ago that women and men had no statistically meaningful difference on about 50 indicators of mental ability, including creativity, and swiftness of responses. The only two indicators on which the two genders showed noticeable difference were physical strength and orientation. The main reason why women drop out from the ladder towards the top of the pyramid is, the definition of “women” the society has imposed on them.”

“Every time when you are making decisions critical for your career you would hear some voices there urging you to give in, to serve as a ‘good’ wife, to choose less challenging and less promising jobs, and to compromise for your family anytime. This is a screening process which clears women off the ladder of their professional development,” she continued: “If you do not follow the definition they impose on you, if you attach more than ‘average’ importance to your professional development, be careful, you are an ‘Iron Lady’,” she laughed: “but of course we are not. I am not an ‘Iron Lady’!”

Truly it is hard to relate this elegant, nice lady of typical femininity to the title “Iron Lady”. Nor could she have expected of such a title when she chose to attend the College Entrance Examination in 1978, the first opportunity to get higher education equally offered to all high school graduates who sought after knowledge and insight, after having been suspended for ten years due to the so-called “Cultural Revolution of China”. She decided to catch the bus, decided later to go even further to do her PhD in England, and decided to initiate the REAP: she decided to be the version of “ZHANG Linxiu” she determines to be.

“Why no one would call an excellent male scientist an ‘Iron Gentleman’? This means something. What I have done is just to follow a journey I prefer, and stick to what I am interested,” she stated.