



Developing Poverty Assessment Tools

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Overview of Presentation

- Methodology for accuracy tests
- Results of accuracy tests in Bangladesh (DRAFT)
- Approach and early results of comparative LSMS analysis
- Overview and status of practicality tests





Methodology for Accuracy Tests





What is a Poverty Assessment 'Tool'?

Tool = specific set of poverty indicators X that **accurately** predict per-capita daily expenditures

Examples: being a farmer, gender of household head, possession of a color TV, type of roof, number of meals in past seven days,..

For **practicality**, information on indicators should be

- easy to obtain (low-cost, limited time to ask and get answers, question not sensitive)
- verifiable (such as condition of house), to avoid strategic answers.

Selection/Certification of Tools = f (Accuracy and Practicality)





Methodology: Identifying the Very Poor

“Very poor” means:

- Bottom 50% below a **national poverty line (NPL)**

OR

- Under US\$1/day per person (at 1993 PPP = US \$1.08/day): **international poverty line (IPL)**

Thus the higher of the two applies.





Poverty Lines in Bangladesh

- IPL leads to a headcount index of 36 percent (based on 2000 expenditure survey, source: WDI 2004). In comparison, the headcount index based on NPL for 2000 was 49 percent (i.e. 25.5 percent of the population is very poor). Hence in Bangladesh the IPL applies.
- IPL in Bangladesh: 23 Taka per capita per day (March 2004, \$1 = 40 Taka). In our sample, 31.4 percent fall below the international poverty line.

In the following, “very poor” abbreviated as “poor”, and “not very poor” as “non-poor”.





Design of Accuracy Tests

- Testing indicators for their ability to act as proxies for poverty
- IRIS field tests: two-step process (implemented by local survey firm) obtains data on:
 - poverty indicators from a Composite Survey Module, and
 - per-capita-expenditures from an adapted LSMS Consumption Benchmark Expenditure Module
- The questionnaire for the Composite Survey is compiled from existing poverty assessment and targeting indicators (as submitted by practitioners to IRIS) plus pertinent indicators from literature or national context.





Implementation of Accuracy Tests

- Sampling: nationally representative sample of 800 randomly selected households. In Peru only, sample expanded to include 1200 clients from 6 different types of microfinance organizations (coops, NGOs,..).
- In Bangladesh only: Participatory wealth ranking of 8 out of 20 survey communities with about 1600 households being ranked, of which 320 are also composite/benchmark survey households.
- Selected survey firms have ample experience in conducting nation-wide socio-economic surveys in their countries.
- Sampling, adaptation of questionnaires, training of enumerators, and rules for data entry were supported by an IRIS consultant in each of the four countries.





Components of Composite Questionnaire

- Identification of household/respondents (Section A)
- Demography and health, clothing expenditures (B)
- Expenditures/minimum wage questions (C)
- Housing indicators (D)
- Food security indicators (E)
- Production and consumption assets (F)
- Experience of shocks, membership in organizations, trust (G)
- Assessment of poverty and satisfaction of basic needs by respondent (H)
- Membership/client Status with MF/BDS programs and information on loan size and credit transactions (I)
- Savings transactions (K)





Example: What is Meant by “Accuracy”?

Benchmark	Tool		
	% poor	% non-poor	% Total
% poor	18	13	31
% non-poor	5	64	69
% Total	23	77	100

Total accuracy: $18 + 64 = 82$ % correctly predicted

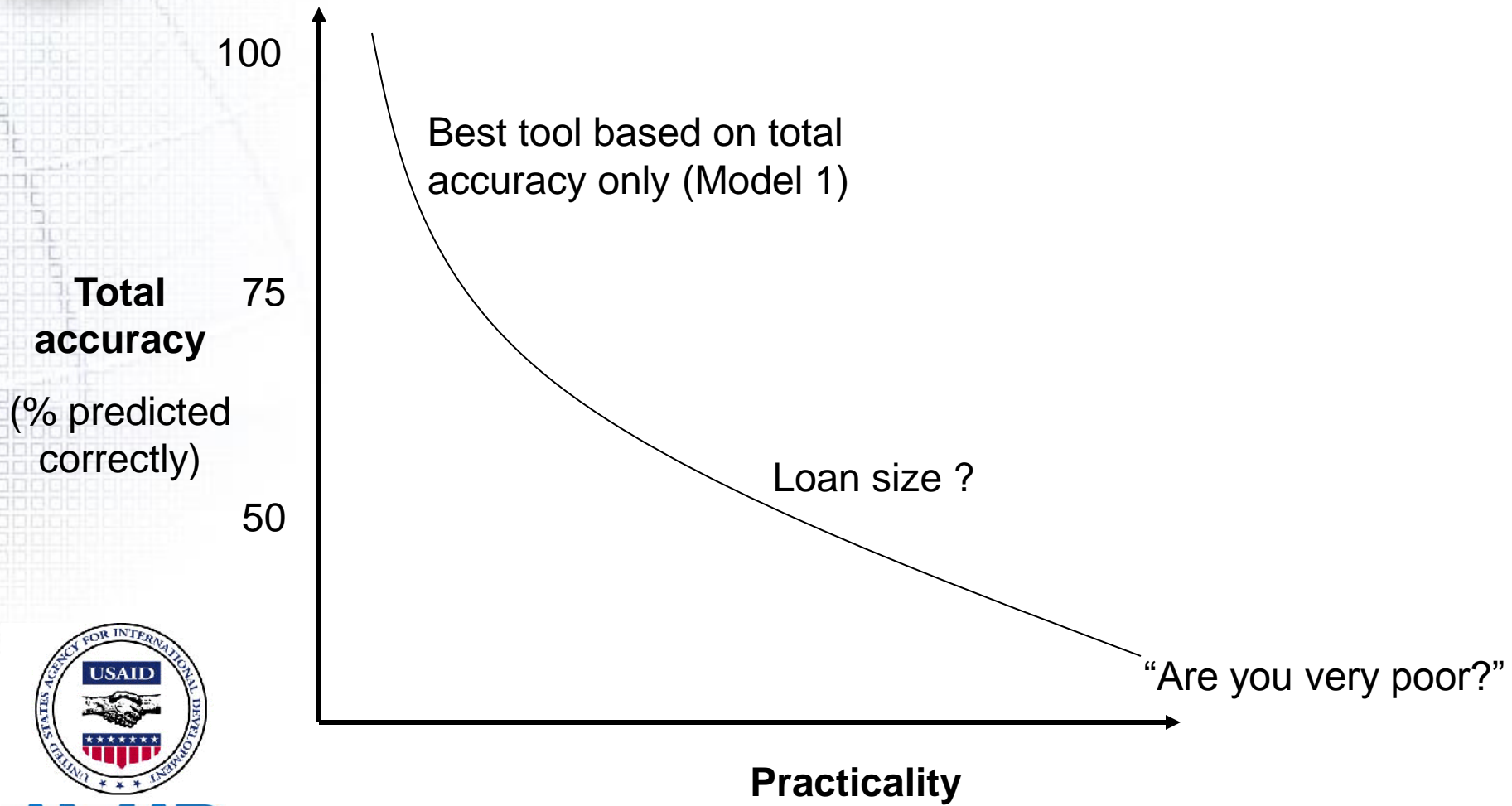
Accuracy among poor: $18/31 = 57$ %

Accuracy among non-poor: $64/69 = 93$ %





Trade-off Between Accuracy and Practicality





Results of Accuracy Tests in Bangladesh





Five Most Significant Predictors per Model

Model 1: Total accuracy: 83.9 %

- Total value of assets
- Perception of respondents that clothing expenditures are below need
- Clothing expenditures per capita
- Food expenditures
- Share of food expenditure in total household expenditure

Accuracy among poor: 66 %, Accuracy among non-poor: 92 %





Five Most Significant Predictors per Model

Model 2: Total accuracy: 81.5 %

- Total value of assets
- Good house structure (rating by interviewer based on observation)
- Household dependency ratio (Number of children and elderly divided by adults of working age)
- Clothing expenditure are perceived below need
- Clothing expenditures per capita

Accuracy among poor: 57 %, Accuracy among non-poor: 92 %





Five Most Significant Predictors per Model

Model 9 (verifiable indicators + clothing expenditure + subjective poverty rating from ladder-of-life): Total accuracy: 79.7 %

- Household is landless
- Value of TV, radio, CD player, and VCR
- Clothing expenditures per capita
- Household perceives itself being below the step on ladder-of-life that was identified as equivalent to poverty line
- Good house structure (rating by interviewer based on observation.)



Accuracy among poor: 54 %, Accuracy among non-poor: 92 %



Loan Size as Predictor

Total accuracy is 68 percent (in a model that also uses household size, household size squared, age of household head, and division variables as control variables).

If these control variables are not used in the regression model, total accuracy is much lower.





Accuracy of Participatory Wealth Ranking

At national level:

Tool 1: Households with a score of 100 are predicted as poor, others predicted as non-poor

Total accuracy: 70.3%

Accuracy among poor: 36 %,

Accuracy among non-poor: 88 %

Tool 2: Cut-off score of 85 or above

Total accuracy: 68.3%

Accuracy among poor: 56 %,

Accuracy among non-poor: 78 %

Accuracy increases at the level of the division, village, hamlet.





Accuracy Improves with Additional Predictors

In models 1 – 9:

Total accuracy %

5 predictors	74-84
10 predictors	75-84
15 predictors	77-85





Lower Accuracy among Poor Compared to Non-Poor

- All models overestimate per-capita expenditures.
- Few predictors in the models (such as being landless) that separate the very poor from the poor.
- Where is accuracy lower/error higher?

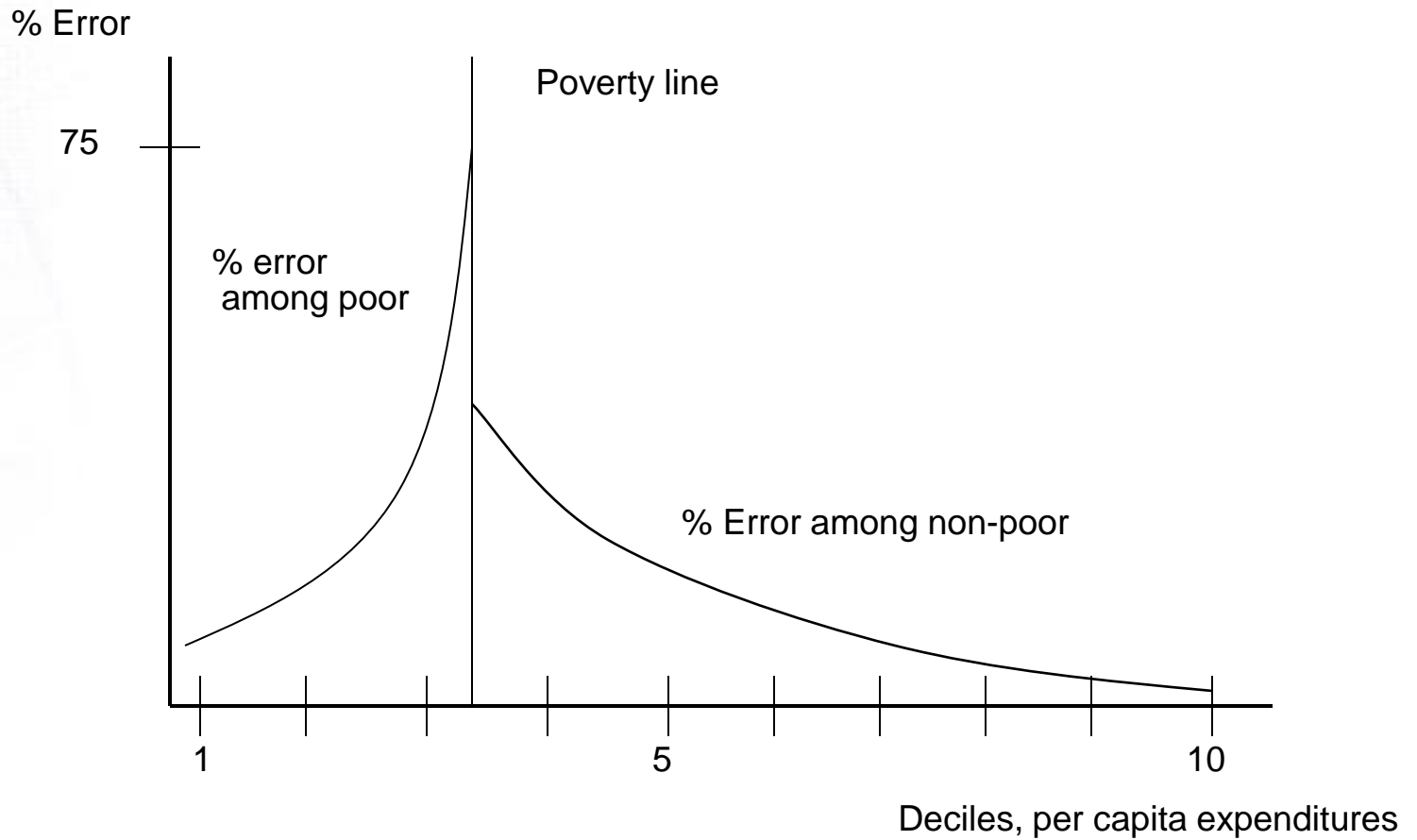
Accuracy among poor lower in urban than in rural areas

Accuracy among non-poor higher in urban than in rural areas





Poor/Non Poor Accuracy: Illustration





Fifteen Best Predictors

1. Demography/occupation/education (section B):

- Demography: dependency ratio, gender of household head, male/female ratio, rural residence.
- Education: percentage of literate adults, maximum education level of females.
- Occupation: daily salary worker, self-employed in handicraft enterprise.

2. Expenditures (section B and C):

- Per capita daily clothing expenditures.
- Food expenditures and food expenditure share.

3. Housing indicators (section D):

Good house structure, key/security lock on main door, separate kitchen, rooms per person, costs of recent home improvements, roof with natural fibers, type of toilet, type of electricity access, exterior walls with natural materials.





Fifteen Best Predictors (cont.)

4. Food security indicators (section E):

- Number of times in past seven days when a 'luxury' food item was consumed.
- Number of meals in past two days.

5. Consumer and producer assets (section F):

Total value of assets, value of house (prime residence of household) irrespective of ownership status, value of consumer appliances, being landless, radio, TV, ceiling fan, motor tiller, phone, or blanket, value or number of cows/cattle.

7. Social capital/Trust (section G):

Membership in a political group.





Fifteen Best Predictors (cont.)

8. Subjective ratings by respondent (section H):

- Subjective rating by household on step 1 to 10 of ladder-of-life, and identification of step equivalent to 3600 Taka (monthly poverty line for a household of five),
- Expenses on clothing are below perceived need

9. Section K: Savings/Loans

- Total formal savings, formal savings of spouse, value of jewelry, having a savings account
- Household states not being able to save

10. Community questionnaire

Number of natural disasters in past five years.





Summary

- Few indicators (up to 15) achieve total accuracy rates of 74-85 percent at the national level. The gain in accuracy through additional indicators is relatively low.
- Models produce lower accuracy among the poor compared to the non-poor
- Indicators come from different tools of practitioners/ dimensions of poverty.
- Indicators vary in their degree of practicality, and there is a trade-off between accuracy and practicality. Value of total assets is a powerful predictor, but it requires that many questions be asked about house, land, and all consumer and producer assets owned by the household.





Comparative LSMS Data Analysis





Comparative LSMS Data Analysis

Objectives:

- Identify 5/10/15 best poverty predictors, using methodology and set of variables as similar as possible to main study
- Assess robustness of main study results over larger number of countries (for common variables)





Comparative LSMS Data Analysis

8 data sets:

- Albania 2002
- Ghana 1992
- Guatemala 2000
- India 1997
- Jamaica 2000
- Madagascar (to be obtained)
- Tajikistan 1999 (to be obtained)
- Vietnam 1998





Comparative LSMS Data Analysis: Common Variables

- Demographic variables (age, marital status, household size)
- Socioeconomic variables (education, occupation)
- Illness and disability
- Assets (land, animals, farm assets; household durables)
- Housing variables (ownership status, size, type of material, amenities)
- Credit and financial asset variables (financial accounts, loans)





Comparative LSMS Data Analysis: Unavailable Variables

- Independent expenditure data
- Associations and trust
- “Subjective” indicators (willingness to work, hunger, ladder-of-life)
- Financial transactions





OLS Results: Best 5 Predictors

Control variables: household size, age of head of household, location, urban/rural

Guatemala LSMS	Vietnam LSMS	Bangladesh (model 6)
<ul style="list-style-type: none">- clothing exp.- # of rooms in house- telephone- gas/electric stove- car	<ul style="list-style-type: none">- clothing exp.- size of house- TV- gas/electric stove- motorcycle	<ul style="list-style-type: none">- landless- value of house- ceiling fan- blanket- dependency ratio
R-squared: 0.76	R-squared: 0.77	R-squared: 0.43





OLS Results: Best 10 Predictors

Guatemala LSMS	Vietnam LSMS	Bangladesh (model 6)
<p><i>All of the above +</i></p> <ul style="list-style-type: none">- # of hh members with no education- children with diarrhea- microwave oven- TV- savings account <p>R-squared: 0.79</p>	<p><i>All of the above +</i></p> <ul style="list-style-type: none">- # of hh members with no education- kerosene for lighting- # of hh members with tech. educ.- flush toilet- refrigerator <p>R-squared: 0.79</p>	<p><i>All of the above +</i></p> <ul style="list-style-type: none">- rooms per person- radio- motor tiller- security lock in main door- savings account <p>R-squared: 0.49</p>





OLS Results: Best 15 Predictors

Guatemala LSMS	Vietnam LSMS	Bangladesh (model 6)
<p><i>All of the above +</i></p> <ul style="list-style-type: none">- hh head literate- hh head completed secondary educ.- hh head with univ. educ.- no electricity- refrigerator <p>R-squared: 0.80</p>	<p><i>All of the above +</i></p> <ul style="list-style-type: none">- farm ownership- # of hh members with prim. educ.- gas as cooking fuel- radio- amount of saving <p>R-squared: 0.80</p>	<p><i>All of the above +</i></p> <ul style="list-style-type: none">- highest educ. of female hh members- separate kitchen- male/female ratio- telephone- political group membership <p>R-squared: 0.51</p>





Comparative LSMS Data Analysis: Accuracy

	Guatemala LSMS	Vietnam LSMS	Bangladesh (model 6)
	<u>5 predictors</u>	<u>5 predictors</u>	<u>5 predictors</u>
Total accuracy	0.84	0.85	0.75
Accuracy among poor	0.83	0.69	0.55
Accuracy among non-poor	0.85	0.91	0.83
	<u>10 predictors</u>	<u>10 predictors</u>	<u>10 predictors</u>
Total accuracy	0.85	0.86	0.78
Accuracy among poor	0.83	0.70	0.67
Accuracy among non-poor	0.86	0.91	0.83
	<u>15 predictors</u>	<u>15 predictors</u>	<u>15 predictors</u>
Total accuracy	0.85	0.86	0.78
Accuracy among poor	0.84	0.70	0.67
Accuracy among non-poor	0.86	0.92	0.83





Overview and Status of Practicality Tests





Tests of Practicality: Overview

- Once indicators are identified, they are integrated into 'tools' (include the process/ implementation issues)
- Practitioners are trained
- Practitioners implement the tools
- Practitioners report back on cost, ease of adaptation, applicability in wide variety of settings, and other criteria
- 10-15 tests to be run in 2005





Purpose of Practicality Tests

Determine whether tools are low-cost and easy to use:

- Cost in time and money
- Adaptation of indicators
- Combination of indicators with data collection methodologies
- Scoring system for indicators





What is a Poverty Assessment 'Tool'?

A tool includes:

- Sets of indicators
- Integration into program implementation: who implements the tool on whom and when
- Data entry and analysis: MIS or other data collection system/template
- Instructions for contextual or programmatic adaptation
- Training materials for users





Data Collection Methodologies: Household Survey

- Annual Survey
- Random sample of clients
- No previous business or personal relation between field staff and interviewed clients
- 20-30 minutes per household





Data Collection Methodologies: Client Intake

- Incorporate indicators into a client intake form
- Higher chance of manipulation by clients
- Indicators groups will exclude highly subjective indicators
- Assess all or a random sample of clients (except in the practicality tests)
- Train program staff to avoid bias
- May add 10-15 minutes to the client intake process





Data Collection Methodologies: On-Going Evaluation

- Incorporates groups of indicators into on-going, periodic evaluation
- Assess all or a random sample of clients (except in the practicality tests)
- Train program staff to avoid bias
- May add 10-15 minutes to the evaluation process





Training Manuals

- Planning and Budgeting
- Indicator Adaptation
- Sampling
- Staff Training
- Data Collection
- Data Analysis





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