

**Workshop on Environment, Resources and Agricultural Policies in China  
19-21 June 2006, Beijing, China**

Session 1: Agri-environmental situation and policies in China: practice and outcomes

**EFFECTS OF INTEGRATED ECOSYSTEM MANAGEMENT ON LAND  
DEGRADATION CONTROL AND POVERTY REDUCTION**

**By HAN Jun**

**Director-General, Research Department of Rural Economy,  
Development Research Centre of the State Council**

**Abstract**

*This paper focuses on a major concern that not only applies to China, but applies universally; namely how to achieve long term ecological improvement whilst addressing the problem of meeting short term needs of rural livelihoods. In the context of the People's Republic of China (PRC), Integrated Ecosystem Management requires: (i) cross sectoral planning; (ii) building human capital; (iii) protecting land users legal rights; (iv) improving policies for poverty reduction; and (v) promoting locally appropriate land management technologies.*

**Key points**

There are two types of the most serious deteriorated territorial resources in China, they are soil erosion and desertification. Soil erosion mostly occurs in the steep mountain areas and on the Loess plateau. Desertification is mainly distributed in areas of deteriorating grasslands.

Currently, China's desertification has reached a total area of 2.62 million square kilometres and is extending at a rate of 67,000 thousand square meters per year. The newly-added desertified areas in the west account for 9 per cent of the nation's territory.

The volume of soil erosion in China totals 5 billion tons per year, two third of which comes from the Western Region.

The occurrence and severity of poverty are closely related to the ecological environment. Presently, over 90% of the population for the rural poor are living in a poor ecological environment, and the Western Region inhabitants are trapped in a vicious circle of ecological deterioration and aggravated poverty.

Poverty-stricken areas are represented in regions where the ecological environment are most severe. Ecological construction and environmental protection policies should simultaneously address the issue of assisting Western region farmers out of poverty, and adjusting the development strategy and policy of the Western region to accommodate ecological environmental protection as its primary goal in the west development strategy.

There are a number of obstacles in the PRC's current systems and policies which deal with the land degradation and environmental deterioration. The predominant issues are; the grievous lack of sufficient investment to treat land degradation and implement environmental protection, and also the lack of a stable incremental mechanisms for investment.

**Key words** Poverty alleviation, desertification, soil and water erosion, ecological environment, land management, grasslands, loess plateau

## **The Application of Integrated Ecosystem Management in Ecosystem Development**

Integrated ecosystem management (IEM) is a cross-sectoral approach for integrated management. It is a new project framework created by Global Environmental Facility under its Operational Program 12 (OP12) for integrated management to improve global ecosystems, particularly measures to address land degradation in dryland ecosystems. The first application of IEM in the PRC indicates that ecosystem development is a priority of the Great Western Development Strategy. Implementation of the strategy should follow international trends for sustainable development.

The overall objective of GEF OP12 project is to promote sustainable development of western China and protect the global environment by combating and harnessing land degradation in the ecosystems of dryland regions. Under the national framework, the project will support the implementation of a 10-year plan to combat degrading ecosystems in the dryland regions of Western China.

The project emphasizes integrated management and communication, and coordination in policies, laws, planning and activities among sectoral and administrative authorities by establishing partnerships to take unified actions to achieve integrated management of land degradation in the western region.

The project adopts middle and long term planning methodologies instead of individual project plans, providing sustained support for the development and ecosystem improvement of western China.

The project also creates a great opportunity to help China to establish an integrated, cross-sectoral and cross-administrative regions management system for environmental resources. The implementation of the project provides a platform for all stakeholders and international organizations to participate in the development of the most optimum options for IEM.

GEF OP 12 is not only a new concept but also a new challenge to adopt IEM in ecosystem development in China. To apply IEM more successfully in China, the following points should be addressed:

- The Coordinating Group comprising of representatives from different sectors and administrative regions should develop a unified objective and plan to combat land degradation. They should also undertake to achieve closer coordination of policies, project and budget at all levels, and put forward recommendations for the plans of relevant agencies in land, agriculture, forestry, water conservancy, environment protection, poverty reduction, science and technology. They should also encourage administrative regions to improve the coordination among these agencies and administrative regions to raise the efficient use of funds. In the process of planning, attention should also be drawn to combining resources of agencies and administrative regions.
- To establish a stable channel for government financial investment and to combine and coordinate with existing projects and funds. Coordination of agricultural investment from different channels should be consolidated. Financial investment for agricultural infrastructure should be strengthened to avoid; (i) duplication of projects and investment and, (ii) the scattering of distribution funds. The functions and responsibilities of all competent agencies should be well defined to ensure the effective allocation of agricultural investment.
- All relevant sectors and administrative regions should develop and improve policies, laws and regulations in IEM, including providing relevant policies and regulations to encourage the private sector, local community and households to participate in; (i) combating land degradation, (ii) strategise policy systems concerning the lack of knowledge to address poverty reduction, (iii) developing an environmentally friendly poverty reduction strategy, (iv) developing an environment protection strategy conducive to poverty reduction, (v) encouraging a poverty reduction strategy with broad participation of governmental agencies, (vi) developing this strategy among civil society and poverty-stricken populations and (vii)

developing the policies and regulations to compensate individuals who efficiently use resources to protect the environment and others' profit.

- It is important to learn the experiences and lessons of IEM both domestically and abroad, and it is relevant to improve coordination among relevant sectors and administrative regions to avoid duplication of planning and investment.
- The advanced technologies and practices in combating desertification and land degradation at home and abroad shall be summarized and publicized.
- The success of IEM depends on the participation of all stakeholders. The local farmers, *i.e.* the beneficiaries, should be the main body for implementing the restructure of management, and thus they should be encouraged to participate in the decision-making process, the planning, the management and supervision.

### **Constraints to the adoption of IEM in China: some observations**

China faces severe ecological and environmental problems and it can be concluded that past efforts have not always yielded good outcomes. The fact that governmental departments do not have clearly defined duties, different policies are being made by various departments, different projects are managed by different departments, and funds and efforts are diverted from various approved purposes does not help. There is no unified system of monitoring, management and coordination. The efforts on the treatment of land degradation are often decided from a top-down approach and carried out in the mode of engineered construction. There is a lack of wide involvement of stakeholders, let alone the people that are directly affected.

#### **1. The enormous effort made by Chinese government to solve land degradation has not reversed the trend of partial improvement and overall intensification**

*The Chinese government has focused its attention on combating land degradation and desertification, and has implemented a series of ecosystem protection projects.*

Since undertaking water and soil erosion conservation in 8 regions beginning in 1983, China has increased investment on soil conservation and erosion control. It launched several projects aimed at combating soil erosion caused by water. Specifically, projects in the middle and upper reaches of the Yellow River and an ecological project for water and soil conservation along the Yellow River and on the Loess Plateau was financed by a World Bank loan. Especially since the 1980s, China has begun to concentrate funds on combating water and soil erosion in Western China, with conservation, restoration and rehabilitation of natural ecosystems its main tasks. All these efforts have greatly contributed to the improvement of local ecosystems.

To further contain the deterioration of ecosystems in the west, China has implemented other projects such as the natural forests protection project, conversion of farmland into forests project and improvement of nature grassland ecosystems project. The total investment on natural forest protection during the period from 2000-2010 will be 96.2 billion RMB, of which 78.4 billion will be sourced from the central government and 17.8 billion from local governments. During the period from 2000 –2010, the investment on conversion of farmland into forest is planned to be 342.8 billion RMB from the central government. By 2003, more than 6.6 million hectares of farmland have been planted under the conversion of farmland into forest project, and western China has taken the lead, planting more than 4.33 million hectares. According to The Regulations on Conversion Farmland into Forests, the priority should be given to conversion of farmland on slopes greater than 25 degree, and farmland of slopes between 15-25 degree in regions of high ecological value and severely degraded farmland. Since the implementation of the project, more than 12.4 million households (17% of rural households) of 52 million people (18% of rural population) have benefited from the project. By 2003, the central government has invested under this project, 34.12 billion RMB in the west region, and taken total investment up to 68.8%.

**Table 1. Total tree planting under the project of conversion of farmland in forests from 1999 to 2003**

(10 000 mu)

Regions	Data from Ministry of Natural Resources					Data from SFA	
	Farmland in 1998	Total conversion from 1999 to 2003	Conversion for ecological purpose	Adjustment of structure	Proportion to farmland in 1998	Total conversion from 1999 to 2003	Proportion to total farmland
National	194463.6	10377	8116.5	2260.3	5.34	10631.4	5.47
Western	74108.5	6464.6	5487.2	977.3	8.72	6539.9	8.82
Inner Mongolia	12004.1	1638	1626.9	11.0	13.64	982.6	8.19
Guangxi	6616.7	162	66.4	95.9	2.45	270.3	4.09
Chongqing	3802.5	266	205.7	59.9	6.99	436.9	11.49
Sichuan	9899.9	739	565.9	173.5	7.47	1175.3	11.87
Guizhou	7340.7	445	401.0	44.2	6.07	543.4	7.40
Yunnan	9638.0	379	245.6	133.6	3.93	412.8	4.28
Shanxi	7651.4	1277	1026.6	250.9	16.70	1134.3	14.82
Gansu	7533.4	500	467.8	31.9	6.63	700.0	9.29
Qinghai	1030.8	199	197.7	0.9	19.26	184.0	17.85
Ningxia	1907.9	462	457.5	4.5	24.21	326.6	17.12
Xinjiang	6136.1	388	217.5	170.9	6.33	373.7	6.09

China is a country with large areas of natural grassland, second only to Australia. China's grasslands occupy 4 million square kilometres, taking up 41.7% of the national territory, 64% of the total national vegetation and 13% of the world's total grassland. Of the national total grassland, more than 3 million square kilometres is of economic value, but animal husbandry products arising from the grassland contributes relatively little to total national animal production. Because of the poor quality land and fragile ecology of natural grassland, the carrying capacity is quite low, with 2 hectares required to feed one sheep. It is estimated that the total stock volume, *i.e.* the population of sheep, is about 100 million across the natural grassland of 3 million square kilometres. This stock population supports the livelihoods of less than 5 million herdsmen. In 2002, the State Council implement further activities under its grassland restoration project by adding 1.2 billion RMB in the form of a bond. The trial project covered about 6.6 million hectares. The trial continued in 2003 and was supported by the investment of 2.2 billion RMB from the central government.

***China still faces a serious situation of land degradation and desertification, and the overall deterioration of the ecosystems in the west has not been reversed.***

The most deteriorated land in China can be grouped into two categories: water and soil erosion, and desertification. Water and soil erosion are mainly distributed in steep slopes of mountainous areas and in the Yellow Plateau, desertification is mainly distributed in grasslands which suffer continued degradation. Desertification covers 2.62 million square kilometres and is expanding at an annual rate of 6700 square kilometres. The expansion of desertification mainly occurs in the west, taking up more than 90% of the national total. As the most severe eco-disaster in China, desertification is increasing at a growing annual rate which was 1560, 2100, 2460 and 3436 square kilometres in 1970s, 1980s, mid-1990s and the period of 1994-1999 respectively. The total area of desertification has reached 1.743 million square kilometres, about 18.2% of the total territory. Desertification contributes to the frequency of disastrous sand storms (8, 13, 14 and 23 times annually in the decade of the 1960s, 1970s, 1980s and 1990s respectively). More than 90% of natural grassland has been degraded to some extent, of which more than 50% suffers from degradation of middle degree. The degradation increases at an annual rate of more than 2 million hectares.

According to the data of the second national remote sensing inventory released by Ministry of Hydrology in January 2002, the total area suffering from water and soil erosion in the west was about 2.937 million km<sup>2</sup>, 82.5% of the national total. It is estimated that the annual erosion of soil is about 5 billion tons, of which two third occurs in the west.

***At present, more than 90% rural poor live in poor ecological environments. The west is trapped in a vicious cycle of deteriorating ecosystem which exacerbates poverty.***

By the end of 2002, the population of rural people living under the poverty line was 28.2 million, this represents 3% of the total rural population and 58.25 million people, 6.2% of rural population, were either living in poverty or with low and unstable income. The net income under the poverty line was 630 RMB per capita, (*i.e.* 80 US dollars). The poverty line of low income was 872 RMB of net income (according to the standards set in 2001). Poor environmental conditions and poverty are intertwined. To some extent, poverty is an ecological problem, and its occurrence and degree is closely correlated with the quality of the ecosystem.

Recognizing that the most poverty-stricken areas in China are located in regions with the most degraded ecological conditions the Chinese government has adjusted its development strategy and policies to account for poverty reduction policies, and has thus put forward concrete objectives of ecosystem protection in the Great Development of the West. This amounts to a task of balancing the relationship between rural livelihoods and ecological protection. For example, it is not wise to sustain the livelihoods of 5 million people by destroying the ecosystems on more than 3 million km<sup>2</sup> of land, one third of the territory, *i.e.* by only obtaining an annual income of 10 billion RMB for herdsman they face an annual net loss of 50 billion RMB from grassland ecosystems. Such measures as conducted under the programs such as graze free seasons, crop rotation of grazing, and all year-around ban of grazing under the Grassland Ecosystem Improvement Project implemented in recent years have led to an effective restoration of ecosystems. However, the objective to improve the livelihood of herdsman has not been achieved. The task of trying to integrate poverty reduction in the west along with policies for protecting ecosystems has become an important task of policy-making.

## **2. The barriers to combating land degradation and ecosystem deterioration posed by administrative systems and policies**

***A serious shortage of investment in combating land degradation and ecosystem protection and lack of stable mechanism of investment.***

Since 1998, China has issued a large amount of state funds (as bonds), of which a large proportion has been invested in the forestry and hydrology sector. The funds raised from state bonds used in agriculture take up more than 70% of the central budget for agricultural infrastructure. It is unlikely that these funds will be available in the long term.

***An overlap of functions of government agencies where there are too many sources of investment to concentrate on priorities.***

At present, there are many investment sources for agriculture, of which the sources for construction investment from the central government include agricultural infrastructure development investment, agriculture integrated development investment, poverty reduction fund, poverty reduction special fund and funds from finance agencies for small public infrastructures and etc. Investment for basic agriculture infrastructure construction is managed by Commission of Development and Reform or jointly managed by agencies of Commission of Development and Reform and Ministry of Agriculture. The investment of agriculture research is managed by competent agencies of finance and science or science and agriculture. Expenditure for agriculture production, expenditure for agencies of agriculture, forestry, hydrology and gas supply and fund for integrated agriculture development are managed by competent agencies of finance or jointly managed by competent agencies of finance and agriculture.

Funds for supporting agriculture from government revenue is usually allocated through financing agencies at all levels. The competent agencies of agriculture, forestry and hydrology above county level also allocate the same funds to the agencies at county level. These funds are thus allocated through

different channels and piecemeal. At county level, the agencies responsible for management of financial investment for agriculture include the Bureau of Development, the Bureau of Finance, the Office of Poverty Reduction, the Office of Integrated Agriculture Development, the Bureau of Agriculture, the Bureau of Forestry, the Bureau of Water Conservancy, the Bureau of Husbandry, the Bureau of Agricultural Machinery, the Bureau of Aquatic Products, the Bureau of Meteorology, the Bureau of State Land, the Bureau of transportation and etc. It is common that a project (or components of it) is managed by many agencies.

Due to the lack of effective coordination amongst the agencies involved in managing the financial investment for agriculture, these agencies operate with their own understanding and control the implementations of policies and use of funds with no other agencies input. At present, there is no effective coordination mechanism for distributing financial investment for agriculture amongst the Commission of Development, the Ministry of Science and Technology, the Ministry of Finance and other agriculture agencies even among institutions of one sector. Each sector manages investment according to its own understanding, leading to investment being scattered and duplicated.

The pattern of agriculture investment management has the following weakness. Firstly, it is hard to make overall and wise allocation of limited financial investment to focus on priorities because financial investment in infrastructure, research, production and marketing is managed by different agencies. Secondly, investment for similar projects usually occur from different agencies. It is difficult for localities to combine investment from different agencies and make a systematic plan for project implementation when there are differing regulations on the use of the investment from the different sources. Thirdly, a project with investment from different agencies will be plagued with supervision and inspection from all these agencies. In fact, it is difficult to conduct any monitoring as the agencies only care about the allocation and disbursement of funds, and care less about the wise management of funds.

#### ***The top-down manner in policy making in combating water and soil erosion and land degradation.***

Within the decision-making process, there is no broad participation of stakeholders, especially those stakeholders directly affected. Influenced heavily by the planned economy system, the direction and quantity of agriculture investment and responsibility of governments at different levels are decided by upper levels of government. Large and middle scale projects are decided upon by central or provincial authorities. This kind of decision making can help central and provincial government to concentrate investment on key projects, but always neglects the actual needs of local governments, communities and farmers, thus it is common that government support cannot meet the actual needs, especially the needs of farmers. Some agriculture investment projects implemented by governments are not based on the actual needs of farmers, but on the will of governments. This kind of investment fails to solve the problems farmers/herders care most about and fails to reflect the opinions of the majority of land users.

Decision-making for projects of middle and large scale is highly concentrated at central and provincial level. In practice, it is not possible for agencies at the central and provincial to make correct and objective analysis of all proposed projects as they may not have all the relevant information for all projects. Thus projects that should be implemented urgently are not approved, but those that should not be implemented or can be implemented later are approved. In the process of approving projects, the competent agencies at central and provincial level always proceed from their experience because of their limited information.

Priority is given to the application of funds, with less attention to the management of fund allocated and the implementation of projects. Firstly, finance agencies and competent agencies at all levels lack basic statistical data of agriculture projects and fail to conduct effective assessment of the use of funds and project implementation. Secondly, there are no strict regulations on the responsible management for implementing projects. The implementing agencies lack a sense of responsibility and pressure because the investment from government revenue comes in the form of a grant. Thirdly, there is no incentive for competent agencies to strengthen management of project implementation since application of new projects is not based on the implementation of existing projects, rather applicants

and competent agencies pay much more attention to packaging new projects, and less attention to supervising and managing existing projects.

Although management system of agricultural fund has been greatly improved, it is still hard to establish standardized supervision and management mechanism as funds are derived from, and managed by, different agencies that have their own regulations and requirements. Thus it is common practice to divert all kinds of investment for agriculture to other unintended uses. According to the audit conducted by The State Auditing Administration in over 50 counties in 2004, the 50 counties diverted financial investment for agriculture in the amount of 495 million RMB mainly to balance the financial budget, lending, business, construction of building and purchase of cars, whilst total financial investment in Agriculture only amounts to 10%. Our investigation in two counties of a Province showed that during the period of 1993-2000, a county diverted 34.58 million RMB of financial investment allocated to agriculture to salary and expenditure of local agencies, including a special fund for hydrology amounting to 19.66 million RMB, a special fund for forestry amounting to 3.56 million RMB, a special agriculture fund amounting to 2.415 million RMB, a special fund for vegetable amounting to 2.67 million RMB, a special fund for transportation amounting to 2.23 million RMB and a fund for education totalling 500,000 RMB. All special funds from the central and provincial revenue will be diverted to salaries and other expenditure if allocated through financial channels. In another county, diversion of financial investment is even more serious, with an annual diversion of 20 million RMB. Total diversion in this county alone was about 56.2 million RMB in recent years.

In addition, state owned institutions in agricultural sector are greatly over-staffed. A certain proportion of state investment funds for agriculture, rural area and farmers are misappropriated by these institutions and their staff, resulting in the funds available to invest in agriculture, rural development and, farmer and herder assistance to be greatly reduced.

The functions and projects of major government agencies in combating land degradation and reducing poverty are set out in Table 2.

<b>Ministry</b>	<b>Department</b>	<b>Function</b>
Finance	Agriculture	Making financial expenditure budget
	Office of Integrated Agriculture development	Organizing and supervising implementation of policies, plans and projects of the state integrated agriculture development; managing and allocating funds from central government for integrated agriculture development. The projects include Bashang Ecological Agriculture, Shelterbelt in Middle and Upper Reaches of the Yangtze River, Combating Water and Soil Erosion in the Upper reaches of the Yangtze River and Taihang Mountain Greening.
Development and Reform	Regional Economy	Coordinating regional economic development, making regional economic development plan for the regions which was revolutionary bases, and is located in remote areas with minorities as main population and stricken by poverty
	Rural Economy	Putting forward proposals for the most important issues of rural economic development and strategy as well as reform of rural economic system
Water Conservancy	Relevant departments	Investment for agriculture from water conservancy sector is mainly used for improvement of farmland, drought control, irrigation restoration of ecosystem, supply of drinking water both for human and animals.
Agriculture	Relevant departments	In 2000, investment in resource and ecosystem protection was about 68 million RMB, about 3.08 % of the total investment from the ministry. In past two, investment in grassland was increased, but the function of the ministry in this regard is not strong enough
State Forestry Administration	Relevant departments	In 2001, State Forestry Administration combined key forestry projects into six national projects: Natural Forest Protection, Shelterbelt, Farmland Conversion, Combating Desertification, Timber Base and Wildlife Protection.
Environment Protection	Relevant departments	Planning, laws and regulations, monitoring and pollution control.
Science and Technology	Relevant departments	Research on key technologies concerning ecosystem improvement, transfer of research results into practice
Office of Poverty Reduction, State Council		Poverty reduction fund is allocated by the central government for the basic livelihood of rural people and social and economic development of the regions stricken by poverty, including development fund for undeveloped regions, increased financial investment and special agriculture fund for the west, northwest and southwest (state fund for poverty reduction).