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Photo by Frederick W. Crook

As water for agriculture becomes more scarce, changes in the pattern of crops are more likely than a reduction in cultivated acreage.



In water-stressed Hebei province, a farmer irrigates his winter wheat field with ground water via flexible plastic tubes.

Photo by Frederick W. Crook

Will Water Scarcity Limit China's Agricultural Potential?

Water shortages in important grain-producing regions of China may seriously compromise China's agricultural production potential. Rapidly increasing industrial and domestic water consumption and expanding irrigation have drawn down groundwater tables and disrupted surface-water deliveries. The problem is most severe in north-central China, where most of China's wheat and cotton is produced and irrigation is essential to maintaining high yields. The situation may worsen unless effective water conservation policies can be put into place rapidly.

China is responding to these concerns on several levels. At the national level, the Ministry of Water Resources began promoting water conservation through various measures in the late 1990s, such as strengthening the authority of National River Basin Commissions to enforce water withdrawal limits and promoting irrigation management reforms. Provincial and other local officials are mediating conflicts between users to improve overall water management. In villages, local water managers and farmers are adopting water management reforms and water-saving techniques, such as forming water user associations and alternating wet-dry irrigation for rice. In addition,

reforms in the pricing and fee collection system may provide farmers with better incentives to conserve water. Pricing water deliver-

ies to farms based on volume could improve efficiency, but would be costly to monitor since China has over 200 million farm households, each tending several tiny plots of land.

As water for agriculture becomes more scarce, changes in the pattern of crops are more likely than a reduction in cultivated acreage. Wheat is most likely to suffer declines, since wheat is irrigated in much of north China and brings low returns to water. Production of a variety of crops—corn, cotton, and high-value fruits and vegetables—may increase as farmers switch from irrigated wheat. High-value fruits and vegetables are often more water intensive, but are also more suited to water-saving irrigation technologies, such as drip irrigation and greenhouse production.

The success of current efforts to encourage water conservation in China will depend on a variety of factors. Policy reforms will depend critically on the enforcement of withdrawal limits both from surface-water systems and from ground water. Also important is the extent to which policies and local management practices motivate water users and water managers to conserve water resources.

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This finding is drawn from...

China's Agricultural Water Policy Reforms: Increasing Investment, Resolving Conflicts and Revising Incentives, by Bryan Lohmar, Jinxia Wang, Scott Rozelle, Jikun Huang, and David Dawe, AIB-782, USDA/ERS, March 2003, available at: www.ers.usda.gov/publications/AIB782/