Infrastructure, Growth, and Poverty Reduction in China

Dong Yan, Fan Hua
Institute of Comprehensive Transportation
National Development and Reform Commission, Jia 11 Muxidibeili, Beijing 100038
Tel; 010-63908667
Fax; 010-63908683
Email; zydongyan@btamail.net.cn

Implementing agency contact:
Mr. Xinghua Li, Deputy Director General
Comprehensive Planning Department, Ministry of Communication, China

Donor partners:
World Bank, JBIC, UNDP, ADB
Executive Summary

China has invested intensively in public infrastructure during the last 20 years. In the transportation sector, such investment has provided access to markets, facilitated domestic market integration, lowered costs of production and transportation, and allowed China to compete both domestically and internationally. Besides contributing to growth, this investment has directly helped reduce poverty by increasing access to services and economic opportunities.

Targeted infrastructure spending also has been part of national poverty-alleviation programs. Since the 1990s—and especially since the tenth five-year plan, with its proactive fiscal policy to spur economic growth and reduce poverty through better transportation—the Chinese government’s investment in transportation infrastructure has increased sharply. Great progress has been made in raising both the quantity and the quality of rural highways. Almost all areas in China can accommodate highways, which means that highways are more accessible than other transport modalities and thus play an important role in economic development and poverty reduction in rural areas.

In 1984, the Chinese government began to construct irrigation, water conservation projects, and county and township highways through the Food-for-Work program. The Food-for-Work Program supplies necessary infrastructure in poor areas and short-term jobs for poor populations. The central government provides food, cotton, and industrial products at no cost. Those products are used to pay rural highway workers. Local governments are required to provide matching funds to pay for materials and equipment.

During the 8-7 National Poverty Reduction Program (which aimed to lift 80 million people out of poverty in the seven years from 1994 to 2000), the Chinese government spent 0.92 billion yuan every year building rural highways in 529 poor counties in 21 provinces. During the plan period, 42,000 kilometers of new rural highways were built each year, and the quality of rural highways improved greatly. In 1998, the Chinese government decided to accelerate construction of infrastructure further, and one of its priorities was county and township highway networks. By the end of 2002, the extent of county and township highways was 1.065 million kilometers—244,000 kilometers more than in 1995.

In 2002, China began to implement a highway construction program to reach counties in the western areas. The new program, an important part of the Chinese government’s campaign to improve transportation and promote economic development in the west, covers 17 provinces and
252 construction projects that will result in 26,098 kilometers of roads. The total investment is projected to reach 31 billion yuan—16.7 billion invested by the central government and 14.3 billion by local governments.

In 2003, the Chinese government launched a nationwide inter-county and rural highway construction program. Under the plan, more than 5,300 projects will begin in 2003, representing 78,000 kilometers of construction for a planned investment of 75 billion yuan. In October, the Ministry of Construction (MOC) expanded the plan to 15,500 projects representing 162,000 kilometers of construction at a planned investment of 109.5 billion yuan. This program is an important signal that China will promote rapid development of rural highways in its efforts to eradicate poverty.

The Roads Improvement for Poverty Alleviation (RIPA) program was launched with World Bank support in selected provinces in the mid-1990s. RIPA focuses on linking those rural villages and townships which do not currently have basic all-weather access to the existing road networks. In the case of Henan Province, quantitative analysis resulting from an ex-post evaluation of the RIPA components showed that remote settlements that had been engaged in subsistence farming prior to the program had made markedly better progress in economic development, social development, and poverty alleviation than comparable populations in control areas. The number of vehicles, and passenger and freight transportation developed quickly in the RIPA impact zone. With the improvement of transportation infrastructure and growth of the farmer’s income, more and more rural household purchased motors and vehicles to undertake nonagricultural industries or facilitate travel. The improvement of transportation infrastructure has transferred the potential transportation demand into the real demand and boosted the development of passenger and freight transportation.

The positive impacts of transportation infrastructure improvements on economic growth, social progress, and poverty reduction arise from several factors, including:

- China was strongly committed to development-oriented poverty reduction—and it established policy priorities accordingly.
- Those policies, backed by effective institutional mechanisms for program management and funding, involved all levels of government, as well as users. The active participation of rural residents was instrumental in filling financing gaps.
Lessons were learned from initial experiences. Management adhered strictly to Chinese regulations and international principles, magnifying the impact of poverty-alleviation funds and ensuring the sustainability of poverty-reduction programs.

Finally, international organizations have played an important role in providing funding and advice on improving rural transportation management and construction.

The 8-7 National Poverty Reduction Program, in place between 1994 and 2000, was the first program of development and poverty alleviation that had specific objectives, targets, measures, and deadlines. The plan clearly stated that manpower, materials, and financial resources would be concentrated, and all social strata mobilized, to solve the problems of feeding and clothing the rural poor population. The program aimed to enhance the ability of poor areas and populations to develop their own capacities.

Lack of funds is the key factor restricting the development of rural transportation. Since the advent of the era of openness and reform, the private sector has developed quickly, along with state-owned and collective-owned agencies, increasing the number of agencies permitted to invest in transportation infrastructure. Reforms of the investment, finance, and taxation systems have increased the financial resources of local governments and the willingness of those governments to invest in transportation infrastructure. To close the funding gap, governments at all levels have been investing more in rural highways, and investment by the governments has increased rapidly. A much-improved legislative and institutional framework since 1998 has smoothed the process of funding, designing, building, and maintaining rural highways.

During the period of the ninth five-year plan, international organizations and foreign governments contributed $7.6 billion in loans for the highway and water transportation construction—including rural roads. The World Bank was involved in the southwest, Qinba, and western projects covering 9 provinces, 91 poor counties, and more than 8 million poor people. The Japan Bank for International Cooperation (JBIC), the United Nations Development Programme (UNDP), and the Asian Development Bank (ADB) also have cooperated with the Chinese government in poverty reduction and transportation infrastructure construction.

International cooperation has also brought new management ideas and methods to the construction of Chinese transportation infrastructure. Loans from international organizations and foreign governments have strict requirements concerning planning, surveying, design, construction, and maintenance. These not only ensure the quality and benefit of the projects, but also help to improve the management capabilities of local governments and the professional capabilities of technicians.
While much progress has been made, much remains to be done. Some 30 million poor people in the middle and western areas of China still must cope with poor transportation conditions. To quicken the pace of poverty alleviation, the Chinese government has adopted an Outline for Poverty Alleviation and Development of China’s Rural Areas (2001–10). The plan document states that the Chinese government will speed up construction of infrastructure in order to further improve the basic production and living conditions of impoverished areas. The government will increase funds for poverty alleviation, expand the scale of the Food-for-Work program, and enhance transfer payments to impoverished areas. The funds invested by the central and local governments will be used mainly to improve the basic production and living conditions and to construct infrastructure.

**Lessons learned**

The successful implementation of poverty-targeted interventions such as the RIPA projects results from the constructive role of governments at several levels. Provincial, city, and county governments accounted for 66.05 percent of the total investment in RIPA, for example. To deal with funding shortages, local governments granted tax concessions and formulated preferential terms for land, materials, water, electricity, and so on. Management in strict accordance with the relevant regulations and international principles is one of key reasons for the successful implementation of RIPA. After the RIPA projects were completed, scrupulous maintenance ensured sustainability. Measures included establishing township maintenance stations for professional maintenance, implementing maintenance contests, planting trees to improve the environment of the highways, and formulating regulations to ensure the smooth operation of the highways.

Although the government is the most important source of funds, it alone is not able to afford the total investment of rural highways. The Japan Bank for International Cooperation has supported much-needed infrastructure investments. Loans from international financial organizations are important sources of funds to build rural highways. The period of loans from international financial organizations is comparatively long and the interest rate is lower. Projects financed by international financial organizations can provide funds urgently needed by rural highway construction and, at the same time, bring international practice to the rural areas and make great contributions to raising the ability to manage projects of local transportation sectors. Experience with projects such as RIPA can be introduced into other projects, helping to improve the level of transportation administration of the impoverished areas.
Institutional and Policy Framework

Institutions involved in rural transportation and poverty reduction

Poor transportation is an important cause of poverty. To promote socio-economic development in poor areas, construction of transportation infrastructure should be accelerated to improve the living conditions of the poor. Understanding its effect on economic development and poverty reduction, the Chinese government regards transportation infrastructure as an important instrument for realizing the national strategy of poverty reduction. Transportation projects keyed to poverty reduction are ongoing in several sectors. Highway projects related to rural development are described below.

Transportation infrastructure includes highways, railways, ports, and airports. Almost all areas in China can accommodate highways, which means that highways are more accessible than other transport modalities and thus play an important role in economic development and poverty reduction in rural areas. Except as otherwise noted, transportation infrastructure refers to highways that are directly related to economic development and poverty reduction in rural areas. In this report, “rural highways” are county and township highways counted in the statistics of the Ministry of Communication (MOC). In China highways are divided into national highways, provincial highways, county highways and township highways. County highways connect county seats with main townships, production and sales centers and inter-county highways that are not national and provincial highways. Township highways are those serving the need of economy, culture and administration of the townships (Guo Xiaopei, Luo Renjian, 1998). According to the regulations of the MOC, highways must meet certain technological standards issued by MOC to be counted in the official statistics. A large number villages and townships have roads that are able to handle vehicles but are not considered as highways according to the official statistics.

Key players in the transportation administration sector

- The Ministry of Communication is in charge of highway work for the whole country. It formulates the development plan for national highways, and collects funds to support construction of national highways and important provincial highways.

- Provincial communication departments are in charge of highway work in individual provinces. They formulate development plans for provincial highways, construct and maintain national and provincial highways within their jurisdictions, and subsidize and direct the construction and maintenance of county highways and township highways.
Prefectural communication bureaus are responsible for reporting conditions in the counties to provincial communication departments and transmitting the departments’ opinions to the counties.

County communication bureaus are responsible for formulating development plans for county highways, constructing and maintaining county highways, and helping township governments formulate development plans for township highways.

Township governments are responsible for formulating development plans for township highways, and for constructing and maintaining township highways.

Village committees are responsible for presenting suggestions for village road planning and construction to township governments, and for constructing and maintaining village roads.

**Key players in the Food-for-Work Program**

The National Development and Reform Commission (formerly the State Development Planning Commission) is in charge of the national Food-for-Work Program. It formulates principles that guide the program as well as plans for distributing funds. The Food-for-Work Program supplies necessary infrastructure in poor areas and short-term jobs for poor populations. The central government provides food, cotton, and industrial products at no cost. Those products are used to pay rural highway workers. Local governments are required to provide matching funds to pay for materials and equipment.

Provincial development planning commissions, along with provincial communication departments, formulate plans for using highway construction funds in Food-for-Work programs within regions, and they examine and approve projects submitted by the counties.

Prefectural development planning commissions are responsible for reporting Food-for-Work project applications to the provincial development planning commissions, and transmitting the commissions’ opinions to the counties.

County development planning commissions formulate county-level plans for using Food-for-Work highway construction funds with the county communication bureaus, and they supervise and inspect the implementation of the projects and the use of funds.

**Poverty reduction institutes**

The Office of the State Council for Development-Oriented Poverty Relief, responsible for poverty reduction throughout China, formulates and coordinates plans for using poverty-reduction funds.
Provincial development-oriented poverty-relief offices are in charge of poverty-reduction work at the provincial level. They formulate and coordinate plans for using poverty-reduction funds distributed by the state and matched by provinces. Plans for using highway-construction funds are formulated with provincial communication departments.

Prefectural development-oriented poverty-relief offices are responsible for reporting on poverty-reduction projects to provincial development-oriented poverty-relief offices and transmitting their opinions to the counties.

County development-oriented poverty-relief offices, responsible for poverty reduction within counties, work with county communication bureaus to formulate plans for spending highway-construction funds.

Figure 1 reflects the present rural highway administration system and the government sectors and institutes that participate in transportation-related poverty reduction in China.

**Figure 1. The rural highway-administration system, showing Chinese government bodies and institutes engaged in reducing poverty by improving transportation**
Transportation policies for poverty reduction

Implementation of transportation policies for poverty reduction in China
In the past two decades China’s policies of openness and reform have brought rapid economic growth. In the mid-1980s the Chinese government adjusted its anti-poverty strategy, formulating the strategy of development-oriented poverty reduction and mobilizing Chinese society to reduce poverty. At the same time, the government adjusted its economic development strategy, implementing strategic measures such as the “developing the west” campaign, which aimed to reduce economic gaps between regions and balance economic development and social progress. Accompanying these adjustments were policies to promote development of rural transportation infrastructure.

Increased investment in transportation infrastructure by Food-for-Work programs. In 1984, the Chinese government began to construct irrigation and water conservancy projects and county and township highways as part of the Food-for-Work program. The goal was to improve infrastructure and increase the ability of poor areas to overcome natural disasters. By supplying infrastructure in poor areas and short-term jobs for poor people, Food-for-Work programs provide relief while laying a foundation for the economic development of entire areas. By 2000, Chinese government spending on Food-for-Work programs totaled 39 billion yuan (State Council Information Office 2001).

Since late 1984 the Chinese government has arranged seven groups of Food-for-Work programs. Most of the resources in the first, second, third, sixth, and seventh groups of programs were used to build rural highways. In 1994, in the spirit of the central government’s rural work conference and 8-7 National Poverty Reduction Program, the Chinese government decided to allocate to the Food-for-Work programs goods valued at 1 billion yuan each year through 2000—the goal was nothing short of solving the subsistence problem of 80 million poor people by the end of the century. The transport-oriented Food-for-Work programs, which also focused improved water supply in poor areas, accounted for 0.7 billion yuan annually from 1994 to 2000. The programs covered 529 state-level poor counties in 21 provinces.

Increased investment in transportation infrastructure by financial transfers. Financial transfers are used by the central government to promote development in China’s central and western provinces. Transportation infrastructure is a key target of such transfers. The tenth five-year-plan of the Ministry of Communication (MOC) declared that the Chinese government would establish the system of financial transfers to support the development of transportation in the
western areas and establish a special national fund for western development that would invest in the construction of infrastructure.

*Poverty-reduction work implemented by the transportation sector.* In 1982 and 1984, the MOC held two national rural-highway construction conferences that promoted rural highway construction. In 1985, the ministry began a systematic effort to use transportation projects to alleviate poverty. This work included helping poor areas build highways, emphasizing exit highways, economic highways, and township and village highways. It also supported transportation construction, staff training, and the training of technicians for local transportation departments.

In 1994 the MOC established the leadership group on poverty reduction and formulated the ninth five-year-plan of highway construction for poverty reduction. Since then it has invested 0.92 billion yuan annually to help poor areas build highways. During the plan period, 42,000 kilometers of new rural highways were built each year, and the quality of rural highways improved greatly.

In 2002, China began to implement a highway construction program to reach counties in the western areas. The new program, an important part of the Chinese government’s campaign, to improve transportation and promote economic development in the west, covers 17 provinces and 252 construction projects that will result in 26,098 kilometers of roads. The total investment is projected to reach 31 billion yuan—16.7 billion invested by the central government and 14.3 billion by local governments.

In 2003, the Chinese government launched a nationwide inter-county and rural highway construction program. Under the plan, more than 5,300 projects will be originated in 2003, representing 78,000 kilometers of construction for a planned investment of 75 billion yuan. In October, the MOC expanded the plan to 15,500 projects representing 162,000 kilometers of construction mileage at a planned investment of 109.5 billion yuan. This program is an important signal that China will promote rapid development of rural highways.

**Achievements of transportation policies for poverty reduction in China**

Since the 1990s—and especially since the tenth five-year plan, with its proactive fiscal policy to spur economic growth and reduce poverty through better transportation—the Chinese government’s investment in transportation infrastructure has increased sharply. Great progress has been made in raising both the quantity and the quality of rural highways.

By the end of 2002, the extent of county and township highways was 1.065 million kilometers—244,000 kilometers more than in 1995 (figures 2 and 3). During the eighth five-year
plan (1991–95), rural highway length increased by an average of 22,000 kilometers per year, twice the increase achieved during the preceding two five-year plans. Under the ninth five-year plan, the rural highway network grew on average by 42,000 kilometers each year, twice the growth achieved under the previous plan.

The quality of rural highways also has improved steadily. Before the reform and openness movements took hold, rural roads were mainly unclassified highways and unpaved roads that were poorly maintained. In the last decade, however, the engineering level of rural highways has risen greatly. By 2002, 68 percent (722,000 kilometers) of all rural highways were in one of the country’s top four classes; the extent of Class 1 rural highways had reached 63,000 kilometers.

Rural highways have become much more extensive. The proportion of townships and villages served by highways increased from 98 percent and 80 percent in 1995 to 99.5 percent and 92.3 percent in 2001.
**Figure 2** Growth of county highways of various classes, 1995–2002 (kilometers)

![Figure 2](image)


**Figure 3** Growth of township highways of various classes, 1995–2002 (kilometers)

![Figure 3](image)

Driving Factors

The rapid development of rural transportation infrastructure in China and the satisfactory outcomes achieved so far can be attributed to four main factors as follows: (i) commitment and political economy for change, (ii) institutional innovation, (iii) learning and experimentation, and (iv) external catalysts.

Commitment and political economy for change

The Chinese government is committed to alleviating poverty. An important component to that commitment is the development of rural roads.

The 8-7 National Poverty Reduction Program, in place between 1994 and 2000, was the first program of development and poverty alleviation that had specific objectives, targets, measures, and deadlines. The plan clearly stated that manpower, materials, and financial resources would be concentrated, and all social strata mobilized, to solve the problems of feeding and clothing the rural poor population. The program aimed to enhance the ability of poor areas and populations to develop their own capacities. The Chinese government’s investment in rural transportation infrastructure increased tremendously during the period of the 8-7 National Poverty Reduction Program: 320,000 kilometers of highways were built in 592 poor counties. By the end of 2000, the problem of feeding and clothing the rural poor had been all but solved, the exceptions being a small number of extremely poor people living in adverse circumstances. The strategic target of the 8-7 National Poverty Reduction Program was largely realized.

To quicken the pace of poverty alleviation, the Chinese government has adopted an Outline for Poverty Alleviation and Development of China’s Rural Areas (2001–10). The plan document states that the Chinese government will speed up construction of infrastructure in order to further improve the basic production and living conditions of impoverished areas. The government will increase funds for poverty alleviation, expand the scale of the Food-for-Work program, and enhance transfer payments to impoverished areas. The funds invested by the central and local governments will be used mainly to improve the basic production and living conditions and to construct infrastructure.
To accelerate the development in western areas, the government began its western development campaign in the late 1990s. The campaign seeks, among other things, to speed up construction of infrastructure, especially irrigation, transportation, and communications. The government also has put a priority on environmental conservation and resource exploration. And it stresses the need to make poverty alleviation an important part of the campaign. Projects will be targeted toward impoverished areas, and workers from poor areas will be used in construction so that their cash income will rise.

The Chinese government’s belief in the importance of transportation infrastructure to the development of poor areas is illustrated by the fact that it has increased highway construction by 35 percent every year since 1994 and raised the share of investment in western areas from one-sixth to one-quarter of the total. If the targets spelled out in the tenth five-year plan of the MOC are realized, the accessibility and quality of rural highways will be remarkably improved by the end of the plan period. According to this plan, three programs will be implemented to construct rural highways: the village-reaching project in the eastern areas, the township-reaching project in the central areas, and the county-reaching project in the western areas. The programs aim to build asphalt or concrete roads from townships to villages in the eastern areas, from counties to townships in the central areas, and from counties to counties in the western areas. The implementation of the three programs is proceeding satisfactorily.

Table 1 below shows the developmental targets of Chinese rural highways during the current 10th five-year plan (2001-05), the next plan (2006-10), and the later decade (2011-20). This shows the determination of the Chinese government to accelerate and complete construction of the rural highway network.

**Table 1. The development targets of Chinese rural highways**

<table>
<thead>
<tr>
<th>Year</th>
<th>Development targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001–05</td>
<td>The accessibility and quality of Chinese rural highways are greatly improved: 99.8 percent of townships have highways, and more than 80 percent of these highways are paved by cement or asphalt. 96 percent of villages have highways, more than 50 percent of these highways are</td>
</tr>
</tbody>
</table>

1 Eastern areas are the 10 coastal provinces and municipalities directly under the central government—Liaoning, Hebei, Beijing, Tianjin, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong. Western areas are 12 provinces, municipalities directly under the central government and autonomous regions—Xinjiang, Inner Mongolia, Gansu, Shaanxi, Ningxia, Tibet, Qinghai, Yunnan, Guizhou, Sichuan, Chongqing, Guangxi. The central areas include the other 9 provinces.
paved by cement or asphalt.

All suitable townships and villages have highways. 95 percent of administrative villages with highways have regular bus service. Highways from counties to townships are of classes 1–4. Highways from townships to villages are paved.

2011–20 Highways from townships to administrative villages are of classes 1–4, and all administrative villages with highways have regular bus service.

**Institutional innovation**

Lack of funds is the key factor restricting the development of rural transportation. Since the advent of the era of openness and reform, the private sector has developed quickly, along with state-owned and collective-owned agencies, increasing the number of agencies permitted to invest in transportation infrastructure. Reforms of the investment, finance, and taxation systems have increased the financial resources of local governments and the willingness of those governments to invest in transportation infrastructure. In parallel rural people volunteer to help build roads; other elements of society contribute money and material. This diversification of funding sources has indeed promoted the development of rural transportation infrastructure.

Funds for rural highways come mainly from: state budgets, including special fiscal funds from the central government and local governments; loans from domestic banks; foreign funds (see section 3.4 below); the vehicle sales tax (whose revenues are transferred to the MOC from the Ministry of Finance); and funds collected by the local governments and other funds, including local tax revenues, voluntary labor, donations from local residents and enterprises, tolls, and road taxes on tractor owners (Table 2).

**Table 2. Construction funds for rural highways in 2002**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount (millions of yuan)</th>
<th>Share of total (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State budget</td>
<td>2,056</td>
<td>4.1</td>
</tr>
<tr>
<td>Domestic bank loans</td>
<td>3,889</td>
<td>7.8</td>
</tr>
<tr>
<td>Foreign funds</td>
<td>356</td>
<td>0.7</td>
</tr>
<tr>
<td>Vehicle tax</td>
<td>2,367</td>
<td>4.8</td>
</tr>
<tr>
<td>Funds collected by the local governments and other funds</td>
<td>41,154</td>
<td>82.6</td>
</tr>
<tr>
<td>Total</td>
<td>49,822</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Compilation of communication statistics (2002).*
As shown in Table 2, funds collected by the local governments and other funds are the largest source of support for rural highways. But because many local governments had difficulty investing in rural highways, a system of voluntary labor underpinned the construction of rural highways for several decades until recently.²

Beginning in the 1950s, China began to organize farmers to build and maintain rural roads. Each rural resident contributes up to three days of work annually.³ Traditionally, voluntary work by local farmers has been an important resource for rural highway construction in impoverished areas. In 1998, the annual value of voluntary labor by rural residents was estimated at 4 billion yuan annually, 30 percent of gross investment in rural highways (Guo Xiaopei and Luo Renjian 1998).

Because of its disproportionate burden on farmers, the voluntary labor system has been replaced by a system of democratic consultation, under which the use of voluntary labor must be agreed on by the village committee. The new system lightens the burden on farmers but weakens the financial power of county and township governments in rural highway construction.

To close the funding gap, governments at all levels have been investing more in rural highways and investment by the governments has increased rapidly. The case of two projects in Henan province—RIPA² and RIPA⁴—provides a good illustration. The use of voluntary labor on a large scale was prohibited in the second project, raising the investment shares of governments at all levels to a great extent (Table 3).

² MOC’s 1987 “Regulations on construction and maintenance of county and township highways” stated that local governments—mainly county and township governments—and local people are responsible for the construction and maintenance of county and township highways. Governments at higher levels provide subsidies. The funding at the local level include tractor fees, additive fiscal revenue of the local governments, voluntary labor by rural residents, and donations from other elements of society.

³ MOC’s 1988 “Detailed rules for the implementation of regulations on highways of PRC” provided that voluntary labor on rural highways should not exceed three days annually; vehicle owners were expected to volunteer their vehicles for no more than two working days.

⁴ RIPA II is the road-improvement for poverty-alleviation component of the Second Henan Provincial Highway Project of the World Bank which included construction of the Luoyang-Sanmenxia Expressway. It is divided into 3 groups comprising 30 road networks and 1,577.04 kilometers. RIPA² began in 1997 and ended in 1999. RIPA III is the road-improvement for poverty-alleviation component of the Third Henan Provincial Highway Project which included construction of the Zhumadian-Xinyang Expressway. It consists of 10 road sections totalling 327 kilometers. RIPA⁴ began in May 2001 and ended in December 2002.
Table 3. Comparison of funding structure between RIPAⅠ and RIPAⅡ (percent)

<table>
<thead>
<tr>
<th>Source of funds</th>
<th>RIPAⅠ</th>
<th>RIPAⅡ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans from WB</td>
<td>26.88</td>
<td>31.81</td>
</tr>
<tr>
<td>Investment of provincial, city and county governments</td>
<td>39.57</td>
<td>66.05</td>
</tr>
<tr>
<td>Voluntary works of the farmers</td>
<td>30.59</td>
<td>1.24</td>
</tr>
<tr>
<td>Food-for-Work</td>
<td>2.96</td>
<td>0.90</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Evaluations of the road-improvement and poverty-alleviation components (RIPA) of the World Bank’s Second and Third Henan Provincial Highway Projects.

Now many local governments are actively exploring the establishment of an effective and stable mechanism for rural highway construction and maintenance. Experiences include: the operation tax of highway building used in rural highway construction; taxes from the expressway enterprises used to build rural highways; a part of agriculture taxes is invested in rural highway construction.

**Learning and Experimentation**

In the past, the construction and maintenance of rural highways lacked appropriate laws and regulations. Before the construction started, there was hardly any technical or social investigation, any feasibility study report. Often the case was that while the road was in construction, the design was not finished.

Since 1998 the Law of Highways, Law of Contract, Law of Bidding, Law of Engineering Administration and Regulations on Highway Construction Market were issued by the Chinese government. The implementation of these laws and regulations has created significant effects on protecting property right of the roads, ensuring smooth operation of the roads, strengthen administration on highway construction and promoted the development of rural highways. At the same time, MOC revised and issued a series of standards and regulations. Since then construction and maintenance of rural highways have been undertaken under a much improved institutional framework.

In the projects financed by the international financial organizations in recent years, international practice was introduced into rural highway construction. These projects, managed in strict accordance with laws and regulations of the Chinese government and international principles
and procedures, have created positive socio-economic benefits, raised the sustainability of poverty alleviation projects and set good models for other projects in the impoverished areas\textsuperscript{5}.

**External catalysts**

The Chinese government has been actively working with international organizations in development-oriented poverty reduction and transportation infrastructure construction. The World Bank was involved in the southwest, Qinba and western projects covering 9 provinces, 91 poor counties and more than eight million poor people. The Japan Bank for International Cooperation (JBIC), the United Nations Development Program (UNDP), and the Asian Development Bank (ADB) also have actively cooperated with the Chinese government in poverty reduction and transportation infrastructure construction.

In rural transportation construction, international organizations play a special role both in supplying funds and in management.

Loans from international organizations and foreign governments are important since the construction of rural highways cannot completely depend on either local governments or voluntary work by the local people. During the period of the 9th five-year plan, international organizations and foreign governments contributed US$7.6 billion in loans for the highway and water transportation construction. Part of this sum was used to construct rural roads, thereby improving rural transportation conditions and development of local economies.

International cooperation has also brought new management ideas and methods to the construction of Chinese transportation infrastructure. Loans from international organizations and foreign governments have strict requirements concerning planning, surveying, design, construction and maintenance. These not only ensure the quality and benefit of the projects, but also help to improve the management capabilities of local governments and the professional capabilities of technicians.

\textsuperscript{5} In section 5.2 of this paper, experimentation and lessons learned from RIPA will be concretely elaborated.
Case Study: Impact of Transportation Infrastructure on Regional Economy and Poverty Reduction

General introduction of RIPA

In China, rural road improvements have been integrated with major highway projects, implemented with World Bank assistance. These improvements were called, “Road Improvement for Poverty Alleviation”, and were linked to on-going poverty alleviation programs. These Bank assisted projects are in five provinces of China: Gansu, Henan, Inner Mongolia, Ningxia and Shaanxi. RIPA focuses upon linking those rural villages and townships, which do not currently have basic all weather access to the existing road networks of a higher order.

The Poverty-Alleviation Road Improvement Component of the Third Henan Provincial Highway Project funded by the World Bank (RIPAⅢ), began in May 2001 and was completed in December 2002. It consists of 10 road sections, 372KM. Total expenses were RMB 333.82 million yuan, of which the World Bank provided RMB 106.19 million yuan.

The targets of RIPAⅢ are: (a) to upgrade a part of the off-class sand and grit roads into class 4 asphalt roads; (b) to upgrade class 3 and 4 roads into class 2 and 4 asphalt roads; and (c) to rebuild some key sections of G312 and upgrade them from class 3 into class 2.

Methodology

We will compare the socio-economic development between the Impact Zone (IZ) and Control Zone (CZ) before and after the implementation of RIPAⅢ to test whether RIPAⅢ have created positive impacts on economic growth and poverty reduction in the Impact Zone.

---

6 For more information on RIPA, please see Roads Improvement for Poverty Alleviation in China, working paper No. 1 of EASTR (the Transport Sector Unit of the East Asia Region of the World Bank).

7 G312 is a national highway from Shanghai in the east to Huo’erguosi, Xinjiang autonomous region in the west. The length of G312 is 4,697 Km. It is an important passageway connecting eastern areas with western areas in China.
The Post evaluation group of the Highway Bureau in Henan Communication Department and Henan Academy of Social Science (“Group” for short) first chose 6 townships as Control Zone in Zhumadian City and Xinyang City. The Control Zone is adjacent to the Impact Zone and is similar to the IZ in economic development, culture, natural environment and geography. Some of townships in the CZ had applied for RIPAⅢ projects but were not approved. Therefore, the similarity and comparability were the basic criteria for choosing the CZ.

The Group extensively collected socio-economic statistics of the IZ and CZ, and at the same time, they designed the specific questionnaire for a rural household survey. In the IZ the criteria for sampling are 100 households every 10 kilometers of roads, and in the CZ selection of 3 villages in every township and 30 households in every village. Most of the questionnaires were distributed by the head of the village, and a small part of questionnaires is distributed by the college students employed by the Group. The Group dispatched researchers to direct and supervise the distribution and callback of the questionnaires. The Bureau of Statistics of Henan province, in cooperation with the Group, was responsible for processing the data. The distribution of the sample is listed in Table 4.

Table 4. Distribution of the sample

<table>
<thead>
<tr>
<th></th>
<th>Impact Zone</th>
<th>Control Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Township</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>Village</td>
<td>46</td>
<td>18</td>
</tr>
<tr>
<td>Rural Household</td>
<td>3724*</td>
<td>540*</td>
</tr>
</tbody>
</table>

Note: * Number of the valid samples.

In addition to questionnaire survey, the Group also interviewed some officials in the local governments and typical farmers. Some useful and interesting information could be obtained from these interviews.

---

8 The methodology and data used in this chapter come from the Post evaluation of RIPA III undertaken by the group of the Highway Bureau in Henan Communication Department and the Henan Academy of Social Science. In this chapter we use part of their research. For seeking more information on RIPAⅢ, socio-economic background of IZ and CZ, household survey, questionnaire of household survey, interviews and comparative analysis, please see above report.
Socio-economic background of Impact Zone (IZ) and Control Zone (CZ)

Socio-economic background of Impact Zone (IZ)

The Impact Zone of RIPAIII includes 8 counties, 40 townships and 546 villages in Zhumadian Prefecture and Xinyang Prefecture, two impoverished areas in Henan province, with a total population of 1.513 million, and a total area of 3880.1 km².

The Impact Zone, situated on the upper valley of Huan River and the northern slope of Dabie Mountains, lags behind other areas in socio-economic development in Henan province. Even though there are abundant mineral resources; famous “Xinyang Maojian” tea and other special agricultural products, Chinese medicinal materials, and natural resources for tourism in this region, the backward transportation have been a serious obstacle for resource exploitation, also a main cause for conservative ideology of local residents. Thus not only the economy but also education, healthcare and other social causes developed very slowly.

Before the implementation of RIPAIII, although there were several trunk railways such as Jingguang Railway, Jingjiu Railway and national highways such as G106, G107⁹ and G312, the communications outside of rural areas were poor because the rural roads linking with major highways were in bad quality and of limited quantity. For example, in Xin county of Xinyang City, there were 112 villages without all weather roads, the backward transportation conditions was one of main reasons causing poverty.

After the implementation of RIPAIII, two national highways (G312−G106), three provincial highways and three county and township highways were upgraded and the road networks are better structured. Especially after the three county and township highways, originally sand and grit roads, were upgraded to asphalt roads, it is more convenient for the rural people in Xin county and Shihe district to travel. The villages originally without roads benefited even more from RIPAIII.

⁹ Jingguang Railway is from Beijing to Guangzhou. Jingjiu Railway is from Beijing to Jiulong of Hongkong. G106 is a national highway from Beijing to Guangzhou. G107 is a national highway from Beijing to Shenzhen.
**Socio-economic background of the Control Zone (CZ)**

The Control Zone consists of 6 townships, 2 of them in Zhumadian Prefecture and 4 in Xinyang Prefecture. The CZ is still a traditional agriculture region majored in grain crops (wheat and rice). Its financial income per capita in 2002 is only 74.47 yuan, less than 1/4 (24.1 percent) of Henan’s average level (308.67 yuan). Like the Impact Zone before RIPAIII, it lags behind other areas in socio-economic development.

In general the quality of rural highway network in the CZ is rather bad. In 2002 there are 1479.1 kilometers of roads of all kinds. The length of asphalt and cement roads is 157.1 kilometer, the length of sand and grit is 170 kilometer, only 10.6 percent and 11.5 percent of total roads. The remaining 1153 kilometers of roads are off-class roads of low quality. Some remote mountainous villages only have simple dirt roads which can not handle traffic when raining.

**Socio-economic impact analysis of RIPA**

**The development of economy**

Table 5 is the comparison of GDP per capita between the IZ and CZ. The growth rate of GDP per capita in IZ is higher than that of CZ, indicating that the economy of the IZ develops faster than the CZ. In addition, the absolute disparity of GDP per capita between the IZ and CZ increased from −31 yuan in 2000 to 43 yuan in 2002, the relative disparity of GDP per capita between IZ and CZ increased from 0.989 in 2000 to 1.013 in 2002, indicating that the economy after the implementation of RIPAIII is better than the CZ.
Table 5 Comparison of GDP per capita between IZ and CZ (Unit: yuan)

<table>
<thead>
<tr>
<th></th>
<th>IZ</th>
<th>CZ</th>
<th>Absolute disparity</th>
<th>Relative disparity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>2847</td>
<td>2878</td>
<td>-31^a</td>
<td>0.989^b</td>
</tr>
<tr>
<td>2002</td>
<td>3236</td>
<td>3194</td>
<td>42^a</td>
<td>1.013^b</td>
</tr>
<tr>
<td>Growth rate</td>
<td>13.66 percent</td>
<td>10.98 percent</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

^a GDP per capita comes from Bureau of statistics of surveyed counties.

^a Absolute disparity is the difference of GDP per capita between IZ and CZ, that is: 3 = 2 - 1.

^b Relative disparity is the ratio of GDP per capita between IZ and CZ, that is: 4 = 2 / 1.

The farmer’s income and poverty reduction

The farmer’s income per capita and cash income per capita. Figure 4 and 5 is the comparison of income per capita and cash income per capita between the IZ and CZ. After the implementation of RIPAⅢ the income per capita and cash income per capita in the IZ are higher than those in the CZ.

Figure 4. Comparison of income per capita between IZ and CZ (Unit: yuan)

Source: Household survey.

The number of poor. Table 6 is the comparison of the number and proportion of poor population between the IZ and the CZ. After the implementation of RIPAⅢ the number and proportion of poor population in the IZ decreased faster than those in the CZ. It shows that the IZ has made better progress in poverty reduction.
Figure 5. Comparison of cash income per capita between IZ and CZ

Source: Household survey

Table 6 Comparison of poor population between IZ and CZ

<table>
<thead>
<tr>
<th></th>
<th>IZ</th>
<th>CZ</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
<td>2002</td>
<td>percent</td>
<td>percent</td>
</tr>
<tr>
<td>The number of poor population</td>
<td>118660</td>
<td>98710</td>
<td>-16.8</td>
<td>-14.0</td>
</tr>
<tr>
<td>Proportion in rural population</td>
<td>7.9</td>
<td>6.5</td>
<td>-17.7</td>
<td>-15.0</td>
</tr>
</tbody>
</table>

Source: Bureau of statistics of surveyed counties.

Market construction and urbanization
The construction and development of rural markets, supported by good transportation conditions, is very important for the growth of local economy and the growth of farmer’s income. Good transportation can also create favorable factors for the concentration of population and industries. Table 7 shows that with the improvement of transportation infrastructure the rural markets and small towns in the IZ developed faster than the CZ.
Table 7. Comparison of rural markets and urbanization between IZ and CZ

<table>
<thead>
<tr>
<th></th>
<th>IZ</th>
<th>Change percent</th>
<th>CZ</th>
<th>Change percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markets and specialized markets</td>
<td>102</td>
<td>127</td>
<td>24.5</td>
<td>14</td>
</tr>
<tr>
<td>Town population (10,000 persons)</td>
<td>14.17</td>
<td>16.79</td>
<td>18.5</td>
<td>1.83</td>
</tr>
<tr>
<td>urbanization percent</td>
<td>9.5</td>
<td>11.1</td>
<td>16.8</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Note: The level of urbanization can be calculated by the following formula:

\[
\text{level of urbanization} = \sqrt{\frac{\text{urban population} \times \text{urban industrial output}}{\text{gross population} \times \text{gross industrial output}}}
\]

Source: Bureau of statistics of surveyed counties.

Rural industrialization

Good transportation is a necessary condition for the development of township and village enterprises. Table 8 shows that with the improvement of transportation infrastructure the growth rate of industry and its proportion in GDP in the IZ are both higher than the CZ.

Box 1. The growth of the farmer’s income

There are abundant tourism resources in the IZ, but the poor transportation restricted the exploitation of tourism resources in the past. After the implementation of RIPA, the improvement of transportation greatly promoted the development of tourism, creating favorable conditions for the growth of the farmer’s income.

“My home village is on the top of Dabie Mountains. There were no roads leading to the outer world. The farmers were very poor…Last year RIPA reached my village. Many tourists come to visit General Xu Shiyou’s museum and tomb daily. We can sell souvenirs and food to them. The villagers become rich. We built new house outside the museum. A remote mountain village became a nice sightseeing.”

——Xu Yimin, a relative of General Xu Shiyou

The improvement of transportation promoted the adjustment of agricultural structure. Agricultural products planted by farmers in mountain villages can be transported to cities easily and fast. The farmer’s income increased fast by planting profitable products.

“In IZ we planted wheat and rice in the past. The farmers were poor. RIPA improved the rural roads. Farmers built greenhouses and plastic sheds along both sides of roads. They planted vegetables and fruits in off-seasons. They planted flowers and precious plants to sell in the cities. They planted medical herbs to sell to the pharmacy factories. The trucks can drive into their gardens to carry the loading. The income
from one mu is equal to that of 10 mu grain…."

——Sun Xiaofeng, technician of Zhumadian Agriculture Bureau
Table 8. Comparison of rural industry between IZ and CZ

<table>
<thead>
<tr>
<th></th>
<th>IZ</th>
<th>Change</th>
<th>CZ</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Added value of industry 10,000 yuan</td>
<td>119788 146151</td>
<td>22.0 percent</td>
<td>17771 20431</td>
<td>15.0 percent</td>
</tr>
<tr>
<td>Its proportion in GDP percent</td>
<td>28.1 29.9</td>
<td>6.4</td>
<td>27.9 28.5</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Source: Bureau of statistics of surveyed counties.

Transportation industry

Table 9 shows that after the implementation of RIPA III, the number of vehicles, passenger and freight transportation developed fast. With the improvement of transportation infrastructure and growth of the farmer’s income, more and more rural household purchased motors and vehicles to undertake nonagricultural industries or facilitate travel. The improvement of transportation infrastructure has transferred the potential transportation demand into the real demand and boosted the development of passenger and freight transportation.

Table 8. Comparison of transportation industry between IZ and CZ

<table>
<thead>
<tr>
<th></th>
<th>IZ</th>
<th>Change</th>
<th>CZ</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of vehicles</td>
<td>87868 99817</td>
<td>13.6 percent</td>
<td>1330 1410</td>
<td>6.0 percent</td>
</tr>
<tr>
<td>Passenger volume 10,000 persons</td>
<td>1335 1550</td>
<td>16.1</td>
<td>190 214</td>
<td>12.6</td>
</tr>
<tr>
<td>Freight volume 10,000 ton</td>
<td>619 762</td>
<td>23.1</td>
<td>86 97</td>
<td>12.8</td>
</tr>
<tr>
<td>Passenger transport task (10,000 persons.km)</td>
<td>52640 66550</td>
<td>26.4</td>
<td>7730 9050</td>
<td>17.1</td>
</tr>
<tr>
<td>Freight transport task (10,000 tons.km)</td>
<td>37810 49740</td>
<td>31.6</td>
<td>6724 7860</td>
<td>16.9</td>
</tr>
</tbody>
</table>

Source: Feasibility research reports and post evaluation reports of every road section of RIPA.

Conclusions

Conclusions from the above comparison analysis can be summarized as follows: After the implementation of RIPA III, the general economy, the farmer’s income, rural markets and small
town construction, rural industrialization, transportation industry in the Impact Zone develops or increased faster than Control Zone. The implementation of RIPAIII also boosted the development of tourism and agriculture, raised accessibility of healthcare service and brought changes in the farmer’s ideology in the IZ. The implementation of RIPAIII has created positive impacts both on economic growth and social progress, benefited directly to the poor population and accelerated the pace of poverty reduction in the IZ.

**Box 2. Changes in the farmers’ ideology**

The improvement of transportation facilitated the travel for poor populations and their connections with outer world, therefore brought great changes in the living styles and ideology of the farmer’s.

“…Now the roads are better, more people went to work in cities. They saw the citizen’s living style. Now in modern city, woman is equal to man. In the city people like girls more because girls are dearer to their parents. Going out to work in cities, girls have more chances than boys. After young people returned home village, they prefer less children and regard baby girls as good as baby boys. Now one family has at most two babies. While in the past, people born child one by one until they born a baby boy…”

——Zhang Hua, Cadre in Xinyang’s Women Federation

**Box 3. Better access to healthcare facilities**

The improvement of transportation has decreased the opportunity cost (mainly time cost) to obtain healthcare service, raised the accessibility of healthcare service and increased utilization of healthcare service of rural populations. When natural disaster happens, good transportation supplies a fast thoroughfare for the relief work, decreasing the loss to the largest extent and keeping the stability of the society.

“…I opened a clinic at the roadside. RIPAⅢ improved the transportation conditions, more people can come to my clinic. If the patient is serious, I can give him first aid treatment and sent him to the better hospital. Now it takes only 20 minutes for us to go reach the county seat…In 2003, there was a big flood in Shangcai. The RIPAⅢ displays its power, the medical teams and medical vehicles from the province came at once. They disinfected the disaster areas and cured the patients. So no one died of epidemic diseases that year.”

——Liu Zhenting, a private rural doctor in Taqiao township, Shangcai county
Lessons Learned from Experience in Poverty-Targeted Interventions

The government’s role is central in Poverty-Targeted Interventions (PTI)

The successful implementation of poverty-targeted interventions such as the RIPA projects is firstly attributed to the dominant role the government has played. The functions of government mainly include:

*Investment of the governments of all levels is the most important fund source of RIPA.* The total investment of RIPA is 333.82 million yuan, comprised of a World Bank loan of 106.19 million yuan, a subsidy of Henan Communication Department of 56 million yuan, a fund collected by all the city and county governments of 164.48 million yuan, and farmers' voluntary work and Food-for-Work which is equal to 7.15 million yuan. The investment of provincial, city and county governments accounted for 66.05 percent of the total investment (see table 3). RIPA having an obvious characteristic of public goods, made it difficult to collect funds from the market as the high-class highways do. Thus the government is necessarily involved in providing funds for RIPA.

*The local governments formulate preferential policies and create favorable conditions for RIPA.* In order to promote the implementation of RIPA under the circumstance of fund shortage, all city county and township governments formulated a series of unified preferential policies, which created favorable conditions for the completion of RIPA. The policies included: preferential terms for land requisition; materials, water and electricity at low price; free sand and grit; tax reduction and so on.

*The local governments pay attention to, support and effectively organize the projects.* The implementation of RIPA depended heavily on the support and effective organization of local governments. At the early stage the local governments did much preparation work. Main leaders of all counties paid great attention to RIPA. They organized planning, surveying and designing of the projects, wrote project feasibility research reports, and chose qualified construction units.

During the construction period the Highway Bureau paid great attention to the construction of RIPA. Main measures taken by the local governments included: establishing the leadership institution responsible for organizing and coordinating; mobilizing and organizing the farmers to work voluntarily.
It has been proven that RIPA can not be successfully implemented without the support and effective organization of local governments.

**Professional management guarantees the successful implementation and sustainability of PTI**

Management in strict accordance with the relevant regulations and international principles is one of key reasons for the successful implementation of RIPA.

Although the investment scale of every RIPA project is small and the construction period is short, every project, from application to completion, was implemented according to the requirement of projects financed by the World Bank.

At the early stage local communication departments organized investigation teams to do serious investigation on the spot. Then they wrote the project feasibility research report. At the same time they did field survey and design work.

During the construction period, every project strictly obeyed the rules of MOC on the basic procedures and management method: FIDIC terms were adopted to choose qualified contractors; independent monitors were employed to supervise the project; construction followed the contractual standards; a strict financial management system was established to strengthen the management of funds, a special account was opened and managed by a specified unit, and the funds were allocated according to the procedures.

After the projects were completed, maintenance was paid great attention to ensure the sustainability of RIPA. Measures included: establishing township maintenance stations for professional maintenance; implementing maintenance contests; planting trees to improve the environment of the highways; formulating regulations to ensure the smooth operation of the highways. These measures increased the investment benefit and ensured the sustainability of RIPA.

**Collecting funds from diversified sources ensured the successful implementation of PTI**

The government, although the most important source of funds, is not able to afford the total investment of rural highways alone. Collecting funds from diversified sources such as loans from international financial organizations and voluntary works of the farmers is a good solution.

First, loans from international financial organizations are important sources of fund to build rural highways. The period of loans from international financial organizations is comparatively long and the interest rate is lower. Projects financed by international financial
organizations can provide funds urgently needed by rural highway construction, and at the same time, bring international practice to the rural areas and make great contributions to raising the ability to manage projects of local transportation sectors. Experience of such projects, as “show case”, can be introduced into other projects, helping to raise the integrated level of transportation administration of the impoverished areas.

Second, the farmer’s voluntary work was, and will continue to be an important source of fund to build rural highways in the future. Traditionally the farmer’s voluntary work was an important source of fund to build rural highways since generally the farmers knew clearly the importance of roads for poverty reduction and had no problem to volunteer their work for the projects. Though it is prohibited to organize voluntary work on large scales after the reform of rural fees and taxes, if the policy of “democratic consultation” is used correctly, there remains great potential that they will continue to be an important part of the solution to rural highway construction needs.

Problems and Prospects

Remaining Problems

Though rural highways have developed rapidly in China during the past 20 years, they have not received enough attention from the central and provincial governments, which have mainly focused on construction of trunk and high-class highways. Local governments and farmers, who are responsible for the construction and maintenance of rural highways, received little support. Except in some developed areas, most local governments do not have enough funds to meet the need for rural highway construction.

As a result, rural highways face two main problems. First, the rural highway network is still not as extensive as it needs to be. At present, more than 180 townships and 50,000 villages still lack highways. Most are in western areas, but there are even some in eastern areas. Second, the quality of existing rural highways is very low because of funding shortages. At present more than 342,000 kilometers of rural highways are off-class roads, representing 32 percent of rural highways in the whole country. The off-class highways, which are in poor condition and not well suited to resist natural disasters, seriously limit the socioeconomic development of rural areas. With the gradual economic development and increase in traffic, improvements will be necessary.

All this suggests the Chinese government should collect funds to increase its investment in rural highways further, and bridge the gap between urban and rural areas. That will be important to
successful implementation of the western development campaign and promotion of rapid and steady economic growth.

**Prospects: Chinese infrastructure development and poverty alleviation in the future**

There are still 30 million poor people in China, mostly in the middle and western areas with poor transportation conditions. It will be a great challenge to provide necessary infrastructure for these areas. At the same time, many rural residents who have enough to eat and wear are still vulnerable to outside shocks and could fall back into poverty. It is also worth noting that China’s poverty line is much lower than the international standard, so China still has a long way to go to reduce poverty.

It has been fully proven that transportation infrastructure, especially highway infrastructure, is a fundamental factor affecting the socio-economic development of poor areas. Creating transportation infrastructure is not just a matter of providing roads. It also actively affects economic development, income and living styles of the farmers, access to health care and social stability. Therefore, the full effects of transportation infrastructure on poor areas are hard to describe in concrete numbers.

Since the current quantity and quality of rural transportation infrastructure do not meet the needs of economic development and poverty reduction, the Chinese government is taking active steps to accelerate the construction of rural transportation infrastructure. Especially in the western development campaign, transportation infrastructure is being paid full attention, and transportation conditions in the middle and western areas have been greatly improved in recent years.

At present, the Chinese government is increasing the accessibility of rural highways, emphasizing construction of roads in the western regions that connect rural areas with economic centers, communication centers and trunk highways. According to the new targets formulated by the Ministry of Communication, more than 340,000 kilometers of highways will be built in the coming eight years, the gross mileage of highways in China will reach 2.1 to 2.3 million kilometers, and all suitable townships and villages will have highways by 2010. By 2020, all county highways in the eastern areas and 90 percent of county highways in the middle and western areas will be above class 3, and the township highways will be above class 4. A rural highway network with a reasonable structure and complete subsidiary facilities\(^{10}\) will be formed by then. In short, transportation infrastructure will continue to play an important role in economic development and poverty reduction in the future.

\(^{10}\) Subsidiary facilities include gas stations and roads signs facilitating transportation.
Bibliography


Post evaluation group of the Highway Bureau in Henan Communication Department and Henan Academy of Social Science, 2000, *Post evaluation on the poverty-alleviation road improvement component (RIPA) of the second Henan provincial highway project loaned by the World Bank*.

Post evaluation group of the Highway Bureau in Henan Communication Department and Henan Academy of Social Science, 2003, *Post evaluation on the poverty-alleviation road improvement component (RIPA) of the third Henan provincial highway project loaned by the World Bank*.


The World Bank, 2000, *Roads Improvement for Poverty Alleviation in China*, working paper No. 1 of EASTR (the Transport Sector Unit of the East Asia Region).

