

# 14

## Poverty Mapping in Vietnam

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### ACRONYMS AND ABBREVIATIONS

<b>CEM</b>	Committee for Ethnic Minorities
<b>D</b>	Dong, the Vietnamese currency
<b>GSO</b>	General Statistics Office
<b>ICARD</b>	Information Center for Agricultural and Rural Development
<b>ILSSA</b>	Institute of Labor Science and Social Affairs
<b>Molisa</b>	Ministry of Labor, War Invalids, and Social Affairs
<b>NEU</b>	National Economics University
<b>VHLSS</b>	Vietnam Household Living Standards Survey
<b>VLSS</b>	Vietnam Living Standards Survey

### Background

Over the past decade, Vietnam has witnessed a rapid reduction in poverty. Data from the Vietnam Living Standards Survey (VLSS) and the Vietnam Household Living Standards Survey (VHLSS), conducted by the General Statistics Office (GSO) in 1993, 1998, 2002, and 2004, show that the poverty rate fell by almost two-thirds, from 58 percent in 1993 to 20 percent in 2004. This was largely due to the sound propoor policies adopted by the government. But these successes have been achieved without a mechanism for targeting assistance to the poor that would meet international standards.

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A continuation of such rapid poverty reduction is likely to require better targeting of transfers to poor areas and poor people. While a number of targeted programs are in place, there is increased recognition in Vietnam that the targeting procedures used in these programs need to be strengthened. Weak targeting mechanisms mattered less in the past, when poverty levels were high and even flawed targeting processes were likely to capture large numbers of poor people. As poverty rates decline, however, targeting becomes more challenging. The government is therefore enthusiastic about exploring more sophisticated techniques to improve the impact of targeted expenditures. In recent years, efforts have been undertaken to test one such promising tool: the small area estimation methodology and the production of highly disaggregated poverty maps. This chapter aims to document the experiences in Vietnam with poverty mapping based on this methodology and assess the impact of the resulting poverty maps on policy making and targeting.

Various government agencies and other stakeholder agencies have shown interest in poverty mapping using the small area estimation methodology. This is so for two broad reasons. First, they have desired to see whether local poverty estimates produced by the Ministry of Labor, War Invalids, and Social Affairs (Molisa) might be verified through alternative and, possibly, more reliable methods. Second, they have wished to determine whether such local poverty estimates might then be used to improve targeting.

The VLSS and VHLSS have enabled reliable estimates of trends in poverty at the national and regional levels, as well as trends in social outcomes among various groups in society. Still, the size of the samples in the 1993 and 1998 VLSS were insufficient to generate poverty estimates for each of Vietnam's 64 provinces. This changed when the number of enumeration areas and the sample size were expanded for the 2002 and 2004 surveys, making it possible to estimate poverty rates in the provinces, albeit with large standard errors ranging from 1.5 percent to 5.5 percent. However, no mechanism existed for producing reliable and comparable poverty estimates for each of the 625 or so districts and each of the 10,000 or so rural communes and urban wards.

While VHLSS data have played an important role by serving as a source of information in the poverty policy debate, official government poverty estimates have not (until very recently) been based on the VHLSS. Instead, poverty estimates were based on nationwide annual counting exercises, whereby the number of poor people was counted by Molisa officials in each commune and ward across the country, and lists with the names of the poor were drawn up. A household was declared poor if its income was less than a low rice-based poverty line, and incomes were supposed to be measured using a detailed household questionnaire.

In reality, however, the number of people who were declared poor depended significantly on the poverty reduction targets for that particular year. These targets were set in advance for each administrative unit (usually a standard 2 percent reduction per year). The number of poor people actually listed also depended on the resources that were available for assisting the poor under national targeted programs. The official poverty line that was applied tended to differ across provinces because the provinces were given

the freedom to set higher poverty lines if they had the resources available to address poverty among larger numbers of people.

Lists were updated annually, and local community meetings were frequently held to decide who would be declared poor and who had moved out of poverty. These meetings often made household income measurements unnecessary. The commune and ward poverty rates that emerged from this exercise were aggregated at the district level, then at the provincial level, and, finally, at the national level.

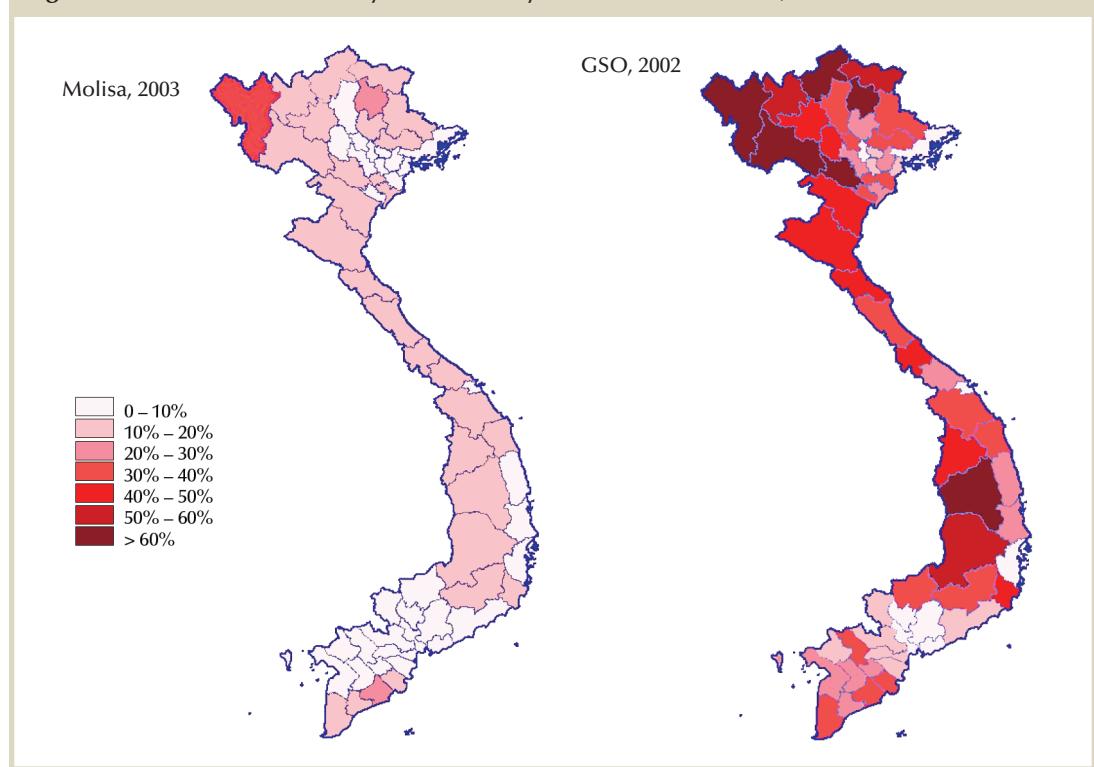
Because these poverty counts were not based on one standard methodology applied throughout the country using an independent measurement tool, such as the VHLSS, but were subjectively defined through a political process driven by targets set by higher authorities, the poverty rates were not comparable across administrative units. As a consequence, the data on local and national poverty rates used in official government reports were not reliable, a finding which has been confirmed by recent research (see Nguyen and Rama 2006).

Not only did the local poverty rates distort intercommune differences, but they were also generally too low. The poverty line that was applied reflected only the minimum amount of rice necessary for survival. It did not reflect other food and nonfood consumption needs. In 2002, the value of the official poverty line used in the Molisa methodology was roughly D 90,000 per person per day, which is US\$0.19, or US\$0.92 valued at a purchasing power parity of 4.9. This is insufficient to meet minimum basic needs in Vietnam. The VHLSS 2002 used a poverty line of D 159,788, which is approximately 1.8 times higher.

The difference in official and VHLSS-based poverty rates may be easily demonstrated by provincial poverty maps derived according to the Molisa or the GSO methodology. Figure 14.1 illustrates how the Molisa data result in lower levels of poverty and a more compressed range of poverty rates across the country.

The lack of reliable poverty rates at the provincial and subprovincial levels that are compatible with the VHLSS estimates stimulated an interest in alternative approaches for estimating poverty rates at these levels.

During the 1990s, the government was placing greater emphasis on two national targeted antipoverty programs through which it was channeling increasing resources. These were the Hunger Eradication and Poverty Reduction Program and a program targeting poor communes that has come to be known as Program 135 after the number of the decision that established it. The former, coordinated by Molisa, was designed to deliver benefits such as subsidized credit, school fee exemptions, and free health care to individuals who live in households defined as poor through the Molisa-led process described above. Program 135 is coordinated by the Committee for Ethnic Minorities (CEM) and makes grants to communes in exceptionally difficult circumstances. The grants are provided mainly for investment in small-scale infrastructure. Communes are identified using a number of criteria, including local geography, the concentration of poor households, the presence of ethnic minorities, and deficiencies in infrastructure.

**Figure 14.1 Provincial Poverty Incidence by Molisa and the GSO, Vietnam 2002 and 2003**

Sources: Administrative data from Molisa; GSO estimates.

Note: The GSO estimates rely on the VHLSS; the GSO data (right) have standard errors ranging between 1.5 and 5.5 percent.

This chapter will next discuss the preparations and the process for the production of small area estimation poverty maps. Thereafter, it offers an overview of the main technical aspects, the key findings, the impact of the maps, missed opportunities, and the sustainability of the process. The chapter concludes with a summary of the lessons learned.

### Arrangements and Process

During 1997, the International Food Policy Research Institute developed a poverty map of rural districts in Vietnam using techniques related to the small area estimation methodology. This map relied on the 1993 VLSS to estimate the likelihood of poverty among rural households as a function of a series of household and farm characteristics and then calculated district averages for these characteristics from the 1994 agricultural census to predict district poverty rates (see Minot 2000). In 1999, a census was completed by the GSO. The World Bank and the International Food Policy Research Institute made use of a 3 percent sample from this census, together with the 1998 VLSS, to develop a provincial poverty map using the small area estimation methodology (see Minot and

Baulch 2002, 2004). This generated the first reliable set of provincial poverty estimates for Vietnam and demonstrated that the small area estimation methodology might be made to work using the available data sets and that the generation of more disaggregated poverty estimates and maps was possible if a larger portion of the census became accessible.

### Institutional arrangements

In 2002, the International Food Policy Research Institute and the Institute of Development Studies, in partnership with the Information Center for Agricultural and Rural Development (ICARD), submitted a proposal to the World Bank on a collaborative effort to generate disaggregated poverty estimates. This would include district and, possibly, commune poverty estimates and district poverty gap and inequality estimates and maps. The proposal would require a 33 percent sample of the 1999 census. Eventually, funding was arranged through the New Zealand Agency for International Development. At the suggestion of ICARD, the proposal included a large capacity-building component for Vietnamese researchers and government officials. It required that the participating international researchers, instead of doing most of the work themselves, as they had done during the earlier provincial mapping exercise, would take a step back this time and play the role of mentor.

A poverty mapping steering committee was established, led by the director of ICARD. The committee included representatives from the key agencies that are involved in anti-poverty programs, such as Molisa, the Ministry of Finance, and the Ministry of Planning and Investment, in addition to the GSO. Each agency was asked to send three English-speaking representatives to form the 12-member Interministerial Poverty Mapping Task Force. The members were to be trained in poverty mapping techniques. The GSO was asked to send one local staff member experienced in quantitative analysis to act as a cotrainer during some of the training sessions, together with two local economists: one from the National Economics University (NEU) and one from the Institute of Economics. One local geographic information systems specialist from Hanoi Agricultural University was also recruited for the training program.

### Training and capacity building

Over the first six months of the project, three one-week training sessions were organized by ICARD and the international experts: one on statistical analysis using the Stata software package, one on geographic information systems using ArcView, and one on poverty mapping. Between these training sessions, subgroups of participants were given assignments to practice what they had learned. Supervision over these assignments was provided by the international experts over the Internet and by the World Bank in Hanoi. Following the final training session, a somewhat smaller group was formed consisting of the analysts who had performed well during the final training. This smaller group worked together to generate the remaining detailed estimates and to produce the maps and a report. The result of this capacity-building approach was a capable local expert

on the small area estimation methodology and a wider group of people who understood and, with some help, would be able to produce poverty maps.

### Attempts to update the original analysis

In the course of 2003, data from a new household living standards survey, the 2002 VHLSS, became available. This made it possible to reestimate the coefficients representing the relationship between household characteristics and consumption expenditure. These coefficients might then be used to revise the household expenditures estimated on the basis of the household characteristics covered in the 1999 census. The Institute of Labor Science and Social Affairs (ILSSA), which is affiliated with Molisa, submitted a proposal to the World Bank to investigate the possibility of updating the maps using reestimated coefficients. The World Bank provided support, mainly through a local poverty mapping specialist from the NEU who guided the ILSSA team through the various analytical steps (see Nguyen et al. 2004a).

Later in 2004, the ILSSA requested help from the World Bank in a renewed effort to test a method for updating the poverty map. This was to be done by using a minicensus in pilot communes to update the household characteristics covered in the 1999 census and on which the poverty mapping estimates were based. This involved testing a bottom-up approach, whereby data would be collected on household characteristics locally to update poverty rates using poverty mapping techniques. The ILSSA also proposed exploring whether the census variables might be applied as proxy indicators to identify poor households. If the test proved successful, then the cumbersome and unreliable Molisa poor household income census would be replaced by a much simpler minicensus to collect data on only 10–15 household characteristics.

In the field, a simple questionnaire on asset ownership was used to identify all rich and all very poor households. These two extreme sorts of households were eliminated from the sample. The remaining households were subjected to a more detailed questionnaire covering household characteristics that was used to estimate household expenditures. To verify these estimates, data were also collected on household expenditures and incomes using simplified versions of the VHLSS questionnaire. Nine communes were included in the field test. Separate tests were run using the 2004 VHLSS to estimate regional and provincial poverty rates directly through expenditures and through estimated expenditures using household characteristics. The results of this work were presented at a World Bank conference in Cambodia on the uses and impact of poverty maps in February 2006 (see Nguyen et al. 2006).

### Overlaying the poverty map with other information

The team that originally produced the national poverty map also produced various overlays for this map, including information on market access. Subsequently, the ILSSA team and the NEU economist overlaid the poverty map with information on the 2,500 or

so communes where Program 135 funds had been distributed. The results of this exercise were presented to Program 135 officials (at CEM) by the local research team during a workshop. The CEM officials subsequently requested training in poverty mapping techniques for 10 CEM staff. A three-week training session was provided by the local poverty mapping specialist from the NEU and was completed in the summer of 2004.

### Producing an updated provincial map

When the provincial authorities of Ho Chi Minh City decided to conduct a midterm population census in 2004, the provincial statistics office approached the World Bank for help with data tabulations and analysis. The idea of using this census, in combination with the 2002 VHLSS, to develop a provincial poverty map quickly emerged. The relevant information for poverty mapping was collected for 10 percent of the sample. It was hoped that the map would be completed in time to feed into the next Ho Chi Minh City five-year plan (2006–10). A collaborative effort was undertaken that included the Institute of Economic Research of Ho Chi Minh City and the provincial statistics office, with technical leadership and training provided by the poverty mapping specialist from the NEU.

## Technical Aspects

### Accounting for regional differences

Seventeen household characteristics that appear in both the 1998 VLSS and the 1999 census were adopted for use in the poverty mapping analysis. Separate regression models were estimated for urban and rural Vietnam. Earlier attempts to derive separate estimates for seven rural strata and two urban strata had produced unconvincing results, and this approach was dropped. The team considered that this use of only two consumption models, one rural and one urban, for the whole country was somewhat unsatisfactory; it seems unlikely that returns to each of the rural (or urban) household characteristics would be the same across the entire country. As an alternative, the regression models included dummy variables for each of the regions to account for regional differences. As a result, the estimated poverty rates for neighboring districts or communes with similar characteristics, but on opposing sides of a regional boundary, sometimes showed unrealistically large differences. This is especially so on the border between the poor Central Highlands and the rich Southeast.

### Large confidence intervals for small communes

The national poverty estimates derived through the poverty mapping exercise using a 33 percent sample of the census were very close to those using a 3 percent sample of the census, as well as to those estimates derived directly from the 1998 VLSS. The 95 percent confidence intervals of the provincial poverty estimates using 33 percent of the sample

averaged  $\pm 5.2$  percent. This figure was only slightly higher for the district estimates, at  $\pm 5.8$  percent, but significantly higher for the commune estimates, at  $\pm 8.1$  percent. Half the commune estimates showed a confidence interval between  $\pm 6.6$  percent and  $\pm 10$  percent. One-quarter of the communes (mostly the smaller ones) showed confidence intervals greater than  $\pm 10$  percent. Clearly, the commune estimates should be treated with caution and should not be used as the sole criterion in targeting resources.

### Intracluster correlation

One of the weaknesses of the poverty mapping methodology applied in Vietnam is the failure to account for the possibility of intracluster correlation in the disturbance terms from the first-stage regression model estimated using the VLSS data. Failure to accommodate for this possibility may mean that standard errors are underestimated. Elbers, Lanjouw, and Lanjouw (2003) recommend that specific steps be taken to minimize the influence of location effects by incorporating into the underlying consumption model variables that are explicitly intended to control for such effects. For example, they recommend that a set of means calculated on the basis of the unit record census data at the level of the primary sampling unit be inserted into the estimation model. The international experts who led the Vietnam poverty mapping exercise adopted this method at a later stage and found that it did not have an important impact on the estimates.

### Access to census data

Raw data from the 1999 Population and Housing Census are not available to the public. However, samples of the data may be purchased from the GSO following submission and acceptance of a formal request spelling out in detail the variables needed and the purpose for which the data will be used. To keep costs down at first, only a 3 percent systematic sample was bought from the GSO, which was deemed sufficient for generating estimates at the provincial level. When the data appeared suitable for the application of the small area estimation methodology, the interest in producing more disaggregated poverty maps grew. This meant a much larger sample of the census data was needed. The poverty mapping proposal submitted to the World Bank by the International Food Policy Research Institute, the Institute of Development Studies, and ICARD to produce higher-resolution poverty maps therefore included a budget item for purchasing a 33 percent systematic sample from the GSO. This was the largest proportion of the population census the GSO was willing to make available. This is unlikely to change in the near future.

### Outdated census data

An important weakness of the national high-resolution poverty maps relates to the fact that the census and survey data on which they have been based were collected in 1999 and were thus four years old at the time the mapping results were made available and

distributed in 2003. In a country where poverty has been declining at an average of 3.5 percentage points per year, such poverty data may no longer be regarded as relevant (see below). In addition, because Vietnam is witnessing rapid migration, in particular from rural to urban areas, population data from the census are also likely to become out of date quickly. The 2004 midterm population census in Ho Chi Minh City showed that immigration there had been much more significant than originally thought and that administrative records on this phenomenon were incomplete.

### Incomplete survey coverage of mobile urban population groups

The poverty maps estimated for Ho Chi Minh City in 2005 were based on the 2004 provincial census and the 2002 VHLSS. The estimation models were based on the 2002 VHLSS data from the urban sample in the Southeast (the region in which Ho Chi Minh City is located). Given the uniqueness of Ho Chi Minh City, it would have been better to use only the data from urban Ho Chi Minh City, rather than data from the whole region, to estimate the regression coefficients. But the urban data provided unsatisfactory results. One of the key problems is the failure of the VHLSS survey to capture urban poverty sufficiently accurately. Although the survey sample is based on household lists from the census and is, in principle, updated using local administrative records, this approach might be problematic in reality given that these records are incomplete and seem to miss large parts of population groups that are more mobile. This is corroborated by the 2004 Ho Chi Minh City population census. Given that these mobile groups are likely to constitute a large fraction of the urban poor, omitting them from the living standards survey sample would have led to biased estimates of the regression coefficients and thus, ultimately, of the small area poverty estimates on this city. Unless the VHLSS is able to cover urban poverty adequately, producing reliable poverty maps for urban areas will be difficult.

### Conflicting methods for measuring poverty

Official poverty rates in Vietnam are not based on the VHLSS, which is used, in combination with the population census, to produce the poverty maps (see elsewhere above). Given the unofficial nature of the VHLSS poverty estimates, the poverty maps have suffered from a similar unofficial status. However, Molisa has come under increasing criticism from various parts of the government for its approach to poverty measurement, and the VHLSS approach is finding gradual acceptance as a more reliable method among planners and policy makers at the national level. This represents an opportunity to seek more official recognition for subnational small area poverty estimates and maps.

### Explaining the methods to nonspecialists

Lastly, the poverty mapping techniques follow rather complex procedures that are difficult to explain to policy makers. The estimation techniques tend to be regarded as a black box, and this has led to doubts about the validity of the estimates.

## The Findings of the Poverty Mapping Exercise

### Dissemination

The small area poverty estimates on districts and communes using the 33 percent sample of the 1999 Population and Housing Census and the 1998 VLSS became available in mid-2003. They were presented to the poverty mapping steering committee by members of the Interministerial Poverty Mapping Task Force at a workshop held at the Ministry of Agriculture and Rural Development. Later that year, the results were presented at a larger forum to which all members of the Poverty Task Force were invited. At that time, the Poverty Task Force constituted the main mechanism for interaction among the government, donors, and nongovernmental organizations on poverty policy work.

Reports in Vietnamese and English that described the methodology and the main findings were distributed at these events (see Minot, Baulch, and Epprecht 2003). Various large, colorful, poster-sized poverty maps were also distributed. Compact discs were produced that included all the poverty, poverty gap, and inequality estimates and other data on communes, districts, and provinces. The discs allowed users to make their own maps for areas of the country that were of particular interest to them.

Since the workshop, the maps, reports, and compact discs have been reissued many times and circulated widely. Several of the maps have been reproduced in other documents, including publications of the World Bank, other donors, and NGOs. They have also been reproduced in a national newspaper and shown on television. The maps were presented to a large number of researchers and officials in various places throughout the country as part of an exercise to disseminate the 2003 World Bank poverty assessment. Currently, the maps are available on the Web site of the Institute of Policy and Strategy for Agriculture and Rural Development as part of an online socioeconomic atlas of Vietnam (see <http://agro.gov.vn/news/default.asp>).

### Key findings

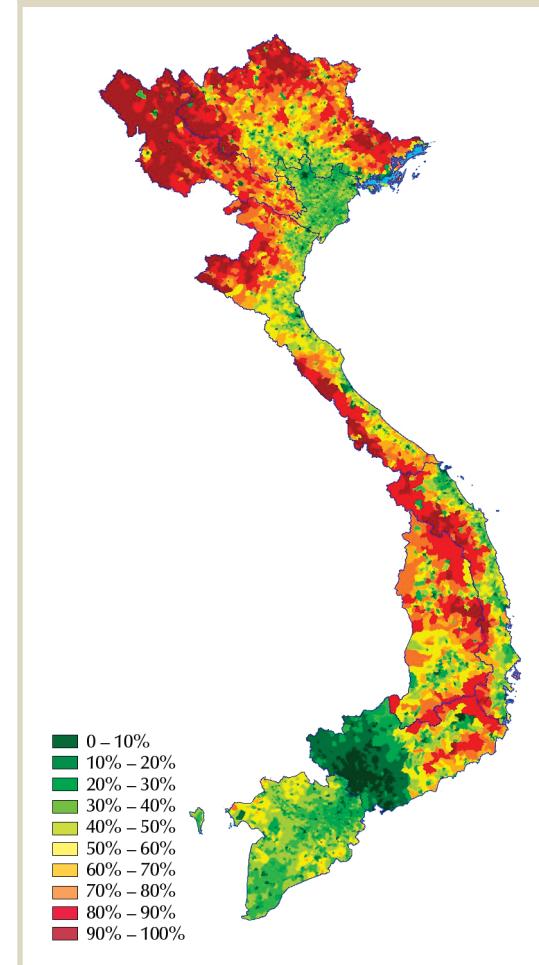
The poverty maps provide estimates of poverty headcounts for provinces, districts, and communes. Large color maps have been reproduced using these estimates. The maps provide a striking visual account of the depth of poverty in the mountains to the north, the upland areas along the coast, and the Central Highlands. They show much lower levels of poverty in the Southeast (where Ho Chi Minh City is located), other lowland areas, the Mekong River Delta, and the Red River Delta. These findings may not be surprising to those already familiar with the VHLSS data. Nonetheless, there appears to be a strong correlation between poverty and geography rather than between poverty and administrative boundaries, a link that is not evident from a list of provincial poverty headcounts. The maps also provided a visual account of inequality in Vietnam for the first time, a topic of much concern to policy makers. The maps showed differences in poverty levels that were much starker than the differences indicated by the data that had been

circulated previously. The district and commune poverty maps strongly support the argument that assistance should be targeted on less densely populated, largely forested, ethnic minority areas (for example, see figure 14.2). The poverty team at the World Bank routinely uses these maps, alongside a map of ethnicity from the population census, to show the correlation between ethnicity and poverty.

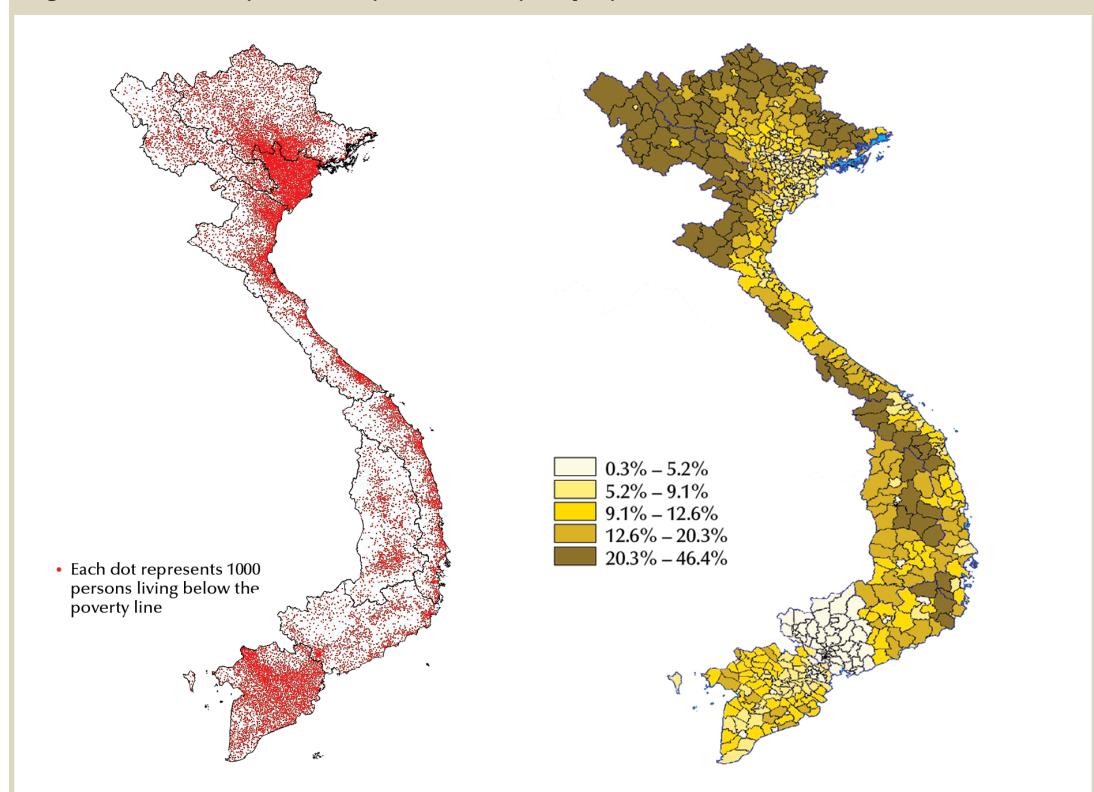
A second map was produced showing the density of poverty in Vietnam (see figure 14.3). This map indicates that the density of poverty is highest where the population density is highest, that is, in the two delta areas of Vietnam and along the coastal lowland areas. This map is almost an inverse of the map showing the incidence of poverty in that the poverty headcounts are highest in more sparsely populated areas. Some actors consulted as part of this review of the impact of poverty maps recalled the map on poverty density more clearly than the map on poverty incidence. When used on its own, this map supports an entirely different argument for resource allocation. When an objective is set to reach the maximum number of people living under the poverty line, the density map used alone suggests a pattern of resource allocation that would be targeted at the more accessible and more rapidly growing parts of the country. A third map, depicting the poverty gap across Vietnam, demonstrates that poverty is not deep in the areas of greatest poverty density (see figure 14.3).

The poverty team in the World Bank uses these three maps together to demonstrate the message that, though large numbers of poor people reside in the deltas, their poverty is not extreme and is likely to be substantially reduced through continued rapid economic growth. By contrast, the areas with high poverty headcounts are experiencing much deeper poverty that is unlikely to be addressed in the medium term by continued growth alone. This message is reinforced by a map developed by World Bank staff in Vietnam from the same data set that shows the cumulative poverty gap, which multiplies the number of poor people in a district by the average poverty gap of that district (see figure 14.4). The poverty density maps are in the public domain and may be (and are) used individually to support alternative arguments for targeting.

**Figure 14.2 Incidence of Poverty in Communes, Vietnam**



Sources: Minot, Baulch, and Epprecht 2003.

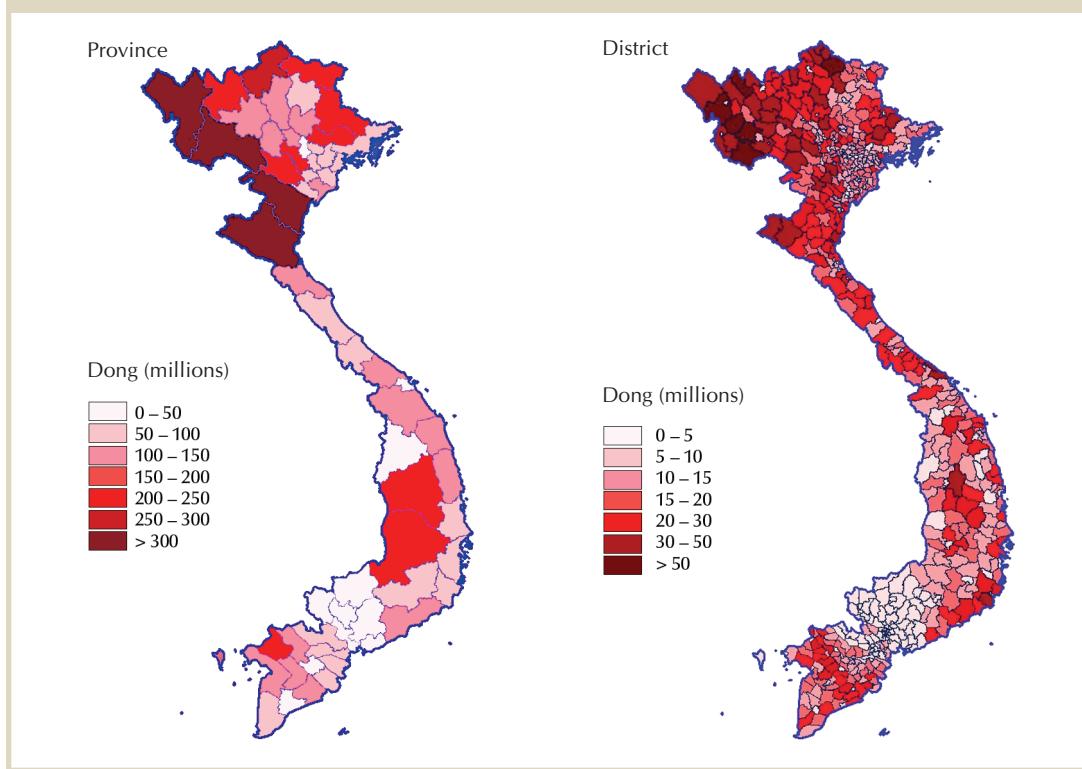
**Figure 14.3 Density of Poverty and Poverty Gap by District, Vietnam**

Sources: Minot, Baulch, and Epprecht 2003.

A further finding arises from the comparison of maps depicting the poverty headcounts in the provinces, districts, and communes (see figure 14.5). This shows the considerable heterogeneity within provinces in many parts of the country. Many rich provinces have several poor districts, while the reverse is true for several poor provinces. By extension, many richer districts include a large number of poor communes. A significant share of the budget is allocated by provincial governments, often using little more than population figures as a basis for determining the distribution across districts. We use these maps to show that more sophisticated criteria might be appropriate as a basis for allocating resources designed to tackle poverty.

### Reactions to the initial findings

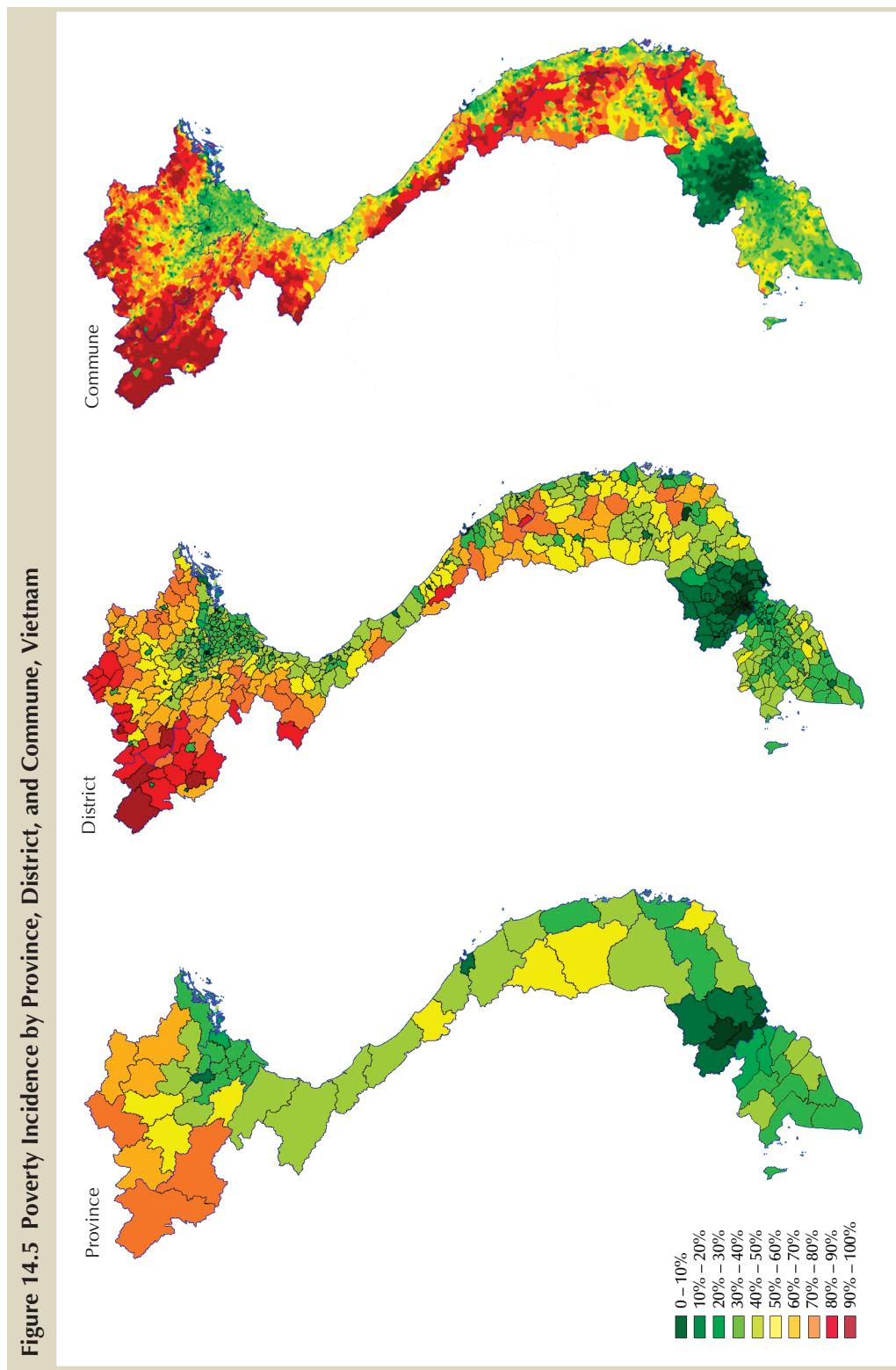
Reactions to the poverty maps were mixed across government authorities. Many researchers and officials found it helpful to have a visual account of inequality, an issue of great concern to the central government. Because the levels of poverty illustrated by the poverty

**Figure 14.4 Cumulative Distance below the Poverty Line by Province and District, Vietnam**

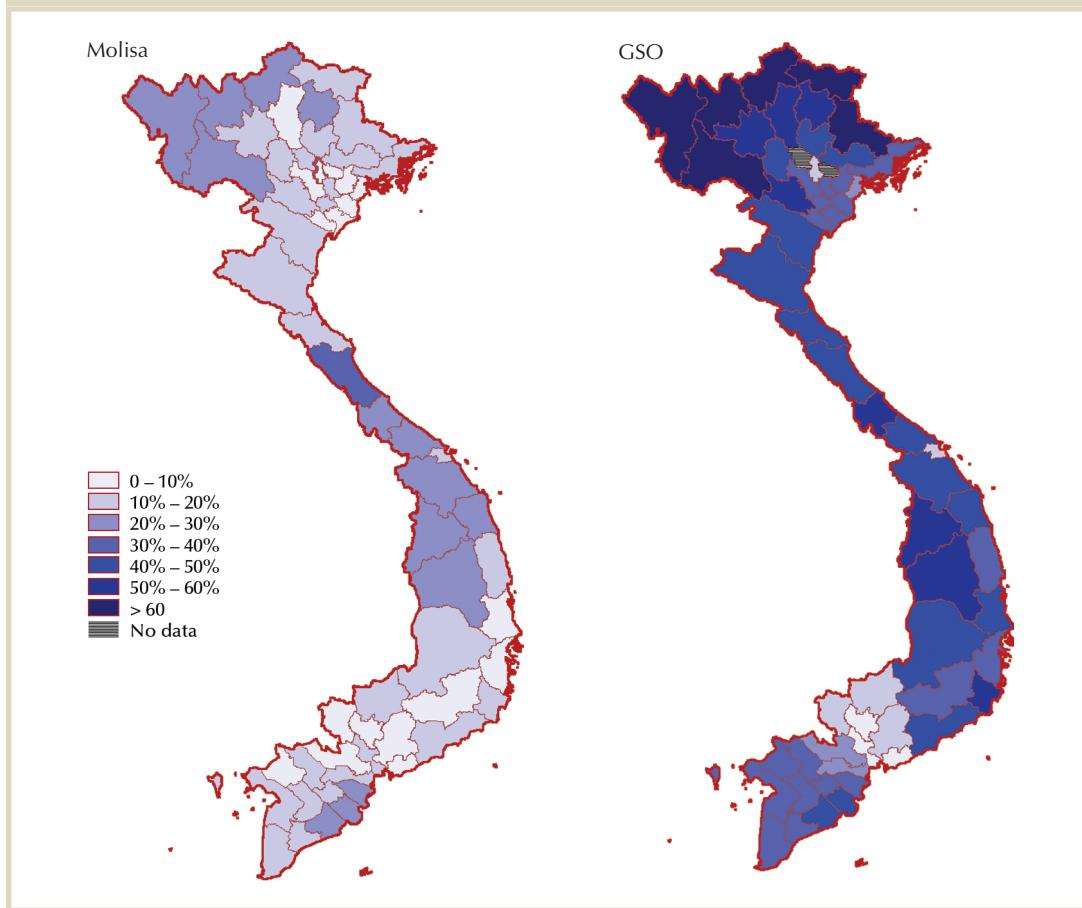
Sources: World Bank estimates.

maps closely agreed with the fieldwork of researchers, many agencies found the maps quite credible and convincing. The least positive feedback came from Molisa, where misgivings about the maps arose from the following factors. First, the data used for the poverty maps came from sources that were different from the official poverty data. The official data were not, at that time, derived from the VHLSS, but through an entirely different process involving local counts of poor people (see elsewhere above). Despite misgivings about this traditional poverty measurement method in some parts of the government, most officials were reluctant to accept any method that deviated radically from official measures. The rather technical nature of the small area calculations also did not help win over the acceptance of government officials.

The two maps in figure 14.6 show the extent of the differences between the official poverty rates and the rates based on the small area estimation methodology. Both maps show estimates of poverty for 1999. The first picture comes from official Molisa sources. The second shows the poverty mapping estimates using the 1999 census and the 1998 VLSS. The levels of poverty indicated through the mapping exercise are much higher



Sources: Minot, Baulch, and Epprecht 2003.

**Figure 14.6 Poverty by Province, as Estimated by Molisa and GSO, Vietnam 1999**

Sources: Molisa 2000; Minot, Baulch, and Epprecht 2003.

than the poverty found in the official data. The maps also show much higher levels of absolute inequality. This is perhaps the single strongest message that many people took away from the maps, probably because it matched their intuition and experience.

The differences in the sources for these poverty data are compounded by a second factor: timing. Because the official data are updated annually, Molisa already had 2002 estimates available as a basis for comparison with the 1999 poverty maps when the maps were released. Given the variations in data sources and timing, Molisa and a large part of the government were disinclined to adopt the messages emerging from the small area estimation poverty maps and rarely used the maps to guide their targeting decisions. Many government officials, however, found the findings interesting and wanted to know more.

One such agency is CEM, which requested training in poverty mapping techniques. It is now expressing interest in using any updates of the poverty maps as aids in targeting

resources under its support efforts for poor communities. The GSO has included in the next agricultural census the variables used for the poverty mapping so that updates of the poverty maps may be produced ahead of the next full census.

### **Updating the poverty maps**

The high level of interest of planners and policy makers in the poverty mapping methodology, especially if this methodology may lead to updated estimates, prompted the World Bank to support two attempts to update the poverty maps (see the section on Technical Aspects for a detailed description of the process). One attempt consisted of updating the maps using a new household survey that had become available. The second attempt tried to arrive at new poverty estimates by updating the census variables through fieldwork.

The team involved in the first attempt combined the 1999 census with the 2002 VHLSS. They found this approach unproductive. The estimated poverty rates were approximately the same as those based on the combination of the census and the 1998 VLSS. Given that, according to the direct measurements of consumption expenditure in the 2002 VHLSS, poverty had declined by 8.5 percentage points since 1998, the finding that poverty had remained constant was not credible. Although the relationship between expenditure and many of the household characteristics had changed, this had not led to a change in the estimated poverty rates. Clearly, lower levels of poverty had become manifest in changes in household characteristics. Without updates on the household characteristics, the new estimates would lead to the same poverty rates because the new estimates continued to rely on the same 1999 census data. However, the regression estimates showed that, between 1998 and 2002, rural poverty had become more strongly associated with a number of household characteristics. These included status as part of an ethnic minority and low educational attainment of the spouse. Also, for both rural and urban areas, some of the regional dummies became less strongly associated with higher household expenditures. Factors that are less region specific had obviously become more important in explaining poverty (see Nguyen et al. 2004a).

The effort to update the poverty maps through local data collection was conducted in nine communes. In all communes, the poverty rates estimated on the basis of expenditure measures gauged through household characteristics were much lower than the poverty rates estimated on the basis of the collected expenditure data. One reason for this appeared to be that the collected expenditure data were lower than the actual expenditures since the data were collected using simplified questionnaires (see Nguyen et al. 2006). This is likely to have led to an overestimation of poverty, making a comparison with the poverty mapping method impossible.

Looking forward, efforts to update the maps regularly will focus on ways to update the data on household characteristics (the census variables) because new surveys and updated estimates of coefficients seem to have little impact on the poverty estimates. Efforts to test methods to update the data on household characteristics so as to calculate new commune or district poverty rates should include more rigorous verification of

the test results. This should include (1) direct poverty estimates calculated from reliable expenditure or income data on a large number of households in the area and (2) discussion with key local informants on the relative ranking of communes or districts by poverty level. Use might also be made of data from the 2006 agricultural census.

### Using poverty mapping to identify proxy indicators

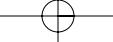
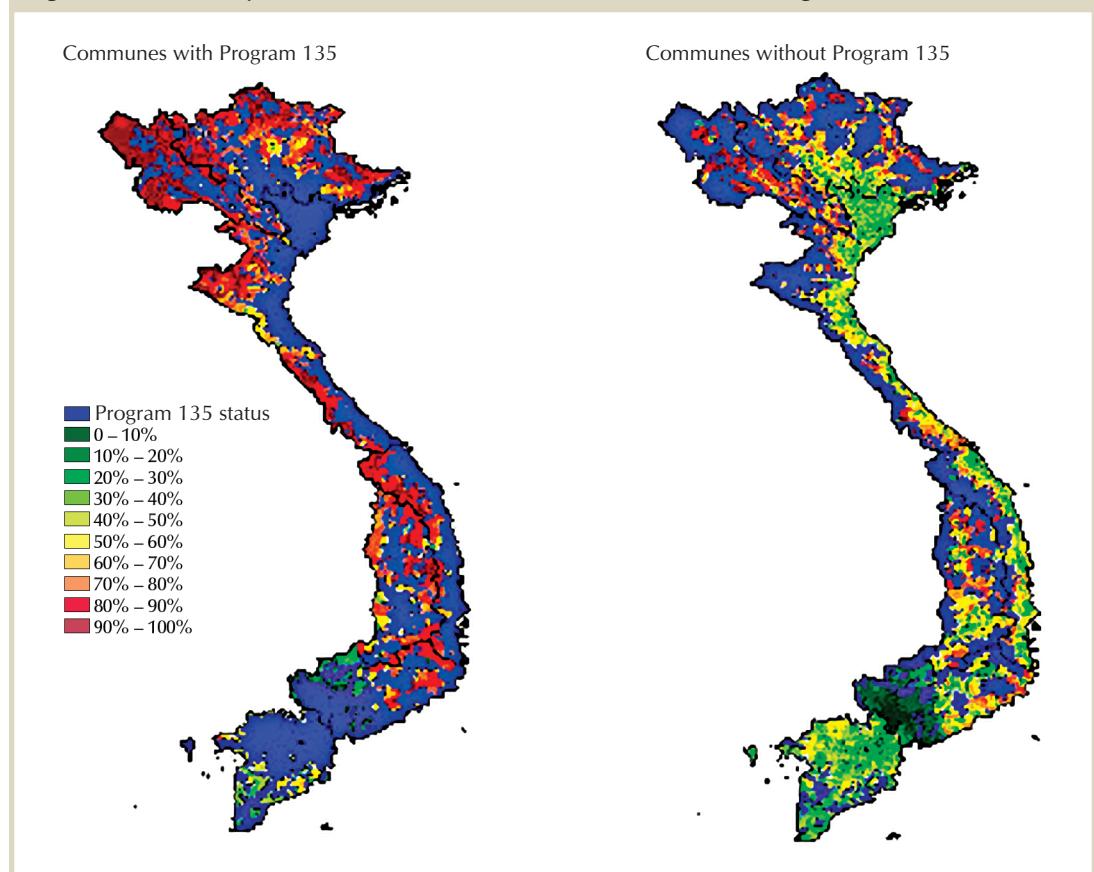
The use of household characteristics from the census as proxy indicators for poverty caught the imagination of staff at the ILSSA and Molisa. The targeted programs managed by Molisa are aimed at households or individuals, rather than small areas. The staff there wanted to test whether these household characteristics might be used to predict whether a household is poor or not. This test was conducted using data from the 2004 VHLSS. The results showed that the coverage rate of this method is only 57 percent, excluding 43 percent of poor households. The leakage rate is lower, suggesting that about one-quarter of the households are miscategorized as poor (see Nguyen et al. 2006). In short, this analysis showed that selecting poor households through poverty indicators might not be as straightforward as was thought.

### Overlaying the poverty maps with information on program coverage

The overlay of the poor communes selected by the government for special assistance under Program 135 showed that nearly all selected communes were in poor areas and that nearly all poor areas were included, but that some gaps existed, particularly in the Northwest (see figure 14.7). The good coverage is partly caused by the fact that Program 135 focuses on remote communes, most of which are poor. In addition to remoteness from infrastructure and services, the selection criteria also include the proportion of ethnic minorities in the communes, which is also strongly associated with poverty. The gaps exist especially in areas that are to be flooded once a new hydropower dam is completed nearby. However, CEM was somewhat disturbed by the exposure of these gaps and wanted to study them more before commenting.

### Producing an urban poverty map

The research team that produced the poverty mapping estimates for Ho Chi Minh City using the city's 2004 midterm provincial census found that there are very few people in the city who are living below the national poverty line. The use of a poverty line established by the Ho Chi Minh City authorities that is about two times higher than the national poverty line resulted in higher levels of poverty (2.6 percent, on average). The highest poverty rates were found in the outlying rural areas of Ho Chi Minh City. Differences in poverty among city districts were low and insignificant (Institute of Economic Research 2005). This is not in line with observations and other data that show that pockets of poverty exist in some urban wards of the city, especially in areas with large numbers of migrants. This finding is probably related to the difficulty in estimating an

**Figure 14.7 Poverty Incidence in Communes with and without Program 135, Vietnam**

Sources: Nguyen et al. 2004b.

Note: On left map, communes without Program 135 are shown in blue. On right map, communes with Program 135 are in blue.

expenditure equation for urban Ho Chi Minh City from the VHLSS, which, in turn, is likely to be caused by insufficient VHLSS coverage of urban migrants. In fact, the midterm census for Ho Chi Minh City indicated that the proportion of people with temporary registration status is 30 percent, whereas only 10 percent of urban residents in the urban southeast sample of the VHLSS (which is heavily dominated by Ho Chi Minh City) have temporary registration status, providing more evidence that the VHLSS leaves out greater proportions of more mobile population groups. This issue is now receiving the attention of the GSO.

## Impact

### Impact of the national poverty maps

The poverty maps were introduced primarily to promote well-informed debate on poverty and inequality by producing poverty estimates disaggregated at the subprovincial level.

The results showed that it was possible to use high-quality survey and census data to generate poverty estimates for provinces, districts, and communes and that the methodology might be used to aid in decisions about targeting. This demonstrated that there was potential to replace the cumbersome and unreliable annual income surveys and the counts of poor people conducted across the country by Molisa. There was no explicit objective to use the poverty maps to encourage revisions to any specific government policies.

As a preliminary step to drafting this chapter, the World Bank conducted a number of interviews and sent a brief questionnaire to people who had seen the poverty maps. The questions covered the exposure of these people to and use of the maps and their recall on the main messages of the maps. The questionnaire was sent to 17 donors, 12 journalists, 9 researchers, 5 NGO representatives, 3 independent development professionals, and 9 officials in Ho Chi Minh City. There were 46 respondents, who answered that they had used the poverty maps in the following ways:

- *Improving their understanding of poverty.* Most respondents stated that they had used the main messages of the poverty maps in explaining poverty to their own organizations, in their dialogue with the government, and (particularly the NGOs) in their discussions with development professionals seeking to learn more about poverty in Vietnam. The journalists said they had used the maps as background for articles, sometimes reproducing the maps. Several researchers had used the maps in lectures or in publications. The maps were used as an aid in discussions in a number of organized forums, including the Poverty Task Force and the Partnership to Assist the Poorest Communes.
- *Targeting resources.* A number of respondents at donor organizations and NGOs said they had used the poverty maps in allocating resources. This involved setting priorities for new programs, adjusting the allocation of resources in ongoing programs, and arguing for more propoor public expenditures within sectors where these organizations are active. One donor used the poverty map overlay of the communes selected for Program 135, which are actually the poorest communes and include nearly all poor communes in Vietnam, as a basis for providing budget support for one of the government programs that channels additional resources to poor communes. NGOs, in particular, used the maps as an advocacy tool to influence others to allocate resources in a more propoor manner. The Office of the National Assembly reported that it, too, had used the poverty maps to argue for more resources for poorer areas. Some respondents had used the maps to argue for the targeting of areas of dense poverty, rather than deep poverty.
- *Rethinking poverty measurement techniques.* As a powerful instrument for generating debate about the different results from the use of different poverty data, the poverty maps have encouraged recognition that the official poverty measurement and targeting techniques relying on Molisa data are flawed. This was confirmed by subsequent research (see Nguyen and Rama 2004). The debate has led to the definition of a new poverty line that brings official poverty estimates much closer to the estimates derived

from the household surveys. The debate has also prompted a series of investigations into new targeting techniques and demonstrated the need for more independent data sources, a need that had not been previously recognized.

Discussions with government agencies about the value of the poverty map exercise suggest that there have been a number of benefits arising from the process of preparing the maps. The institute leading the research argues that the approach to the work—the establishment of a multistakeholder task force—set a precedent for cross-agency collaboration that has since become normal in government operations. There had previously been little collaboration across government agencies in the production of analytical work, particularly in poverty analysis. Poverty analysis had previously been associated with the targeted Hunger Eradication and Poverty Reduction Program coordinated by Molisa, rather than with policy development across a range of sectors.

In addition, government agencies noted the capacity that the poverty mapping exercise had built. There are now a number of Vietnamese experts able to construct poverty maps with minimal outside support, indicating a sustainable improvement in the capacity to use poverty data to influence debate (see below on Sustainability). One government agency also argued that the poverty mapping exercise had changed the government's approach to presenting data more generally. The poverty maps were an inspiration for a whole range of other mapping exercises, which vividly illustrate a number of social trends and other trends. For example, following the success of the poverty maps, ICARD and the GSO collaborated to produce a socioeconomic atlas of Vietnam using the 1999 data. This atlas, which includes the poverty maps, allows easy, visual cross-referencing between the poverty headcount and other indicators, such as the presence of forest cover. Helvetas, the Swiss Association for International Cooperation, is now using mapping techniques in Vietnam to motivate discussion at a subnational level in support of a provincial planning process to develop a more sound evidence base and to become more propoor by mapping a range of administrative and other data.

### **Impact of the Ho Chi Minh City poverty maps**

The results of the Ho Chi Minh City mapping exercise were made available at a dissemination workshop hosted by the Institute of Economic Research in December 2005. Representatives from the People's Council and from city departments, district officials, and researchers attended. Feedback from the attendees suggests that they found the poverty maps either "very useful" or "quite useful." Those most interested in using the maps as an instrument for policy design or resource allocation voiced concerns about the errors resulting from the absence of nonpermanent migrants from the Ho Chi Minh City sample of the VHLSS. They were interested in encouraging follow-up work that would reduce the likelihood of errors and that would investigate links between poverty and other indicators, such as access to basic services. Several officials mentioned that they had used the maps in internal reports, district plans, and research.

## Missed Opportunities for Influence

A number of factors constrain the level of influence that the poverty maps have had in policy- and decision-making processes. The two most significant limitations relate to the timeliness of the maps and their relationship to official poverty data. The focus of the dialogue at the national level rather than locally and, perhaps, the failure to engage with certain organizations as early and as energetically as might have been desirable have also been important.

### The timeliness of the maps and the conflict with official data

The poverty maps became available in 2003, around the time that the 2002 VHLSS data also became available. The 2002 VHLSS data showed clearly that rapid poverty reduction had continued and emphasized that the levels of poverty (though not the overall patterns of distribution) illustrated in the 1999 poverty maps were no longer accurate. While appreciating the higher levels of disaggregation available in the poverty maps, planners and policy makers within government were frustrated by the prospect of using old data as a basis for planning. Moreover, the fact that the poverty maps used nonofficial poverty data was an additional reason for reluctance to use the poverty maps formally in decision making or in government documents. These factors did not mean that the poverty maps were not used informally (even within the government) in framing debate and in identifying issues to be tackled. But they certainly inhibited the degree to which the maps were used formally, a problem that was recognized at the outset of the exercise. Even with hindsight, it is not clear what more might have been done. Arguably, the maps might have been produced more quickly had the balance of the work taken place outside the country, with less iteration and interaction with local officials. But this would have required trade-offs in capacity building and local ownership.

The maps are now well out of date and are used less frequently in presentations and publications. There is an urgent need to update them. The poverty team in the World Bank office in Vietnam is supporting a number of activities to produce updated maps. Official data at the national level might now be more closely aligned to the VHLSS, suggesting that the problems caused by the difference between the stories of poverty described in the VHLSS and the official data are less likely to arise in the future. Furthermore, the greater familiarity that now exists with poverty mapping techniques and the higher levels of enthusiasm for representing poverty data graphically suggest that updated maps would be well received.

### Engagement at subnational levels

Though one of the most significant potential uses of the poverty mapping methodology lies in the ability to provide decentralized, subnational government agencies with reliable poverty estimates, little effort has gone into validating and promoting the poverty maps

in the provinces. Large poverty maps may be found in central government and civil society offices in Hanoi, but they are very much less visible in offices in the provinces. Discussions on the poverty maps have generally taken place in Hanoi and are very frequently related to how the disaggregated picture of poverty should influence national decision making: for example, how the targeting of lagging regions by national agencies might be refined; how resource allocation criteria in the Ministry of Finance might be amended; and how inequality might be tackled more effectively.

The poverty maps were discussed at regional workshops as part of efforts to disseminate the poverty assessment produced in 2003. But the audience at these workshops consisted primarily of local researchers based at regional universities. A systematic attempt to disseminate the findings of the poverty maps to 64 provinces in a meaningful way would require considerable resources.

There might also have been a process to work with provinces to tackle the disparity between the districts and to reflect on improved resource allocation at the subprovincial level. This was not actively pursued, partly because the problems arising from the conflict between official poverty data and the VHLSS poverty data are compounded in the provinces because provincial officials have generally had less exposure to the VHLSS data. The Molisa estimates on poverty in the provinces and districts are available to provincial officials, but these officials are less likely to recognize an estimate derived from the VHLSS or the poverty maps. When discussions have taken place with local officials about the poverty maps, the officials have been disinclined to base their work on poverty data that they have not been authorized to use. Had some kind of validation exercise taken place in collaboration with local officials, the understanding of and commitment to the maps might have been more substantial.

The work carried out in 2005 in Ho Chi Minh City to combine the 2004 midterm Ho Chi Minh City census data and the 2004 VHLSS data has nonetheless generated considerable enthusiasm. This exercise produced poverty maps based on both the GSO poverty line and the higher, city-defined poverty line, and officials were able to compare the different views on poverty that resulted from the use of the different lines.

### Engagement with key national agencies

One important national process that the poverty mapping exercise might have influenced was the targeting work that has directed the flow of resources for Program 135. CEM is responsible for identifying poor communes to be included in the program. It therefore has an institutional interest in assessing commune poverty levels. CEM did not participate in the poverty mapping exercise. The value of engaging with CEM and the potential for assisting CEM in developing more robust means of targeting poor communes were recognized about 18 months after the poverty maps had been released. By that time, the data on which the maps are based was five years old. CEM is now engaged in some of the follow-up work.

Though the Ministry of Finance was part of the multiagency task force that was established as a governance structure for the poverty mapping exercise, there was little effort put into following up on the main messages of the poverty maps with the ministry. The poverty focus of public expenditure has improved quite remarkably over recent years, whether or not poverty maps have played a role. In any case, the ministry remains receptive to new ideas and suggestions on the allocation of resources across provinces in ways that promote social equity.

Lastly, although GSO staff members have been trained as trainers in poverty mapping techniques and contributed to many of the subsequent training sessions for other agencies, the GSO has never been central to the actual production of the poverty maps. A more central role for the GSO might have facilitated access to census and other data. But the decision to move the production of poverty mapping estimates closer to the users, that is, the sector ministries, was deliberate. It aimed at making sure the efforts would more easily feed into decision making.

## Sustainability

The 12 analysts of the Interministerial Poverty Mapping Task Force were closely involved in all the analytical work leading up to the preparation of the district and commune maps. As a consequence, they were able to explain the poverty mapping methodology to their colleagues and superiors in the respective ministries. However, only one of them, the NEU researcher, was able to conduct poverty mapping calculations without support from international experts. After the district and commune poverty mapping work was completed, the task force was no longer active. However, a series of follow-up activities have taken place since then. The original lead agency, ICARD, continued to produce maps of socioeconomic information from the census. But it was ILSSA that requested further training in poverty mapping techniques and in testing methods for updating the maps. Over the past two years, the NEU researcher has worked with a team of ILSSA researchers on a number of research topics. Foreign expertise was hired on only one occasion for this. The poverty work in Ho Chi Minh City was conducted entirely by Vietnamese experts.

In Vietnam, there is now a strong demand for poverty maps that may be updated regularly and that reflect local realities. Molisa wants to improve its targeting methods to address the weaknesses that have been exposed. It is interested in a method that enables the poverty maps to be updated from the bottom up through local data collection on household characteristics. Such a method might replace the ineffective income surveys and the reliance of Molisa on poverty reporting by local officials that is easily manipulated. CEM has communicated that it needs an updated map to conduct a midterm evaluation of its program to assist the poorest communes. This may perhaps be accomplished using the 2006 agricultural census. Little foreign expertise will be needed to meet these demands. However, support from international experts might still be required to test new approaches such as exploiting the panel component of expenditure surveys to update maps, using

administrative data on population movements to take account of migration trends in new poverty maps, and verifying the methods for bottom-up poverty mapping techniques. External help might also be required to apply the small area estimation methodology to map other indicators such as vulnerability or nutrition.

## The Lessons Learned

Together with other poverty analyses, the poverty maps have undoubtedly stimulated debates on trends in poverty, on the methodology underpinning poverty measurement, on the geographical dimensions of poverty and inequality, and on national resource allocation across provinces. The maps have led to increased demand for more independent data on poverty especially at the local level. The poverty team at the World Bank will continue to support efforts that provide reliable poverty data, disaggregated to the level where decisions are made. Future work in this area will respond to the lessons of the past 10 years of experience with poverty mapping. These lessons cover the following issues.

### Keeping up with changes and developing second-generation poverty maps

Vietnam is a rapidly changing country. Poverty has fallen by more than 3.5 percent per year over the last 10 years. The population is becoming increasingly mobile. In this context, techniques that depend on census data that become available only every 10 years are not going to provide a dependable flow of updated information for policy makers. Though past attempts to update the poverty maps have not been successful, ongoing work that is focused on updating the data on household characteristics and correcting for past technical errors will likely deliver interesting results.

### Improving outreach and use at subnational levels

The last few years have seen a growing focus on public expenditures to influence poverty. In particular, the Ministry of Finance has made efforts to revise the criteria and coefficients it uses in determining allocations across provinces. Remote and upland areas are increasingly favored in the allocation of the recurrent budget. However, little progress has been made below the provincial level. Population figures still seem to dominate in the calculations that determine how provinces allocate funds across districts and how districts allocate funds across communes. At these levels of decision making, access to reliable poverty data that local officials feel permitted to use and that they feel they may trust might make a difference in the way resources flow to poor areas.

### Strengthening the validation process

Future activities in producing second-generation poverty maps will include a process that may generate more effective technical and political validation of the small area estimates,

as well as a better local understanding and ownership of the numbers behind the maps. It is a significant challenge to reach out to 64 provinces in a meaningful manner using this kind of analysis. Nonetheless, the research with the ILSSA that sought to test the updating of poverty maps by collecting new data on household characteristics might have included an exercise to verify the results informally with key local informants. This would have been better than trying to compare the results with poverty estimates calculated from detailed income and expenditure data that appeared unreliable.

### **Improving the coverage of urban migrants in household surveys**

The poverty mapping work in Ho Chi Minh City demonstrated how the incomplete capture of nonpermanent migrants in the VHLSS might influence poverty mapping estimates. There is a need to examine how the sample for the VHLSS may be made more inclusive of mobile populations. The extension of the work to ward-level differences has been important in improving the understanding of urban poverty. This work has also taught us that there might be a useful collaboration between statistics offices and research institutes outside Hanoi.

### **Maintaining the emphasis on capacity building**

There has been a significant emphasis on capacity building throughout the poverty mapping work and among the team. This has paid off in the development of a small pool of Vietnamese experts who are confident in their ability to use poverty mapping techniques and a larger pool of Vietnamese experts who understand enough about the techniques to feel at ease with the products. Though working with local experts has meant that the maps have perhaps taken longer to produce than might have been the case had they been produced by a team of international experts, this approach has had benefits. It has meant that there is a team of experts available to explain the techniques in Vietnamese to more skeptical audiences. It means that dissemination and outreach may be carried out in Vietnamese and that requests for technical information may be satisfied quickly. If the people's committee of a province contacts the World Bank asking for a training course so as to understand and use the poverty maps, the existence of skilled local researchers means that it is possible to respond quickly and appropriately. Future work will continue to emphasize the need to build the skills of local researchers in these techniques.

### **Strengthening engagement with national agencies where it has been deficient**

Future activities will engage more directly with CEM, an agency that has a functional role in identifying poor communes. CEM staff are currently defining a revised list of poor communes, but they are hopeful they will be able to use any updated poverty maps that become available as they review this list in 2008.

### Continue responding to the demand for credible local poverty measurements

Replacing the currently flawed official poverty measurement approach with the poverty mapping methodology has never been a realistic objective. But the methodology has helped crystallize the debate at the local level and even at the level of national poverty measurement. The poverty mapping exercise has led to a search for reliable alternatives for the measurement of poverty to replace the current approach. The Ministry of Finance has expressed an interest in making subnational poverty rates part of its criteria for budget allocations. But it will do this only after a robust, reliable method has been identified that is accepted by subnational governments.

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