



Evaluating China's Slope Land Conversion Program as sustainable management in Tianquan and Wuqi Counties

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ABSTRACT

Increased soil erosion on sloped land has become a significant environmental concern in China that has been attributed to human activities such as deforestation, over-cultivation, and over-grazing of livestock. In order to reduce soil erosion on sloped lands, the Chinese government has responded by implementing large-scale, ecological rehabilitation programs, including the "Grain for Green" reforestation project. This program involves financial incentives to transition farmers into other economic activities with the goal of reducing ecological pressures and degradation. Because of the scope and potential impacts from these programs, detailed research is needed to understand their social and ecological effects. This paper reports on research conducted in Tianquan County, Sichuan Province, and Wuqi County, Shaanxi Province, that evaluates the effects of the program upon local economies and household livelihood systems. The paper argues that the successful conversion of farmland under "Grain for Green" depends upon local government involvement, local economic development, and funding for local projects. Without economic development within rural economies, we conclude that farmers will remain dependent upon continued subsidy assistance to meet the policy's ambitious environmental restrictions, thereby undermining the program's long-term sustainability.

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1. Introduction

In 1997 and 1998, China experienced a series of environmental disasters along the Yellow and Yangtze Rivers. The Yellow River in northern China dried up for roughly nine months in 1997, creating a severe water shortage for the region. In 1998 the Yangtze River basin and its tributaries flooded nearby areas along the waterway, killing over 3600 people and destroying more than 4.5 million homes (Xu et al., 2006a). The national government identified soil erosion and the resulting buildup of sediments in the rivers as contributing factors in both events. With limited regulation of farmland expansion in hilly and mountainous regions farmers have, out of necessity, expanded agriculture to include sloped land along streams and rivers (Han, 1989; Rozelle et al., 1997; Xu et al., 2006a) which seemingly placed these areas at greater risk of soil erosion into nearby waterways. As has been reported elsewhere, other activities contributing to soil erosion within the country include

grazing intensification on grasslands, logging for timber, mining, and localized deforestation for fuelwood (Han, 1989; Rozelle et al., 1997; Huang et al., 2002; Xu et al., 2006a).

In response to these events, the Chinese government created two large-scale, heavily funded ecological rehabilitation programs: the Natural Forest Protection Program (NFPP) and the Slope Land Conversion Program (SLCP). The NFPP addresses soil erosion originating from deforestation by limiting or banning logging and closing large tracts of land for afforestation. The mission of the SLCP, also known as the "Grain for Green" program, is to reduce soil erosion from sloped, degraded cropland by converting these areas to forest or grassland cover. Farmers in the Yellow and Yangtze River basins and other erosion-prone areas are expected to convert their sloped agricultural land in exchange for a financial subsidy. According to the policy, households are compensated 260 yuan per year for each mu (15 mu = 1 ha) of land converted. Initially the government subsidy to SLCP households was set to expire after eight years, but as of 2008 the national government has extended its compensation to farmers for eight more years. Initiated in 1999, the goal of the SLCP is to convert a total of 32 million hectares of marginal sloped farmland and barren lands back to forest and grassland by 2010 (Xu et al., 2006a). The SLCP was run as a pilot program from 1999 to 2001 in Sichuan, Shaanxi, and Gansu provinces and was then implemented

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nationally starting in 2001 (Xu et al., 2006a). There are now 25 provinces involved in the program, encompassing all of China with the exception of the densely populated and developed eastern seaboard (Liu et al., 2008).

The requirements of the SLCP specify that farmers who live on steep slopes may lose a majority or even all of their land to conversion. Given the scale of the program, it is clear that detailed empirical studies are needed to understand its social and ecological effects. This paper works to address this need by analyzing the effects of the SLCP within rural economies and household livelihood systems. We concentrate in particular upon labor distribution and income sources to examine how farmers have adjusted to the program's restrictions. A comparative case study between Tianquan County, Sichuan Province and Wuqi County, Shaanxi Province is used to analyze how rural areas with different economic patterns have responded to the program. The first section of the paper provides an overview of the implementation of the SLCP in Tianquan and Wuqi Counties. This is followed by an investigation of the economic transitions that have taken place in each county from 1999 to 2007, drawing upon household semi-structured interviews completed in 2007 and 2008. The fourth section of the paper presents the findings that evaluate the livelihood impacts for affected households. This article concludes with a discussion section that evaluates the comparative economic effects of the SLCP implementation on Tianquan and Wuqi counties. We argue that the successful conversion of farmland under the program depends upon three key factors: (i) local government involvement, (ii) local economic development, and (iii) funding for local projects. Without economic development and local government assistance within rural economies, the article concludes that farmers will remain dependent upon continued subsidy assistance to meet the policy's ambitious environmental restrictions, thereby undermining the program's long-term sustainability.

2. Slope land conversion and environmental management in China

The social and ecological effects of natural resource management and conservation policies have been the subjects of considerable interest within the social and natural sciences. Research typically classified as political ecology has worked to show how an ecological process such as soil erosion, which is often attributed to decision-making in local settings, is simultaneously shaped by other processes at multiple spatial and temporal scales (Blaikie, 1985; Zimmerer, 1996; Forsyth, 2003; Zimmerer and Bassett, 2003; Robbins, 2004). The effects of national policies, therefore, can vary substantially and have divergent effects depending upon local context. Similarly, other work has argued that livelihood systems are spatially and temporally variable (Scoones, 1998; King, 2011), being shaped by the interactions between the particular users, governance systems and resources within social-ecological systems (Ostrom, 2008, 2009). Research and policy on sustainable development is similarly committed to addressing the social and ecological impacts of conservation and environmental rehabilitation programs (Fairhead and Leach, 1996; Adams, 2001) while highlighting the often varied impacts of these initiatives. While there are differences in their normative intentions and methodological approaches, these fields share an interest in understanding the divergent impacts of national environmental policies, including those intended to support environmental rehabilitation and economic development.

The SLCP has been evaluated from a number of vantage points to investigate its diverse social and ecological effects. Several studies have addressed the effect of the SLCP on household income levels and determined that the program has had mixed results. Farmers with low-yield, sloped farmland are receptive to the program and

experience a net income increase from the subsidy, while farmers required to convert high-yield farmland are negatively affected by a net income decrease (Weyerhaeuser et al., 2005; Xu et al., 2006b; Wang et al., 2007; Zhou et al., 2007). Therefore farmers' experiences with, and opinions of, the SLCP remain diverse, depending on whether the annual SLCP subsidy amount exceeded their yearly crop gains. Wang et al. (2007) make the suggestion that, to maximize both environmental improvements and economic benefits to farmers, the SLCP should focus on converting only low-yielding, degraded farmland, as is intended, instead of applying the policy uniformly regardless of land quality. This identified error in program execution emphasizes an important point: program implementation varies from county to county, sometimes not following SLCP guidelines, which can lead to very different outcomes from case to case. It is therefore important to examine not only the program results themselves, but also factors such as local government involvement and oversight that determine the specific effects of the SLCP.

While national statistics largely portray the SLCP to be an environmental and economic success thus far, Trac et al. (2007) point out that these impressive numbers may not accurately portray the results on the ground. They raise the concern that the reported national statistics do not align with case studies conducted locally, and some statistics may have been inflated, perhaps multiple times, by officials at different levels of government. This discontinuity emphasizes the importance of local case studies in verifying statistics and determining individual and community experiences with the program. The research conducted by Trac et al. (2007) has asserted that the SLCP was a failure at the local level, falling short of both its environmental and economic goals because of inadequate management and a lack of funding for implementation. As another example, Bennett (2008), whose study focused on possible program improvements, described the lack of technical support by local officials as a primary program weakness. These findings suggest that local government involvement, specifically the degree of financial, managerial, and technical assistance they provide, is a key factor for proper application of the SLCP and its long-term viability. These studies, however, do not directly discuss the importance of local government assistance and economic development in helping farmers transition to other employment possibilities, which is likely an important variable in the implementation of the SLCP.

Because rural households involved with the SLCP often give up a large portion of their farmland, they must be able to shift away from growing crops to other opportunities in order to provide for their own subsistence and earn an income, especially after the termination of the subsidy program. Several case studies found that much of that free time was redirected toward animal husbandry (Caldwell et al., 2007; Uchida et al., 2007; Xu et al., 2007), which resulted in only a marginal net income increase in these areas. In contrast, the SLCP counties that shifted much of their labor toward off-farm jobs reported a more substantial income increase (Xu et al., 2006a; Peng et al., 2007; Liu et al., 2008; Uchida et al., 2008; Zhang et al., 2008). Uchida et al. (2008) cite multiple studies that demonstrate that the availability of rural off-farm jobs is responsible for a significant percentage of the increase in farmers' incomes (e.g., Parish et al., 1995; Zhang et al., 2002; de Janvry et al., 2005). In some areas, households used their surplus labor from the SLCP to seek off-farm jobs elsewhere when few local jobs were available. As one example, a case study in Gansu Province found that migrant work in major cities has been a major contributor to SLCP household income increases (Peng et al., 2007).

Given the existing literature, it is clear that identifying the primary factors shaping the long-term viability of the program, and ensuring that these factors are addressed throughout SLCP implementation, is necessary in making the SLCP a sustainable initiative.

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