Identifying the Poor Using CBMS

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AKI-DLSU Lecture Series on Poverty

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Outline

- Why do targeting?
- Types of targeting
  - Self-Targeting
  - Administrative Targeting
    - Household Targeting
      - Means Test
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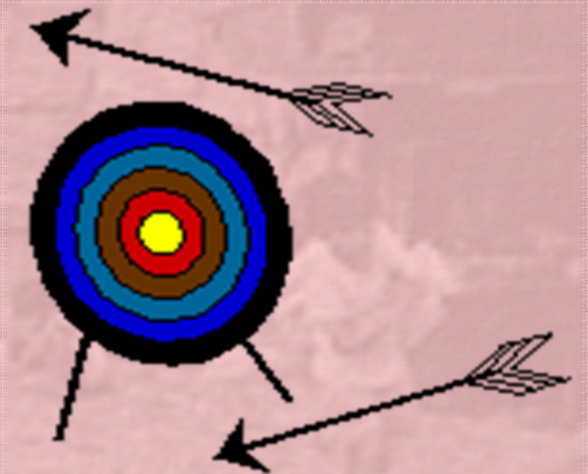
    - Categorical Targeting
      - Geographical
      - Other Characteristics
- Conclusion

Why do targeting?

- Resources are limited so we want resources to go to those who need them most.



Untargeted

Targeted

Targeting

Example: Access to NFA Rice Program

Income Quintile	Magnitude	% of HHs in the Income Quintile who were able to access
1	482	68.9
2	375	53.6
3	258	36.9
4	165	23.6
5	87	12.4
Total	**1,367**	**39.1**

Source: CBMS Survey 2009

- Not all HHs in the lowest income quintile were able to access the program. Yet, there were households in the richest quintile who were able to benefit from the program.

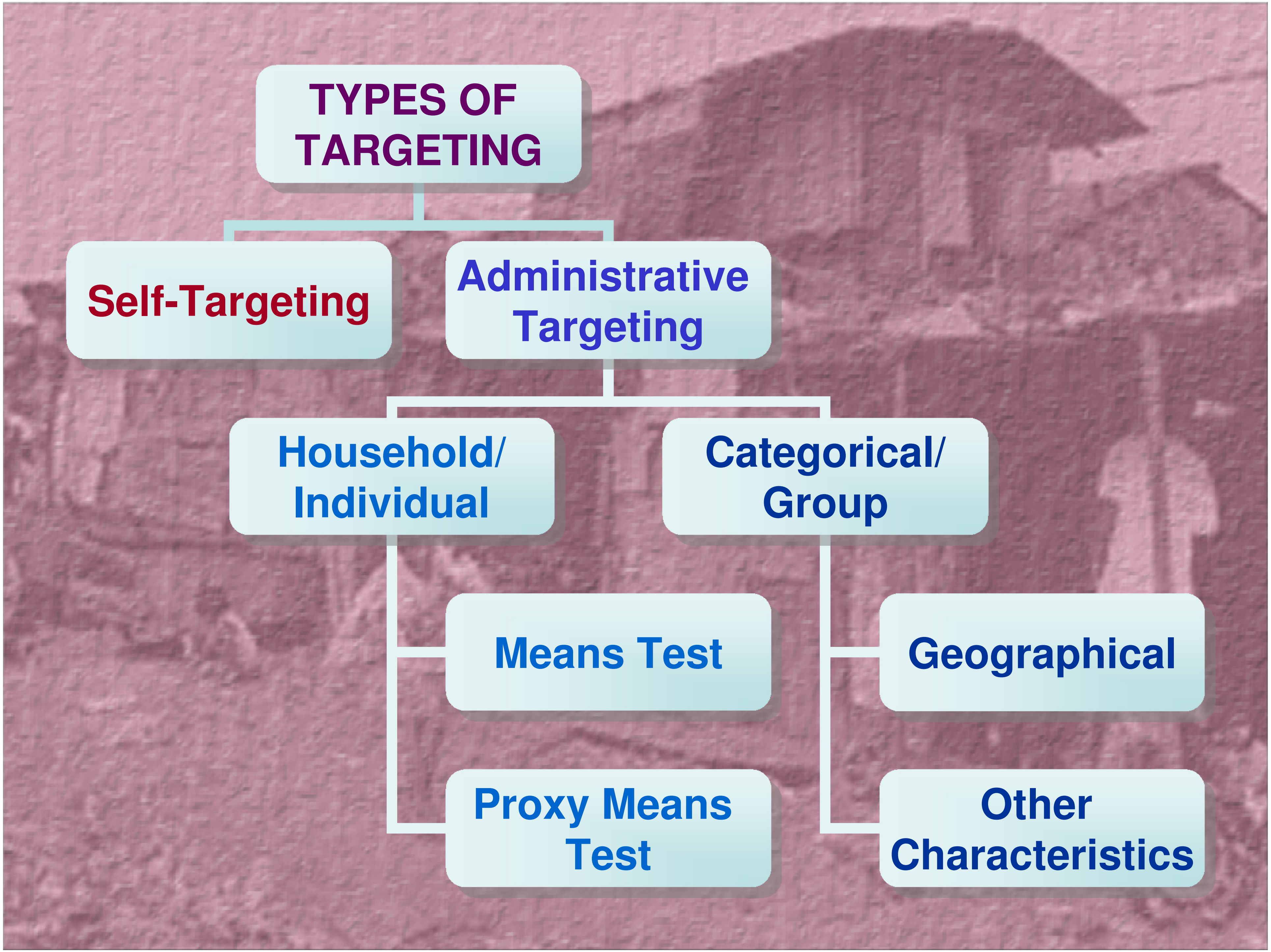
Targeting

Example: Access to NFA Rice Program

SITE	LEAKAGE RATE	EXCLUSION RATE
ALL SITES	48.9	35.6
Rural	38.8	22.8
Urban NCR	87.8	44.6
Urban Area Outside NCR	41.6	47.9

Source: Authors' calculations

- 48.9 % of all households who access the program are considered non-poor
- 35.6 % of poor households were not able to access the program


TYPES OF TARGETING
Self-Targeting
Administrative Targeting
Household/ Individual
Categorical/ Group
Means Test
Proxy Means Test
Geographical
Other Characteristics

Self-Targeting

- Makes benefits available to all but involves design features intended to discourage the non-poor from claiming them while encouraging the poor to use the program

Means Test

- Verified Means Test
  - screens applicants based on income, assets or expenditures
  - Example:
    - If income is below the poverty threshold, then the individual is considered poor.
    - At the household level, if per capita income is below the poverty threshold, then the household is considered poor.

Means Test

- Verified Means Test
  - How do we determine the poor?
    - Poverty and food thresholds can be used as cut-offs.

Province	Food Threshold (2006)	Poverty Threshold (2006)
Manila	11,807	20,270
Palawan	9,046	13,344
Eastern Samar	9,413	13,029
Zamboanga del Norte	9,812	14,310

Means Test

- **Unverified Means Test**
  - relies on self-reported income with little or no verification

Proxy Means Test

- Socio-economic variables are used to predict household welfare
- A weighting system is adopted to combine the different variables to come up with an index
- A cut-off is used to determine who are eligible or not

Proxy Means Test

- Why do proxy means test?
  - Getting accurate measures of income would require long questionnaires and trained enumerators.
  - Instead, proxy variables can be used to predict income.

Proxy Means Test

- How do we determine proxy variables?
  - The choice of variables are determined by economic theory and empirical evidence. Regression models are estimated to determine which variables can predict income well. The strategy is to find a minimum (due to cost in collecting data) set of variables that can predict income well.

Proxy Means Test

- How do we determine proxy variables?
  - Predictors of poverty status may change over time so need to use the latest available dataset, in this case the 2006 FIES. This dataset consists of 38,483 sample families.
  - The goodness of fit of the model is determined by how well the model is able to predict accurately the poverty status (whether poor or non-poor) of the family.

Proxy Means Test

- How do we determine the weights of the socio-economic variables?
  - No weights/equal weights
  - With weights
    - Can use econometric techniques
      - Multiple Linear Regression
      - Logistic Regression

Proxy Means Test

- Logit model to determine probability of being non-poor
  - Can relax cut-off point to reduce exclusion rate but this increases leakage rate
    - This is a better policy option
  - Can use additional filters to prune down list of eligible beneficiaries
    - For example, electricity consumption, etc.

Proxy Means Test

- What model to use?
  - The performance of the model can be assessed by how well it is able to classify the poor and non-poor correctly, the leakage rate and the exclusion rate.
  - Correctly classified – the proportion of households that are correctly classified
  - Leakage rate – the ratio of non-poor households to the total number of beneficiaries
  - Exclusion rate – the ratio of poor households considered not eligible to the total number of poor households

Proxy Means Test

- ## Logistic Regression Model

$$\ln\left(\frac{P(Y=1)}{1-P(Y=1)}\right)=\ln\left(\frac{p}{1-p}\right)=\beta X$$

where: ***ß*** **= vector of coefficients**
X **= vector of independent variables**
p **= probability that an event occurs**
(*1-p)* = probability that an event does not occur

Logistic Regression Model

Dependent Variable:

poverty status based on per capita income

Independent Variables:

- family size
- square of family size
- dependency ratio
- highest educational attainment of household head
- age of household head
- kind of business/occupation of household head
- access to electricity
- access to water supply
- access to toilet facility
- ownership of assets (i.e., TV, VCD/VHS/DVD, refrigerator, washing machine, airconditioner, car/jeep/motor vehicle, telephone, computer, microwave oven)
- urbanity
- region

Classification Tables

Probability cut-off: 0.50

Frequency

Predicted poverty status	Actual poverty status		
	non-poor	poor	Total
non-poor	25,824	3,400	29,225
poor	2,316	6,942	9,258
Total	28,141	10,342	38,483

Percent

Predicted poverty status	Actual poverty status		
	non-poor	poor	Total
non-poor	67.11	8.84	75.94
poor	6.02	18.04	24.06
Total	73.12	26.88	100

Correctly classified:	85.14
Exclusion rate:	32.88
Leakage rate:	25.02

Classification Tables

Probability cut-off: 0.70

Frequency

Predicted poverty status	Actual poverty status		
	non-poor	poor	Total
non-poor	23,424	1,771	25,195
poor	4,716	8,571	13,288
Total	28,141	10,342	38,483

Percent

Predicted poverty status	Actual poverty status		
	non-poor	poor	Total
non-poor	60.87	4.60	65.47
poor	12.26	22.27	34.53
Total	73.12	26.88	100.00

Correctly classified: 83.14
Exclusion rate: 17.12
Leakage rate: 35.49

Classification Tables

Probability cut-off: 0.80

Frequency

Predicted poverty status	Actual poverty status		
	non-poor	poor	Total
non-poor	21,455	1,064	22,519
poor	6,685	9,278	15,964
Total	28,141	10,342	38,483

Percent

Predicted poverty status	Actual poverty status		
	non-poor	poor	Total
non-poor	55.75	2.76	58.52
poor	17.37	24.11	41.48
Total	73.12	26.88	100.00

Correctly classified: 79.86
Exclusion rate: 10.29
Leakage rate: 41.88

Results for varying probability cut-offs

Probability Cut-off	Exclusion rate	Leakage rate	Sensitivity*	Specificity**	Correctly classified
0.50	32.88%	25.02%	91.77%	67.12%	85.14%
0.55	28.65%	27.63%	89.99%	71.35%	84.98%
0.60	24.43%	29.83%	88.19%	75.57%	84.80%
0.65	20.63%	32.70%	85.83%	79.37%	84.09%
0.70	17.12%	35.49%	83.24%	82.88%	83.14%
0.75	13.57%	38.28%	80.30%	86.43%	81.94%
0.80	10.29%	41.88%	76.24%	89.71%	79.86%

* % correctly classified non-poor

** % correctly classified poor

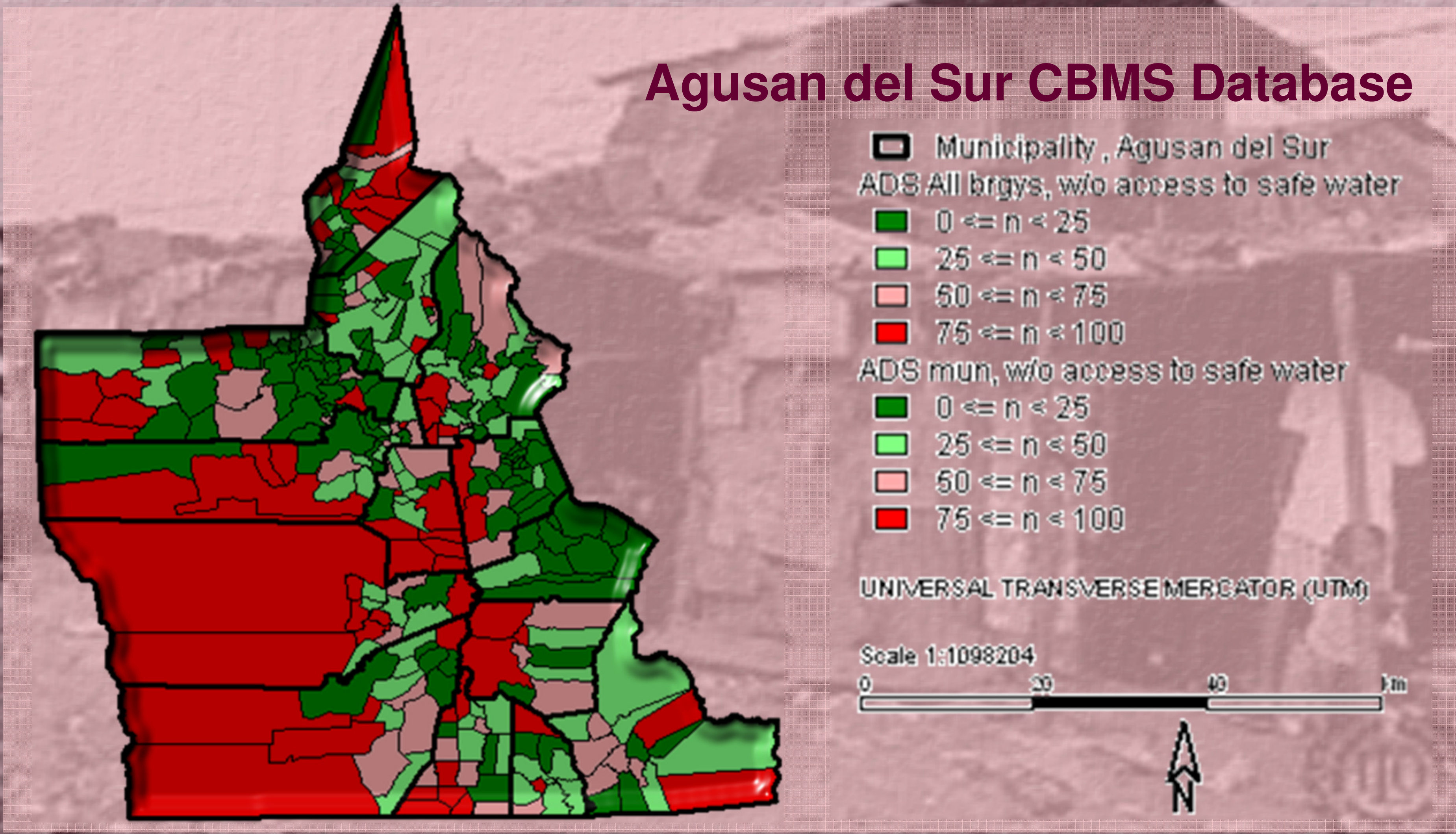
Categorical Targeting

- refers to selection of broad groups of households or individuals based on a common characteristic (e.g. geographical location)

Geographical Targeting

- eligibility of benefits is determined by location of residence
- particularly appropriate in circumstances when:
  - considerable variations exist in living conditions across regions
  - administrative capacity is sufficiently limited so as to preclude use of individual or household assessment
  - delivery of the interventions will be a fixed site, such as school, clinic or store

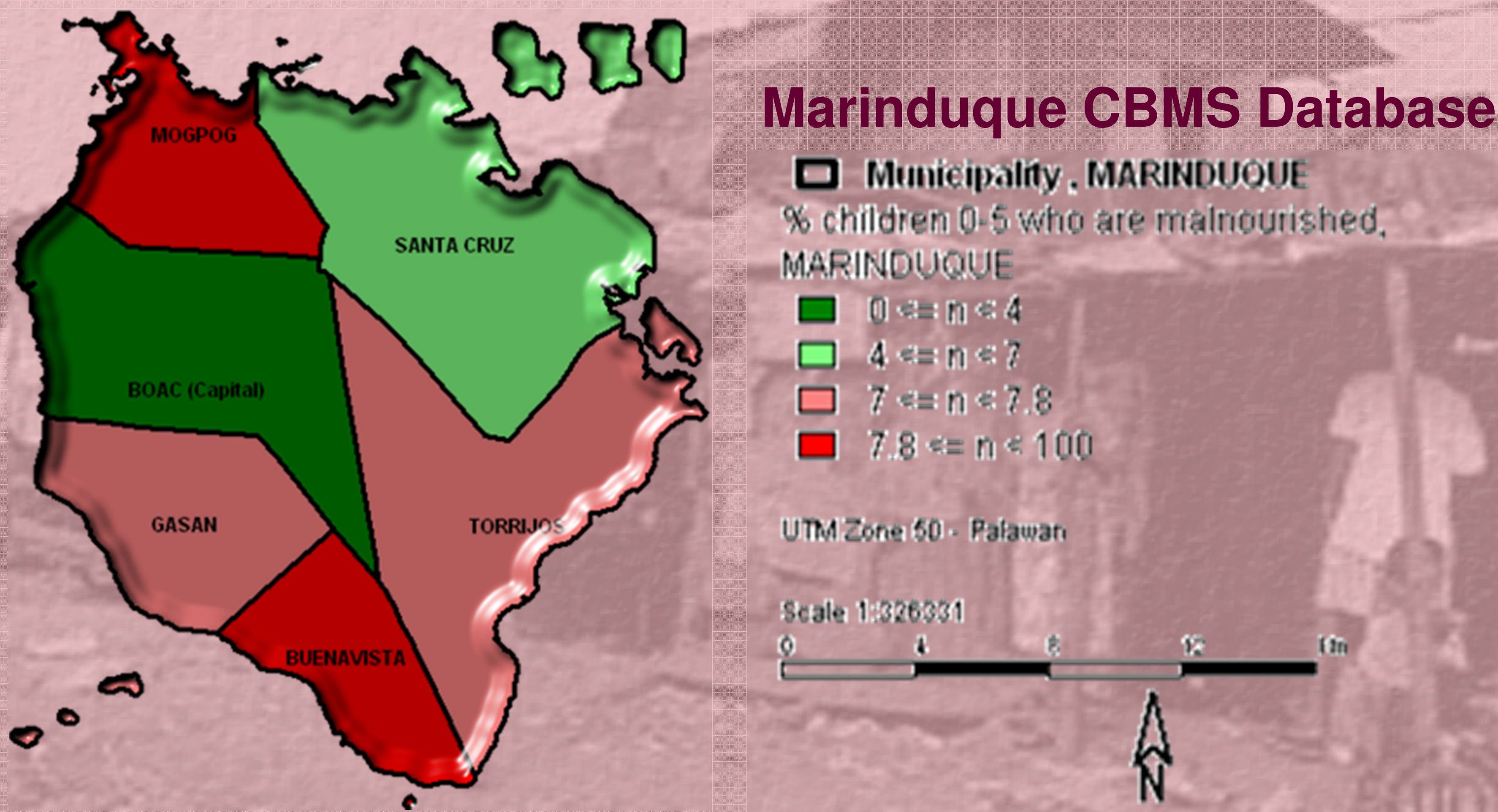
Proportion of households without access to safe water supply in Agusan del Sur, by barangay



Geographical Targeting Combined with Household Assessment

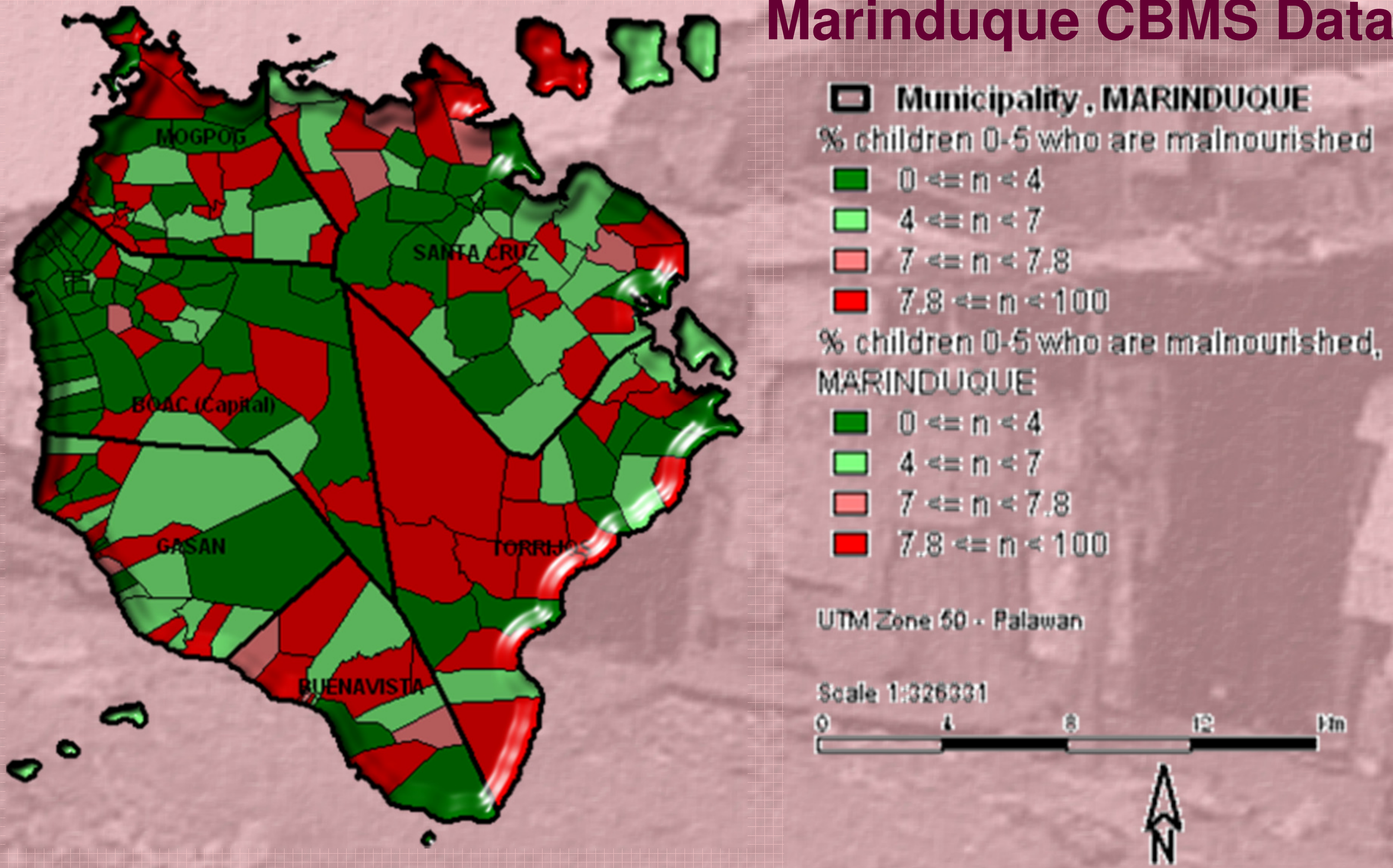
- combined use of multiple targeting mechanisms may lead to more accurate outcomes

Proportion of children aged 0-5 years old who are malnourished in Marinduque, by barangay

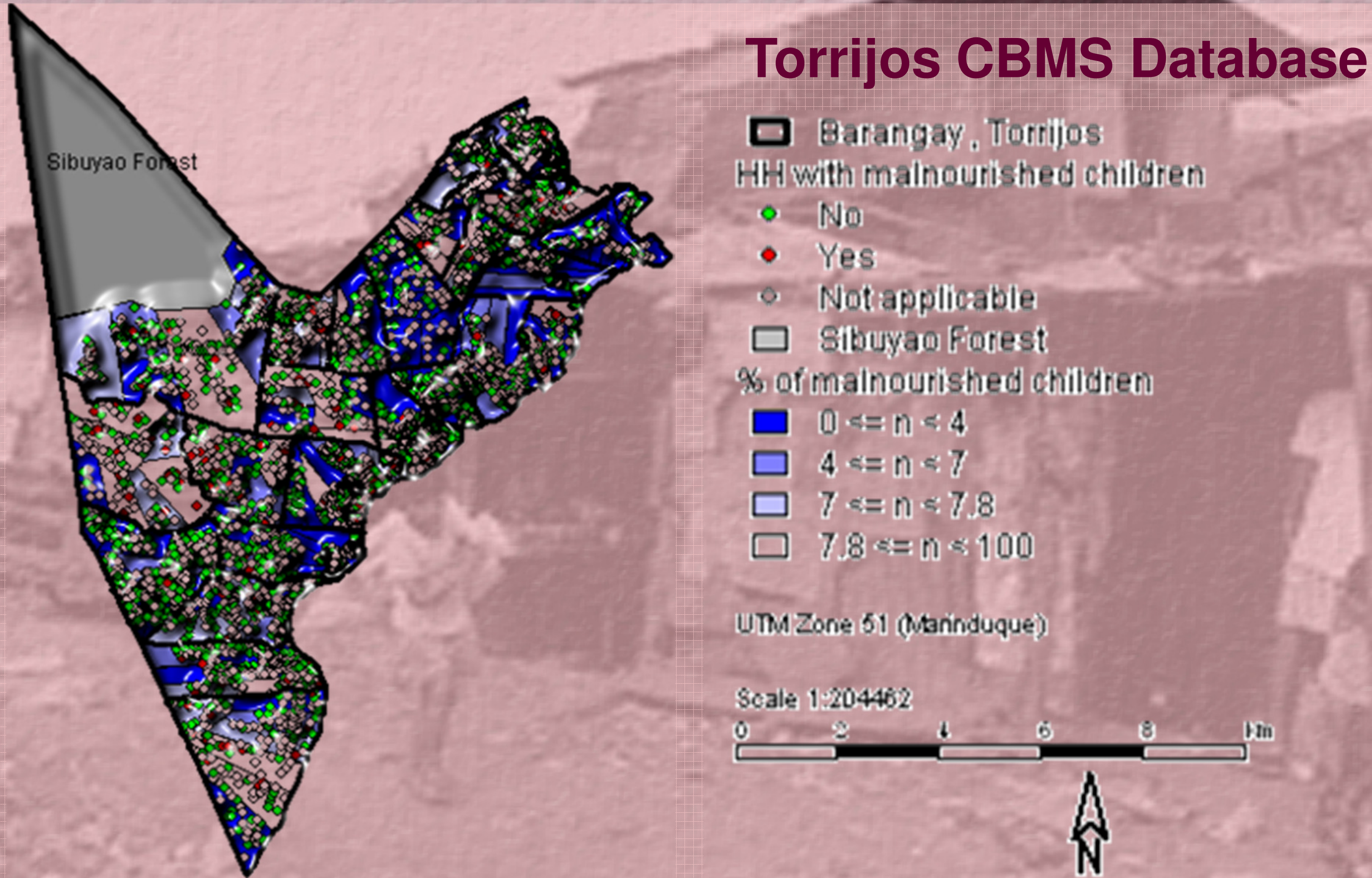


Proportion of children aged 0-5 years old who are malnourished in Marinduque, by barangay

Marinduque CBMS Database



Proportion of children aged 0-5 years old who are malnourished in Torrijos, Marinduque, by purok and location of households



Conclusion

CBMS data can be used to identify the poor. This will facilitate the implementation of targeted programs and ensure that benefits accrue to the poor.

Thank you!