Approaches to Determine and Represent Geographical Units Including Geocoding, for Statistics: Philippine Experience

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Agenda

• Introduction
• Use of Philippine Standard Geographic Code in Generation of Statistics
• Use of Digitized Maps in Delineation and Enumeration
• Sharing Map Shapefiles Holdings and Geography-based Statistics
• Future Directions
Introduction

- The Philippines is an archipelago of 7,107 islands
- 17 administrative regions
- 81 provinces
- 144 cities and 1,490 municipalities
- 42,028 barangays (or villages)
Use of Philippine Standard Geographic Code in Generation of Statistics

- PSA generates statistics for all levels of administrative areas using the Philippine Standard Geographic Code (PSGC) to uniquely identify each of the geographic units.
- As a policy, the PSGC is used as a common standard in coding geographic units in all censuses and surveys.
Use of Philippine Standard Geographic Code in Generation of Statistics

- The **Philippine Standard Geographic Code** (PSGC) is a systematic classification and coding of geographic areas of the Philippines.
- Based on the 4 hierarchical levels of geographical-political subdivisions of the country such as the administrative **region**, the **province**, the **municipality/city** and the **barangay**.
Use of Philippine Standard Geographic Code in Generation of Statistics

- The PSGC is a product of an inter-agency Technical Working Group (TWG) on Geographic Classification led by the National Statistical Coordination Board (NSCB)
- Members of the TWG include:
  - Commission on Elections (COMELEC)
  - Department of the Interior and Local Government (DILG)
  - National Statistics Office (NSO)
  - National Computer Center (NCC)
  - National Mapping and Resource Information Administration (NAMRIA)
  - Department of Budget and Management (DBM)
  - National Statistical Coordination Board (NSCB)
Use of Digitized Maps in Delineation and Enumeration

- Digitized EA maps are used in area delineation and enumeration.
- EA maps are used to ensure completeness of coverage and to avoid overlaps during censuses or surveys.
- Field personnel identify permanent features of the area such as rivers, streets, barangay roads, national roads, and landmarks that may serve as boundaries of the enumeration area or barangay.
- The boundaries are then indicated on the EA maps printed from GIS shapefiles. Usually, the printed EA maps are overlaid with Google maps to ensure proper identification of boundaries.
Use of Digitized Maps in Delineation and Enumeration

Nationwide Mapping Using GPS

- **Pilot mapping operation** was undertaken for the 2010 CPH to ensure accurate boundary maps covering barangays (or villages) with 2 or more EAs or highly populated areas in 5 regions.
- Key field personnel underwent training on census mapping using GPS.
- Equipped with GPS units, field staff went around most of the geographical units to verify and plot boundaries, rivers, roads and landmarks.
Use of Digitized Maps in Delineation and Enumeration

- **Provincial Office**
  - GPS data downloaded into map DB
  - Validation of shapefiles and overlaying with Google maps
  - Snapping of municipal, barangay and EA boundaries
  - Coding and labelling of geographic areas and landmarks

- **Regional Office**
  - Snapping of provincial boundaries
  - Quality check

- **Central Office**
  - Validation of shapefiles
  - Adherence to mapping standards, coding
  - Snapping of regional boundaries
Use of Digitized Maps in Delineation and Enumeration

- A **nationwide mapping** of area boundaries was undertaken during mapping activities for **2012 Census of Agriculture and Fisheries (CAF)**

- Mapping of areas with no digital maps were also undertaken using GPS units

- For the **2015 Mid-Decade Census of Population**, the PSA is currently conducting **EA delineation operation and updating of digitized maps**.

- With updated digitized maps, the PSA expects that all areas will be enumerated completely and accurately
Use of Digitized Maps in Delineation and Enumeration

Use of Map Shapefiles in the Development of Master Sample Frame

- Use of digitized maps, Google Earth maps and 2010 census block maps facilitates the development of PSU formation guidelines for the development of new master sample.
- The overlaid digitized maps help identify the natural boundaries such as rivers, roads or street patterns, and known landmarks in the area, results into a clearer and non-overlapping segment boundaries.
Use of Digitized Maps in Delineation and Enumeration

Use of Map Shapefiles in the Development of Master Sample Frame

- Clusters of roofs help in determining the presence of residents, community, and villages.
- This information could vastly improve the quality of new master sample frame for household-based surveys.
Sharing Map Shapefiles Holdings and Geography-based Statistics

- PSA shared its map shapefiles holdings and geography-based statistics with other government agencies, NGOs, and researchers.
- This is to encourage use of statistics in planning and research.
Sharing Map Shapefiles Holdings and Geography-based Statistics

• Users of PSA digitized maps include:
  – Department of Science and Technology’s Project NOAH for their Disaster Management Using WebGIS
  – NGO to assist mothers in setting up household-based stores in communities in selected provinces
  – National Mapping and Resource Information Authority (NAMRIA) acquired Barangay boundary shapefiles
  – National Economic Development Authority (NEDA)
  – National Anti-Poverty Commission (NAPC)
  – Department of Health (DOH)
The PSA also conducted workshops for municipal planning officers and regional statisticians on how to include data from 2010 CPH microdata into thematic maps using CSPro. The workshops equipped them with tools to present accurate profiles of their municipalities and regions.
Future Directions

• The PSA intends to include geospatial-based data visualization tools in its website in the near future

• PSA proposal to create a new division called Geospatial Information Management Division under the Philippine Statistics Authority
Future Directions

• Field Office Initiative to map buildings and housing units - a workable model for field offices

Digitized buildings

Red dots: housing units

Blue dots: establishments
Future Directions

- Field Office Initiative to map buildings and housing units - a workable model for field offices

Plotting
Bldg attribute
Future Directions

• Field Office Initiative to map buildings and housing units - a workable model for field offices

Concentration of plotted housing units
Future Directions

- Field Office Initiative to map buildings and housing units - a workable model for field offices

Plotting Attribute of Housing units
Thank you !