**Background**

1. Feeding China’s vast and growing population is a continuing major challenge for the Government of China (GOC). Present annual consumption of grains is about 480 million tons and is expected to grow to about 700 million tons by the year 2020. This is due not only to the increasing population, but also to increased per capita consumption of grain, particularly as a result of increased meat consumption as incomes rise. The Ninth Five Year Plan (1996-2001), has the objective of increasing domestic grain production from about 450 million tons to 500 million tons. In 1996 production had reached some 480 million tons. Large increases in cotton, oils and other products are also planned. The proposed Guanzhong Irrigation Improvement Project would contribute to meeting the Provincial and Central Governments production targets.

2. With 22 percent of the world’s population and only 7 percent of the arable land, it is critical for China to continue to raise agricultural productivity. In addition, as population grows and development proceeds, encroachment of urban and industrial areas is continually reducing the land available for agricultural production. These circumstances require increasingly intensive use of existing arable lands. To increase cropping intensities, about half of China’s 100 million ha of cultivated land is currently irrigated. The productivity of irrigated land averages twice that of rainfed land and is more reliable. Areas under irrigation have more than doubled, from 20 to 50 million hectares since 1949. Nationally, irrigated land produces about 70 percent of the total grain output and about 80 percent of all fruits and vegetables. Almost all of the future increases in grain production will be on irrigated lands. In some areas, flood control, drainage and salinity mitigation are also essential for raising agricultural productivity. Drainage works are essential to allow high productivity in cultivation of low-lying areas subject to waterlogging and salinization. So far, drainage works have helped control waterlogging on 19 million hectares and have reclaimed 4.8 million hectares of saline land.

3. The Guanzhong Plain in the Wei River Valley where the nine subprojects under the proposed project are located, is Shaanxi’s main production base for grain, cotton and oilseeds. It relies on irrigated agriculture to achieve high, sustainable yields. Although the nine subproject areas are already
equipped with irrigation and drainage systems, land development and agricultural services, much of the areas needs improvements and some tracts of land remain to be improved and adequately developed. Most of the existing irrigation and drainage systems, including water storage and diversion infrastructure facilities, are several decades old, have suffered from poor design and construction standards and inadequate operation and maintenance (O&M) due to lack of resources, and are now in need of rehabilitation. Consequently, the performance of these systems has gradually deteriorated. In addition, for some of the systems the secondary and tertiary canal networks and on-farm works were never fully completed, and in some cases never built at all. Relatively modest investments in the improvement and completion of these systems can yield high returns. Critical needs include: (a) irrigation and drainage infrastructure rehabilitation and completion; (b) use of both ground and surface water together (conjunctive use); (c) on-farm development works improvements; and (d) improvements in agricultural services such as high quality seed development, mechanization and agricultural extension. The proposed project would include investments in these critical areas.

4. The key issues for sustainability in the irrigation subsector are how to pay for irrigation and drainage improvement investments and operation and maintenance (O&M); how to achieve more efficient, unified management of irrigation systems; how to increase local participation and "ownership" in irrigation; and how to design, implement, operate and maintain irrigation investments to consistently higher technical and institutional standards. In addition to substantial improvements in irrigation facilities and increases in agriculture production, there is a need for institutional reforms to correct these shortcomings. The need for such reforms is strongly supported by the Ministry of Water Resources (MWR).

Project Objectives

5. The Government’s primary objectives for the water resources and agriculture sectors in relation to the GIIP project are to: (i) increase agricultural production, in particular of grains, in the nine project areas; (ii) increase incomes of project farmers; and (iii) strengthen organizational, technical and financial aspects of irrigation management, in particular of operation and maintenance.

6. The project’s objectives are to: (a) increase agricultural production; (b) increase employment opportunities through improving and expanding irrigation; (c) increase per capita incomes for farmers in the project areas; (d) gradual shift from cultivating grains to cash crops with higher net returns; (e) introduce modern technologies leading to improved and more efficient water use; (f) improve project management, in particular the organizational, financial and technical aspects of operation and maintenance; and (g) delegate responsibilities for operation and maintenance to water-users.

Project Description

7. The project seeks to improve existing infrastructure facilities in nine project areas, which provide at present irrigation to about 524,000 ha in the Guanzhong Plain in the Wei River Valley of Shaanxi Province. Most of the existing main infrastructure facilities of the nine project areas were built in the 1950s and 60s. In addition the
project seeks to: (i) develop new water resources to extend irrigation to another 50,000 ha; (ii) improve the agricultural production of 180,000 ha of currently medium and low-yielding lands, and; (iii) strengthen organizational, technical and financial aspects of irrigation management, including arrangements for Operation and Maintenance. The project would be implemented over a period of five years.

8. Main components The project’s main components are expected to be the following:

(a) Rehabilitation of dams and diversion headworks, including remedial works on key water storage facilities;

(b) Rehabilitation of about 1200 km of main and lateral irrigation canals, including 140 (?) km of concrete canal lining and the repair or replacement of 14 major structures;

(c) Rehabilitation and extension of 478 km of main and lateral drains;

(d) Improvement of 52 pumping stations, including the installation of 286 sets of new electromotors and pumps;

(e) Completion of land development, on-farm development works and soil improvement on 180,000 ha of low and medium-yielding farmland and on about 50,000 ha of currently uncultivated marginal lands;

(f) Institutional development, including improving integrated water resources and project management;

(g) Strengthening operation and maintenance, through developing more efficient farmers participation, strengthening organizational arrangements, introducing modern water saving technologies and improve cost recovery;

(h) Introducing modern communication systems and Management Information Systems

(i) Strengthen the provision of agricultural support services, including research, extension and training of farmers.

9. The total project cost is estimated to be $200 million, with the irrigation and drainage improvement and expansion components accounting for about 80% and the agricultural support services and institutional development components about 15%. The project would be financed by a proposed IBRD loan of $80 million (40%) and an IDA Credit of $20 million (10%), and local counterpart funding equivalent to $100 million (50%).

Project Management Structure

10. A Project Leading Group (PLG), chaired by Shaanxi’s Deputy Governor responsible for Agriculture, has been established. The PLG include senior representatives from the Provincial Planning Commission, Financial Bureau, Audit Bureau, Water Conservancy Bureau, Agricultural Bureau and the Agricultural Bank. The PLG will oversee project implementation and provide
guidance to ensure proper coordination and adequate support from the various provincial agencies for all aspects of project implementation, including allocation of funds and land acquisition.

11. The Provincial Water Conservancy Bureau (PWCB) will be responsible for project planning, preparation and implementation. It will set up a special Project Management Office (PMO), with full-time staff transferred from PWCB. Each of the nine irrigation subproject areas will establish Project Management Offices for project preparation and implementation. These offices will be managed by the head of the management bureau or deputy of the prefecture and/or county located in the irrigation areas. Staff will be assigned to these project offices from local prefecture and/or county bureaus on a full-time basis for the duration of the project.

Rationale for Bank Involvement

12. The Provincial Government of Shaanxi, which has a long and successful history with irrigation and drainage development in the Wei Valley, is keen and dedicated to further improve institutional, technical and financial aspects of water management in the Guanzhong plain. The GIIP would serve as a vehicle to achieve that. The Bank, considering its past involvement and experience with large water resources development projects in China, has the expertise to provide technical and financial support to the Government of Shaanxi to: (i) modernize existing infrastructure; (ii) promote integrated water resources management in the Guanzhong plain; (iii) promote efficient use of limited land and water resources, greater crop diversification and increased agricultural production; (iv) protect and improve the environment; and (v) recover operation and maintenance cost and a reasonable portion of the investment cost through enforcing appropriate levels of water charges.

13. The Bank, therefore, is well positioned to assist all levels of Government in Shaanxi to effectively address organizational, technical and financial improvements under the GIIP, which would take into account the considerable achievements and lessons learnt from the Donglei water resource component under the recently closed Shaanxi Agricultural Development Project.

Poverty Alleviation

14. Although the project would not be targeted for poverty alleviation, the majority of the project beneficiaries would be poor farmers who presently have low agricultural production on low-yield and non-irrigated lands. Their incomes would be significantly increased through the implementation of the project.

Lessons Learned.

15. Key lessons from previous Bank supported water resources projects are that: (a) detailed organizational and staff arrangements should be formulated and agreed before implementation; (b) counterpart funding should be committed and secured at all levels of government before implementation, based on an accurate and realistic year-by-year project financing plan; (c) project design should support the "user pays" principle, and active participation of beneficiaries from the initial project formulation stages into the operation and maintenance stage would increase effectiveness of project implementation; (d) irrigation, drainage and flood protection investments should include
adequate cost recovery levels from beneficiaries; (e) projects should include institutional development support for the strengthening of provincial and local Water Resources Bureaus; (f) baseline data of key performance indicators should be established for all components before or at appraisal; and (g) the project launch workshop and/or initial Bank supervision missions should focus on resolving procurement and disbursement issues.

16. Valuable lessons learned from the design and implementation of the large water resource/irrigation component under the recently closed Shaanxi ADP project must be taken into account when preparing GIIP for implementation. This applies in particular to raising the needed counterpart funds on time, and ensuring efficient coordination of provincial and local government agencies. Support for GIIP will be linked to the satisfactory and expedient completion by mid-1999 of the Donglei irrigation component of the Shaanxi ADP, for which IDA Credit closed June 30, 1997. [Note: Lessons learned from completed and ongoing projects financed by the Bank and other development agencies.]

Participation

17. The primary participation aspect of the project will be the involvement of stakeholders (farmers benefiting from irrigation and drainage) through consultation and collaboration, in planning and implementing the lower irrigation and drainage networks and in deciding on the most suitable arrangements for operation and maintenance of these systems.

Project Evaluation

18. Environmental Aspects In general the project is expected to make a positive impact on the environment, by improving sanitary conditions through the provision of good quality water, and reducing the ill effects of droughts. No major environmental issues are expected under the project. Minor issues may include: (a) the impact of drainage systems on soil erosion and salinity levels; (b) the effect of irrigation with high-sediment content water on soil conditions; and (c) the impact of reclaiming marginal lands currently under rainfed agriculture or uncultivated. Assessments of the expected environmental impact of the proposed works will be made.

19. Project Benefits The project is expected to generate the following benefits: (a) increased agricultural production to 4.4 million tons per year, which is about 20% above the average production during 1991-96; (b) increased employment opportunities because of the expansion of the irrigated area with about 50,000 ha; (c) increased per capita incomes for farmers in the project areas; (d) shift from cultivating grains to cash crops with higher net returns; (e) introducing modern technologies leading to improved and more efficient water use; (f) improved project management, in particular the organizational, financial and technical aspects of operation and maintenance; and (g) further delegation of responsibilities for operation and maintenance to water-users. The preliminary economic rate of return for the project has been estimated at 19%.

20. Project Sustainability. Project sustainability depends on: (a) effective project management arrangements; (b) high quality project design and implementation standards; (c) strong interagency coordination at various government levels to ensure agreed and equitable water allocation and
distribution to and within the nine subproject areas; (d) introducing efficient and sustainable O&M procedures and providing adequate funding for O&M.

21. Risks. The main risks of achieving the project’s objectives are: (a) adequate project management and coordination between the government offices at provincial and local levels; (b) product prices are maintained in real terms; (c) no significant transport and marketing constraints; (d) water charges will be brought to a sufficiently high level to cover the costs of adequate O&M and a reasonable portion of the investment cost; (f) equitable water allocation and distribution. The risks associated with the achievement of project outputs are whether: (a) key inputs such as fertilizer and construction materials will be available when needed; (b) adequate implementation supervision; (c) counterpart funding is available and on time; and (d) extraordinary floods or droughts occur.

Contact Point: InfoShop
The World Bank
1818 H Street, N.W.
Washington, D.C. 20433
Telephone No. (202) 458 5454
Fax No. (202) 522 1500

Note: This is information on an evolving project. Certain activities and/or components may not be included in the final project.

Processed by the InfoShop week ending March 20, 1998
Major Environmental Issues:

None expected

Other Environmental Issues:

None identified

Justification/Rational for Environmental Category

Project classification is still to be determined. However, from preliminary information received the project is likely to be classified Category "B", because it is not expected to have major negative impacts on the environment. This classification will be reviewed when the final environmental impact assessment report will be made available.

Reporting Schedule

Government of Shaanxi has undertaken an Environmental Impact Assessment (EIA) of the impact of project implementation on the environment. The English translation is expected to be made available to the Bank’s identification/preparation mission scheduled for April 1998.

The nine subprojects and their originally designed irrigation areas are: Baojixia - 194,810 ha; Jinghuiqu - 89,360 ha; Jiaokouchouwei - 79,820 ha; Taoqupo - 21,220 ha; Shitouhe - 24,670 ha; Fengshiashan - 90,910 ha; Yangmaowan - 21,330 ha; Luohuiqu - 49,550 ha; and Shiabaochuan - 20,670 ha. Total 592,340 ha.