Efforts of the Philippine Statistical System in Poverty Mapping

Presented by
Jessamyn O. Encarnacion
National Statistical Coordination Board

Workshop on Geospatial Analysis for Attaining the MDGs And Sustainable Development
20-24 April 2009, Bonn, Germany
Outline of the Presentation

I. NSCB’s Role in the Compilation of Poverty Statistics

II. NSCB’s Poverty Mapping Efforts
   - Small Area Estimation
   - GIS-based Poverty Mapping

III. NSCB’s Role in Monitoring the MDGs
1. NSCB’s Role in the Compilation of Poverty Statistics

About the PSS

• The Philippine Statistical System is a decentralized statistical system

• Many government agencies generate statistics

  ➢ National Statistics Office
  ➢ Bureau of Agricultural Statistics
  ➢ Bureau of Labor & Employment Statistics
  ➢ Bangko Sentral ng Pilipinas
  ➢ DENR, DOT, DepED, CHED, DOH, DOST, etc.

• Need for a coordinating agency - the National Statistical Coordination Board
I. NSCB’s Role in the Compilation of Poverty Statistics

About the PSS

Executive Order 121 - January 30, 1987
Reorganizing the Philippine Statistical System and for Other Purposes

- Created the National Statistical Coordination Board (NSCB) as the highest policy-making and coordinating body on statistical matters in the country
I. NSCB’s Role in the Compilation of Poverty Statistics

About the NSCB

Some of Our Products

• Statistical Policies

• National Accounts of the Philippines
  ➢ GDP, GNP, Regional Accounts, Input-Outputs Tables, Satellite Accounts

• Official Poverty Statistics
  ➢ Poverty Threshold
  ➢ Poverty Incidence

• Environmental Accounts

• Philippine Statistical Yearbook, Regional Social and Economic Trends, Countryside in Figures
I. NSCB’s Role in the Compilation of Poverty Statistics

About the NSCB

Our Services

• Coordination services
  ➢ Inter-agency concerns
  ➢ Survey review system
  ➢ Designation of statistics
  ➢ Subnational statistical system

• Online statistical service - http://www.nscb.gov.ph
• National Statistical Information Center - a one-stop shop of statistical information in the Philippine Statistical System
I. NSCB’s Role in the Compilation of Poverty Statistics

Generation/compilation of the following poverty-related statistics/indicators:

1) Official poverty incidences and magnitude of the poor, by province, every three years;
2) Poverty statistics for the basic sectors;
3) City/municipal level poverty statistics; and
4) GIS-based poverty mapping.
II. NSCB’s Poverty Mapping Efforts

1. Small Area Estimation

- Philippine official poverty statistics are released every 3 years at the regional and provincial levels of disaggregation.
- All official regional poverty estimates (for 2000, 2003 and 2006) are reliable (having coefficients of variation (CVs) of at most 10%).
- In the case of the official provincial poverty estimates, 28 out of 84* or 33% of the provinces are reliable with CVs less than 10%, while 46% have acceptable CVs between 10 and 20 and 21% have CVs over 20%.
- No official municipal or city level estimates are generated
II. NSCB’s Poverty Mapping Efforts

- Official poverty statistics
  - national
  - regional (17)
  - provincial (81)
  - city/ municipal (1,623)
  - barangay
II. NSCB’s Poverty Mapping Efforts

Small Area Estimation Methodology
II. NSCB’s Poverty Mapping Efforts

Basic problem: No one data set

• Main source of information on income - household income and expenditure surveys - permit only limited disaggregation

• Very large data sources (e.g. census) typically collect very limited information on household income and consumption
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Aim

- Produce provincial-, municipal- and city-level estimates of poverty incidence, gap and severity based on official income-based provincial poverty lines by merging information from census and surveys.
Main idea

- Merge information from the two types of data sources to come up with small area poverty estimates
- “Borrow strength” from the much more detailed coverage of the census data to supplement the direct measurements of the survey
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Data Requirements

• Survey containing target variable \( Y \), independent variables \( X \)

• Census containing \( X \) (but not \( Y \))
II. NSCB’s Poverty Mapping Efforts

Two types of data sources:

1. Household surveys
   - include a detailed income and/or expenditure module
   - however, due to relatively small sample size, collected information is usually only representative for broad areas of the country, e.g., regions

Data sources for the Philippines:
2000 Family Income and Expenditure Survey (FIES) and Labor Force Survey (LFS)
II. NSC B’s Poverty Mapping Efforts

Two types of data sources *(cont’d)*:

2. Census data
   - available for all households and can provide reliable estimates at highly disaggregated levels such as cities and municipalities
   - however, census data do not contain income/expenditure information necessary to estimate poverty

**Data source for the Philippines:**

2000 Census of Population and Housing (CPH)
II. NSCB’s Poverty Mapping Efforts

Basic procedure

• Use the household survey data to estimate a model of per capita income ($Y$) as a function of variables that are common to both the household survey and the census ($X$’s).

• Use the resulting estimated equation/model to predict per capita income for each household in the census.

• The estimated household-level per capita income are then aggregated for small areas, such as cities and municipalities.
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Modeling

- Regression

\[ Y_{ij} = X_{ij} \beta + h_i + e_{ij} \]

Regression models were constructed that estimated the income of households based on household level and community-level characteristics.
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Production of small area estimates

2000 poverty estimates for each city/municipality, province (urban and rural):

- poverty incidence
- poverty gap
- severity of poverty
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NEED to update these city and municipal level estimates

- NSCB embarked on the Intercensal Updating of SAE Project in 2006 through the World Bank Trust Fund for Statistical Capacity Building (WB TFSCB)
II. NSCB’s Poverty Mapping Efforts

How to update these city and municipal level estimates?

2000 SAE

- 2000 Family Income and Expenditure Survey
- 2000 Labor Force Survey
- 2000 Census of Population and Housing

2003 SAE

- 2003 Family Income and Expenditure Survey
- 2003 Labor Force Survey
- 2000 Census of Population and Housing

Time-invariant (i.e., variables that may be considered “stable” over time)
### II. NSCB’s Poverty Mapping Efforts

#### Features of the 2000 and 2003 SAE methodologies used

<table>
<thead>
<tr>
<th>Features</th>
<th>2000 SAE</th>
<th>2003 SAE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2000 FIES</td>
<td>2003 FIES</td>
</tr>
<tr>
<td></td>
<td>2000 LFS</td>
<td>2003 LFS</td>
</tr>
<tr>
<td></td>
<td>2000 CPH</td>
<td>2000 CPH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identifying time-invariant variables</td>
</tr>
<tr>
<td>2. Variables used</td>
<td>Consistent across all data sets</td>
<td>Consistent AND TIME-ININVARIANT across all data sets</td>
</tr>
<tr>
<td>2. Models developed</td>
<td>National model</td>
<td>Regional models</td>
</tr>
</tbody>
</table>
Criteria used in choosing the regional model

• The relationship of the variables, whether positive or negative, on Y is generally consistent with earlier researches on poverty (e.g. education should have a positive effect on income).

• The models should be robust, which means that small changes to the model do not greatly affect the significance or signs of the variables.

• Estimated regional poverty incidence does not largely differ from the official regional poverty estimates.
### Distribution of the Coefficients of Variation of the 79 Provincial Level Poverty Incidence Estimates

<table>
<thead>
<tr>
<th></th>
<th>Official</th>
<th></th>
<th>SAE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq</td>
<td>Percent</td>
<td>&lt; RCF</td>
<td>Freq</td>
</tr>
<tr>
<td>&lt;10</td>
<td>34</td>
<td>44</td>
<td>44</td>
<td>74</td>
</tr>
<tr>
<td>11-20</td>
<td>39</td>
<td>50</td>
<td>94</td>
<td>5</td>
</tr>
<tr>
<td>21-50</td>
<td>5</td>
<td>6</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>&gt;50</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>
II. NSCB’s Poverty Mapping Efforts

Distribution of the Coefficients of Variation of the 1622 Municipal and City Level Poverty Incidence Estimates for 2003

<table>
<thead>
<tr>
<th>Coefficient of Variation</th>
<th>Freq</th>
<th>Percent</th>
<th>&lt;RCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>623</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>11-20</td>
<td>757</td>
<td>47</td>
<td>85</td>
</tr>
<tr>
<td>21-50</td>
<td>223</td>
<td>14</td>
<td>99</td>
</tr>
<tr>
<td>&gt;50</td>
<td>19</td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>
II. NSCB’s Poverty Mapping Efforts

Provincial level SAE of poverty

City/Municipal level SAE of poverty
II. NSCB’s Poverty Mapping Efforts

Other indicators where SAE technique was applied in the Philippines

- Proportion of households not meeting energy adequacy at the provincial level
- Provincial prevalence of underweight among 6-10 year old children
- District (or barangay) level estimation of the proportion of underweight Filipino children aged 0-5 years
- Proportion of stunted 0-5 year-old children at the provincial level
- Provincial prevalence of hypertension among adults
- Labor and employment statistics at the provincial level
II. NSCB’s Poverty Mapping Efforts

Relevance/Actual policy use of the 2000 and 2003 SAE of poverty

1. Targeting beneficiaries of programs and projects

Examples:

• Nationwide Conditional Cash Transfer implemented by the Government
• Deployment of unemployed registered nurses to the 1,000 poorest municipalities of the country to mitigate the effects of the economic crisis
• Establishment of livelihood projects for communities
• Enrolment of indigent population in health insurance sponsored programs
• Estimation of volume of rice needed in the “Food for Children” Program
II. NSCB’s Poverty Mapping Efforts

Relevance/Actual policy use of the 2000 and 2003 SAE of poverty

2. Policy formulation and planning

Examples:

- Design and implementation of the local poverty action plan
- Development of Medium-Term Regional Development Program
- Development of the Provincial Development and Physical Framework Plan in the preparation of Provincial Plan for Children
II. NSCB’s Poverty Mapping Efforts

Relevance/Actual policy use of the 2000 and 2003 SAE of poverty

3. Poverty monitoring

Examples:

- Monitoring of the MDGs at the subnational level
- Preparation of State of Children Report
- Assessment of nutritional situation of children
- Development of the human development index at the subnational level
II. NSCB’s Poverty Mapping Efforts

2. GIS-based poverty mapping

- Currently being implemented in 46 of the 79 provinces of the Philippines through NSCB Regional Divisions
- Indicators cover the following sectors/areas of concern:

1. Nutrition
2. Health
3. Water and sanitation
4. Peace and order/public safety
5. Basic education and literacy
6. Family care/psychosocial needs
III. NSCB’s Role in Monitoring the MDGs

- As the repository of MDG Indicators
- Statistical coordination mechanisms that support generation and dissemination of MDG indicators
- Dissemination of MDG indicators (e.g., MDG Watch, Compendium of Philippine MDG Indicators, Philippine MDG Country website - [http://www.nscb.gov.ph/mdg](http://www.nscb.gov.ph/mdg))
- Provision of technical assistance
### III. NSCB’s Role in Monitoring the MDGs

#### Dissemination of MDG indicators

**MDG Watch (National and Regional)**

**Philippines' Progress based on the MDG indicators as of September 2008**

<table>
<thead>
<tr>
<th>Goals/Targets/Indicators</th>
<th>Baseline</th>
<th>Target</th>
<th>Latest</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GOAL 1. ERADICATE EXTREME POVERTY AND HUNGER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>target 1</td>
<td>Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>indicator 3</td>
<td>Share of poorest quintile in national income</td>
<td>4.7 (1991)</td>
<td>increasing</td>
<td>4.8 (2006)</td>
</tr>
<tr>
<td>target 2</td>
<td>Halve, between 1990 and 2015, the proportion of people who suffer from hunger</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>indicator 5</td>
<td>Percent of household with per capita energy less than 100% adequacy</td>
<td>69.4 (1993)</td>
<td>34.7 (2015)</td>
<td>56.9 (2003)</td>
</tr>
<tr>
<td><strong>GOAL 2. ACHIEVE UNIVERSAL PRIMARY EDUCATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>target 3</td>
<td>Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>indicator 6</td>
<td>Net enrolment ratio in elementary education</td>
<td>84.6 (1990)</td>
<td>100.0 (2015)</td>
<td>83.2 (2006)</td>
</tr>
<tr>
<td>indicator 7a</td>
<td>Proportion of pupils starting grade 1 who reach grade 6</td>
<td>69.7 (1990)</td>
<td>100.0 (2015)</td>
<td>73.4 (2006)</td>
</tr>
<tr>
<td>indicator 7b</td>
<td>Completion rate in elementary education</td>
<td>64.2 (1990)</td>
<td>100.0 (2015)</td>
<td>71.7 (2006)</td>
</tr>
</tbody>
</table>
III. NSCB’s Role in Monitoring the MDGs

Dissemination of MDG indicators
Compendium of Philippine MDG Indicators

MDG 1
ERADICATE EXTREME POVERTY AND HUNGER

Target 1: Halve, between 1990 and 2015, the proportion of people who suffer from hunger

Indicator 1: Proportion of population below national poverty threshold

- The proportion of population living below the national poverty threshold has declined from 45.8% in 1991 to 30.4% in 2003.
- All regions in the country posted significant declines in poverty incidence of population from 1991 to 2003 with those experiencing the highest decline at 25.1 percentage points and the Autonomous Region in Muslim Mindanao (ARMM) posting the lowest decline at only 2.9 percentage points.
- For the period 2001 to 2003, MIMAROPA, Western Mindanao, Northern Mindanao, Southern Mindanao and Cagayan are experiencing an increase in poverty incidence of population.

Indicator 2: Poverty Gap Ratio

- Poverty gap in the Philippines has narrowed from 13.0% in 1991 to 8.4% in 2003 among the regions, for the period 1994 to 2000, the Cordillera Administrative Region (CAR) experienced the biggest improvement in narrowing poverty gap by 11.2 percentage points while Eastern Visayas only managed to narrow the poverty gap by 2.3 percentage points.
- Only ARMM experienced an improvement in poverty gap.

Indicator 3: Share of poorest quintile in national consumption

- From 1991 to 2003, the share of the income of the poorest fifth of the population to the total income remains unchanged at 4.7%.
III. NSCB’s Role in Monitoring the MDGs

Dissemination of MDG indicators

In September 2000, member states of the United Nations (UN) gathered at the Millennium Summit to affirm commitments towards reducing poverty and the worst forms of human deprivation. The Summit adopted the UN Millennium Declaration which embodies specific targets and milestones in eliminating extreme poverty worldwide.

To help track progress in the attainment of the 8 goals and 18 targets of the Millennium Development Goals (MDG) over the period 1990 to 2015, experts from the United Nations Secretariat and International Monetary Fund (IMF), Organisation of Economic Cooperation and Development (OECD) and the World Bank identified and selected a set of time-bound and measurable indicators. Data series on the 48 MDG indicators are compiled to provide the basis for the preparation of progress reports by member states of the United Nations (UN) on the implementation of the UN Millennium Declaration.
III. NSCB’s Role in Monitoring the MDGs

Localization of the MDGs

- Localization of MDG indicators through the NSCB Regional Divisions
- Policies to localize the MDGs (at least five)
- Mandates of local government units on MDGs (at least two)
- Development of an MDG Localization Framework
Maraming Salamat po!

URL: http://www.nscb.gov.ph
e-mail: info@nscb.gov.ph