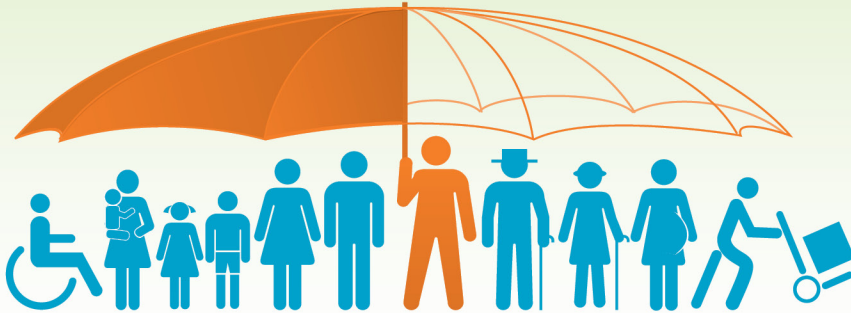


ADB



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Potential Use of Non-Traditional Data for Poverty and Social Protection Programs in the Philippines

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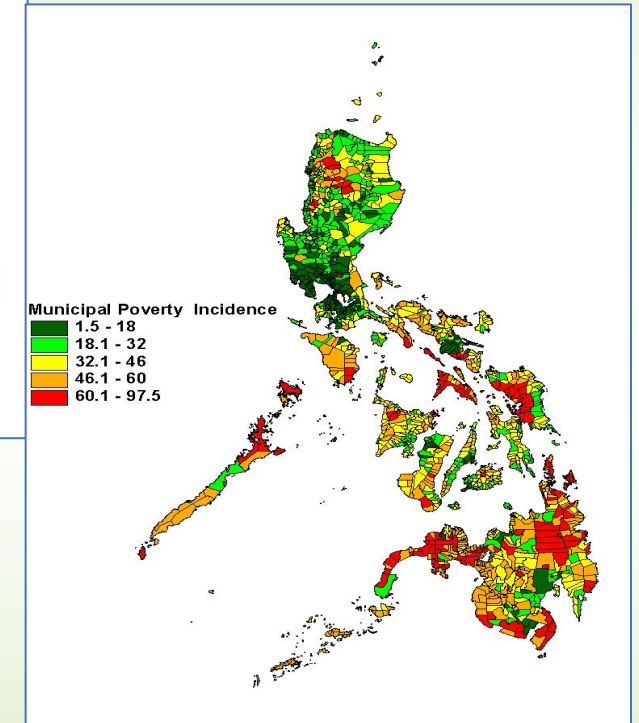
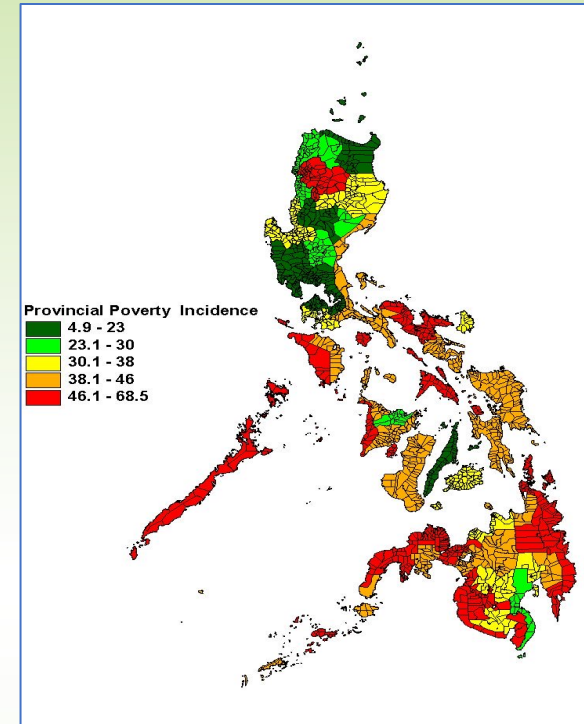
Outline

- Background
- Efforts of PSA in providing local level poverty estimates
 - Use of small area estimation methodology
 - Use of nighttime lights
 - The potential of Community-Based Monitoring System (CBMS)
- Use of satellite images for ADB's Bayan-Bayanihan Program



Background

- Many social protection and poverty reduction programs have limited resources, hence, the need to target and prioritize to ensure that the appropriate beneficiaries are identified.
- However, official poverty statistics released by the Philippine Statistics Authority (PSA) is only available at the national, regional, provincial and highly urbanized city levels.



Efforts of PSA in providing local level poverty estimates

Use of Small Area Estimation (SAE) Methodology

Main idea

- Merge information from different types of data sources
- “Borrow strength” from the much more detailed coverage of the census data to supplement the direct measurements of the survey

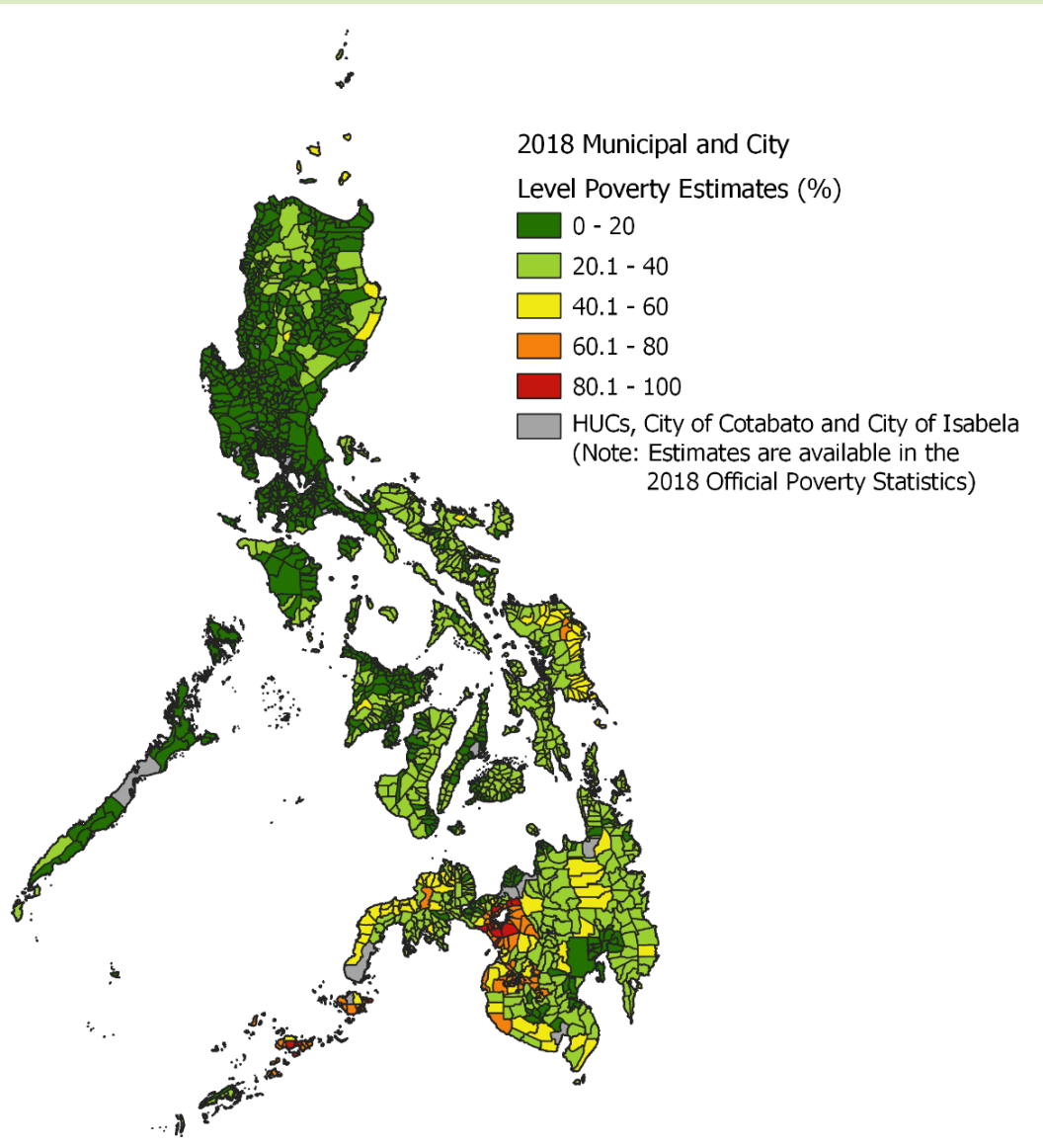
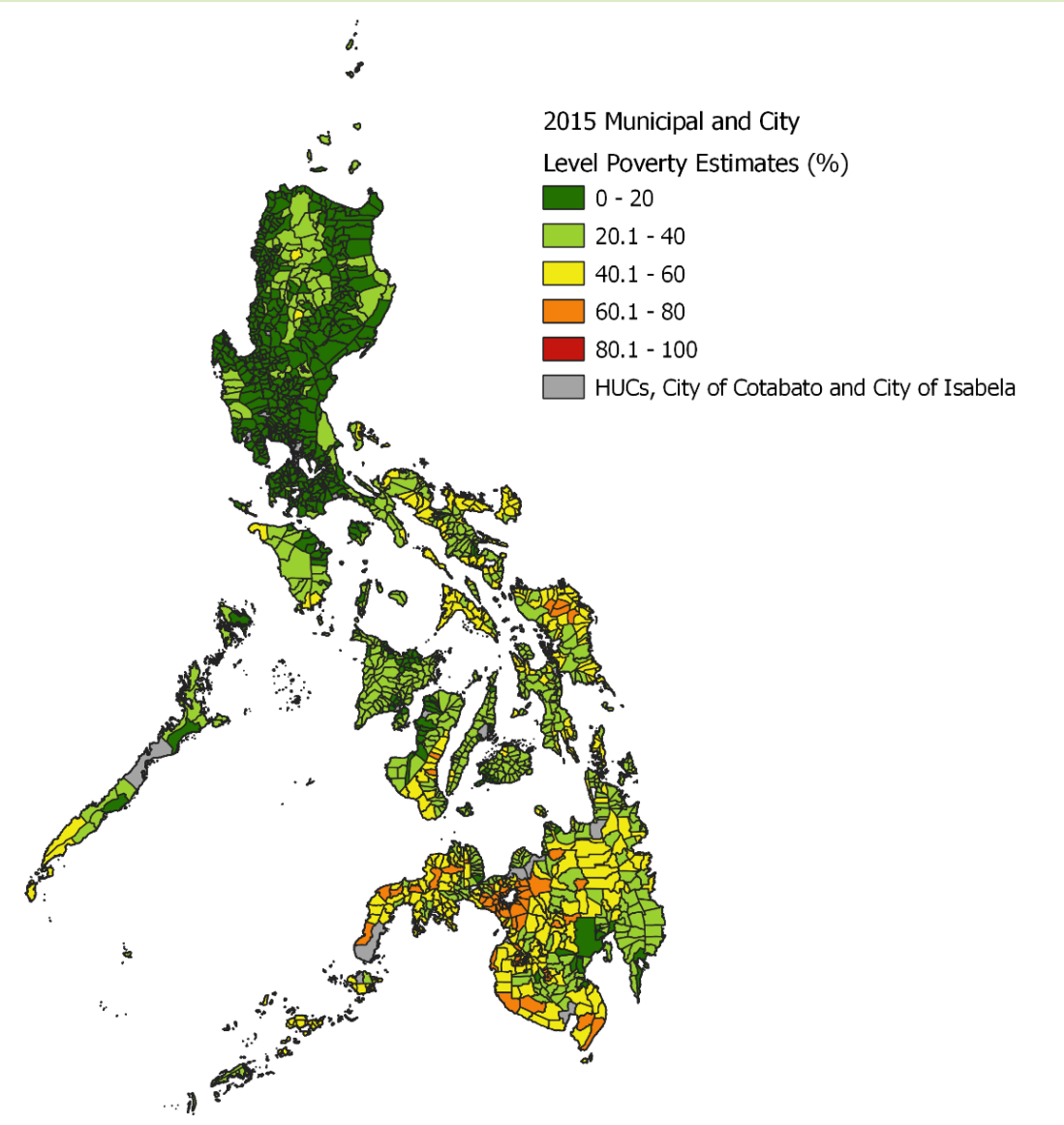
Basic procedure

- 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.
- Unbiased estimates and standard errors of poverty incidence, poverty gap and severity of poverty for small areas, such as cities and municipalities, are then generated by using bootstrap procedure.



Efforts of PSA in providing local level poverty estimates

Use of Small Area Estimation (SAE) Methodology



Efforts of PSA in providing local level poverty estimates

Use of Small Area Estimation (SAE) Methodology

Distribution of the Municipalities and Cities
based on the Coefficient of Variation of the Estimates: 2015 and 2018

Type of Estimates	Coefficient of Variation (%)	2015 ^{1/}			2018 ^{2/}		
		Count	%	< RCF	Count	%	< RCF
Reliable	At most 10.0	529	32.2	32.2	567	35.2	35.2
With acceptable measure of reliability	> 10.0 but ≤ 20.0	932	56.7	88.9	874	54.3	89.4
Unreliable	> 20.0 but ≤ 30.0	163	9.9	98.8	135	8.4	97.8
	> 30.0 but ≤ 40.0	16	1.0	99.8	29	1.8	99.6
	> 40.0 but ≤ 60.0	4	0.2	100.0	4	0.2	99.9
	> 60				2	0.1	100.0
TOTAL		1,644	100.0		1,611	100.0	

Notes: 1/ Still used the poverty thresholds released in October 2016 where the food thresholds were still based on the Consumer Price Index (CPI) market basket of prices for 2006. Excludes estimates for the Cities of Isabela in Region IX and Cotabato in Region XII.

2/ Excludes the estimates for the highly urbanized cities, and the Cities of Isabela in Region IX and Cotabato in Region XII. Their estimates are available in the 2018 Official Poverty Statistics.

- In 2018, 89.4% of the resulting estimates are with acceptable measures of reliability. The rest of the estimates should be used with much caution.
- The Municipality of Talipao in Sulu had the lowest CV of 2.4%, while the Municipality of Adams in Ilocos Norte had the highest CV of 80.3%.



Efforts of PSA in providing local level poverty estimates

SAE and Nighttime Lights

2018 Nighttime Lights Data of the Earth Observation Group (EOG) of the Colorado School of Mines



Nighttime Lights
 \approx
Economic Activity



Efforts of PSA in providing local level poverty estimates

SAE and Nighttime Lights

Comparison of SAE with and without Mean Luminosity Variable

Region/ Province/ HUC	2018 Official PovStat		2σ	With Mean Luminosity		Without Mean Luminosity	
	2018 Official	SE		2018 SAE	Difference (Official-SAE)	2018 SAE	Difference (Official-SAE)
Zamboanga Peninsula	32.7	1.3	2.6	30.9	1.8	30.0	2.7
Zamboanga Del Norte	45.4	3.0	6.0	44.4	1.0	42.7	2.7
Zamboanga Del Sur	23.7	1.7	3.4	22.3	1.4	21.9	1.8
Zamboanga Sibugay	35.4	2.6	5.2	32.5	2.9	31.7	3.7
City of Isabela	51.0	3.7	7.4	43.8	7.2	42.6	8.4
Zamboanga City	10.2	1.2	2.4	12.7	2.5	14.0	3.8

Efforts of PSA in providing local level poverty estimates

SAE and Nighttime Lights

Distribution of the Coefficient of Variations (CVs) of the SAE of Poverty Generated with and without Mean Luminosity

Grouping	With Mean Luminosity Variable	Without Mean Luminosity Variable
Less than 10	50	38
10 to 20	22	33
20 to 30	0	1
More than 30	0	0



Efforts of PSA in providing local level poverty estimates

Some Actual Policy Uses of Small Area Poverty Estimates

- Used by the National Commission on Indigenous People Region IV-A to serve as input/reference for the equitable distribution of funds for the Educational Assistance Program
- The Department of Agriculture used the SAE in the Panay Island Sustainable Agricultural Upland Development Project as basis to determine recipients of the projects in the pilot communities in order to address the need for nutritious and healthy food by building the capability of people in implementing upland agricultural and forest development programs.



Efforts of PSA in providing local level poverty estimates

Potential Use of the Community-Based Monitoring System (CBMS)



Republic Act No. 11315 or the CBMS Act was approved on 17 April 2019

The State shall adopt a CBMS that will generate updated and disaggregated data necessary in:

- Targeting beneficiaries
- Conducting more comprehensive poverty analysis
- Designing appropriate policies and interventions
- Monitor impact over time



Efforts of PSA in providing local level poverty estimates

Potential Use of the Community-Based Monitoring System (CBMS)

- Status:

a. 2022 CBMS Rollout: 323 PSA funded and 312 LGU funded

b. 2023 CBMS Rollout: 57 LGU funded

- Data will be used for prioritizing timely, relevant, and much-needed social protection programs of the government
- Will also be used for governance processes such as local planning, budgeting, etc.
- Plan is to conduct it in all LGUs next year



Use of daytime satellite images for ADB's Bayan-Bayanihan Program

ADB's Bayan-bayanihan Program

A food program by the Asian Development Bank (ADB) in partnership with the Philippines' Department of Social Welfare and Development and the private sector and in coordination with the Philippine Army during the Enhanced Community Quarantine, which started in Metro Manila in mid-March 2020.

The Program aims to distribute critical food supplies to the poorest areas of Metro Manila and nearby provinces during the lockdown.



The screenshot shows a web browser displaying an explainer article. The browser's address bar shows the URL: <https://development.asia/explainer/how-satellite-data-helped-get-food-hungry-during-c...>. The page header includes the Development Asia logo, navigation links for 'About', 'Topics', 'Countries', 'Sustainable Development Goals', 'All content', and 'Communities', and a search bar. The main content area features a red 'EXPLAINER' tag above the article title: 'How Satellite Data Helped Get Food to the Hungry during COVID-19'. Below the title is a photograph of two men in masks handling a large white sack of food. A caption below the photo reads: 'A COVID-19 emergency food program in the Philippines offered an opportunity to design a targeting program based on granular poverty maps that were compiled using traditional and innovative data sources and artificial intelligence. Photo credit: ADB.'



Use of daytime satellite images for ADB's Bayan-Bayanihan Program

ADB's Bayan-bayanihan Program

- Need to identify poorest areas of Metro Manila and nearby provinces
- Poverty maps were produced by training a computer vision algorithm to spot specific features from daytime satellite images to predict the level of economic activity in an area. This built on an earlier initiative of ADB which used intensity of lights as a proxy for economic development and made adjustment to estimate poverty in the Philippines. Since satellite imagery is available for granular areas, this method can produce poverty maps at granular levels too.
- The ADB project team looked at above-average poverty levels, size of the population, and distance from shops to identify the most vulnerable households.
- Data pertaining to the presence of retail facilities and markets in a barangay were taken from the [Census of Population and Housing](#) of PSA.



Use of daytime satellite images for ADB's Bayan-Bayanihan Program

ADB's Bayan-bayanihan Program

- By integrating this data source with the poverty maps, the program was able to prioritize areas that were poor and whose residents may encounter more difficulties in accessing food due to longer distances to markets.
- Data sources were further triangulated with real-time information coming from the field.
- In a span of 2 months, the program served basic food commodities to 162,000 households across 44 barangays.



Maraming Salamat Po! Thank You!

PSA-SDG Webpage: psa.gov.ph/sdg

PSA SDG Email: sdg@psa.gov.ph

