2. Project Objectives and Components

a. Objectives

The objective of the project was to help achieve sustainable development in the Loess Plateau by increasing agricultural production and incomes and improving ecological conditions in the tributary watersheds of the Yellow River through: (1) the introduction of more efficient and sustainable use of land and water resources; and (2) the reduction of erosion and sediment flows into the Yellow River.

b. Components (or Key Conditions in the case of Adjustment Loans):

1. Crop-land Improvement (Planned US$118.97 million, Actual US$114.91 million or 97% of planned), with three sub-components: (a) terracing; (b) sediment control structures; and (c) irrigation. The component was designed to create wide, level terraces from slopelands and old irregular terraces to enable sustainable agriculture with improved yields to be practiced. Sediment control structures were designed to control flooding, create usable land and store water for irrigation and village water supply. Irrigation works included the construction of small water cisterns to catch run-off (mainly from roads), small surface-water diversion structures and small-sized irrigation schemes.

2. Slopeeland Protection (Planned US$83.29 million, Actual US$94 million or 113% of planned), with three sub-components: (a) afforestation and vegetative cover; (b) grass and livestock development; and (c) horticulture. The main purpose of the component was to increase the vegetation cover and improve the erosion control capacity in the watershed areas covered by the project through the planting of trees, shrubs and grass, thereby allowing farmers to diversify their production systems and increase their income.


The purpose of the component was to finance research and extension; training and study tours; monitoring and evaluation activities; survey and design work; vehicles, office equipment and building up-ground costs; and project operation and management costs.

c. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project closing was extended for 6 months to mitigate crop failure caused by drought and the loss of a construction season incurred by an outbreak of SARS. Reduced interest payments during construction led to project cost savings of US$12.2 million. The IDA credit and IBRD loan were fully disbursed.

3. Relevance of Objectives & Design:

Relevance was and is high. The project was relevant to the CAS objectives and for the agriculture sector in China. These called for assistance to promote better utilization of marginal land through sustainable techniques, and to develop new income-generation programs in poorer provinces. Environment objectives of the CAS include promotion of soil and water conservation that are the major components of this project. China’s Ninth Five-Year Plan (1995-2000) placed sustained and stable growth in agriculture and the rural economy at the top of its agenda, and its ambitious goals include major increases in grain production and farmers incomes particularly in the arid and semi-arid zones that account for 30 percent of the total arable land. In the Loess Plateau government strategy...
emphasizes the comprehensive and integrated planning of small individual watersheds in close consultation with the beneficiaries because land conservation is compatible with sustainable and productive agriculture and they are mutually reinforcing. This approach was piloted on over 700,000 ha of land in the highly successful first Loess Plateau Watershed Rehabilitation Project (LP-I) that overlapped this project and was completed in 2002. Flooding on the Yangtze River had also heightened the Government's concern to address the causes of the flooding, deforestation and erosion caused by decades of unsustainable land -use practices. Consequently the project enabled the promotion of integrated watershed development on a large scale in China.

- Project design was correct in designing the project as a partnership between the public sector, local governmental institutions and farmers because the project integrates management issues affecting both the physical watershed the village and its constituent farmers, traders and businessmen. In addition small watershed development involved integration of forestry, soil and water conservation, agriculture, and livestock sectors, and effective planning required involvement of public sector technicians familiar with these sectors. At the time of design the private sector was unwilling to provide financing for these types of investments, particularly in the poorer areas targeted by the project.

- Project design successfully addressed the conditions for sustainability by its emphasis on productivity improvements, land stability, resilience to erosion and promotion of equity.

4. Achievement of Objectives (Efficacy):

Overall achievement of objectives was high. Some 1.9 million people benefited from the project, 80% of whom were directly involved in project activities. Incremental per capita incomes in the project area were estimated to be 58% higher then in non-project control areas. The project significantly contributed to the restructuring of the agricultural sector, the adjustment to a market-oriented economic environment and created conditions for sustainable soil and water conservation. Terraces have significantly reduced labor inputs and, together with road access to the terraced fields, have allowed for mechanization and better communication to markets. The resulting labor savings have permitted many farmers to pursue new income-earning activities, such as off-farm jobs, livestock production and high-value fruit and nut tree production. Increased income and the prospect of a sustainable natural resource base have allowed farmers to invest in a wide range of enterprises and social programs which have benefited the communities as a whole. Agricultural production has changed from generating a narrow range of food and low-value grain commodities to high-value products. Total grain production increased from 0.73 million tons to 1.3 million tons per year and per capita output from 365 kg to 591 kg per year.

Objective 1 achievements were high. Specific achievements were:

- Terracing and land improvement. Some 80,832 ha of terraces (91 percent of the appraisal target) were constructed and provide the basis for annual and perennial crops produced on terraces, including food grains, vegetables, fodder crops (e.g., maize and legumes) and fruit trees. Conversion of slopeland to leveled fields increased moisture retention, reduced soil erosion and led to higher crop yields (50-100 percent higher than on the previously sloped land) and more diversified cropping. Along with the terracing of slopeland, some 24,000 water cisterns were constructed (79 percent of the appraisal target) and are successfully mitigating adverse effects of frequent periods of drought. This initiative has been replicated in national funded programs and this was the reason the project target was reduced from 30,000 to 22,500 water cisterns. In Shanxi Province, 1,830 ha (99 percent of the PAD target) of low-lying infertile alkaline land have been improved by putting a 30 cm layer of loess soil on top of the alkaline soil combined with a drainage system. Virtually unproductive land was thus transferred into valuable crop land and was allocated to farmers formerly cropping on nearby steep slopes.

- Irrigation. Some 5,321 ha of irrigated land (110 percent of the PAD target) were developed and led to increased yields and crop diversification. Most investments in irrigation were made in Inner Mongolia where the extremely low rainfall means that terracing alone would not sufficiently raise yields to bring about a sustainable agricultural system.

- Improved forage. Farmers established about 57,000 ha of forage that not only reduced soil erosion of sloping lands but also provided fodder for pen-fed animals thus reducing grazing pressure. All project counties have now adopted and enforce grazing bans, and the provincial authorities have extended this practice to most other counties in the four project provinces. After the widespread adoption of grazing bans, the growing of forage was successfully practiced on a large-scale in most project areas.

- Improved livestock. Along with the grazing ban, the project successfully provided investment in livestock production to help farmers to cope with the effects of the ban, support the transition into sustainable production systems and make full use of incremental fodder and crop residues produced by other activities. The introduction of new breeds of sheep and goats suitable for pen-feeding, such as Cashmere and Boer goats and Shandong small-tailed sheep, rapidly replaced local breeds and their improved productivity made livestock production a major contributor to household incomes.

- Horticulture. 63,000 ha of “economic trees” and orchards were planted under the project (87 percent of the appraisal target of 72,000 ha). Continuously improving road network and information access has enabled these plantations to generate attractive financial returns on domestic and export market. Over 1,100 fruit stores were built (103 percent of the target) and allow farmers to capture additional benefits from selling off-season.

Objective 2 achievements were high. Reduction of erosion successfully reduced sediment flows into the Yellow River.
• **Sediment Control Structure.** The 2,100 small sediment control structures built are estimated to divert or capture about 25 million tons per year, of which some 45 percent is retained by the dams and the remainder is retained by the terraces and the various vegetative measures. To date project works retained an estimated total of 53.4 million tons of sediment.

• **Afforestation and Vegetation Cover.** This sub-component established 109,000 ha of forest trees (121 percent of the appraisal target) in contour trenches or in pits on wastelands. In areas less suitable for trees, some 71,000 ha (78 percent of the appraisal target) of drought-tolerant shrubs have been planted. Some 57,000 ha of slopeland were closed and protected for the purpose of natural regrowth of vegetation.

5. **Efficiency:**

The project was efficient.

- Overall ERRs varied from 18.5% to 21%, close to appraisal estimates. The slightly higher values include the benefits from sediment reduction and carbon sequestration.

6. **M&E Design, Implementation, & Utilization:**

- Robust monitoring indicators were developed at appraisal and fully implemented using existing M&E systems developed under LP-I.
- The institutional development impact induced by good M&E practices is substantial and far-reaching. The project broadened and consolidated the institutional development impact of LP-I and built on the existing institutions in the government and public administration thus facilitating the replication of good project experiences. Transparent and effective accountability allowed evaluation of the effectiveness of public sector institutions, PMOs and individuals and improved local implementation capacity. Local ownership is high and political leaders at various levels have taken personal responsibility for the project, exercising a tight system of control and self-evaluation. Effective M&E systems were fully internalized and have been widely adopted in other national programs.

7. **Other (Safeguards, Fiduciary, Unintended Impacts--Positive & Negative):**

8. **Ratings:**

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<td><strong>Outcome</strong></td>
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<td><strong>Quality of ICR</strong></td>
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**NOTES:**
- When insufficient information is provided by the Bank for IEG to arrive at a clear rating, IEG will downgrade the relevant ratings as warranted beginning July 1, 2006.
- ICR rating values flagged with ‘*’ don’t comply with OP/BP 13.55, but are listed for completeness.

9. **Lessons:**

- **Projects that replicate successful models in a flexible manner can be highly successful at relatively low risk.** Key elements of success require active Bank engagement over the long term and consistent promotion of sustainable land policy and management practices.
- **The focus of project design on development objectives facilitates outcome-oriented project implementation.** The project implementers were facing many attempts to address additional development challenges in project areas, such as marketing, farmers’ organizations, agricultural extension services, and targeted poverty programs. Without neglecting the importance of these issues, the continuous discussions of the dual project objectives of increasing income and improving the environment kept the focus on how to achieve these most effectively, given the institutional and other constraints.
- **Building a strong Bank-Borrower partnership needs consistency in task management and in the composition of the task team.** The mutual trust and shared responsibility in the implementation and supervision of the project was possible through the maintenance of a consistent task team throughout the implementation of the project. The fact that the project was task-managed from the field office facilitated Bank-Borrower cooperation and partnership.

10. **Assessment Recommended?** ☑ Yes ☐ No

**Why?** This is an exceptional follow-on project with an embedded integrated watershed management model which has demonstrated the feasibility of breaking the cycle of poverty and environmental degradation in
severely water stressed regions. These themes are core elements of the Bank's sustainable development strategy and an independent project performance review, especially one clustered with the recently completed China Red Soils I Project and LP-I Project could be of great value to the Bank and many of its clients with similar arid region problems.

11. Comments on Quality of ICR:
Concise and well written - a very good account of the project. The use of photographs to show project achievements is very helpful: pictures 7-12 are particularly good illustrations.