

IDIN Summer Research Fellowship Final Report



Learning to Adapt: A Case Study of a Climate Change Pilot Project in Shaanxi, China

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PART 1: Summary of Research Conducted

Research Focus and Objectives:

My project evolved from examining government implemented adaptation pilot projects to focusing on a pilot project implemented by Oxfam Hong Kong. The project was created to test a new model called low-carbon adaptation and poverty alleviation program. The first pilot was conducted in Yujiashan village in Shaanxi Province in western China. The project was implemented over three years and just completed this year. The second pilot project following a similar model began this September in Gansu, making this an opportune time to examine the lessons learned from the previous project in order to apply them to the next round.

The questions I was hoping to answer are:

1. Under what conditions can pilot studies contribute to climate adaptation efforts?
2. How do forms of knowledge influence the pilot project process?

This was an appropriate case choice because it is unique in its focus on combining poverty alleviation, climate change adaptation and mitigation while also including various types of knowledge in project development and implementation. Additionally, the project was able to alter the local development plan for the area to consider climate change adaptation and mitigation. This is the first county in China to integrate these considerations into its planning.

Research Activities:

My research took a two-pronged approach combining case study research with a larger set of interviews to understand how this pilot fit into the wider landscape of climate adaptation work in China. I conducted 35 interviews with OHK project staff throughout the various phases of the project and within various roles, staff from national and international civil society organizations, current and former government officials, government researchers and academics. I also collected and analyzed project and program documents, presentations and research data, policy documents and research reports.

Research Findings:

Provide a summary of what you learned and the key insights you gained related to your core research question and objectives, as well as other key findings that by the end of your study seemed significant and worth reporting, even if they were not directly related to your original question.

There are several interesting findings:

- Poverty alleviation, low carbon development and adaptation can be addressed more effectively in tandem in rural mid-West Chinese villages. The model put forward in this project (described in more depth in the attached case study) was able to address the agricultural risks of farmers, establish a disaster management system, increase energy efficiency, reduce coal use and address water scarcity. Through these actions, the project improved livelihoods and increased the overall resiliency of the village.
- In this case, integration of climate change into development planning at the local level in China requires an innovative policymaker who is open to new ideas and who has come from outside the local area along with empirical data from researchers who are considered credible from the perspective of government actors. For this project, it was

researchers that work for national research institutes and were viewed as experts on the subject.

- The NGO acts as a link to bring knowledge and expertise to policymakers through translating scientific findings into accessible language. The NGO in this case was uniquely able to integrate expert opinions and local knowledge into the local development plan because they understood the local conditions on the ground through spending time in the village and using participatory and gender sensitive tools to collect information from the farmers themselves. This type of participatory approach is rare in China and villagers do not usually have a means to influence their local plans. While the policy recommendations were not presented as from the farmers, the project manager was able to integrate their concerns. In the process, it also made climate change, which was already affecting farmer's livelihood, a priority on the local development agenda.
- Experts have a range of roles within adaptation planning through providing expertise, conducting studies within the pilot, sharing knowledge with outside actors, bringing other experts into the process and developing policy focused research which is acceptable to government officials.
- While it is often believed that civil society has no role in policy change in China, this case is an example of where NGOs can have an impact although this work may be limited in the near future.

Next Steps:

If you or someone else were to continue the investigation you conducted this summer, what would you recommend as the key additional research that needs to be done? What important questions remain unanswered and what else, if anything, would you want to know if there were more time available to pursue this research further?

There are still many unanswered questions. Ideally, I would have visited the village and spoken to farmers, the village and provincial government. This is impossible in the current political climate but I hope I will be able to follow up on this in the future.

PART 2: Findings Related to Local Innovation

Understanding Local Innovation:

What aspect(s) of local innovation did you focus on understanding or researching in your project? What did you find and learn specifically related to these aspects?

I focused on innovation within the project design and implementation and the roles of experts and farmers in the implementation process. The model that the project used, called low-carbon adaptation and poverty alleviation, was innovative in that it combined low carbon development, adaptation and poverty alleviation in one program design. This allowed for a holistic approach, which could address both the emerging and long-term concerns of local residents while also building on existing policy priorities. This has not been done in China as usually these issues are tackled separately. Also, low carbon development has been mostly viewed as an urban issue in China, although this is now starting to change. Additionally,

usually rural development projects in China do not attempt to change policy and instead focus on addressing primary livelihood concerns.

PART 3: Lessons Learned and Recommendations

Please share any challenges you encountered in implementing your research as planned, either from a practical standpoint or a standpoint of research methods.

I encountered various difficulties in implementing my research. My original project proved to be too challenging to implement within the grant period. I was too ambitious. The summer also was a difficult time to reach many of my existing contacts. There are also new constraints on civil society organizations that I was not expecting. This limited the people I was able to interview this summer. I hope I will be able to go back next summer to complete these interviews.

If another student were to conduct a similar project, what would be several key recommendations you would make, based on your experience this summer?

I would encourage the student to be flexible in how they can answer their research questions or in adapting their questions. I would also encourage them to find a way for their research to assist the partner organization. This will provide a stronger incentive for the partner to help them with the research.

Low Carbon Adaptation and Poverty Alleviation Pilot Project
Yujiashan Village, Shaanxi Province, China
Case Study

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Introduction

China is one of the most vulnerable countries to climate change (Information Office of the State Council 2008; Wheeler 2011). Shaanxi Province in China's northwest has been experiencing climate change impacts including rising temperature and declining precipitation. Extreme weather events such as drought, floods, heavy precipitation, snow, sudden frost and hail have become more frequent and intense (Shaanxi DRC 2011). These impacts are adversely affecting food production and water resources, both preconditions for rural livelihoods. It is widely accepted that climate change will disproportionately affect rural, marginalized and natural resource-dependent households who have higher exposure and lower adaptive capacity, increasing overall vulnerability (ADB et al. 2003; IPCC 2012).

Oxfam Hong Kong developed the 'Low-Carbon Adaptation and Poverty Alleviation Programme' (LAPA) as a means to address climate adaptation, low-carbon development and poverty alleviation in rural communities. The initial project using this model was piloted in Yujiashan Village in Shaanxi Province. Yujiashan is located in a poverty county with coal as the primary source of energy affecting indoor air pollution and greenhouse gas emissions. This case study highlights the innovations from the three-year project.

Background: Climate Change and Poverty

Poverty is a primary driver of climate vulnerability as the poor lack the capacity to anticipate impacts, invest in risk reduction strategies, ability to cope and the means to increase resilience (Adger and Kelly 1999). Exclusion from access to services, social networks, and resources exacerbate climate vulnerabilities due to unequal social relations of power and representation (Ribot 2009). Women are especially vulnerable as they are the majority of the agricultural labor force and are often responsible for securing water, food and energy for cooking, caring and heating, resources, which will be further constrained by climate change (Clancy 2002; de Brauw et al. 2002). Climate change therefore becomes an issue of development, equity and social justice as climate stresses exacerbate existing inequalities and entrench poverty, making adaptation an essential policy response (Kates 2000).

Rural households have historically demonstrated the capacity to adapt to climate variability and change (Newsham and Thomas 2011; Orlove 2005). Climate change though will produce new risks, shifting the overall conditions in which understanding, institutions, and behaviors have developed and functioned effectively. The success of rural communities to continue to adapt is based within the broader economic-social and political arrangements as adaptation "occurs through actions of individuals facilitated or constrained by relevant institutions as well as through the action of the institutions themselves" (Adger and Kelly 1999; Smit and Wandel 2006). Therefore, whether adaptation for the rural poor is successful is highly dependent on an enabling environment and formal and informal institutions (Agrawal 2010).

Project Objectives

1. Poverty Reduction and Low-carbon Adaptation in Agricultural Production
2. Low-carbon and climate-resilient rural construction and living
3. Capacity building

Project Site

Shaanxi Province is located in Northwest China and can be characterized by three distinct regions in terms of climate, ecology and economy: Northern Shaanxi, Guanzhong and Southern Shaanxi. The regions are divided by a topographic barrier of mountains in the North and the Qingling Mountains in the South. Shaanxi is home to 37.35 million people, where 66% of the population is working in agriculture (China Statistical Yearbook 2011). Although the majority of population is agriculturally dependent, only 20% of the land is agricultural of which only 22% is irrigated (Wang et al. 2011).

Northern Shaanxi is dominated by the semi-arid Loess Plateau region. It contains 40% of the province, 26% of the economy and 15% of the population (Shaanxi Statistical Yearbook 2011). The agro-ecology is predominately grassland, rain-fed summer crops and sparse woods (Ostwald et al. 2007). This is a dry farmland area with one summer crop planted between April and June and harvested in August or September and an occasional winter crop (Ostwald et al. 2007). The North has a severe shortage of water resources. Droughts further limit agriculture production. Low soil fertility also contributes to low outputs and the area is prone to soil erosion due to its soil structure and intensive cultivation practices (Huang, Chen, and Li 2011). There is a lack of irrigation infrastructure with estimates that 80% of the agriculture is rainfed (Li and Shangguan 2010). The local economy has been transformed in recent years with the discovery of extensive coal and oil resources, fueling the development of the province as a whole (Vermeer 2004).

Yujiashan village is located at the edge of Shaanxi and Gansu Province on the Loess Plateau in the region between the Northern Wei River and the East Gansu Plateau. It is located 1,200 meters above sea level. Due to its geography, the village receives 600 mm of rainfall a year and 2,241 hours of sunlight. The rainy season is from June to August. The average temperature is 9.74°C, with summer temperatures reaching 37°C, and winter temperatures reaching -20°C. Generally, there is little rain in the spring and summers are characterized by drought.

According to farmers in the village, temperatures are increasing especially during the winter and summer months. Most farmers agree that winter temperatures have risen faster than summer temperatures. Overall, the weather has become more variable than it was in the past. Some farmers mentioned that the differences between seasons are not as obvious as temperatures are not changing as dramatically. The village officials ranked the main climate disasters that impact village livelihoods as drought, sustained rainstorms and frost. Drought often threatens persimmons, apple and corn harvests. In recent years, drought has been particularly severe. Losses are between 40-70% depending on the severity of the drought.

The village is home to 159 households with a population of 588 people. There are 190 women and 398 men. In 2006, 47 households were officially added to the village and in 2011, another village was relocated through government programs into the village. The village was recently relocated once again due to mining. The village has a high proportion of single men. The average per capita

net income is 2100 RMB, 58% below the provincial average for rural households. Incomes are based on agriculture and migrant labor. Five households have yearly incomes of 40,000 RMB (3%) and 30 households have 20,000 RMB (21%). Over 70% of households are considered poor by village government officials making it one of the poorest counties in the country. Approximately 55% of all households have an elementary school education and 22% are illiterate.

The majority of households are small farmers. Until recently, cash crops were more diversified including wheat, corn, tobacco, apples and persimmons. From 1984-2008, the village grew tobacco but stopped because the quality standards were not high enough for local markets. Apples were a primary crop from 1994 to 2010, but diseases caused the apples to rot. Persimmons are still producing large harvests were no longer sold at the outset of the project. Most grain production is for household consumption. Other crops still grown include apples, rapeseed, beans and pagoda tree (*sophora japonica*). Families also cultivate gardens for household consumption but after September, they rely on the market for vegetables. There are only 4-5 households with livestock or chickens.

Project Innovations

1. Integrating Climate Change into Local Development Plans

The low-carbon adaptation and poverty alleviation (LAPA) model combined low carbon development, adaptation and poverty alleviation into one project design. This allowed for a holistic approach, which could address both the emerging and long-term concerns of local residents while also building on existing policy priorities in an innovative way. This is the first project of its kind in China.

The project was designed from the outset to inform policymaking and test the effectiveness of linking these issues in the context of rural western China. At the outset of this project, poverty reduction policies in China did not take climate risks into account. While poverty reduction is prioritized in specific rural counties, including where the project was located, this link is not apparent in the day-to-day work of government officials given their current mandate and expertise. By explicitly linking these areas and involving the Poverty Alleviation Bureau as a partner from the beginning, the project provided a means to test addressing these issues in an integrated way and allowing the results to be seen by government officials.

Additionally, low carbon development while a higher priority within the Chinese government at the beginning of this project, it was not considered an important issue for rural areas. Given that the Chinese government has been investing heavily in rebuilding the countryside including in the project village, this was a unique opportunity to promote energy efficiency with construction of the new village. For example, the project advocated for using hollow bricks to replace solid ones. According the Shaanxi Province Building Energy Efficiency and Wall Material Office, it takes 40 per cent less material and energy (coal) to create a hollow brick than to make a solid one. Thermal insulation materials have been also been added to the houses' external walls and insulated glass has been installed to make the new village more energy efficient.

Ultimately, the design of the project culminated with altering the local development plan to address climate change risks and low carbon development. Prior to the project, climate change was not a concern for the local government and they did not know how to address the problem. The project was able to provide concrete recommendations that climate change adaptation and mitigation could

be addressed in practice and supported by policy. This is the first county in the country to have a climate resilient development plan.

2. Co-production of Knowledge

Collaborative research informed the entire project. A participatory gender sensitive study was conducted before the project site was chosen. This included a village-level vulnerability assessment with four main components: (1) village government in-depth interviews, (2) village focus groups, (3) household surveys, and (4) village ranking. Through adapting participatory tools to address climate change, the experiences and ideas from the villagers were captured and used to understand the social, political, environmental and institutional context of the area. This information was used to inform the potential interventions and training that was appropriate for the village. For example, there were persimmons that people were growing but being sold. Through the project, a cooperative was developed to dry and package the persimmons to sell at nearby market, increasing local incomes.

Experts from the Chinese Academy of Agricultural Sciences conducted a study on corn production in the village. The research determined that fertilizer use could be reduced by 20 percent. This decreases the costs to farmers, environmental pollution and greenhouse gas emissions. Additionally, the project worked with farmers to introduce cash crop farming. Farmers choose between plant oil peony, walnut, purple sweet potato, Chinese prickly ash and other cash crops. This gave the farmers a means to diversify their crops to address climate risks without taking on large economic risks.

The project was implemented by a group of agricultural scientists from the Northwest Agriculture and Forestry University who combined their knowledge of agriculture and pest control into the project design. This allowed for low cost agricultural innovations to be disseminated in the village. Shaanxi's 12th Five Year Plan for Climate Change calls for the promotion of agricultural technology as an adaptation strategy but it had not implemented the policy in vulnerable communities. Environmentally friendly pest control methods like solar-power insecticidal lamps and integrated pest management were introduced to replace pesticides. A straw mill was provided to each village group in order to facilitate farmers using straw as fertilizer. Drought resistant corn and wheat seeds were introduced to local farmers through small-scale planting experiments. These demonstrations allowed farmers could choose the variety they wanted to plant based on the results of the experiments.

3. Partnerships

The project consulted and worked with fifteen partners allowing for a robust project that brought in new ideas, information and support that otherwise would not have been possible. All levels of government were consulted on the project from the National Development and Reform Commission (which leads climate policymaking), national State Forestry Administration, and national State Grain Administration to the province, country, town and village government. Through consultations with these government entities it was possible to raise awareness of the rural climate poverty issues and demonstrate initial results in order to encourage future policy change beyond the village. Academic institutions also provided expertise on the development and design of the project, the testing of innovations and dissemination of key findings. Through working with national researchers, the case of one village has the capacity to wider audience and the lessons from Yujiashan can be shared with other researchers working on similar issues. This also provides another means to influence policy as the Chinese Academy of Science and the Chinese Academy of

Agricultural Science provide recommendations for national policymakers. Other NGOs also partnered on the project bringing in their expertise and their experiences. For example, the China Green Carbon Foundation calculated the emissions reductions from the village forests to determine if it could be used in national or international emissions trading. Project partners were also able to build the capacity of villagers through trainings on low-carbon, organic agriculture, low-carbon industry development and low-carbon production and cooperative development.

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