Country Context

The history of the Chinese government’s more recent poverty reduction programs may be divided into three stages. During the first stage, from 1978 to 1985, the government, through higher product prices, encouraged rural households to raise agricultural output. As a result, greater agricultural output translated into increases in the incomes of farm households. Official poverty incidence declined from 30.7 to 14.8 percent during this period. In the second stage, from 1986 to 1993, the State Council Leading Group Office of Poverty Alleviation and Development was established to provide coordination on targeted antipoverty interventions. This entity has since become the key agency responsible...
for interventions related to poverty. It has more than US$2 billion in annual funding. During this period, the government introduced several large-scale programs focused on reducing rural poverty, and the number of the rural poor fell from 125 million to 80 million. In 1994, in the third stage, China launched the ambitious 8–7 Poverty Reduction Plan to eradicate absolute poverty. The plan called for amassing the manpower, materials, and financial resources necessary to help the remaining 80 million poor in China exit poverty within seven years (8–7). The number of poor fell from 80 million in 1994 to about 58 million in 1997. Despite the successful government effort in poverty reduction, more than 30 million people are still poor in China today. Rapid economic growth has been a major factor in China’s success in reducing poverty. However, the progress has been most notable when growth has been concentrated in the agricultural sector and in poorer regions. In earlier years, substantial poverty reduction might be achieved through general economic growth and broadly targeted programs. Today, the poor are more difficult to track: they may be found in resource-deficient areas and in remote uplands in the interior provinces of northern, northwestern, and southwestern China, as well as in periurban regions with high population densities. However, the central government’s poverty reduction funding is available only to counties designated as poor, and the poor residing in counties not designated as poor are excluded from this support. Thus, a tool such as a poverty map might significantly improve the targeting of the poor.

Urban poverty in China is a relatively new phenomenon and the government has little systematic information about the location, profile, and nature of urban poverty. The main motivations for constructing poverty maps include the serious need for subprovincial information to improve the effectiveness and efficiency of current poverty reduction programs and the potential help offered by poverty maps to the government in designing poverty reduction programs in urban areas.

The latest effort undertaken by the government to identify the poor is a new poverty database, the poor household register, launched by the Poverty Alleviation and Development Office of the State Council. However, there are a number of shortcomings in the register. First, the register is very costly to maintain, and the data collection process relies on the judgment of village leaders to identify who are the poor. There is a tendency toward overreporting. Other weaknesses include the lack of clear guidelines about the poverty threshold across counties and villages, which leads to inconsistencies and arbitrariness, and the difficulty in differentiating between near poor households and poor households. Some of the advantages of the poverty mapping approach include the statistical robustness of the estimates (that is, confidence), transparency, consistency, and objectivity based on observed information.

The Mapping Process

The World Bank and the National Bureau of Statistics (NBS) collaborated in 2002–03 to apply the poverty mapping methodology in Yunnan Province. Yunnan Province was selected because of its ethnic diversity and relatively high poverty incidence. The objective was to test whether the methodology might produce reliable poverty incidence estimates down to the township level in rural areas and down to the district level in urban areas.
There were two stages to the study. During the first stage, a poverty map on rural Yunnan was produced based on the First National Agricultural Census, which was conducted in January 1997, and the 1997 Rural Household Survey. The second stage consisted of expanding the exercise to all of Yunnan Province based on the Fifth Population Census (2000), combined with the 2000 Urban Household Survey and the 2000 Rural Household Survey, to produce poverty estimates both for urban and for rural areas. In addition to the censuses and surveys, supplementary county-level administrative data from the county statistics database (1996 and 1999) were used.

Three NBS departments—the Rural Survey Department, the Urban Survey Department, and the Population Department—were involved in the construction of the maps, and each department carried out its responsibilities according to its data expertise. The poverty map project brought together the three NBS departments to produce a common output for the very first time. It was also the first time that all three data sources (that is, the urban and rural household surveys and the census) were merged and used together.

Data Issues

Several data issues arose during the process of the construction of poverty maps of Yunnan. First, there was a sampling issue that might affect the comparability of the household survey and the agricultural census. For the 1984 survey, 40 sampled counties were selected from among the 126 counties in the province. The county sampling has not changed since then. In 1984, the sample was designed to be self-weighting according to the probability-proportional-to-size method of sampling. However, by 1997, the sample was no longer self-weighting because of variations in population growth across clusters at all three levels of administrative division in the province (prefecture, county, and township). The 40 counties in the sample showed quite diverse population growth rates from 1985 to 1997, ranging from 12.5 percent to 60 percent. Counties with a higher income growth rate attracted more residents. It was therefore necessary to construct a household sampling weight to reflect the changes in the cluster population.

On the issue of representativeness, the variation in income growth across clusters raised the question of whether the 1984 sample of counties would still be representative of the 1997 population. For instance, in 1984, all counties were ranked according to average net per capita income over the previous three years, and the counties were selected systematically for the sample so that each selected county would also represent its neighboring counties on the ranking list. But, after 1984, some counties grew more rapidly than others, and the original ranking was no longer accurate by 1997. Similarly, the Urban Household Survey samples were selected in the early 1980s and have never been updated. The representativeness of that survey is even more doubtful because of the rapid urbanization over the past decade that has been motivated by market liberalization and policy changes.

Another issue encountered during the merging of the rural survey, the urban survey, and the population census involved the sampling frames. Both the rural survey and the urban survey used different sampling frames from the population census.
When the simple rule was applied of splitting the population census to match the sampling frames of the rural survey and the urban survey, 10 percent of the population in Yunnan Province remained unaccounted for; the corresponding share was as high as 25 percent in large cities. Neither the urban survey nor the rural survey had been designed to reflect the migration issue. A small fraction of the population temporarily residing in urban areas has been ignored in both surveys. Information on the income and population of primary sampling units would be used to address this issue in both cases.

Field Validation

As measured by the reasonably small standard errors, the poverty estimates used to produce the poverty maps are rather precise all the way to the township level. However, the results at the village level (below the township level) are no longer so precisely measured; the standard errors are relatively high. Two examples of the poverty maps are presented in figures 7.1 and 7.2.

To verify the accuracy of the results, World Bank and NBS staff undertook two field validation trips to Yunnan. The first trip found that the preliminary results on poverty headcount rates by county derived from the First National Agricultural Census and the Rural Household Survey were consistent with the perceptions of local officials. During this trip, the team was able to discuss many issues regarding the methodology for the collection of census and survey data with local NBS officials. These discussions helped in the merging of census and survey data. The second field trip was conducted to distribute and discuss the findings using the population census, the rural survey and the urban survey. Meetings were held at the provincial, prefecture and county levels. All local government officials and researchers agreed that the results of the pilot study at the prefecture level were reasonable. The results on the poverty headcount rate in only one of the 16 prefectures might be viewed as an underestimate; this was the prefecture of Diqing.

Figure 7.1 County-Level Poverty Incidence Estimates, Yunnan Province, China

NBS staff then visited Diqing to meet with officials from various government departments. The prefecture officials echoed that the estimated poverty headcount rate seemed lower than anticipated, but the ranking of counties by poverty headcount was reasonable. Contributing to the underestimation was a shortage of data and the difference between the poverty threshold in Diqing and the poverty threshold in the other 15 prefectures.

**Dissemination**

The results of the poverty mapping exercise were distributed to various government agencies, donors, non-governmental organizations (NGOs), and researchers through two seminars organized by the NBS and the World Bank. Since the poverty map of Yunnan was only a pilot exercise to test the methodology, the results were not published by the NBS. The participants were not allowed to quote the results, and only hard copies were distributed to participants at the seminars. NBS also did not actively promote the use of the maps at that stage. Many participants regarded the poverty map as a way to fulfill the demand for poverty information at the prefecture and township levels. However, many others were skeptical whether the poverty map may be used in practice to allocate resources to the poor. The government agencies felt that more validation exercises had to be carried out to confirm the reliability of the poverty map findings. While most of the government agencies were well aware of the poverty maps and appreciated their usefulness, they were skeptical of the reliability and robustness of the results. The methodology is still new to them, and they need time to understand and become familiar with it. Also, the tool has only been applied in one province, and further tests on the results or additional applications in other provinces will be necessary. Many of the officials who were interviewed expressed the need to conduct a new round of poverty maps once the Second National Agricultural Census is completed in 2007. While local officials were eager to use the poverty maps, they were worried that any mistargeting will have severe political consequences because of heavy scrutiny through central government audits of antipoverty funding.
Other reasons cited to explain the possible lack of usefulness of the poverty maps echo concerns expressed in other countries: (1) the need for poverty information at the lowest administrative unit (that is, the village); (2) the need for additional indicators, especially indicators on the nonmonetary dimension of poverty, besides poverty and inequality estimates; and (3) the need for regular updates of the maps given that a single map produced to coincide with the census every 10 years is not sufficiently accurate to be useful. These are all issues that may be successfully addressed. To have robust estimates on the lowest administrative unit, additional village-level information will have to be made available, and such a process might be incorporated into the regular data collection of the NBS. Additional indicators might also be constructed, as in other countries. And, lastly, the updating of the maps during between-census periods is being developed and applied in several countries in the region, for example, the Philippines and Thailand.

**Impacts of the Maps**

**Actual uses**

The only government agency that has used the poverty maps is the National Development and Reform Commission. The commission has made use of the poverty map to review the county-level allocation of project funding, as well as the incidence of poverty in all Yunnan counties. The commission has found the poverty map less useful for its food-for-work program because poverty headcounts on villages are not available in the map.

The World Bank and the U.K. Department for International Development have used the poverty map of Yunnan to help select beneficiary areas for their Poor Rural Communities Development Project. The project was approved by the Board of the World Bank in June 2005. It covers three provinces: Guangxi, Sichuan, and Yunnan. The project will help the Chinese government to improve resource targeting on the poorest and reduce leakage to the nonpoor.

The poverty mapping exercise has motivated important changes at the NBS. The data issues uncovered during the exercise have been particularly valuable in improving the next rounds of data collection by the NBS. The NBS has also used the poverty mapping results as a guideline in designing the questionnaire for the Second National Agricultural Census, which is being fielded in 2006–07. Additional indicators that may be calculated in future poverty maps are being incorporated in the second agricultural census. The census will now also include data on all households in rural areas rather than merely households with specific types of production. To ensure comparability with the population census, the NBS will be matching the household survey domain with the census domain.

**Potential uses**

While there has been only limited use of the maps of Yunnan so far, our interviews with various government agencies, donors, and NGOs suggest that there is a tremendous
demand for poverty maps in China. The government of China is very conscientious in its efforts to reduce poverty, and a significant amount of funds is designated for poverty reduction. Most donors rely on the government poverty indicators in targeting their programs. Thus, reliable and robust poverty information is crucial.

The government is the main potential user of poverty maps because it oversees a large amount of program funds. The central government plays a major role in distributing antipoverty funds to counties through various government departments and state-owned banks. There are four main government organizations responsible for delivering and managing government antipoverty funds: the Leading Group Office of Poverty Alleviation and Development, the Agricultural Bank of China, the Ministry of Finance, and the National Development and Reform Commission. Each organization uses its own scoring system to channel poverty funds to provincial and county governments. Only counties that have been designated as poor are eligible for the funds. The poverty map tool might provide poverty estimates of the counties in a more systematic, cost-effective, and transparent way.

The following are some of the many programs that might also benefit from the information in national poverty maps.

**The subsidized loan program**

The objective of this program is to provide credit support in poor areas to boost economic development and improve the incomes of the poor. The bulk of the subsidized loans are supplied to households or enterprises in poor counties. The program is managed by the county office of the Leading Group for Poverty Reduction and the county branch of the Agricultural Bank of China. The county offices select the projects and households in poor areas. Wang (2004) finds that the project has failed to target the poor.

**The food- and cash-for-work program**

The objective of this program is to make use of the surplus labor resources in poor areas to build infrastructure such as roads, water management structures (for example, reservoirs), and drinking water treatment facilities. The program aims at providing poor farmers with job opportunities and sources of income. The program is managed by the National Planning and Development Commission. Program wage payments are given out as coupons to exchange for grain, clothing, and other daily necessities. Some of these coupons may also be exchanged for cash through state-run commercial banks. It is unclear how the commission determines the villages that will receive the coupons to implement the program.

**The budgetary development fund**

The objective of this fund is to support productive construction projects and investments. The budgets of local governments in poor areas tend to be in deficit, and the poor areas are unable to make any infrastructure investments. The Budgetary Development Fund was launched by the Ministry of Finance. Many villages are chosen for the program from among counties that are not officially designated as poor, and many people believe that the leakage to the nonpoor is substantial.
The compulsory education project

The objective of the project is to improve the conditions for basic education in poor counties. The program has been running for nearly 10 years and is managed by the Ministry of Education. The project has constructed new primary and secondary schools, renovated and expanded old school buildings, purchased equipment and furniture for schools, and trained teaching staff. The project covers 522 poor counties, mainly in mountainous, pastoral, border, and minority areas.

Nongovernmental programs

The NGO representatives interviewed for this study were generally not aware of the existence of the poverty maps, but expressed interest in learning more about them. Some of the interviewees were disappointed that they had never been informed about the maps, and some would also like to become involved in the mapping process and map construction. They found the information in the maps valuable in their activities. For example, the largest of the NGOs that dealt only with poverty directly, the China Foundation for Poverty Alleviation, is eager to acquire poverty information disaggregated at the county level. While the foundation’s programs mostly target individual households, organized, structured information on poverty in counties and townships would be immensely valuable.

The Badi Foundation is a successful local NGO that deals with capacity building. The foundation provides training for the poor, particularly poor rural women. The foundation uses data supplied by the government, usually the NBS, to identify poor villages. While Badi staff had never heard of the poverty maps, they indicated that poverty information on lower-level administrative units would be very useful not only for them, but for other organizations dealing with poverty issues.

Reducing the diversion of poverty funds to other usages

Local governments have, at times, utilized poverty reduction funds for other purposes. One reason is that the revenues of the counties are generally not sufficient to cover county expenditures, and poverty funds are therefore diverted to uses other than poverty reduction. Many observers believe that the poverty maps may help reduce the diversion of poverty funds to other uses because the central government would be able to apply the maps in assessing resource allocations and monitoring the impacts of related projects and polices.

Lessons for Scaling Up

Involve potential users in all stages of map construction

The main concern of government agencies with regard to the poverty maps has been the issue of reliability. Because the methodology is relatively new, there is still much doubt and skepticism. Collaboration between the producer of the maps (that is, the NBS) and potential users at the early stages of map development and continuing all the way through
to the completion of the mapping project is vital. Each government agency requires different types of data for its programs, ranging from consumption data and nutrition data to data on educational attainment, illiteracy, access to safe drinking water, and infrastructure. It is important that potential map users be able to provide inputs and suggestions at an early stage so that the end product may better serve their needs. Also, it is important to undertake a process of data validation at the local level; this process should also directly involve potential map users.

Informal discussions on updating and expanding the scope of the poverty maps are currently under way with various government agencies that deal with poverty. The NBS is proposing that a working committee be established, consisting of at least the line agencies, with the main task of discussing the development and construction of poverty maps.

Disseminate actively, widely, and effectively

Besides actively engaging potential users during the development stage and on through construction to the validation of the maps, the NBS must also actively, widely, and effectively disseminate the results. Holding seminars to discuss the results, as in the case of Yunnan, is not sufficient or effective in promoting wider use of the maps. The poverty maps should be published formally, and both soft and hard copies ought to be distributed to potential users. A Web site should be created for the purpose of dissemination and also to educate users on the application of the maps. Dissemination across the country at the local level is equally important. The donor and NGO communities are likewise important users that should be involved from the start.

Improve data quality through better coordination among NBS divisions

During the poverty mapping exercise, a number of data shortcomings were uncovered. These issues should be addressed in future rounds of data collection to improve data quality and the poverty estimates shown on the map. To address these shortcomings, the NBS must improve internal coordination in data collection, processing, analysis, data standard-setting, and data sharing. For example, the household survey data and the population census depend on different sampling frames. It is poor internal coordination within the NBS that has led to the development of incompatible data sets.

The NBS has expressed an interest in updating the poverty maps on Yunnan and constructing maps for several more provinces as soon as the second agricultural census becomes available. The new census has incorporated many improvements and includes additional indicators that should be used in future poverty maps.

Increase the capacity of the NBS

The construction of a poverty map on the entire country is a huge task, and the NBS will need substantial technical assistance. Additional manpower will also be necessary to support field validation, the collection of additional local information, and so on.
Conclusions

The pilot study of Yunnan province was intended to test the applicability of the poverty mapping approach and the relevant data in China. Despite the data shortcomings that were uncovered, it has been a productive endeavor. As reflected in the relatively small standard errors, the poverty estimates were measured with good precision at the county and even township levels. The results suggest that there is substantial geographical heterogeneity in poverty in Yunnan. Even considering the large number of counties, there is considerable variation in the incidence of poverty across townships. A change in the targeting rules for the national poverty reduction program from county-based targeting to township-based targeting might therefore enhance the program’s effectiveness in reaching the poor.

If future poverty maps of China are to have an impact, the NBS should ensure that potential users, especially various government agencies, have an adequate understanding of the uses and applications of the maps. Moreover, it is important that users become engaged and involved from the start of the project on through map construction to validation and dissemination. It appears that the NBS is already taking steps to engage various agencies in discussing additional work on the poverty maps, which would include updating the Yunnan poverty map and extending the exercise to other provinces as soon as the second agricultural census becomes available.

Notes

1. See http://www.theinternetfoundation.org/China/Ag/FirstAgriculturalCensusChinaTOC.htm for the agricultural census.

References