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Comprehensive Agricultural Development: Opportunities from the current economic crisis

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Comprehensive Agricultural Development Opportunities from the Current Economic Crisis

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Introduction

In 2008, back-to-back crises struck the international markets. A soar in food prices hit the Asian rice industry just months before a financial crisis in the United States reverberated around the world, sending national economies into flux. For the People’s Republic of China (PRC), the impact of both crises presented the following three major challenges for the country’s manufacturing and agriculture sectors:

- (i) stimulating domestic consumption, particularly in rural areas, to replace declining foreign demand for products made in the PRC;
- (ii) creating jobs, especially for unemployed factory workers returning to their rural communities; and
- (iii) improving the country’s prospects for long-term food security.

This paper looks at how the PRC can turn these challenges into opportunities for a more prosperous future. This paper suggests a one-time sharp increase of government investments in the country’s successful but constrained Comprehensive Agriculture Development Program (CAD). This well-established national program is a natural conduit



Jieshou City Government

A farmer is able to water his field as a result of a CAD water supply project, which provided well, pump, and hose.

for raising the quality-of-life in the PRC’s countryside while expediting land reform and long-term food security.

History of CAD

CAD began in 1988 as a way of fast-tracking the construction of much-needed rural infrastructure. CAD projects are typically small scale but with high impact—irrigation, bridges, wells, and narrow roads for farm equipment to maneuver between fields.² The projects are intended to

¹ Tun Lin is a natural resources economist at the Asian Development Bank (ADB). The author thanks ADB, the People’s Republic of China, and State Office for Comprehensive Agricultural Development colleagues for their useful comments and suggestions. Melissa Alipalo, Roger Collier, and Xi Zhang assisted in preparing the paper.

The views expressed in this article are those of the author and do not necessarily reflect the views and policies of the Asian Development Bank or its Board of Governors or the governments they represent.

² In 1988, the State Council established the National Land Development and Construction Fund, which later became the special Comprehensive Agricultural Development Fund to support CAD. With support from the PRC Ministry of Finance, the National Comprehensive Agricultural Development Leading Group and Office were established, closely followed by the creation of provincial CAD agencies.



A cement canal constructed with CAD program funds.

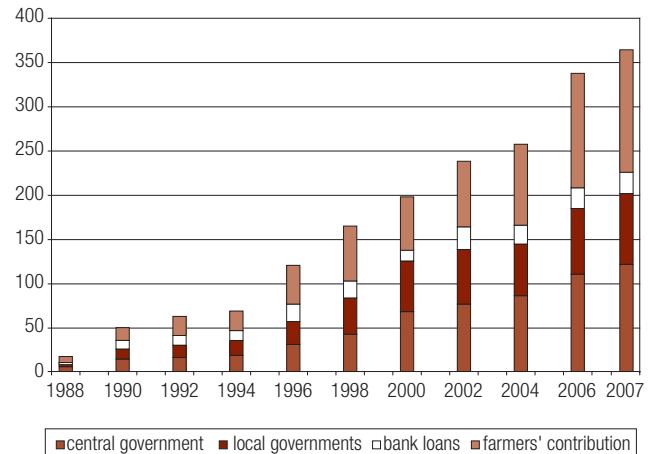
be of manageable size—a size farmers can construct and maintain. In the 20 years since it began, CAD's coverage has expanded from 11 provinces to 31 provinces and 4 specially administrated cities, which serves 1,916 counties and 220 state-owned farms.³

CAD follows two mandates:⁴

- (i) **Improve land management.** CAD works on upgrading agricultural land with suboptimal yields and introducing more ecological, water-saving irrigation. Better land management can lead to more reliable infrastructure and higher productivity, which are required for the country to achieve long-term national food security.
- (ii) **Develop agricultural industries.** Beyond the fields, CAD works on building agricultural processing, forestry, livestock, and aquaculture. By diversifying the ways rural communities can earn income, local economies are reformed and people are less vulnerable to market fluctuations and risks that are inherent in agriculture.

Financing. CAD is funded by four sources: central government, local government, bank loans, and farmer contributions (Figure 1). Total CAD investments from 1988 to 2007 is CNY319.3 billion. In 2007, total CAD investment was CNY36.3 billion, with the greatest share coming from farmer contributions at 38% (CNY13.8 billion), followed by 33% from central government (CNY12.1 billion), 22% from local government (CNY8.0 billion), and 7% from bank loans (CNY2.4 billion).

Figure 1: Levels and Sources of Comprehensive Agricultural Development Funds from 1988–2007
(CNY, hundreds of million)



Several factors determine investment levels from year to year. The amount of financing from the central government often determines how much other sources will contribute. CAD policy stipulates fixed government proportions. Central government and farmer contributions have tended to offset the decline in bank loans (Figure 1). Farmers are now the largest financer of CAD projects, increasing sharply from 28% of total financing in 2001 to 38% in 2007. Farmer contributions come in forms of labor and cash.

Achievements. By the end of 2007, CAD had made significant achievements. In terms of land management, 522 million mu⁵ (mmu) of mid- and low-yielding land were upgraded under the program; 49.9 mmu of pasture were improved; 29.9 mmu of desolate land were brought under arable cultivation; 481 mmu of new and rehabilitated irrigated land were developed; 212 mmu of waterlogged land were rehabilitated; and 330 mmu of new forest belt were created.

In terms of development of agricultural industries, the program increased the output of machinery by 20.7 million kilowatts, accumulated an additional crop production capacity of 89.3 million tons (mt), increased crop productivity in the project areas of 150 kilogram/mu, and increased the production capacity for cotton, oilseed, and sugar. Taken together, these have directly benefited

³ All statistics quoted in this paper are from the State Office of Comprehensive Agricultural Development, unless otherwise noted.

⁴ In addition to the two mandates, there were also a small number of projects for scientific and technological demonstration purposes.

⁵ A mu is a unit of measurement in the PRC (1 mu = 666.67m²).

22 million farmers annually, which generally increased the annual per capita net income of CAD farmers by CNY510.

Barriers. For all its achievements, CAD has been equally constrained by insufficient and ineffective investments. In general, investments do not match the scale of need. For example, in 2007, CAD invested CNY15.4 billion to rehabilitate about 25 mmu of mid- and low-yielding land.⁶ The total estimated area of land needing rehabilitation, however, is 795 mmu. At the current rate of investment, complete rehabilitation would take about 32 years. When calculated with inflation and the cost of CAD's policy of postponing rehabilitation of more difficult land, the total rehabilitation time will take about 95 years.⁷

Financial inputs from central and local governments have been increasing annually, but the rate of those increases has slowed. Calculated at current rates, the average annual increase from 1998 to 2007 has been 11%, compared to 18.8% from 1988 to 2007. One source of financing that remains high and continues to rise is farmer contributions. Meanwhile, bank loans have been declining.

Two factors contribute to the declining bank loans. On one hand, commercial banks are increasingly hesitant to lend for agricultural infrastructure because of the low profitability. On the other hand, the central government is reluctant to borrow money from development banks on a large-enough scale to adequately finance CAD. Instead, the government has preferred to either use public revenues or collect even more from farmers, but both are financially suboptimal to what development banks offer. Increasing farmer contributions is not advisable, as the current rates are already placing too heavy of a financial burden on them. In

The accelerated investment scenario would increase annual rural incomes by CNY38 billion—about 13% of the sum of all farmers' income in potential project areas



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A pumping station financed by the CAD program.

many CAD regions, the labor and cash inputs by farmers are already greater than levels allowed by rural taxes and fees.

CAD also suffers from ineffective investments. A number of systemic weaknesses undermine CAD. First, there is no comprehensive planning and information management at any level. Second, because of unclear property rights, the maintenance of CAD infrastructure is poor. Third, new technology has not been introduced to farmers, which is the result of insufficient funding and poor coordination between research institutions and agricultural extension offices. Lastly, CAD could be more effective if there were more farmer organizations. Alone and unorganized, farmers have trouble participating in the market and dealing with risks. These issues are further explained in the concluding recommendations section, because they are specific areas that need targeted funding.

Policy Options and Analysis

Two scenarios are analyzed in this paper to demonstrate the potential impact that a better-funded CAD would have on rural development and, subsequently, national growth. The “present scenario” assumes no change in investment trends; it is the status quo. The “accelerated scenario” calls for immediately doubling investments in CAD and then—from this new, higher threshold—increasing annual investments at current rates (about 11%). The impact of these scenarios are applied to the three challenges outlined in the beginning: increasing rural incomes to raise domestic

⁶ This gives a national average of rehabilitation cost of CNY616 per mu. The rehabilitation for most provinces ranged from CNY500 to CNY700 per mu in 2007. The rehabilitation cost was the lowest in Tianjin (less than CNY500 per mu) and the highest in Tibet (over CNY 2,000 per mu). The rehabilitation cost in both Zhejiang province and Dalian municipality also exceeded CNY1,000 per mu.

⁷ The CAD principle of rehabilitating “easy first, difficult later,” together with the inflation, increases the rehabilitation costs. The above calculation is based on the assumption that the increase of rehabilitation costs exceeds that of investment by 3.5% per annum.

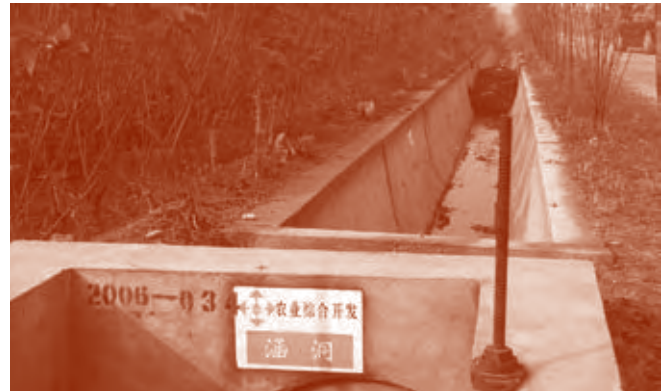
The accelerated investment scenario will create 4.5 million more rural jobs—a significant opportunity for returning migrant workers

consumption, creating rural employment for returning factory workers, and increasing agricultural production for food security.

1. Increase Farmer Incomes to Raise Domestic Demand

National growth in the PRC has been driven by export-oriented manufacturing. Naturally, as demand from world markets began falling in the recent economic crisis, manufacturing has sharply declined, threatening national growth and increasing urban unemployment. Rural communities, where the population is concentrated and generally poor, are unable to fill the demand gap. The only way rural communities can consume more is if they can afford more. For years, incomes of rural households have been augmented by remittances from family members working in factories in the city—the same factories that are now shutting down and forcing millions of unemployed migrant workers to return home.

Increasing agricultural production does not guarantee higher income and consumption in the countryside. For years, the costs of farm input (i.e., fertilizers and pesticides) have been outpacing any increase in income. In CAD project areas, however, farmers have increased their income. From 1998 to 2003, farmers' average annual net incomes in CAD project areas were 8% higher than the national average. In 2007, CAD rehabilitation of mid- and low-yielding areas directly benefited 21.8 million farmers, increasing farmers' income by CNY7.8 billion. In addition, increased agro-industrial activity directly benefited 19 million rural people with increases in income totaling CNY11.2 billion.



Luo Luyong

A cement canal and culvert constructed with CAD program funds.

Under the current investment scenario, based on the 2007 figures, CAD can be expected to increase rural incomes by about CNY19 billion annually. The successful implementation of the accelerated investment scenario, however, would increase rural incomes by CNY38 billion every year. That is a 13% increase over the current sum (CNY300 billion) of all farmers' net annual income in potential project areas.

2. Provide Jobs for Returning Factory Workers

Before the global economic crisis, CAD projects were difficult to construct because the rural labor force was primarily elderly and less skilled. Tens of millions of rural people had migrated to cities for higher-paying factory jobs. With the downturn in manufacturing, many of those migrant workers are now returning. They offer the countryside a stronger, more skilled labor force. They can easily fill the labor gap being experienced in CAD projects.

In 2007, farmer contributions to CAD totaled CNY13.8 billion. Assuming half of this amount is accounted for in labor at a daily rate of CNY25, the total labor days for CAD annually are about 270 million. Doubling CAD investments, however, would create 4.5 million new rural jobs in addition to those already available and planned.⁸ **The accelerated investment scenario could provide almost as many jobs as the number of returning migrant workers**, assuming that 25% of the 20 million unemployed migrant workers

⁸ By doubling CAD investments, 270 million more labor-days will be created than in the present scenario. If returning workers are permitted to work more days than what current policy allows, each farmer could work 20 days per month at a monthly salary of CNY500. If the government adopts a formula of paying a half-month salary and a half-month labor input, 2.3 million returning migrant workers could be employed. If further allowance is made for indirect employment opportunities in CAD industries, purchasing, services, and supervision, an average of 1,000 new jobs will be provided in each CAD county, totaling 2.2 million new rural jobs nationwide. Labor input for CAD projects will provide jobs to about 4.5 million rural people.

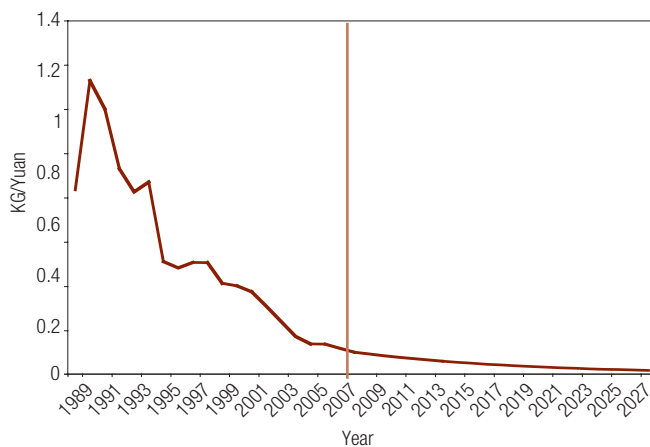
The accelerated investment scenario can provide food security for over 100 million more people than the present rate of investment

will return home. These are national figures and need to be recalculated for regional distribution of CAD projects and rural communities of the returning workers. However, the potential remains considerable.

3. Increase Agricultural Production to Ensure National Food Security

CAD projects have increased agricultural productivity by improving soil fertility and yields through the development of shelterbelt forests and projects on flooding and drought.⁹ Based on an annual per capita grain consumption of 400 kilogram, CAD is feeding approximately 7.5 million more people every year. Even more remarkable is the high proportion of national increases in grain production that can be attributed to CAD. In recent years, CAD has increased grain production capacity by about 3 mt per year—25% of the actual national grain production in some years, such as in 2006, when grain production increased by 13.5 mt. More

Figure 2: Projected Capacity Increase Per Unit of Comprehensive Agricultural Development Investment (1988–2027)



⁹ Over the 20 years of CAD activities, net increases in production include: grain, 89.4 mt; cotton, 1.7 mt; oil, 4.5 mt; sugar, 26.4 mt; meat, 4.6 mt; milk, 1.5 mt; aquatic products, 1.9 mt; and eggs, 300,000 mt.

¹⁰ The future cost of a 1-kilo increase of food production capacity is forecasted based on a first-order autoregressive model: $Y_t = 0.91565 * Y_{t-1}$ ($R^2 = 0.8$).



Luo Luyong

An agro-transport road constructed as a project of the CAD program.

importantly, the increased production capacity is sustainable over long periods.

Additional investments are also needed to keep pace with the increasing unit costs (Figure 2). In the early years of CAD, an input of just CNY1 bought a 1-kilo increase in production capacity. By 2007, a 1-kilo increase costs CNY67. This cost increase is compounded by CAD's approach of prioritizing easy over difficult land. Twenty-year forecasts under the present scenario estimate a total increase in food production capacity of 42.5 mt, compared to 85 mt under the accelerated scenario.¹⁰

Recommendations

To turn CAD's potential into a sustainable reality, both short- and long-term interventions are required. In the long term, land reform will give farmers much-needed security, which serves as an incentive to invest more in their land and take better care of communal infrastructure (i.e., CAD-implemented infrastructure). Such investments should be supported by reform of the rural financial system. Substantial discussions of these long-term reforms, however, are beyond the scope of this paper. The following concluding sections present recommendations for accelerating CAD investments and improving their effectiveness.

1. Recommendations for Accelerating CAD Investments

The accelerated investment option is clearly the recommended strategy for the PRC to substantially address its current and future scale of rural employment,



A covered well constructed from CAD program funds.

rural income and consumption levels, and national food security. The above analysis supports the accelerated investment option, based on a one-time injection of doubled investments and then a continuation of the current annual rate of investment from this higher level. The source of these accelerated investments should come from central and local governments, and banks where possible. Expected increases in farmer contributions will create too much of an affordability strain, dampening their participation in CAD projects. This section discusses specific recommendations by funding source.

Central government. In 2007, the central government inputs for CAD were CNY12.1 billion. The accelerated investment scenario analyzed in the previous section suggests the central government's inputs be doubled and then increased at approximately 11% annually. This is fiscally possible given the strength of state finances.

Local government. CAD policy is based on fixed proportions between central and local government contributions, with those fixed proportions varying according to a province's ability to pay. In more affluent areas, the central government's contribution is matched one-to-one, and less in poorer areas. Provinces that are strategically important to national grain production contribute less. In 2007, total contribution by all local governments was CNY8 billion; accelerated investment at the central level would lead to local government increases. Most provinces have the fiscal resources for such an increase, except in some western and economically less-developed provinces, which are in need of CAD programs. In such cases, the central government could consider raising debt at the subnational level to finance CAD.

Box 1: Examples of Incentives for Farmers

In the past decade, local governments and some Comprehensive Agricultural Development Program (CAD) areas have tested innovative schemes that provide farmers incentives to maintain CAD infrastructure, and these should be studied and adopted. Some of these schemes include the following:

- (i) The middle and downstream plain regions of the Changjiang River, as well as elsewhere, are piloting special irrigation companies.
- (ii) Water users associations are being established to introduce and develop participatory management.
- (iii) Jiangsu Province auctioned property rights for small-scale rural irrigation systems to the private sector for a certain period. (However, because long-term ownership remains unclear, short-term land-use activities prevail.)
- (iv) Anhui Province piloted two initiatives. One assigned ownership of small infrastructure to farmers and the other hired, trained, and certified farmers to inspect the maintenance of CAD infrastructure. Both innovations produced positive results.

Bank loans. In response to the declining participation of commercial banks in CAD, the PRC could adopt two policies to attract loan funds. The first would be to strengthen cooperation with the World Bank, ADB, and other international financial development organizations, which can provide low-interest loans to accelerate development. A second policy could be to encourage participation from private capital and domestic commercial banks. One possibility is the central government subsidizing the interest on loans to make them more affordable for farmers and more commercially viable for banks. In the past, the central government would borrow from the World Bank and transfer to provinces grants that were funded from the World Bank loans. The responsibility for repaying the loans remained with the central government though. In the future, if more international loans were utilized for CAD, other options could be considered to lessen the central government's debt burden. For example, the central government could borrow and lend the money—perhaps offering a subsidy—to provinces, who are then expected to repay.

Farmer contributions. In the accelerated investment scenario, measures must be taken to lower the proportion financed by farmers. Expecting farmers to either pay or work more for CAD implementation is inconsistent with the national goal of alleviating their hardships. Too high expectations on farmers would exclude the poorer ones from participating in CAD.

The government should consider relaxing the maximum work hours so that poorer farmers can participate in CAD by contributing more labor and less cash. More importantly, a policy of paying for half of labor contributions should be considered. Wages under the accelerated scenario would cost CNY7 billion annually. Returning migrant workers should be given priority in filling these jobs.

2. Recommendations for Improving Quality of CAD Investments

CAD implementation is constrained by a lack of (i) planning and information management, (ii) property rights and innovative management, (iii) science and technology, and (iv) organizational development. New investment levels should be coupled with initiatives that address these constraints. The following section offers recommendations for relieving CAD of these constraints.

Improve planning and information management.

National, regional, and provincial CAD plans should be developed and based on measurable objectives. Project information systems are needed for better project management, and these systems should cover project design, approval, procurement, supervision, construction, monitoring, and maintenance. Information generated from these systems should then be used for future planning. Once the systems are in place, the information should be made easily available to both government and farmers to improve their decision making.

Clarify rights and responsibilities. Within CAD projects, there is a disconnect between engineering, construction, and maintenance—the “sustainability chain.” CAD projects have tended to emphasize construction and overlooked post-construction management and maintenance, which requires farmers’ commitment. An evaluation of CAD projects in the Haihe River plain found that more than 40% of the infrastructure is not maintained.¹¹ This issue is



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Bridge and drainage constructed as a project of the CAD program

rooted in obscure property rights and unclear maintenance responsibilities. Currently, farmland and infrastructure are public property in the PRC. Yet the land is cultivated by small and scattered rural households and the maintenance of this infrastructure requires farmers’ investments and labor. Farmers are often unwilling to maintain new CAD infrastructure because of this.

Transferring farmland and infrastructure to private ownership will be a lengthy process. The government is testing some schemes, but in the meantime, farmers need some measure of certainty and security—incentives—to maintain CAD infrastructure.

In CAD areas where unclear property ownership and rights are an impediment to participation, the key is to (i) clarify the maintenance responsibilities of CAD projects; (ii) provide sufficient funding for maintenance; (iii) offer incentives to farmers and innovative arrangements for the maintenance; and (iv) build competitive environments among irrigation managers, whether they are user groups, private groups, or other cooperatives (Box 1).

Fund research and development. Advancements in agrosience and technology are being made within CAD, but not fully applied. According to research by Wang, only about 30% of the technological innovations under CAD have been used in fields and 20% scaled up for wider usage (footnote 11). For example, about 150 new species and combinations of food crops were identified every year of the 8th Five-Year Plan, 1990–1995, but many were not used or promoted. CAD’s science and research system is obviously not as strong as it should be, but there is also a disconnect

¹¹ Wang, Jin-An. 2005. Thinking of Strategy Direction for CAD. *Agricultural Economic Issues*. 4. 58–61; Wang, Jin-An. 2007. Problems and Root-causes Analysis of China’s CAD Policy. *Agricultural Research and Development*. 1. 44–46.

between science institutions and agricultural extension offices.

To harness the potential of science for CAD, several actions are called for: (i) develop long-term, focused planning for technology development; (ii) increase investments in research to at least 6% of total CAD funding (compared with 3% in 2007); (iii) balance conventional training with training in the new technology; (iv) identify gaps between research, promotion, and production; and (v) dedicate investments to transferring lab achievements to farmers' fields.

Develop support organizations. The benefits that CAD farmers reap in the field from increased productivity are undermined when farmers approach the market with their goods. Individually, farmers have little bargaining power in purchasing or selling. They depend on middlemen and often suffer from malpractice as serious as using false fertilizer and seeds. Small farmers have inadequate technical support, and their products are not well packaged, transported, or marketed. They are also at a disadvantage when mitigating market and natural risks.

Farmers, with their communities, must be more empowered to deal with the markets, and CAD can help. Stronger farmer organizations and technology service providers can strengthen farmers' bargaining position through awareness and collective action—especially by women. CAD

infrastructure and agricultural insurance organizations could also greatly help small-scale farmers mitigate the crises that are inevitable with rural and farming life.

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加快农业综合开发， 应对国际经济危机

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2009年7月

一、 简介

2008年，危机接踵而至，先是粮食价格飙升使稻米产业遭受打击，短短数月之后美国金融危机席卷全球，使各国经济陷入动荡之中。这两个危机也中国提出了三大挑战：

- 1、 如何刺激国内消费，尤其是农村消费，以替代日渐萎缩的外贸需求；
- 2、 如何新增就业，尤其是为返乡失业农民工新增就业；
- 3、 如何改善国家长期的粮食安全形势。

本文探讨中国如何通过加快农业综合开发， 应对国际经济危机，化危机为转机，实现长期繁荣。在中国，农业综合开发已经取得很大的成功，但还存在种种制约因素，本文建议政府一次性大幅增加农业综合开发投资， 并辅以加强规划，产权革新，推广科技，发展农民组织等措施来提高投资效率。

二、 农业综合开发历史

农业综合开发始于1988年²，初衷是为了迅速开展灌溉设施、桥梁、机井和狭小的田间机耕路等农村急需基础设施建设。20年来，农业综合开发项目的范围从1988年的11个省（区）扩大到31个省、4个计划单列市的1916个县（区、市）和220个国有农牧场。³

农业综合开发有以下两大任务⁴：

- 1、 **土地治理。**农业综合开发致力于农田升级改造，包括中低产田改造，引入生态综合治理和中型灌区的



图片提供：安徽界首人民政府

农业综合开发项目下农民得以灌溉田地

节水配套改造，目的是更有效的土地治理可提高农业基础设施可靠性和农业综合生产能力，保证国家长期粮食安全。

- 2、 **产业化经营。**除了农田改造外，农业综合开发也致力于发展农产品加工、林业、畜牧业和水产养殖等产业。农村地区多种经营可改革地方经济，增强农民抵御农产品市场波动和农业风险的能力。

资金投入。农业综合开发的资金来源有四个，即中央财政、地方财政、银行贷款和农民自筹（参见图一）。1988—2007年累计投入农业综合开发项目资金3183亿元，2007年的总投入为363亿元，其中农民自筹部分（138亿元）比例最大，占38%，中央财政投入（121亿元）占33%，地方财政投入（80亿元）占22%，银行贷款（24亿元）占7%。

¹ 林曦系亚行自然资源经济学家。作者对亚行和国家农发办同事提出的意见和建议表示感谢。Melissa Alipalo、Roger Collier和张曦协助本文撰写工作。

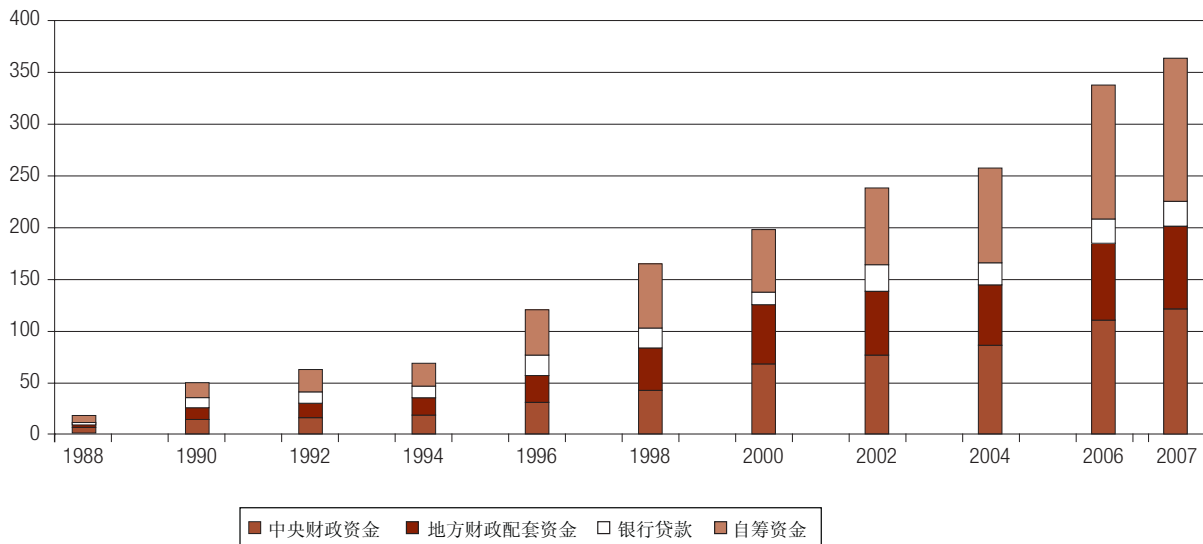
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² 1988年，国务院设立国家土地开发建设基金，后来改为农业综合开发基金，专项用于农业综合开发。在国家财政部的主持下，成立了国家农业综合开发领导小组和办公室，随后各省的农业综合开发机构也相继建立起来。

³ 除非另有说明，文中引用的所有统计数据均由国家农业综合开发办公室提供。

⁴ 除两大任务之外，还有少量的定点科技示范项目。

图一：农业综合开发的投入与构成：1988-2007
(单位：亿元)



在四种资金来源中，中央财政资金投入起了决定作用。各级政府的投入，通常是根据中央投入按比例配套。这些年银行贷款部分，在逐年萎缩，而中央财政和农民自筹部分，在逐年增长（参见图一）。目前，农业综合开发项目资金投入中，农民自筹所占比重最大，2001年至2007年间从28%大幅增至38%。农民自筹部分来自于农民的投工投劳和现金投入。

成果。截至2007年底，农业综合开发工作取得了显著成果。在土地治理方面，全国累计改造中低产田5.22亿亩⁵，改良草场4987万亩，开垦宜农荒地2989万亩，新增和改善灌溉面积4.81亿亩，新增和改善除涝面积2.12亿亩，增加林网防护面积3.3亿亩。

在农业产业发展方面，全国新增农机总动力2068万千瓦。项目区累计新增粮食生产能力892.54亿公斤，近几年粮食亩均增产150公斤。同时，棉花、油料、糖料的生产能力也得到了大幅提升。近年来，产业化项目每年直接带动农民2200万人，年人均纯收入一般比项目实施前增加510元左右。

困难。农业综合开发工作取得显著成果的同时，也受到了投资不足和低效的制约。总体而言，投资跟不上需求。例如，2007年，农业综合开发在土地治理项目里面全国总投入是154亿元，改造中低产田约2500万亩⁶，但需要改造

的低产田总面积估计为7.95亿亩。按当前的投资速度计算，完成改造工作需要32年。如果考虑进去物价上涨因素和“先易后难”原则造成的成本上升，完成改造工作实际所需时间将为95年。⁷

中央财政的投入水平虽然逐年增加，但增速有所放缓。按当年价格计算，过去十年的年均增速为11%，过去20年的年均增速为18.8%。农民自筹资金一直居高不下，并且持续增长。同时银行贷款在逐渐萎缩。



农业综合开发项目建设的水渠

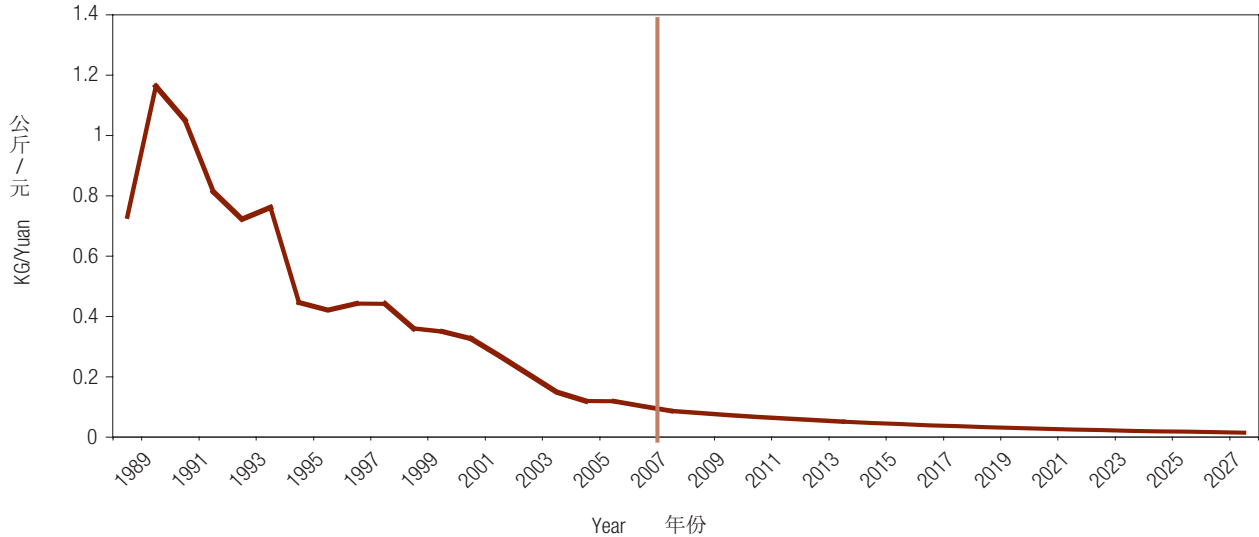
图片提供：罗禄勇

⁵ 亩为中国度量单位，1亩=666.67平方米。

⁶ 全国每亩平均投入是616元。各省地理情况不同，改造成本也差异比较大，天津每亩改造成本平均低于500元，而西藏每亩改造成本高于2000元，但绝大多数省份都集中在500-700元每亩。超过1000元每亩的省份和单列市只有西藏，浙江，和大连。

⁷ 假设物价上涨和先易后难因素造成每亩改造单价上升速度超过投资增长速度3.5%，我们现有的低产田改造一遍需要整整95年的时间。

图二：单位农业综合开发投入新增的粮食生产能力
(1988-2027)



银行贷款萎缩的原因在于：一方面商业银行出于财务考虑在退出农业基础设施建设，另一方面政府尚未大规模利用发展银行的贷款。相比起利用发展银行资金，政府更倾向于使用财政收入或从农民那里筹集更多资金，来筹集农发基金。但实际上，这两类资金的边际成本都要高于发展银行的资金。增加农民自筹资金尤其不可取，目前的筹资比例已然给农民带来了过重的负担。目前，在很多实行农业综合开发的地区，农民筹资和投劳都超过了农村税费改革要求的上限。

农业综合开发也受制于低效的投资。若干制度性缺陷影响了农业综合开发。首先，各级缺乏综合规划体系和信息管理系统。其次，由于产权不明晰，农业综合开发基础设施维护不力。再次，由于资金投入不足，各研究机构和农技

推广部门之间协调不够，新技术并没有向农民推广。最后，如果农民组织数量增加，农业综合开发的效果可能更好。由于农民各自为阵，没有组织起来，因此在参与市场和应对风险方面面临困难。建议小节对这些问题作了进一步阐述，因为它们均需要专项资金来加以解决。

三、政策选择与分析

本文分析了两种情形，目的在于表明资金投入充足的农业综合开发对农村发展和国民经济增长的潜在影响。“常规情形”（即现状）假定投资趋势不变，“加速发展情形”要求立即实现农业综合开发投资翻番，然后以此为新起点，按照当前速度（11%左右）增加年度投资。两种情形的影响适用于本文开篇所述的三大挑战，即增加农村收入以扩大内需、为返乡农民工新增就业、增加农业生产以确保粮食安全。

（一）通过农民增收，持续扩大内需

中国国民经济增长一直受外向型制造业驱动。随着国际市场需求在近期经济危机中开始减少，出口制造业很自然地

“加速发展情形”下，农民每年将增收380亿元，约占潜在项目区农民收入总额的13%。



图片提供：安徽省人民政府

农业综合开发项目建设的排灌站



农业综合开发项目建设的机耕路

出现了大幅下滑，对国民经济增长构成了危险，导致城镇失业增加。经济危机以来，由于城镇工厂倒闭，迫使大量失业农民工返乡。农村地区虽然人口集中，却因为收入低，不能填补上需求缺口。内需不足的症结在于城乡收入的结构性的不平衡，增加内需的关键是农民增收。

农业增产不增收问题长期存在，其中涉及农产品市场与生产资料市场多层次问题，比如化肥和农药等农用物资成本增速超出了农产品价格增速。然而现有数据显示，农业综合开发确实能带来农民增收。1998—2003年间，项目区农民年均纯收入比全国平均水平高出8%。2007年的农业综合开发，中低产田改造这一块，直接惠及2180万农民，共增收78亿元；产业化这一块，直接惠及1900万农村人口，共增收112亿元。

根据2007年数据，在“常规情形”下，农业综合开发投资有望使农民每年增收约190亿元。如能成功实施“加速发展情形”，农民每年将增收380亿元，占潜在项目区农民一年纯收入总额（3000亿元）的13%。

“加速发展情形”下，将新增450万个农村就业岗位，极大缓解返乡农民工的就业问题。

（二）通过增加农民就业，解决返乡民工安置

全球经济危机爆发之前，由于青壮年农村劳动力进城打工，留下老幼妇和技能较弱的人，因此农业综合开发项目建设面临劳动力短缺困难。随着制造业下滑，很多农民工纷纷返乡，为农村提供了更强壮、技能更高的劳动力，填补了农业综合开发项目面临的劳动力缺口。

2007年，农业综合开发的自筹资金为138亿元。假设其中一半为农民的投工投劳，按农民日工资25元计算，大约是两亿七千万个工作日。但是，如果农业综合开发投资实现翻番，就可以新增450万个农村就业岗位。⁸ 假设2000万失业农民工中有四分之一返乡，则**“加速发展情形”下，可提供接近返乡人数的就业岗位**。这些均为全国数字，需要根据农业综合开发项目和返乡农民工社区的地区分布进行仔细计算，但就总体而言，农业综合开发的就业潜力还是相当大的。

（三）通过农业增产，确保国家粮食安全

通过抗旱排涝，增加农田林网防护，⁹ 农业综合开发项目提高了地力，增加了亩产，进而增强了农业生产能力。按人均粮食消费800斤计算，每年的农业综合开发大约能养活750万人口。近年来，每年农业综合开发为国家增加粮食生产能力60亿斤左右，这些生产能力如果全部转化为生产，可以达到全国粮食增产的四分之一（如2006年，当年



农业综合开发项目建设的井

⁸ 在“加速发展”情形下，农业综合开发投资翻番，就能比“常规情形”新增两亿七千万个工作日。如果政策上能够撤开投劳天数限制，允许返乡民工多投劳，每个农民每月可工作20天（折月工资500元）。如政府采取“半工半劳”形式，允许其半个月投劳，半个月领薪，这就能在总量上保障230万人返乡后全年有活干。如果进一步算上农业综合开发下产业开发、设备采购、项目服务和监督管理带来的就业机会，将平均为每个农业开发县（农场）新增1000个就业机会，全国就又能解决220万个岗位。也就是说，投工投劳加上项目就业，全国一共能解决近450万农村人的就业问题。

⁹ 通过20年的农业综合开发，新增粮食生产能力894亿公斤，棉花17亿公斤，油料45亿公斤，糖料264亿公斤，肉类46亿公斤，蛋3亿公斤，奶15亿公斤，水产品19亿公斤。

与“常规情形”相比，“加速发展情形”能1亿以上新增人口的粮食问题。

全国粮食增产270亿斤)。更重要的是，粮食生产能力可以不断累积，具有长期可持续性。¹⁰

农业综合开发的先易后难原则造成了增加粮食生产能力所需要的单位投入在逐年增加，与此相应，新增投资也要逐年增加（参见图二）。在我国农业综合开发的初期，每一元投入能增加约一公斤的粮食产能力；到了2007年，大约要67元的投入才能新增一公斤的粮食产能力。根据预测，在“常规情形”下，未来20年可累积新增粮食生产能力约850亿斤；而在“加速发展情形”下，未来20年可累积新增粮食生产能力近1700亿斤。

四、建议

要使农业综合开发潜力变为现实，短期和长期的干预措施都需要。从长期看，土地流转制度改革将给予农民投资土地和基础设施的动力，农村金融体系改革给予农民投资土地和基础设施的资金支持。不过，对两种改革的深入讨论超出了本文的范畴。在短期看，加大农业综合开发的投资力度和效率，是有效途径，以下小节对此提出了具体建议。

专题1：农民激励机制实例

过去10年来，地方政府和部分农业综合开发项目区试点实行了一些创新制度，鼓励农民维护农业综合开发基础设施。应根据各地情况对这些制度加以研究。

- 1、长江中下游地区的某些地区考虑进行农田水利资产公司试点。
- 2、各地正在组建用水户协会，引入并发展参与式灌溉管理模式。
- 3、江苏将小型农村水利工程产权拍卖给私人（但长期所有权尚不明晰，造成短期行为）。
- 4、安徽试点实行了业主所有制和农民巡视员两项制度，均取得了较好的效果。

（一）加速农业综合开发投资

很显然，加速投资是为中国大力解决今后农村就业规模、农村收入和消费水平和国家粮食安全等问题而建议的一项策略。上文按照投资翻番和保持当前的年度投资速度两种情况进行分析，该分析支持加速投资策略。投资应来自中央和地方财政，有条件的地方可来自银行。农民自筹部分的增长将涉及农民是否可承受，也影响农民参与农业综合开发项目的积极性。本节按照资金来源提出具体建议。



农业综合开发项目建设的机耕路

图片提供：罗禄勇

¹⁰ 未来一公斤新增粮食生产能力所需投入采用一阶自回归模型 $Y_t = 0.91565 * Y_{t-1}$ ($R^2 = 0.8$) 预测。



农业综合开发项目建设的渠和桥

中央财政投入可翻番。2007年，中央投入121亿元。上文分析的“加速发展情形”建议中央财政投入比现有水平翻一倍，并保持每年约11%的速度增长。国家财政有这个实力。

地方财政投入可考虑地方债。根据中国现行农业综合开发政策，中央投入与地方投入的比例配套基本是固定的，各省（市、区）的配套比例因经济发展水平不同，财力不同，粮食生产的战略地位不同而存在一定差异。在经济发达地区，中央和地方投入的比例配套为1:1，而在经济落后地区，则到不了这一水平。对国家粮食生产具有战略重要性的省份配套要求较少。2007年所有省份地方财政配套加总为80亿；在加速发展情形下，中央财政投入提速将带动地方投入增加一倍。大部分省份具备这一财力。如果西部省份、经济落后省份配套翻番确实有困难，可以考虑采取中央代发地方债方式进行募集。

银行贷款可多用发展银行低息贷款。针对目前国内商业银行在农业综合开发中参与日渐减少的现状，国家可以采取两项政策来吸引贷款资金参与农业综合开发。第一，加强与世界银行、亚洲开发银行和其它国际发展类金融组织的合作，利用其低息贷款来加速开发；第二，鼓励民间资本与国内商业银行的参与。为使贷款更能为农民所承受，对银行更具有商业可行性，中央政府可实行贴息政策。过去，中央政府从世行贷款，并将世行赠款转发给地方，但还贷责任还是由中央承担；今后，如果要利用更多国际贷款，可以考虑采取其它方式来减轻中央的债负。例如，贷款可由中央借取，然后通过贴息方式转贷给各省，但还款由各省负责。

自筹资金要控制集资，适当投劳，考虑半工半投。如果加速农业综合开发，必须要采取措施，降低农民自筹的比例。否则农民出钱出力部分也要同比增长，不符合国家减轻农民负担的总方针。而且，对农民自筹部分要求过高会阻碍贫困农民和贫困农村参与到农业综合开发项目中来。

政府可考虑放开投劳天数的上限，以便贫困农民在更多地投劳、更少地投入现金的情况下参与农业综合开发项目。也可考虑实行半工半投政策，这一点更为重要。在“加速发展情形”下，投劳工资投入每年可能需要70亿元。同时在项目带来的就业上，可优先考虑返乡农民工。

（二）提高农业综合开发投资质量

由于缺乏规划和信息管理系统、产权和创新管理模式、科技以及机构建设，农业综合开发项目实施受到了制约。新增投资应有解决这些制约因素的措施配套。本小节针对如何减少此类制约因素提出了建议。

加强规划与信息管埋。应根据可评估的目标制定全国、区域和省级农业综合开发规划。为改进项目管理，应建立项目信息系统，涵盖项目设计、审批、采购、监督检查、施工、监测和维护等各个方面。系统产生的信息应能用于今后规划工作。系统一旦到位，其信息应透明，便于政府和农民使用，以完善其决策。

明确权利与责任。在农业综合开发项目下，存在工程规划、建设与维护（即“可持续发展链”）脱节的现象。农业综合开发项目倾向于重建设，轻建后管理与维护，而管

¹¹ 王金安。2005。《关于农业综合开发战略定位问题的思考》。《农业经济问题》，2005（4），第58—61页。王金安。2007。《中国农业综合开发政策的问题及根源分析》。《农业研究与发展》1，第44—46页。



图片提供：罗禄勇

农业综合开发项目建设的渠和涵洞

理与维护需要农民参与。对海河流域农业综合开发项目开展的一项评价发现，40%以上的基础设施未得到维护。¹¹ 这一问题的根源在于产权不清，责任不明。目前，农田基础设施归国家所有，但土地由分散的小农户耕种，农田基础设施维护需要农民的投入和投劳。正因为产权不清，许多地方存在重建轻管，农民不愿意对新建农业综合开发基础设施进行维护的现象。

农田基础设施作为国家基础设施一部分，在农户小而散，土地公有的现实国情下，应当有很长一段时间还是公有制为主导。目前，政府正在试点实行一些产权制度改革，但中短期内需要制定一些激励机制，明确管护责任，明确管护资金来源，鼓励农民对农业综合开发基础设施进行管护。关键是要（1）明确农业综合开发项目维护责任；（2）安排足够维护经费；（3）鼓励农民参与维护，制定创新维护安排；（4）在用水协会、私人团体或其它合作社等灌溉管理者中间营造参与与竞争的氛围（参见专题1）。

支持科研推广。农业综合开发项对科技研发缺乏长期规划，总投入不足，科技推广项目立项投入都较分散，许多成果并未得到应用。王金安教授的研究显示，农业综合开发的科技成果转化只有30%；科技成果推广率只有20%（参见脚注11）。例如，“八五”期间每年繁育并通过鉴定的粮食作物新品种新组合约150项，许多品种没有得以应用或推广。农业综合开发科研显然有待加强，同时科研机构 and 推广机构之间互相脱节的情况也有待改进。

为通过科研发掘农业综合开发潜力，建议采取以下几项行动：（1）制定重点明确的长期技术开发规划；（2）使研究投入从2007年占农业综合开发总投入的3%增加到至少

占6%；（3）平衡常规技术培训与新技术培训；（4）探索科研、推广和生产之间的薄弱环节；（5）安排科技推广投资，使实验室成果转化为农田成果。

发展各类支持性组织。小农户与大市场的矛盾会影响农民增收。单个农民的议价能力很弱，常受到中间商盘剥，买到假劣化肥和种子等问题频发。小农户很难得到足够的技术支持，他们生产的产品得不到很好的包装、运输或销售环节的支持。同时单个农民抵抗自然与市场风险的能力都很差。

必须要提高农民及其社区与市场打交道的能力，这方面农业综合开发可以提供帮助。通过提高认识和集体行动，尤其是通过妇女的参与，更强大的农民组织和技术服务组织可增强农民的议价能力。农业综合开发基础设施和农业保险组织也可以大大有助于小农户缓解农村和农业生活必然面临的风险与危机。

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