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Sustainable Agricultural and Rural Development
In the New Era of Development: Preparing for the Future

BACKGROUND

China feeds 20% of the world’s population from 9% of the world’s agricultural lands. It has been able to do so successfully, even producing a net food grain surplus and to develop an export market for many agricultural products. Yet the status of agriculture in the national economy is declining steadily, eclipsed by industrialization and accompanying urbanization. Labour is surplus in the countryside and growing income gaps exist between urban and rural populations. These are among the most difficult concerns faced by government.

China faces severe rural environmental problems, including those associated with massive application of agricultural chemicals, land degradation and pressure on ecological resources and biodiversity. Scarcity of natural resources, especially water, is pronounced in parts of the country, especially in the northern regions. China also continues to face the threat of major disasters such as flooding. Thus protection of the rural ecological environment is of great importance in ensuring food security, social stability and the sustainability of the national economy as a whole.

Starting from the late 1990s, China’s agriculture and rural development began to enter a new historical period. WTO accession has become a driver for change. This new era of development has its own features, conditions and problems, requiring new objectives, institutional arrangements and policy adjustments. This paper reviews many of the current policies, and a range of views about needed changes for sustainable rural development. Seven major issues are highlighted.

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1 This paper has been produced from an original, longer Chinese language document prepared and distributed by Chinese members of the CCICED Lead Expert Group and others. It has involved some reorganization and abridging of material in this English summary version. The input of the CCICED Agriculture and Rural Development Task Force has been extremely helpful in preparation of the original Chinese document.
GOVERNMENTAL COMMITMENT

The new Chinese government regards agriculture, rural development and the income of peasants as problems of the first order in building a well-off society. In February 2004, the CPC Central Committee and the State Council jointly issued Document No.1, “Proposals on Policies of Increasing the Income of Peasants.” Based on the reports to the 16th CPC National Congress and the Third Plenary Session of the 16th CPC Central Committee, the document upholds the scientific approach to development. It proposes comprehensive, coordinated and sustainable development that takes into full account the requirements for unified and planned urban and rural economic and social development, and makes the increase of peasants’ income a matter of national concern—not only a major economic issue but also a major political issue. The document calls for a new line of thinking and integrated measures to bring about a major change in development strategy, the economic system, policy measures and working mechanisms so as to arrest the growing income gap between urban and rural areas.

The new government has adopted the following six measures to resolve the problems of agriculture, rural development and peasants’ income:

• Raising grain production capacity to ensure food security;
• Promoting strategic adjustment of agriculture and rural economic structure to increase non-agricultural activities;
• Continuing the reform of taxes and fees in rural areas;
• Deepening the reforms of the grain distribution system, land requisition system and rural financial system;
• Increasing investment in agriculture and rural development to improve the social undertakings and infrastructure of the rural areas; and
• Raising the level of organization in the rural areas to improve the capabilities of farming households to participate in market competition.

China’s agricultural and rural development have entered a new stage (sometimes described as a New Era) of development marked by four major changes:

• **Shifts in supply and demand of agricultural products and more diversified targets of development.** The country used to seek aggregate commodity targets. But now it has begun to seek multiple targets of quality, high yield, high efficiency, ecological balance and security. China’s grain production capacity has reached 500 million tons to become the biggest grain producer in the world. The average per capita supply of agricultural products has been substantially increased. In 2002, per capita meat output reached 40.8 kg and per capita aquatic products output reached 35.6 kg, well above the world’s average. Starting from the late 1990s, there have been successive good harvests and the grain in stock has increased significantly. The total grain supply has become surplus at this stage. While ending the period of grain shortages, China also has had the opportunity to restructure the agricultural economy,
focusing its attention on multiple targets, such as quality of agricultural products, the efficiency of resources utilization and ecological restoration.

• **Employment changes, with non-agricultural activities becoming the mainstream.** As the pace of industrialization and urbanization has picked up and agricultural labor productivity has been raised, more than 100 million people in the rural areas are in disguised unemployment, or are under-employed. Agriculture is unable to provide more jobs. Now, more than one-third of the rural labour force has moved to non-agricultural activities, with inter-regional movement, and migration to urban areas. Agricultural income comes mainly from crop cultivation and animal husbandry. At present, peasants mainly rely on non-agricultural jobs to increase their income. This major change in the employment structure is sure to bring about a series of changes in other areas.

• **Major changes in the dependency of cities and towns and the national economy.** China’s industrialization resulted in a dual economic and social structure, seriously isolating agriculture from industry, country from towns, and peasants from city dwellers. But with the establishment and improvement of a market economy, the dual structure is beginning to fall apart. All production factors, including labor, have begun to move and the ties between agriculture and industry and between town and country have been strengthened. The interaction and complementarity in the development of town and country have become more and more significant. The unified planning of the relations between town and country is an inevitable trend. But it will be a gradual process. Macroeconomic considerations are exerting an increasingly big influence on the development of agriculture and rural development. Thus the central government needs to slant its fiscal, taxation and other policies more toward agriculture and rural areas.

• **Major change from a closed economy to the utilization of both internal and external markets, with dependency on foreign trade increasing steadily.** China’s WTO membership has brought about both opportunities and grave challenges to China’s agriculture. From a long-term point of view, the increased linkages with international markets offers opportunities based on China’s comparative advantages and has created the conditions for importing capital and technology and for exporting more agricultural products. At the same time, China will need to directly face up to the international market and competition in products and technology. Its export of agricultural products will be subject to quality standards and trade barriers. Furthermore, the import of a large amount of land-intensive products will mean a strong challenge to China’s existing grain security system.

**TASKS AHEAD**

The following categories of tasks are to some extent now being addressed. They will be the core of activities to come in years ahead.
• **Change in governmental functions.** Although the government has put forward a number of policies such as those in Document 1, they depend upon reform of administrative management and changes in the functions of the government. This includes the fostering of a scientific approach to development and performance assessment, and limiting the extent of direct interference of government in economic activities.

• **Satisfying diversified market demands.** With the maturity of the market and the rising living standards of the people, people will demand agricultural products diversified in variety, superior in quality and meeting the prescribed food health standards. This requires the display of comparative advantages, the raising of the level of specialization and regional division of labor. Also needed are constant improvement of good strains, improved resource utilization rate, the development of environment-friendly planting techniques and, through structural adjustment, increasing the proportion of animal husbandry and more advanced food processing in line with local conditions.

• **Food safety and environmental protection.** Improper application of fertilizers and farm chemicals leading to health, pollution and ecological damage has become an important factor impeding sustainable development. It is necessary to work out corresponding laws, regulations, management rules and standards and implement them strictly. It is necessary to foster more widespread organic and green food production. In areas of ecological damage continued efforts are required for ecological restoration and reduced economic losses caused by agricultural development.

• **Raising agricultural competitiveness by relying on science and technology.** Agriculture is more and more dependent on the advancement of science and technology. China needs to produce more agricultural products with the limited water and land resources. It also needs to reduce cost and raise competitiveness. It is, therefore, necessary to strengthen the leadership role of government by increasing investment in research, changing the current agricultural research system, cutting redundancies to increase efficiency and creating the conditions for the private sector to invest in agricultural research.

• **Rural infrastructure and public service.** At present, infrastructure and public service in the rural areas are relatively weak, an important factor restricting the sustainable development and the building of a well-off society. It is, therefore, necessary to build at the grassroots level in different regions a fair, equitable, open and standard transfer payments system to ensure the provision of minimum compulsory education, public health, law and order, minimum cost of living and other basic public goods and corresponding infrastructure (including roads, water supply, medical and health service, power and telecommunications, water conservancy, sewage and garbage treatment). Education and training should be the top priority in public investment.

• **Raising the level of rural organizations.** The level of rural organization, both socially and economically, is low. At present, China’s rural areas have universally adopted the model of “company plus farming households”. Although this model has established ties between small farming households and the “big market”, there are many defects. The existing rural social organizations lack legal status. It is a pressing
task to raise the level of rural organizations, especially the level of organizations for peasants to get access to the market. Document No. 1 encourages the development of all kinds of specialized cooperative organizations and that is a good opportunity. It is, therefore, necessary to produce corresponding supportive policies while accelerating legislative procedures and financial policies for promoting the formation of specialized cooperative organizations so as to ensure that these organizations are brought onto a healthy path.

SEVEN ISSUES

There is no end of significant issues affecting agriculture and rural development. Seven major ones are discussed. They are:

• Food security policies;
• Farmers’ income and rural labour migration;
• Rural public goods supply and investment;
• Improved rural governance and development of rural organization;
• Environmental consequences of agricultural development;
• Ecological restoration, nature conservation and local livelihoods; and
• Sustainable land and water use.

A dominant theme that runs through all of these issues is the need for more attention to human development so that those people remaining on the land have more options. And those that seek livelihoods elsewhere can do so in an equitable fashion. The issues also highlight the overarching concern for linking food and ecological security, during the important transition to more open domestic and international markets.

ISSUE – Food security policies

Although the population has grown by more than two-fold to reach nearly 1.3 billion, China is able to provide adequate food. China has not only been able to feed more than 20% of the world’s population but also has become a net food exporter. In 1997, it became a net grain exporter. China has become the second largest country in terms of foreign exchange reserves. It has succeeded in reducing the number of rural poor population from 250 million in 1978 to 28 million by 2002. In 2000, the per capita caloric intake averaged 3040 kilocalories a day, 14% higher than the average level of other developing countries or 8% higher than the world average. China is not only one of the developing countries where food and grain supply is the most secure, but also it has made tremendous contributions to food security in the world.

Even with totally realized trade liberalization (beyond what China has committed to), China could maintain a fairly high self-sufficiency in many of the most important agricultural products. If China is able to continue to increase investment in agricultural science and technology, and more effectively utilize the cultivated land and water resources, its self-sufficiency rate in cereals could be kept at about 90% by 2020. Rice
could be more than self-sufficient (104-108%); wheat self-sufficiency rate could reach 93-98%. But it would have to import more than 50 million tons of corn, about one-third of the total demand in 2020, but less than 10% of the international grain trade of the year. At the same time, the self-sufficiency rate of oil- and sugar-bearing crops and other land-intensive food would drop from the current 85-95% to 60-75% by 2020. Such agricultural products as animal by-products, aquatic products, fruits, vegetables and flowers and other labor-intensive agricultural products would continue to develop and about 5-10% of the total production would be exported by 2020.

As viewed from an agricultural economics perspective, there are no factors posing a major threat to China’s food and grain security. Food or grain security is determined by production capacity, purchasing power, abilities of exchange and regional distribution. At present, China has grown in all these capabilities. In 2003, China’s food and grain export and net export (export minus import) reached a historical high. The extraordinary state grain reserve in 1990 led to a year-by-year drop in the prices and production of grain.

In recent years, with the rise in grain prices and the reduction in cultivated land, the problem of grain security has been raised again. From 1999 to 2003, China’s cultivated land was reduced by nearly 100 million mu (about 6.6 million ha). Since September 2003, grain prices have begun a strong upward trend. Grain security has gained extensive attention again. Even some leaders and experts hold that China is facing a serious grain security problem. However, a careful analysis shows that factors leading to grain insecurity are not so significant. The reduction of cultivated land was caused mainly by ecological construction investments. Despite the fact that 2003’s grain output continued to drop, the state grain reserve was still kept at a proper level. Local grain short supply situations were directly associated with the inefficient grain distribution system. The grain price hike tracked changes on the international market.

Restoration of land reclaimed from forests or grassland is the main reason for the reduction of cultivated land over the past five years. China has returned more than 7 million ha of cultivated land reclaimed from forests or grassland. The proportion of this portion of land in the total reduction of cultivated land rose from 47% in 1999 to 80% in 2003. But the loss of these lands from agriculture has very limited impact on grain production and prices. It was marginal land for agriculture to begin with, and many farmers have seen their income grow and direct ecological benefits such as reduction in water loss and soil erosion.

China’s grain security is no longer entirely a problem of quantity but a problem of quality, structure and environment, suggesting the following approaches:

- **The core of China’s food security should be food security of families, mainly of poor families that have a low capacity of obtaining food.** At present, China has more than 120 million people living under the poverty line as defined by the World Bank and this poses a threat to a certain extent to food security at the microscopic level. What merits attention is that at the beginning of the 21st century, there are still about 100 million people suffering from hunger and malnutrition (FAO, 2002). Such
family food security should have more attention from policy decision makers and the society as a whole, given that the national economy as a whole is growing steadily and that equity is a serious concern.

- **Food quality and safety improvements are needed.** Nearly a quarter of the land has the top soil polluted to varying degrees due to multiple toxic pollutants. Residue of farm chemicals has been increasing year-by-year in both variety and quantity. About 10% of the grain, 24% of animal by-products and 48% of the vegetables produced have quality and safety problems. The recent animal epidemics have become more and more worrying.

- **State grain reserve system still has weak links.** Although the state grain reserve management system has improved in many aspects over the past years (such as separating commercial purchase and marketing from the operation of state reserves), it has remained one of the feeblest links in China’s grain security. The state grain reserve policy targets are not clear and the quantity is not clear either. Information is lacking and not transparent. All these problems can readily cause market disorder and instability of grain prices.

- **Grain security in the past was characterized by a high self-sufficiency rate that was realized at an economic and environmental price.** By economic price, it means the price of bulk agricultural products in China is higher than on the international market, failing to fully display its comparative advantages. At the same time, there is certain conflict between ensuring grain security and raising the income of farming families. Environmental problems such as land deterioration due to long-term intensive land development will further affect the sustainable production capacity of the land.

The government produced many policies in support of grain production in 2004, including the 10 billion yuan “direct grain production subsidy”, the plan to expand the area and size of grain subsidies in the future, strictly controlling and even banning the use of cultivated land for non-agricultural purposes and reducing the scale of returning cultivated land reclaimed from forests and grassland and suspending the examination and approval of the use of land for construction purposes. Different from other macroeconomic control policies, these restrictions on the use of land have had some impact on local economic growth and poverty reduction, failing to adopt proper counter-measures to tackle problems at the deeper layers.

In reality China has established a massive and solid foundation in resources and agricultural productivity to ensure state grain and food security. China is also able to ensure a high level food security in the years to come. It is, therefore, necessary for the state to review its grain security problem and establish a new framework. This framework should take into account broader perspectives on food security and their linkage to household food security and to ecological security.
ISSUE – Farmers’ income and rural labour migration

Since the mid 1990s, off-farm work has emerged as the main source of income growth for rural households. Between 1980 and 2000, rural household income per capita rose by 4% per year. When households are able to place one more member into an off-farm job, household income, on average, rises by 56%. By 2003 one-half of China’s rural labor force earned at least part of their income from off-farm jobs; more than 85% of households had at least one person working off the farm.

Off-farm employment is the primary engine of poverty reduction and in recent years has begun to aid in the reduction of rural income inequality. Economic growth and access to off-farm employment were by far the greatest sources of poverty alleviation during the 1980s and 1990s. The increase in participation of young men and women demonstrates the pervasiveness of the penetration of labor markets into poor rural areas. For example, the participation rates of 16-25 year old men and women from poor rural areas in wage earning activities rose from about 15% in 1990 to nearly 70% in 2000.

Migration has become the most common way for rural laborers to get a job off the farm. More than 100 million migrants now reside and work outside of their home villages. More than 75% of 16 to 20 year olds work off the farm in cities far away from their homes. A veritable flood of young and relatively well-educated workers has been flowing towards China’s cities and into industrial and service sector jobs in recent years. Self-employment opportunities in the rural economy also have risen rapidly during the past two decades, and the quality of these micro-enterprises has steadily improved. The firms, although household-based and extremely labour intensive, provide employment for more than 80 million rural residents in more than 50 million households.

In general, rapid economic growth has been responsible for the strong expansion of off-farm employment for rural workers. China’s continued rural transformation will, above all, depend on the demand for labour generated by the industrial and service sectors. Importantly, the sectors that have been instrumental in job creation are mostly in the private sector and are becoming more market oriented. At the same time, improved policy and institutional situations, such as allowing for labour mobility and secured land tenure rights have facilitated the health development of China’s labour markets.

Further shifts of rural labour to urban and non-agricultural sectors depends largely on overcoming the following constraints:

- **Not enough jobs and poor human capital.** Further increase in employment opportunities will depend on continued growth of labour intensive sectors, such as small enterprises and the service sector. It is obvious that current job creation levels are far less than needed to absorb increased surplus rural labour. Education has been the significant factor that helps rural labour to enter into off-farm sector. However, the level of rural education and/or the quality of rural human capital is still very poor.
This, to a great extent, has been constraining rural people to move into city and non-farm sectors.

- **An urban social welfare system that discriminates against rural migrants.** While the dual urban-rural household registration system does not act directly as a barrier, the lack of basic services for rural migrants is undoubtedly slowing China’s transformation. Migrants still face discrimination in entering urban school systems despite recent changes in regulations. Private clinics that are affordable for rural migrants are heavily regulated, frequently to the point to which they are driven underground. Housing policies in the cities have not promoted the emergence of a low-cost housing sector—either for sale or rent. There is little private housing available to migrants and their families—especially in the larger, faster growing municipalities. Health insurance, unemployment insurance and social security are still unavailable to rural workers.

The labour and migration issues and constraints are partially the failure of government policies. In the past, much progress has been made in the management of China’s industrial structure in job creation. However, many policies of the past and present distort the relative demand for labour and capital. For example, an inordinate proportion of loans from the nation’s banking system are targeted for capital-intensive industries that provide relatively little employment, while many medium and small enterprises are unable to obtain enough financing.

The quality of rural education is poor. This is partially due to the poorly developed education and training system and partially due to the low level of funding for rural education. There is almost no country in the world in which primary education is not free. China’s rural households, especially in poor areas, spend up to half their per capita income on elementary school fees and more than per capita income on middle school. In many cases they are unable to afford high school and college, in the rare cases that rural students are able to gain entry. The main problem, of course, is lack of funding. Part of this problem is structural. In China, local governments still bear an unusually large part of the burden for financing primary and secondary school education. In nearly all other modern nations the national government provides basic educational services. With the rise of migration in China, local governments will have increasingly less incentive to provide high quality education, since those that get educated will almost certainly leave the local economy.

Unfortunately (but realistically), there are few new policy ideas for those interested in tearing down barriers to the continued expansion of off-farm employment. Most off-farm employment will continue to depend on new jobs and enhancing human capital. Financial and fiscal policies are needed to promote labor-intensive manufacturing and service provision in order to create more jobs. More funding should be provided to rural education and training, especially in poor rural areas. Urban development policies should also take into consideration needs of migrants, such as providing equal and affordable health care access, education as well as housing and other services to rural migrants.
ISSUE – Rural public goods supply and investment

Despite various attempts in reforming China’s rural fiscal systems in the past decade or so, problems still persist on both revenue and expenditure sides and on the way public goods and services are financed. Over 70% of counties and townships are in chronic deficit. Local governments are under increasing pressure to meet policy goals with far less than sufficient funds. The recent Tax for Fee Reforms, although well-intended, do not seem to be solving rural China’s fiscal problems. Persistent fiscal gaps between required expenditures and fiscal capacity have several adverse effects. One is that many rural governments are unable to provide the level and quality of social services mandated by national policy.

The major problems are reflected in the following sectors:

- **Investments.** Deferred investment is an immediate victim of fiscal shortfall. As officials struggle to meet wages and other immediate needs from diminishing revenues, these needs are displacing development-oriented investments. Even if budgetary officials are directed to allocate funds to fixed investment, the funds are often diverted or borrowed, and, if not returned, the investment is not just delayed but permanently deferred.

- **Rural education.** Although efforts have been made to increase spending on education, the goal still has not been met. Imploring local governments to increase education funding more rapidly than the growth in financial revenue has gone largely unheeded, and meeting this target appears improbable. Insufficient fiscal revenues have undermined the quality of education as measured by a number of human capital indicators. Where funds cannot be raised, education and health services have disappeared or declined in quality, resulting in the large-scale out-migration of teachers, doctors, and other professionals.

- **Rural health.** Ministry of Public Health goals call for 8% of rural budgets to be spent on health care. National officials have mandated improved facilities, expanded coverage, and minimum training for doctors. Rules describe what is expected of county and township leaders for establishing ideal rural health systems. However, like education, the actual resources allocated to achieve national objectives fall far short of needs. The national government allocates only 2.4% of its recurrent budget for health care services, and only 1.2% of the capital construction fund. The situation is more severe in poor areas.

- **Increased dependence on extra-budgetary revenue sources:** To meet the revenue requirements for public goods and services, county and township governments attempt to increase revenue from off-budget sources. Without legal taxing authority or ability to borrow, counties and townships have developed off-budget sources, primarily extra-budgetary funds (EBFs) and self-raised funds (SRFs). Although the
growth of off-budget revenues has eased fiscal pressures for many localities, it has also produced adverse consequences. It has hastened the decline of the formal fiscal system by providing an alternative tax source that is 100 percent retained. It has created a tax system beyond the reach of the formal fiscal system that is ad hoc, nontransparent, and regressive; the lack of legitimacy may be a greater source of rural discontent than the total burden. Perhaps the most egregious consequence of off-budget financing is the tendency of county and township governments to give policy and regulatory agencies control over the assets they regulate or operate (or the resources they are charged with protecting). Officials then encourage agency officials to use these assets to generate income for staff salaries and other expenses. This is a pervasive issue including nature reserve and other natural resource management and in agricultural extension. There have been efforts to control this, but the reactions of local government have almost been as quick as any action from above.

It is recognized that the current tax system, which remains heavily industry-based, can distort investment incentives and induce local governments to promote industrial development even in areas without a comparative advantage in manufacturing. These elements of the tax system have been shown by China’s economists to slow development. The 1994 tax reform increased the tax collection power of the central government, which would allow more equitable redistribution. However, while more revenues have flowed into central coffers (reducing local revenues), little has been shifted to poorer or deficit areas, and the new tax policy continues to favour relatively affluent areas, exacerbating rather than alleviating the rural fiscal crisis. Increased pressure at counties and townships to generate revenues to meet the system’s unfunded mandates leads to excessive fee collection. This has led to the new round of Tax for Fee Reform.

However, it is believed that China’s rural fiscal reforms need to go beyond Tax for Fee Reform and consider the way expenditures are managed. There is a lack of proper review of the public goods and services that are needed in rural China. Policy goals need to be realistic and priorities should be established for their provision. Each level of government needs to be handed clear responsibilities for the provision of a subset of the public goods. The resources needed to provide the public goods also need to be clearly defined. Leaders need to insure that sufficient resources are available to support the expenditures needed to meet their mandates. In the process, expenditures also need to be reorganized.

While increased transfers to eliminate unfunded mandates are key to the solution of the rural fiscal crisis, the reforms also need to completely restructure local government and fundamentally reorganize public finance. Even though such reforms in China will be disruptive, they need to be implemented in a comprehensive way. To minimize the disruption for the nation as a whole, rural fiscal reforms can begin with regional experimentation.

There is considerable evidence that China is at a crossroads in agricultural development as the country has moved from taxing to subsidizing agriculture. How to design an agricultural support policy to achieve long-term sustained, equitable and sustainable
growth is a hotly debated topic among Chinese policymakers and researchers. The following suggestions for policy reform have been suggested:

• **More public spending in rural sectors.** Rural investment accounted for only 19% of total government expenditures in 1997, but rural residents account for 69% of China’s total population. Moreover, almost 50% of national GDP was produced by the rural sector (agriculture and rural township and village enterprises) in 1997. Government’s rural spending as a percentage of rural GDP is only about 5% compared with 11.6% for the whole economy. China has implemented an urban and industry biased investment policy for the past several decades. As a result, the rural-urban income gap is large and has increased over time. Any policies that discriminate against the rural sector will aggravate the existing disparity and should be discontinued.

• **More investment instead of more subsidies.** China has already reached the initial stage of the agricultural transformation even though China did not provide direct subsidies in either inputs or output. Therefore, China should not follow the path of other countries by massively subsidizing its agriculture. Instead, the government should use its limited public resources for improving human and physical conditions of rural areas to enable farmers to engage in high-value production or migrate to non-farm activities.

• **Correcting regional biased government policy.** Particularly under the previous centrally planned economy, natural resources such as minerals, oil, gas, and even land have been owned by the central government. These resources were shipped to the Eastern regions at low prices or even free of charge, thereby transferring rents to the coastal areas. The Western provinces, although rich in these resources, benefited very little from the exploitation of these resources. Even worse is the latest reform of these state-owned enterprises, which left millions of laid off workers and degraded environments under the responsibility of local governments. In particular, the central government should re-direct its public resources towards the western region. The western region shows the highest returns to all kinds of public investments targeted to reducing rural poverty and regional inequality. This is consistent with the national strategy to develop western China. Investment in agricultural research, education, and rural infrastructure there should be the government’s top priorities. Among all, the most critical is universal and free primary (ideally 9 years) education funded by the central government.

• **Reforming the fiscal system for more equitable regional growth.** China is highly decentralized in its government spending. Local governments account for more than 70% of total government spending. The central government plays a limited role in equalizing regional development through its financial transfers. Most of the transfers from central government to local governments are tax rebates. This mode of transfer is seriously biased against the poor provinces in Western China. In fact, this may be one of the major factors underlying the increased regional inequality after 1988 when China introduced its new financial responsibility system. Under this system, every
province signs a contract with the government with regard to each other’s obligations and responsibilities. This system gives each province more incentive to develop its economy through retention of more revenue. However, poor provinces suffer because their tax bases are low. As a result, inequality in per capita government fiscal resources has increased dramatically. For example, the gap in per capita expenditure between the richest and poorest provinces has increased from 6 times in 1990 to 19 times in 1999.

ISSUE – Rural governance and development of rural organizations

Although the biggest disadvantaged group, China’s peasants are poorly organized. They neither have effective ties with the market nor have cooperative organizations to sell their products, obtain market information and monitor the quality of products. It is, therefore, most pressing to raise the level of organization in the rural areas to address the challenges of a market system. At present, there are the following organizations in the rural areas: grassroots governments, rural economic cooperative organizations, specialized technical associations and rural non-governmental organizations (rural NGOs).

The rural organizations have the following characteristics:

• Local rural governments basically control and manage almost all rural activities. Rural governance mainly manifests itself in top-down management. With the reform of rural governance, the original grassroots government functions (such as enterprise development, taxation and family planning) have gradually been weakened.
• Rural economic cooperative organizations are very weak. The current model “company plus farming households” has institutional drawbacks, hardly able to resolve the conflict between small farming households and the “big market”.
• Peasants’ specialized technical associations have been slow in development and the technical levels of the associations themselves are not high, hardly able to provide technical support to farming households.
• Rural areas lack grassroots NGOs that engage in poverty relief, nature protection, pollution monitoring and protection of rural women and children, unable to ease all these social problems. Preliminary statistics show that there are about 10,000 rural economic cooperative organizations and specialized technical associations, accounting for 70% of the social groups registered with the county-level civil affairs departments. It is estimated that about 1-2% of the farming households have participated in such rural NGOs.

There are several key problems.

• New rural governance structure needs to be established. The government should gradually shed its economic functions so that it can perform oversight and regulation and provide services—to facilitate the activities of peasants instead of controlling
them. In the present stage, China’s rural areas need to establish three kinds of partnership. One is partnership between the grassroots, governments and peasants; the second is the partnership between government’s public service departments and the private sector; and the third is the partnership between the peasants and all types of rural economic organizations and NGOs. Such partnerships could enhance the capabilities of peasants to participate in the market activities, agricultural and rural development. The establishment and development of rural economic cooperative organizations is crucial to solving the universal problem that small farming households are separated from the “big market”.

- **Rural organizations are small in number, low in capabilities and too administrative in their functions.** China’s rural organizations are small in number and low in peasant participation and are mostly distributed in the eastern part of the country. The rural organizations themselves are inadequately staffed, the level of their social security is low, suffer from inadequate financial strength, and are poor in capacity building and self-discipline. They cannot display their due roles. Some rural organizations are subject to strong interference by the local governments. Their leading posts are often taken up by government officials and, with the government in charge of business operations or technologies, the government departments monopolize all activities. Some have become appendages of the local governments or have even become governmental organizations, thus acquiring administrative functions while losing their NGO nature.

- **Rural organizations have poor financial and technical support in their development.** Rural organizations (especially NGOs) cannot be established and developed spontaneously. They need financial and technical support from external organizations and organs (such as local governments, NGOs and international organizations). These external organizations do not have their own economic interests in the rural areas. This is manifested in the peasants’ organic agricultural associations, fishing associations and ecological tourism companies established in the Dongting Lake area with the help of WWF.

In 1996, the General Offices of the CPS Central Committee and the State Council issued a circular “On Strengthening the Management of Social Groups and Non-governmental Non-Enterprise Units”. In 1998, the State Council issued the “Interim Regulations on the Registration and Management of Non-Governmental Non-Enterprise Units” and the “Regulations on the Registration and Management of Social Groups”. In 1999, the General Offices of the CPC central committee and the State Council issued a circular “On Further Strengthening the Management of NGOs”. In 2002, the government revised the “Agricultural Law”, clearly putting forward the idea of promoting the production and marketing organizations of peasants. In March 2004, the State Council issued the “Regulations on the Management of Funds”, providing the policy guarantee for the development of funds. Document No. 1 of the central authorities in 2004 encourages the formation of rural specialized economic cooperative organizations and urges active efforts to promote legislation on specialized cooperative organizations of peasants. As a
governmental organization in charge of NGOs, the Ministry of Civil Affairs issued the “Guidelines for the Cultivation, Development, Registration and Management of Rural Grassroots Specialized Economic Associations”.

This list is impressive, but there are still big gaps in legislation, systems and financing mechanisms for the building of rural organizations. Legislatively, the country has not established the legal status of rural economic cooperative organizations, rural technical associations and rural grassroots organizations. They do not have the status as legal bodies, making it difficult for them to raise funds and to carry out their activities. The “threshold” for forming NGOs is too high (local social groups need 30,000 yuan to have their organizations registered with the civil affairs departments), restricting the establishment and development of rural NGOs.

Institutionally, rural organizations are subject to dual management, with a department in charge to exercise oversight and the civil affairs department in charge of registration (and unable to keep up with the demand.) Departments in charge are incapable of promoting the development rural NGOs or providing adequate policy guidance and technical support. The upshot is that many rural NGOs cannot get the approval of departments in charge. Some NGOs are operating outside the system, making it hard for the government to exercise effective guidance and management.

Financially, although the state promulgated the regulations on the management of funds, there are not matching policies and enterprises. Companies cannot get tax reduction or exemption when donating to funds and NGOs, thus cutting off financial sources for NGOs to do public good.

In conclusion, raising the level of rural organizations calls for:

- A new type of rural partnership, including the partnership between grassroots governments and peasants, the partnership between government’s public service departments and the private sector and the partnership between the majority peasants and minority “flagship enterprises”. Reform should proceed in a gradual process, beginning with the separation of government’s economic functions from its public welfare services and then proceeding with its social functions.

- Granting of legal status to rural economic cooperative organizations, rural specialized technical associations and rural grassroots organizations, with a lowering of the threshold for approval and registration. At the same time, it is necessary to lift control over economic cooperative organizations in guarantee, financing, technology, production, marketing and quality control Priority should be given to the development of economic cooperative organizations and to accelerate the pace of preparing a law on rural cooperative organizations.

- Changes in the mechanism of government departments in charge of the formation and development of rural NGOs, changing from the current “control” to “support”.

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• Tax concession policies for organizations engaging in public welfare causes so as to encourage them to provide financial support to rural NGOs; to encourage foreign government aid agencies, domestic and foreign NGOs to carry out experiments and demonstration projects in such areas as poverty relief, nature protection, environmental protection and training of community personnel, and provide financial support and technical service to raise the capacities of rural NGOs.

ISSUE – Environmental consequences of agricultural development

**Water and air pollution**

In China’s rural areas, there are three major environmental pollution sources: agriculture, rural industry and residential municipal wastes.

China now is the biggest producer, importer and user of agricultural chemicals in the world. It’s because of China’s agriculture policy incentives, such as low customs tariff, subsidies, and chemicals as bonus for farmers. Nitrogen fertilizer is of greatest concern, increasing from 9.34 million tons in 1980 to 21.62 million tons in 2000. Chemical fertilizer application levels are now more than double of world average per hectare.

Overuse of chemical fertilizer and pesticide is resulting in serious non-point source pollution and eutrophication of water bodies. For instance, more than half of nitrogen and phosphate of non-point pollution in Taihu Lake are from chemical fertilizer use. All big lakes, and 75% of all China’s lakes are too rich in nutrients.

Intensive livestock industry is a major point source of water pollution, often in suburban areas, where chicken and pig farms are common. In 1995, total livestock excrement was 2.5 billion tons, 3.9 times the total annual industrial solid wastes. Very little livestock excrements are treated before they enter water bodies.

Residential municipal sewage in towns and villages is also becoming a water pollution problem, especially in east coastal regions. In recent years, COD effluents from cities, towns and villages are about 8 million tons, which are 35% higher than industrial effluents, with a growth rate higher than 10%.

Grassland and forestland have been cultivated as farmland in recent decades. And some grassland has been over-grazed to produce more livestock. The frequency and intensity of stand storms are increasing. In Beijing the API (air pollution index) of worst air pollution day could be higher than 500 during sand storms.

Another air pollution source is from crop straw burning in the field. After crop harvest, in many areas farmers directly burn straw in the field, which results in very heavy air pollution. For example, in 2002 the bad air pollution by straw burning dramatically decreased invisibility in Shijiazhuang City, leading to airport closure. Every year, there are about 400 million tons of crop straw to be handled properly.
Land degradation

Soil fertility in most regions is declining. Farmland with humus soil below 0.6% now takes up 12% of total farmland. In total arable land, 59% of arable lands lack phosphate, and 23% lack potash.

There are 130 million ha of degraded grassland in China, increasing by 2 million hectares annually. Extension of farmland to marginal land results in soil erosion. There are 1.8 million km² of water erosion areas in China, 18.6% of total territory. It has been increasing in the past years until the Grain for Green program started.

Soil contamination is also a problem. Each day there are about 350 thousand kg of municipal solid wastes produced in rural areas. In 1995, nearly one million tons of agriculture plastic films were used, covering some 6.5 million ha of farmland. Some soil contamination is from industrial wastewater irrigation, which comes from township and village enterprises and urban industries.

Food safety

The annual amount of pesticide used is more than 1.2 million tons. About 9 million ha of farmland have been polluted by pesticide. Residual pesticide on agriculture products is a severe problem. A relatively high proportion of products cannot meet the standards for pollution-free food labeling. Green food and organic food are only a small proportion of agriculture products. Agriculture products laced with pesticide often result in food poison. China’s agriculture products also face trade barriers when exporting to other countries. For example, in 2001 the EU increased the number of pesticide-checked items from 6 to 62 on Chinese tea products.

Invasive species and biodiversity loss

Expansion and intensification of agriculture activities results in natural habitat decrease, threatening biodiversity. There are 640 endangered species on the CITES list, among them China has 156. Invasive species are becoming a large problem.

Strengthening rural environmental protection

Weak rural environmental management capacity, contributes to China’s inability to internalize rural environmental costs. Currently less than 6% of townships have environmental management bodies. The average staff number of township level environmental management bodies is 2.7 persons. Even at the county level, the average environmental staff number is only 12.87 persons. Among them, less than half are governmental civil servants; the rest are contracted staff. Township and county level environmental management organizations are too poorly equipped to monitor rural environmental pollution and degradation.
The second reason is lack of coordination between agriculture policy and environmental policy. Many agricultural officials do not realize that agriculture is one of the most environmentally polluting and ecological degrading sectors. Environmental security is often ignored in the process of implementing food security. In 2003, China’s grain products were 430 million tons. To ensure food security of 400 kg per capita, the Ministry of Agriculture has set a target of 550 million tons grain production in 2010. The plan has never been reviewed from the view of environmental management. According to the Environmental Impact Assessment Law, such agriculture development regional plans, or projects should be evaluated.

For better dealing with relationships between food security and environmental security and better coordinating agriculture policy and environmental policy, and establishing environment-friendly agriculture, the following policies are suggested:

- **Strongly enhance rural environmental management capacity.** Central government should delegate more rural environmental tasks to county and township level environmental authorities along with more financial resources. Local environmental staff need both training and equipment. Environmental impact assessment of agriculture projects and regional development plans is very urgent to prevent new sources of rural pollution and environmental degradation.

- **Adjust rural economic structure towards more labor-intensive rather than resource-intensive industries.** Resource-intensive production will lead to greater pollution. Hence, farmers moving from agriculture to manufacturing, services and other labor-intensive industries should be strongly encouraged. Importing higher levels of water, chemical and energy-intensive agricultural commodities while placing greater emphasis on production within China of fruits and other high value, labour-intensive agricultural products makes sense.

- **Encourage domestic consumption and export of organic food and green food.** Ecological or sustainable agriculture is a farming system with good environmental performances, such as high efficiency of water resources use and reduced or no chemical use. Certified Organic Food and Green Food are products of ecological agriculture.

**ISSUE – Ecological restoration, nature conservation and local livelihoods**

China’s current natural conservation and ecological restoration programs are of global significance and have achieved sound ecological benefits and biodiversity gains. But the programs are not all economically sustainable. And some farmers in conservation and restoration areas are facing difficulties with livelihoods, either due to the loss of cropland, or due to the constraints of development. Finding alternative livelihoods for such people is becoming a critical issue in China’s rural development.
Since 1998, large-scale ecological restoration programs (accompanied by various resource harvest bans) have become an important investment mechanism, including: Natural Forest Protection Program (Logging Ban), Grain for Green Program (restore cropland into forest and grassland), Restoration of Lakes from Cropland, Grassland Grazing Ban, Fishing Ban (along Yangtze River).

The central government invested more than 100 billion RBM in these programs, of which the Grain for Green Program was about 50 billion RBM, Natural Forest Protection Project is about 40 billion RBM and Return Cropland to Lake Project is 10.9 billion RBM. Some subsidies have been provided to rural residents based on lost cropland, labour and house rebuilding costs. Some 60 million rural households are involved in Grain for Grain, especially in Western China including the Upper Yangtze and Upper and Middle Yellow River, with about about 7.2 million ha of cropland converted to forest or grassland. Some 0.62 million rural households are involved in Return Cropland to Lake, with about 470 thousand ha of cropland converted to permanent or temporal wetlands or rivers. Ecological restoration is the main reason for loss of cropland in the past 6 years, accounting for about 50% of national total net loss in this period.

Grain for Green more than compensated farmers for lost production, with about 30 million tons compared to a loss of about 15-25 million tons grain production of converted upland. This meant a significant decrease of national grain storage, which is believed to be the main reason for a decrease in Grain for Green in 2004 (3.33 million ha in 2003 to 0.67 million ha in 2004).

Protected Areas, especially Nature Reserves, increased rapidly in recent years. Protected Areas now account for some 17% of National Territory, with Nature Reserves accounting for 13% of National Territory. 40% of the Nature Reserves are located in West China and 25% are located in poverty regions. The increase in Protected Areas (especially Nature Reserves) has led to concern on the part of some societies and conflicts with local communities.

Most rural residents including farmers, forest workers, herdsmen and fishermen welcome national policies for ecological restoration and conservation in terms of economic benefit, but some face challenges to find alternative livelihoods:

- At least 5 million farmers reduced their living standards from Grain for Green cropland loss.
- More than 1 million forest workers lost their jobs after the logging ban in 1998.
- About 500 thousand fishermen lost their fishing licenses for the boats after fishing ban in the coastal area and some 50 thousand fishermen cannot fish during fishing ban period of 3 months.
- Some 250 thousand farmers lost cropland in the Middle Yangtze from the Return Cropland to Lake including Hunan, Jiangxi, Hubei and Jiangxi Provinces.
- Some 1 million herdsmen were asked to raise their stock in fenced lands to avoid overgrazing.
Moreover, with the rapid expansion of Grain for Green in 2002 and 2003, the subsidies of grain and cash could not fully delivered to farmers in time, which made some farmers’ livelihood even more difficult.

Local governments are facing financial difficulties due to the loss or reduction of agriculture taxes in the restoration areas. This affected staff salaries and continuity of rural development initiatives.

Most national ecological restoration programs have ended (Return Cropland to Lake in 2002; logging ban in 2001), or will soon. National strategy and plans for new initiatives are not clear to the public yet. Some farmers have lost their trust in the Grain for Green. Thus, how to sustain the ecological gains of these initiatives is becoming an important issue. Furthermore, current policies on food security and cropland protection are not in line with the ecological restoration programs. Some people worry that no more grain can be provided for the Grain for Green Program, given the focus now on national food security. With the strict new land protection policy, there is a fear that perhaps no more cropland will be spared for forest, grassland or lake restoration.

If the sector-oriented and ill-coordinated Protected Areas increase steadily, more farmers may be dislocated, and more farmers near the Protected Areas risk losing their rights to harvest local resources on which they are dependent.

Nature conservation and ecological restoration could be redesigned to deal with these issues, as noted below.

- Re-design the above-mentioned programs in sustainable ways and at a reduced scale, focusing especially on fragile areas of the western part of China. The following sustainability concerns need to be considered:
  - Central government allocation of reasonable amounts of funding and grain in order to maintain the ecological gains and to prevent possible cropland reclamation in fragile regions.
  - Governments at all levels should combine ecological restoration with poverty alleviation and provide a reasonable level of welfare to farmers in poverty.
  - Integrate population policy and compensation policy in eco-restoration i.e., family plan compensation and alternative livelihoods.

- Promote off-farm employment and alternative livelihoods for farmers in ecological restoration and natural conservation regions.

- Design a new and comprehensive protected areas system and ensure that local people benefit, not suffer, from living near protected areas.

- Involve a more active participatory approach in ecological restoration and nature conservation in order to let farmers associations be active in the decision-making, planning and monitoring processes.
ISSUE – Sustainable management of land and water resources

Sustainable management of water and land resources will be a major determinant of sustainability in China’s immediate and longer-term future. It is obvious that agriculture will play a key role in establishing a resource-saving society. Yet agriculture continues to be the largest consumer of land and water resources and is virtually dependent on these resources. Some baseline share of these resources is needed to ensure national food security. And it is only through more efficient use of land and water that agriculture will yield the necessary room for urbanization, industrialization and, indeed, adequate protection of natural heritage and ecological services.

Water and land resources in vast rural areas of China support the livelihoods of 900 million people, 70% of the total national population. As legitimate owners of these resources, rural people are ultimate decision-makers and beneficiaries, and their way of living and production will determine the sustainability of these resources.

Critical issues in the interplay of water and land resources and agro-rural development include:

- Inherited scarcity and depletion by over-exploitation;
- Inherited low quality and degradation by irrational use;
- Uncertainties of water and land resources availability and regional variation in the context of global climate change;
- Decreasing share of water and land for agricultural-rural development; and
- Low efficiency of water and land use.

Land

China’s per capita arable land is only about 1/3 of the world average. Productive land (ranked as grade 1) is only 1/3 of the national total, the rest is poor quality, low productivity, or subject to land degradation such as desertification, salinization, and soil erosion (56 million ha). What is more, 8.67 million ha have been lost to pollution and acid rain. Land reserved for reclamation is limited only to 7.53 million ha.

China has suffered a net loss of arable land since 1958. During 1978 to 1998, the rate of average farmland loss was only 0.185 million ha/yr, whereas during 1998-2000, the rate increased to 0.58 million ha/yr, three times that of the earlier period.

Recent surveys show a significant loss of arable land. From 2000 to 2003, the net loss of arable land in China was 5.47 million ha, most of which are for ecosystem restoration program such as Grain for Green. However, the reduction of grain production has been mostly leveraged by reclamation of new arable lands and yield increase per unit area thanks to pro-grain production policy in recent years.
Based on the experiences from developed countries and eastern coast regions in China, further loss of arable land to urbanization and other non-agricultural uses is inevitable. For example, in Changshu City of south China’s Jiangsu Province, per capita farmland decreased from 0.073 ha in 1980 to 0.061 ha in 1999, and will further be reduced to 0.051 ha by 2015. Though it seems that land loss has an insignificant impact on grain production in the short term, a baseline level of land resources for agriculture has to be reserved for the longer run.

Numerous studies show that global climate change and environmental deterioration pose threats to land quantity, quality and productivity. This means an uncertain future for available land resources to ensure long-term food security.

**Water**

Water constraints for food production are even more challenging than land. China’s per capita water resource is only 2200 tons, 1/4 of the world average. Great spatial and temporal variation causes disasters of drought and flood, impeding agricultural uses. To the north of the Yangtze River, is 64% of the total cropland with only 17% of total water resources. Yet in the south, there is only 36% of total cropland with 83% of water resource (Liu 1999).

China’s irrigated farmland accounts for 21% of the world’s total, and per capita irrigated land equals the world average. This portion of farmland, 41% of the national total, produces 70% of national cotton, 90% of the vegetables and 2/3 of grain. Very unfortunately, the baseline water supply required to sustain the current farmland irrigation and agricultural production practices faces great challenges.

The first is the decreasing share for agriculture. Jiang (2002) identified that water resources for agriculture decreased from 97.1% in 1949 to 68.8% in 2000. Experts predict that by the year 2050, the share for agriculture will be further down to 54%. This trend shadows the experiences of OECD countries.

The second is low water use efficiency in agriculture, industry as well as cities, exacerbating water scarcity everywhere. Average GDP water consumption in China is 4 times the world average, and agricultural irrigation efficiency 1/2 of OECD countries.

The third is the impact of global climate change. More climate variability and extreme events add more uncertainties and difficulties in water management in the agricultural sector, as there will be an increase in frequency and intensity of both flood and drought. More variability and extreme events will aggravate spatial disparity between land and water, as well as temporal disparity between growing and rainy seasons. Though climate change is unlikely to have an effect on municipal and industrial demand, it may substantially affect irrigation withdrawals. For instance, the productive northeastern China plain used to be called China’s grain store, contributing about 50% of commercial
grain. This is not the case today. Severe drought episodes in recent years greatly
compromised grain production in this region.

The fourth is increasing water pollution. On a number of occasions farmland has been
ruined from discharge of polluted water. Irrigation using polluted water not only
produces unhealthy food and other agricultural products, but also deteriorates farmland in
the long run, putting agricultural sustainability in jeopardy. In fact, agriculture could
easily become marginalized when allocating water amongst sectors in the economy. In
the end, only the poorer quality water could be left for agricultural production.

China’s government attaches greatest importance to the wise use and management of
water and land resources. At the national level, there are laws, regulations, plans and
other preferential policies for land and water management, including Water Law, Law of
Soil and Water Conservation, Land Administration Law, Regulations on Protection of
Basic Farmland, etc.

Line agencies such as the Ministry of Water Resources, Ministry of Agriculture, Ministry
of Land and Resources, together with local authorities and farmers, have been trying
everything possible to manage land and water resources. And to some extent, they have
been successful in transforming their functions, for instance Water Resources is moving
towards integrated water management from flood and disaster prevention. Examples in
water-saving demo cities like Zhangye of northwest Gansu Province are successful in
terms of macro policy control, market-driven and community participation, and in terms
of the development of water rights and market theories. Another case in Hebei province
shows a 40% increase of water use efficiency by simply adopting an incentive
mechanism. There also has been good progress in water saving technology development
in the agricultural sector. Experiments show that water use efficiency of trickle or drizzle
irrigation is 2 times that of conventional methods.

Still, existing action is far from adequate to address water and land scarcity for
agricultural rural development, and there are huge gaps of policy, institutions and
knowledge that need to be bridged before we can really think of a resource-saving
society.

- **Policy gaps.** Resources are public goods with both natural and commercial
  properties. Existing laws, regulations and policies are sometimes provisional. There is
  a lack of overall planning of resource management for all regions and sectors, lack of
  regional and sectorally differentiated policy, lack of coordination between policy
  setting and implementation, lack of coordination amongst different stake-holders of
  resources, and lack of monitoring and enforcement, lack of incentive mechanism and
  market regulation mechanism.

- **Institutional gaps.** There is no integrated approach to managing resources among
  sectors; no clear cut differentiation in roles of different ministries, and between
central and local governments, between local authorities and communities, and between government and market.

- **Knowledge gaps.** An integrated approach to resource carrying capacity analysis is lacking in the projected development goals. Thus land and water availability to meet key development components is unclear. A baseline analysis of water and land supply to sustain minimum agricultural production for food security is needed. It should address the lack of cost-effective water-saving technologies and regional application of information on resources and environment.

**Towards a resource-saving society**

Having analyzed the issues and policy gaps of water and land resource management and their interactions with agricultural-rural development, one can only conclude that establishing a resource-saving society is necessary for China’s rural areas and for future food and ecological security. This also coincides and resembles with a more specific call of Premier Wen “to strengthen water resource management, increase water use efficiency, establish water-saving society…”

The concept of a resource-saving economy and/or society was proposed in the early 1990’s, when China’s economy was impeded by severe shortage of land, water, mineral resources and energy after 10 years of economic reform and rapid development (Hu and Wang, 1991). Remarkable progress has been made ever since, though sometimes provisionally, in applying the concept and coping with resource crisis. However, this is far from adequate. The magnitude and speed of today’s development needs a much more complementary and concerted approach involving all dimensions of the society to use and manage resources wisely. Reform and transition of the last 25 years has created an enabling environment in which to realize the concept of resource-saving society.

The core set of components of a resource-saving society consists of:

- increasing awareness of all stake-holders, particularly local authorities and farmers
- knowledge for policy advocacy, particularly carrying capacity of land and water resources, and technology for implementation;
- policy reform; and
- new institutional arrangements—to strengthen the macro-control of land and water resources as public goods, to create an enabling market environment for shifting resource rights and payments, to consolidate farmer’s resource rights and to promote farmers’ participation in all activities.

A resource-saving society is a package of components involving government macro-control, market forces, and farmers’ rights. These should focus on increasing resource use efficiency through various measures as noted throughout this issues paper. It should start from an analytical knowledge base, including better understanding of land and water carrying capacity. A unitary development plan operating at national, regional and/or local
levels can be formulated based on an understanding of both opportunities and constraints. Demonstration projects will further promote overall implementation.