National Conference on Social Protection 2025

"A Journey Towards an Equitable Society"

Poverty Map of Bangladesh 2022

Small Area Estimation|| District and Upazila Results

Venue: BCFCC **Date: 01 September 2025**

Organized By: Cabinet Division

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What we are going to discuss

- History of Poverty Statistics by BBS;
- Why Poverty Mapping?
- Utilisation of Poverty Mapping;
- Poverty Mapping Exercises by BBS;
- Results: Poverty Map of Bangladesh 2022;
- Way Forward;
- Q & A?

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History of Poverty Statistics by BBS

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HISTORY

Household Expenditure Survey (HES)

: BBS conducted the 1st round of HES in 1973-74;

Method of Poverty calculation:

- DCI/FEI up to 1991-92 HES;
- Introduced CBN in 1995-96.

Data Collection Tenure:

- 01 year, to capture the seasonal variations

Household Income and Expenditure Survey (HIES)

Renamed: HIES in 2000 (13th Round)

Improvement in HIES 2022 (17th round):

- **Introduction of CAPI;**
- **COICOP**
- **Weigh scale;**
- **Diary;**
- **Residential Training of the Enumerators, etc.**

HES/HIES IN BANGLADESH: AT A GLANCE

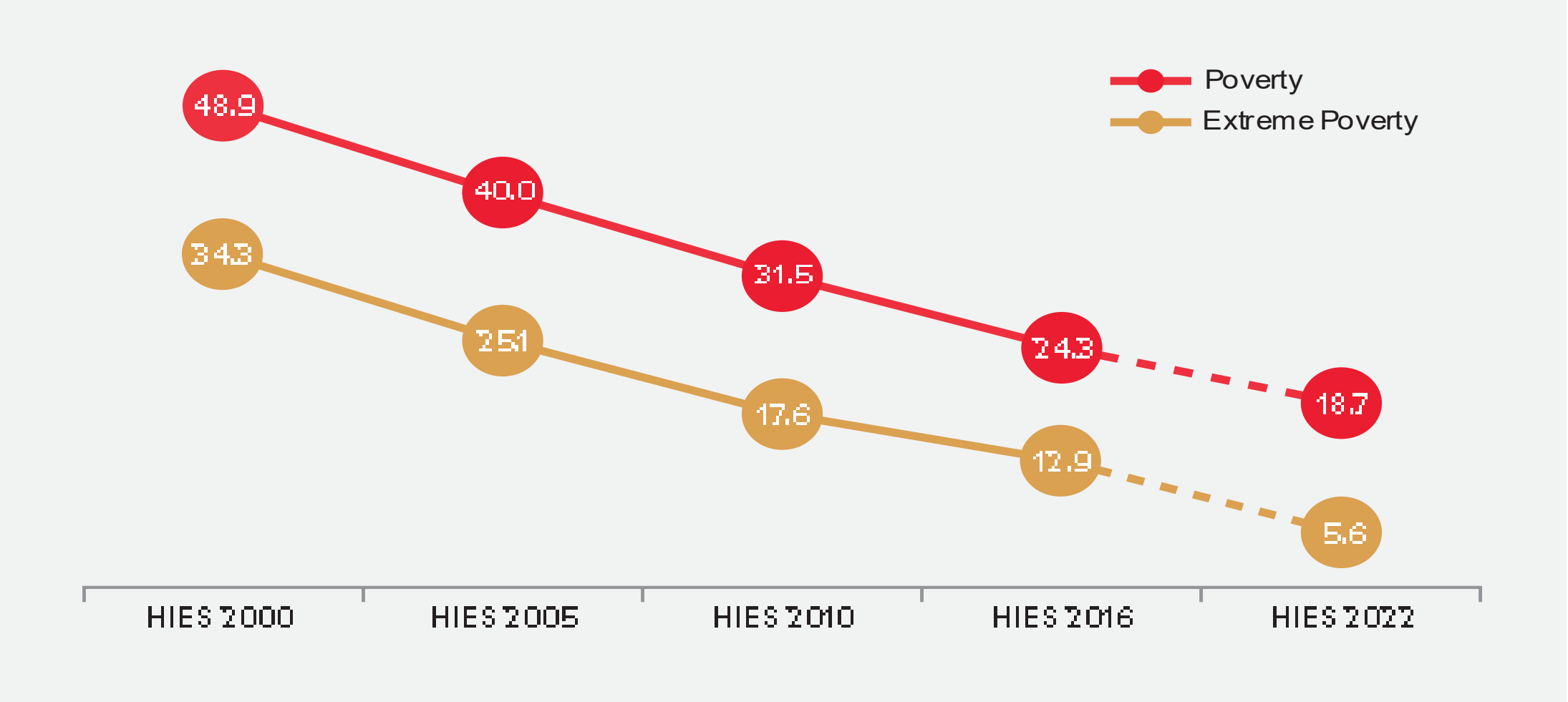
Round	Year	Name of the Survey
01	1973-74	HES
02	1974-75	HES
03	1975-76	HES
04	1976-77	HES
05	1977-78	HES
06	1978-79	HES
07	1981-82	HES
08	1983-84	HES

Round	Year	Name of the Survey
09	1985-86	HES
10	1988-89	HES
11	1991-92	HES
12	1995-96	HES
13	2000	HIES
14	2005	HIES
15	2010	HIES
16	2016-17	HIES
17	2022	HIES

Transition of Sample Size in HES/HIES

Round	Year	PSU	HH	Level of Estimate
11	1991-92	360	5760	National
12	1995-96	371	7420	Division
13	2000	442	7440	Division
14	2005	504	10080	Division
15	2010	612	12240	Division
16	2016-17	2304	46080	District
17	**2022**	**720**	**14400**	**Division**

OFFICIAL POVERTY ESTIMATES: FROM 2000 TO 2022



It is worth mentioning that the HIES 2022 poverty estimates are not strictly comparable with the previous rounds of HIES estimates. Because in HIES 2022, the substantial developments complied while execution and comprehensiveness of the food and non-food items (COICOP) covered in the questionnaire. However, the back calculation, which required more time for the earlier rounds, is under way, and it will be reflected later on in the main report of HIES 2022.

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Why Poverty Mapping?

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Why Poverty Mapping?

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Household Income and Expenditure Survey (HIES)

- It allows us to generate poverty estimates up to the Division level;

- Direct estimates from the survey.

Poverty Mapping

- It allows us to generate poverty estimates up to the Upazila level, including the District as well.

- Model-based Indirect Estimates (using SAE technique) from HIES and PHC micro-datasets.

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Utilisation of Poverty Mapping

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Application of Poverty Maps in Bangladesh

- Poverty maps are an essential tool for evidence-based policymaking.
- Improve accuracy, fairness, and transparency of social security programs.
- Strengthen Bangladesh's progress toward SDGs (No Poverty, Zero Hunger, Reduced Inequalities).

Application of Poverty Maps in Bangladesh

- Assist in resource allocation for health, education, and infrastructure.

- Support targeting of social security programs to the poorest unions/villages.

Example: Poverty map (2005, 2010, 2016 & 2022) guided the planning of safety net expansion.

Role in Social Security Programs

- Targeting: Ensure benefits reach tothe poorest households.
- Efficiency: Reduce leakages and overlaps in safety net programs.
- Equity: Prioritise marginalised areas with high poverty incidence.
- Monitoring: Track the poverty reduction impact of SSNPs geographically.

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Poverty Mapping/SAE Exercise by BBS

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BACKGROUND

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HIES

Coverage (Partial):
Approximately 12-20 Thousand HHs

Strength of HIES: Presence of PCEXP and other poverty-relacted variables

Weakness of HIES: Limited sample size, especially at Upazila or Union level

Population and Housing Census

Coverage (100%):
Approximately 40 million HHs

Strength of Census: Full coverage of population –extensive observations at Upazila, Union levels and Mauza/Village level

Weakness of Census: Lack of PCEXP and limited set of poverty-related variables

Datasets Utilized in SAE

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HIES

- Poverty Estimates Up to Division level
- Main sources of indicators of living conditions, poverty, and social exclusion
- indicators of well-being
- Samples too small

+

PH & C

- Provide 100% coverage
- Population Statistics up to EA level
- Detail Socio-Economic Infrastructure Variable
- Details Geo-Information

=

Small Area Estimation

- **Combine** survey and census data
- Small Area Estimation with **Modeling** and **District and Upazila** Results

Both HIES and Census data were collected in 2022

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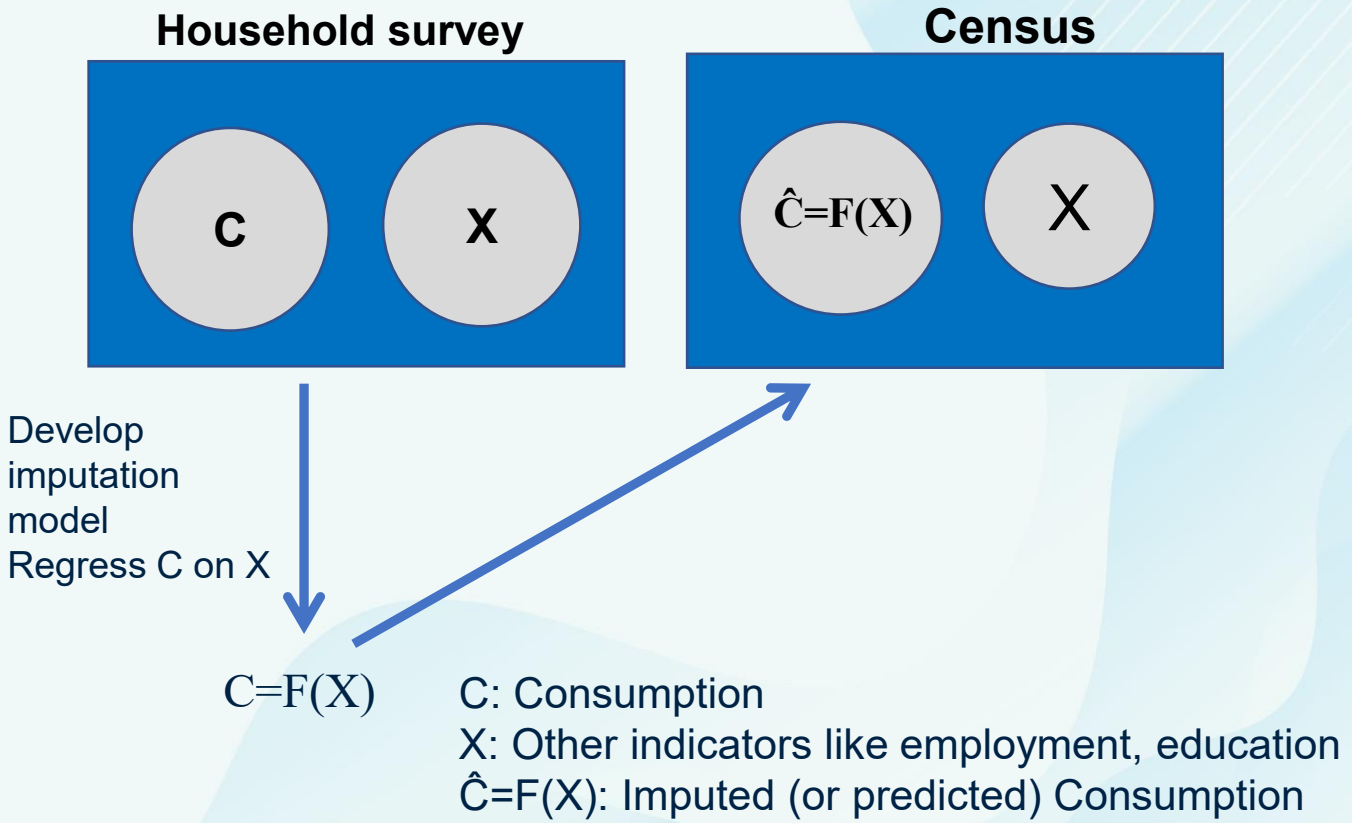
SAE TECHNIQUE

Three important conditions

- The **predictors** in the survey have to be **the same as in the census** (definition, distribution)
- The variables **X have to be good predictors** of consumption
- The model estimated for a region has to apply for the smaller areas within the region (**Area homogeneity assumption**)



Good news: Latest HIES and Census both collected in 2022.

This removes concern in 2016 of the time lag between the census (2011) and HIES (2016)

UNIT LEVEL MODEL IN SAE

The nested error model used for unit level small area estimation comes from Battese, Harter and Fuller (1988):

$$y_{ch} = x_{ch}\beta + \eta_c + e_{ch}; \quad h = 1, \ldots, N_c; c = 1, \ldots, C$$

where $\eta_c \sim N(0, \sigma_\eta^2)$ and $e_{ch} \sim N(0, \sigma_e^2)$

- C is the number of locations, N_c is the number of observations in location c
- The model was originally used to produce county-level corn and soybean crop area estimates for Iowa, U.S by Battese, Harter and Fuller (1988)
- The model assumes **normally distributed error terms**

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Recent Methodological Developments in SAE Technique

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Methodological Techniques Evolve and Improve Over Time

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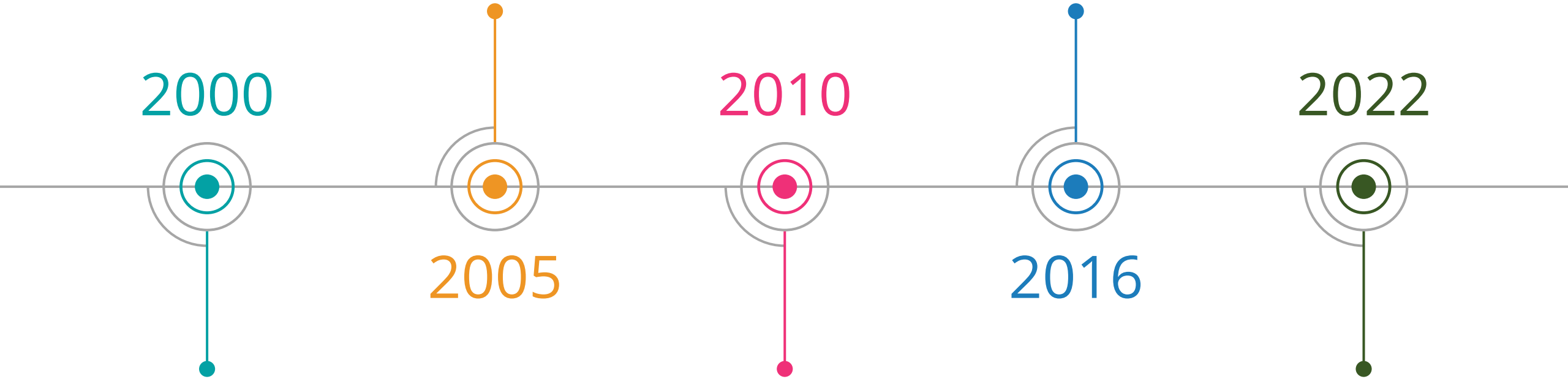
- Hentschel, Lanjouw, Lanjouw, and Poggi (HLLP) (1998) laid the foundation but did not account for random location effects.
- **Elbers, Lanjouw and Lanjouw (ELL) (2003) improved the HLLP (1998) method.**
- Criticisms of ELL→ improvements
  - heteroscedasticity - Haslett (2010)
  - survey weights - Van der Weide (2014)
- Over time, enhancements to the ELL method have focused on increasing precision and reducing bias in small-area estimates.

- **Molina and Rao (2010) found ELL to be noisy and less reliable under model assumptions.**
- **The World Bank adopted Molina and Rao's EB methods, detailed in Corral, Molina, and Nguyen (2021).**
- CensusEB improves upon the earlier ELL method by integrating Monte Carlo simulation and bootstrapping to refine point estimates and mean squared errors (MSE).

Poverty Mapping Years



Poverty Mapping 2022 Exercise Support

- **Technical support from the World Bank**

THE WORLD BANK

- **Technical and financial support from the World Food Programme.**

WFP
wfp.org

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Poverty Map of Bangladesh 2022

Methodology

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SAE Technique and Micro-datasets

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- **Followed the latest SAE guidelines of the World Bank;**

[Census Empirical Best- CensusEB method]

Micro-datasets:

- **HIES 2022 by BBS**

[Introduced CAPI, COICOP, Enumerators, Residential training, rigorous monitoring, etc., that enhanced the data quality]

- **The Population and Housing Census 2022 by BBS**

[Introduced CAPI, ICMS, NOC, etc. that improved the data quality]

* Utilizing microdata from both sources, a comprehensive set of common variables is constructed to develop the poverty maps through a unit-level modelling approach.

Geographic and Administrative Units:
Poverty Map of Bangladesh 2022

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8 Divisions

64 Districts

590 Upazilas/Metropolitan Thanas

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Results:
Poverty Map of Bangladesh 2022

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Comparative Picture of Direct (HIES) and Indirect (SAE) Estimates

Table 2: Direct (HIES) and Indirect (SAE) Poverty Estimates (%) by National, Rural and Urban (UPL), 2022

	HIES				SAE, CensusEB			
	Mean	SE	Confidence limits		Mean	SE	Confidence limits	
			LL	UL			LL	UL
Bangladesh	18.7	0.8	17.0	20.3	19.2	0.4	18.4	20.0
Bangladesh, rural	20.5	1.1	18.3	22.6	20.3	0.5	19.3	21.3
Bangladesh, urban	14.7	1.2	12.4	17.1	16.5	0.6	15.3	17.7

Note: CensusEB estimates with heteroskedasticity and sample weights. Mean=point estimate, SE= √MSE, LL=lower limit, UL=upper limit.
Source: Estimations based on HIES 2022 and PHC 2022, BBS

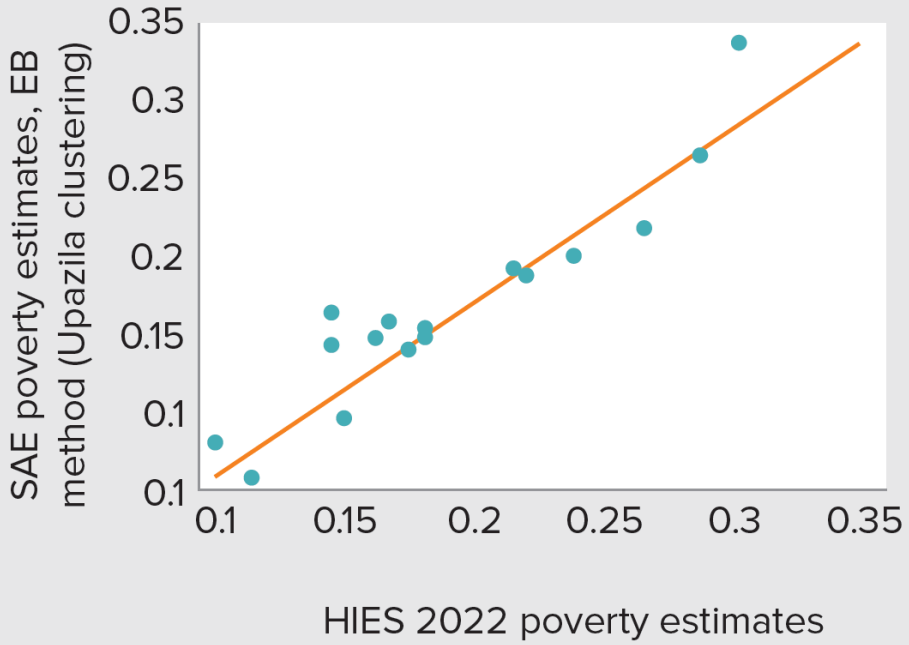
Comparative Picture of Direct (HIES) and Indirect (SAE) Estimates

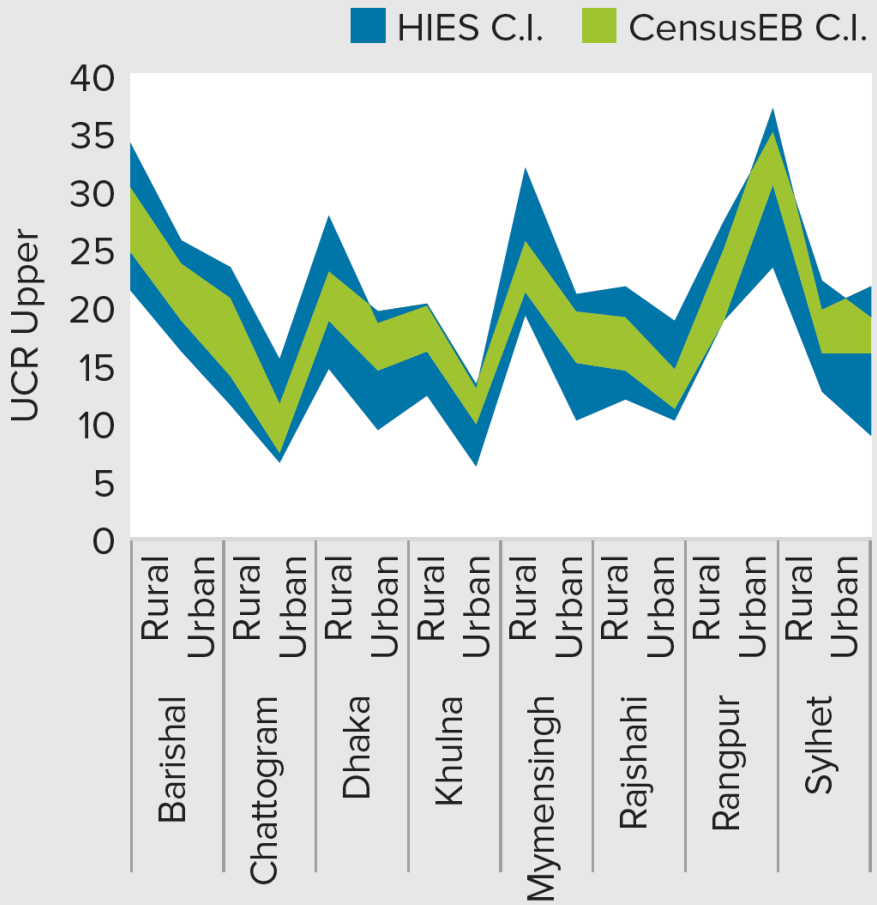
Table 3: Direct (HIES) and Indirect (SAE) Poverty Estimates (%) by Division (UPL), 2022

	HIES				SAE, CensusEB			
	Mean	SE	Confidence limits		Mean	SE	Confidence limits	
			LL	UL			LL	UL
Barishal	26.9	2.6	21.7	32.1	26.6	1.1	24.3	28.8
Chattogram	15.8	2.2	11.5	20.1	15.2	1.2	12.8	17.7
Dhaka	17.9	2.0	13.9	21.9	19.6	0.9	17.9	21.3
Khulna	15.1	1.6	11.9	18.2	17.1	0.8	15.4	18.7
Mymensingh	24.2	2.6	19.0	29.5	22.6	0.9	20.8	24.4
Rajshahi	16.7	1.9	12.8	20.5	16.3	1.0	14.4	18.1
Rangpur	24.7	1.9	21.0	28.5	25.0	1.3	22.4	27.6
Sylhet	17.3	2.0	13.2	21.3	18.5	0.9	16.8	20.2

Note: CensusEB estimates with heteroskedasticity and sample weights. Mean=point estimate, SE= √MSE, LL=lower limit, UL=upper limit.
Source: Estimations based on HIES 2022 and PHC 2022, BBS

HIES and SAE (CensusEB) Poverty Estimates Alignment at Domain Level, 2022





Thresholds of Poverty Estimates (SAE), 2022

2022

Upper Poverty Severity Group

- Very Low (<9.80%)
- Low (9.81% - 14.90%)
- Moderate (14.91% - 21.15%)
- High (21.16% - 28.20%)
- Very High (>28.21%)

Lower Poverty Severity Group

- Low (HCR<2.15%)
- Moderate (2.16%<HCR<5.52%)
- High (HCR>5.53%)

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Distribution of Districts Across Different Poverty Levels, 2022

Table 7: Distribution of Districts Across Different Poverty Levels, 2022

Division	Number of Districts					
	Very low (Q1) (<9.80)	Low (Q2) (9.81-14.90)	Moderate (Q3) (14.91-21.15)	High (Q4) (21.16-28.20)	Very high (Q5) (>28.20)	Total
Barishal	0	0	2	2	2	6
Chattogram	1	4	3	3	0	11
Dhaka	1	3	1	5	3	13
Khulna	1	3	4	2	0	10
Mymensingh	0	0	3	0	1	4
Rajshahi	0	3	3	1	1	8
Rangpur	0	0	1	5	2	8
Sylhet	0	1	2	1	0	4
Total	3	14	19	19	9	64

Source: Estimations based on HIES 2022 and PHC of 2022, BBS

Distribution of Upazilas/Thanas Across Different Poverty Levels, 2022

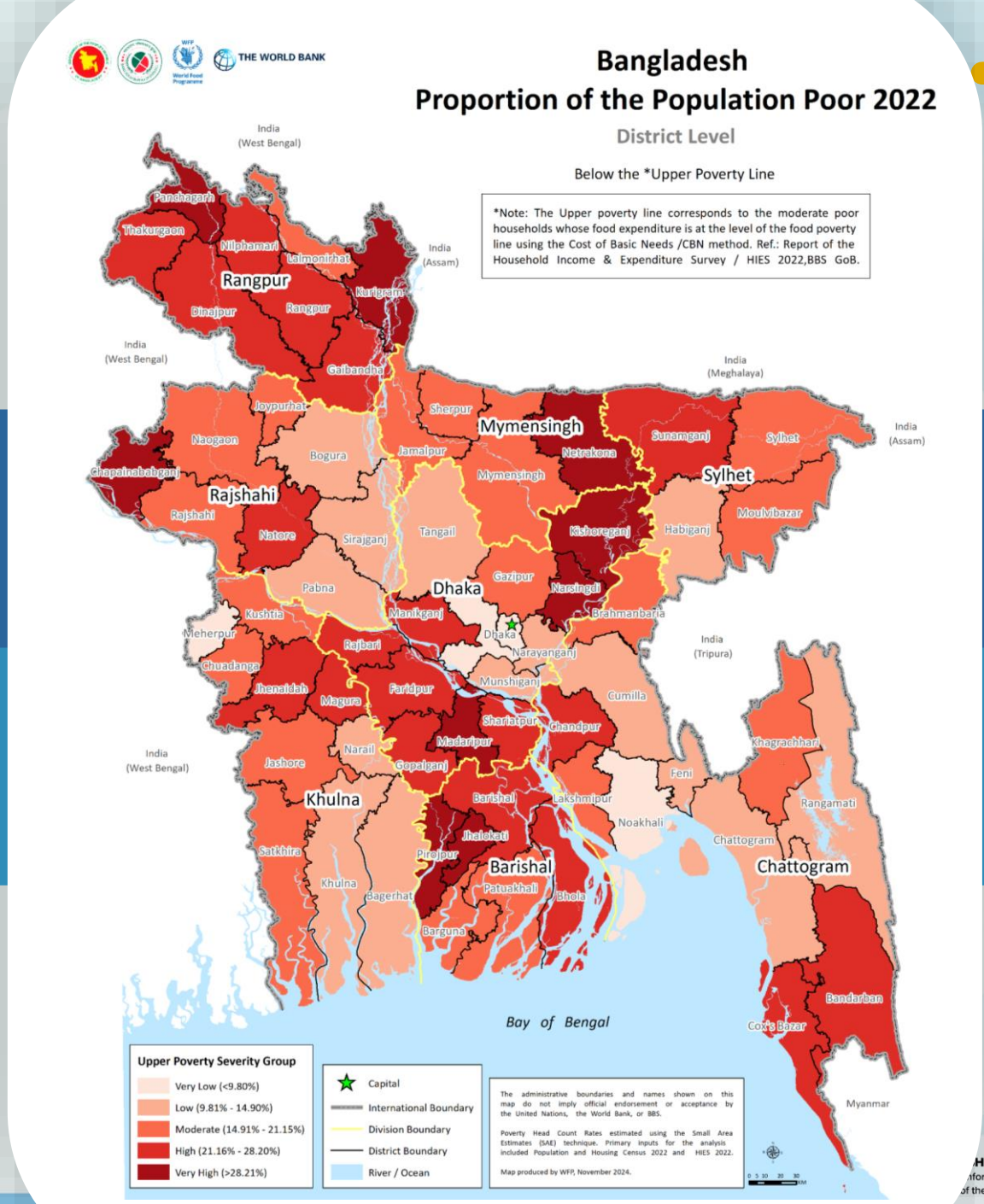
Table 8: Distribution of Upazilas/Thanas Across Different Poverty Levels, 2022

Division	Number of Upazila/Thana					
	Very low (Q1) (<9.80)	Low (Q2) (9.81-14.90)	Moderate (Q3) (14.91-21.15)	High (Q4) (21.16-28.20)	Very high (Q5) (>28.20)	Total
Barishal	1	3	10	9	19	42
Chattogram	32	33	24	17	13	119
Dhaka	48	21	20	21	37	147
Khulna	11	19	15	18	1	64
Mymensingh	3	7	2	11	12	35
Rajshahi	14	23	19	11	6	73
Rangpur	1	1	16	23	23	64
Sylhet	8	11	12	8	7	46
Total	118	118	118	118	118	590

Source: Estimations based on HIES 2022 and PHC 2022, BBS

Poverty Maps

Poverty Estimates at District Level (UPL), 2022 [CensusEB]



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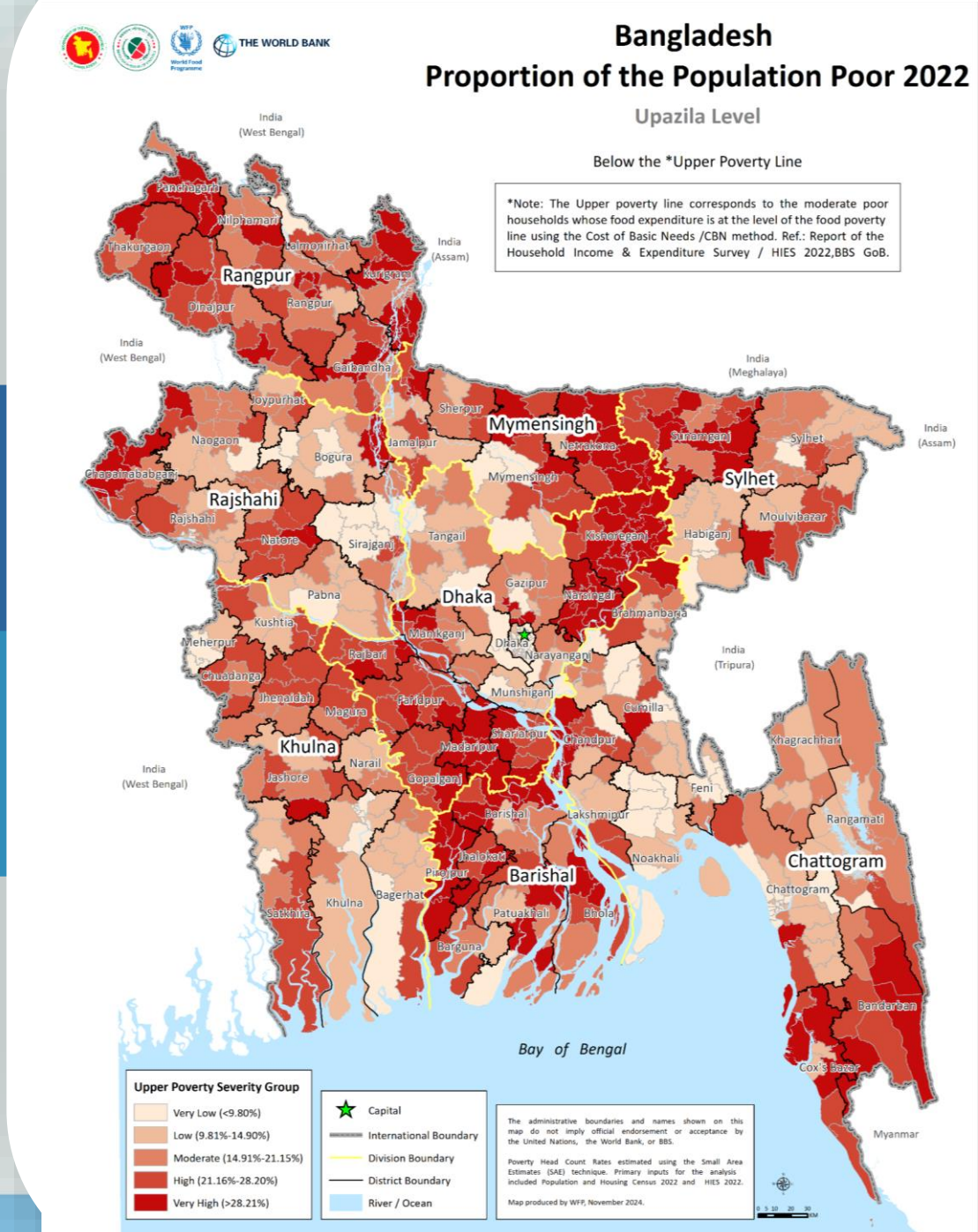
Poverty Estimates at Upazila(UPL), 2022 [CensusEB]



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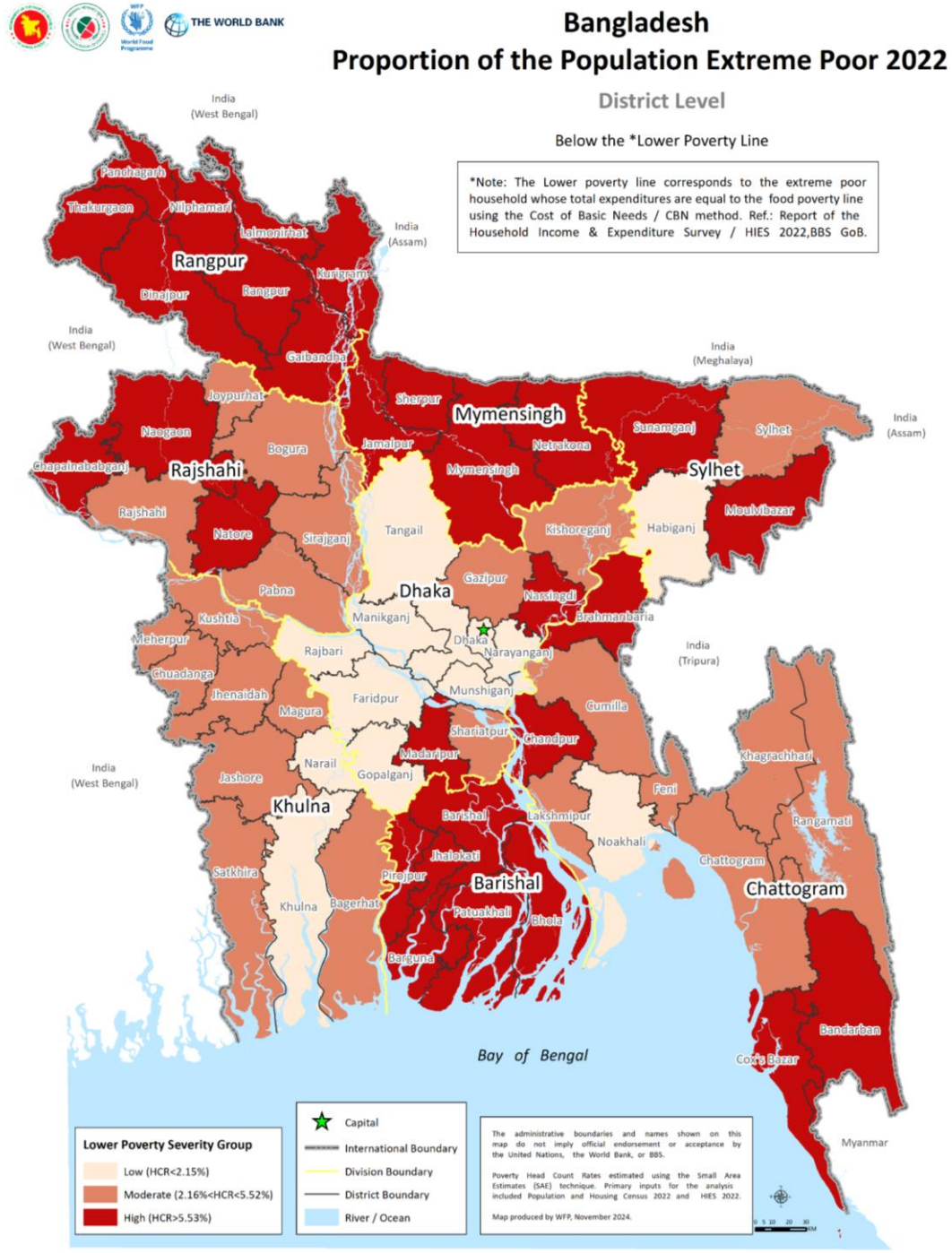
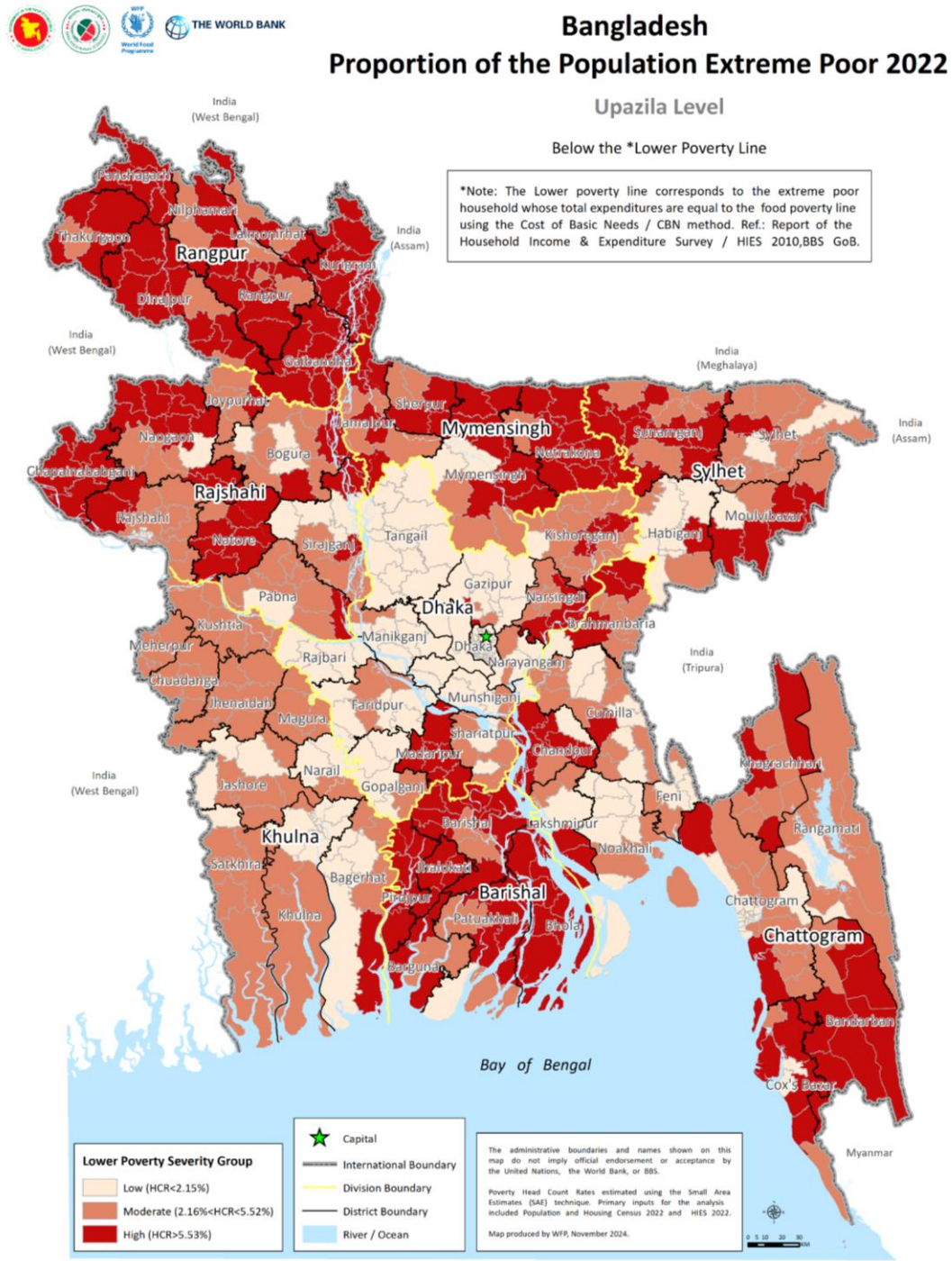
Extreme Poverty Estimates at District Level (LPL), 2022

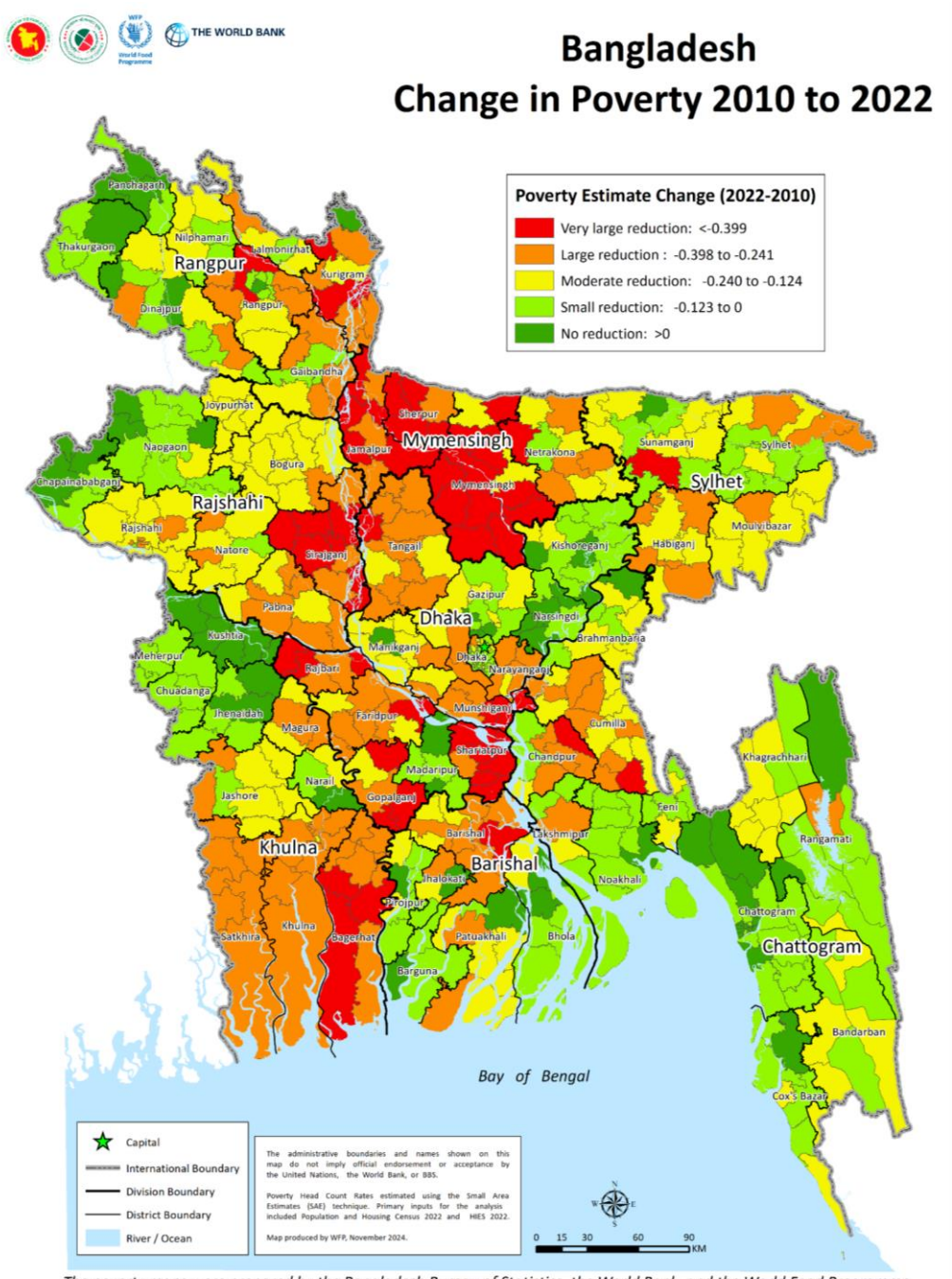
[CensusEB]



Extreme Poverty Estimates at Upazila Level (LPL), 2022 [CensusEB]



Decadal Snapshot: Change in Poverty at Upazila Level



The poverty maps were prepared by the Bangladesh Bureau of Statistics, the World Bank, and the World Food Programme. The printing and dissemination of the maps was funded by the WFP.

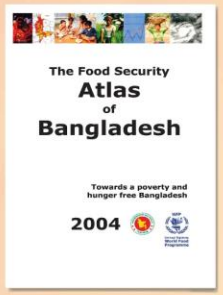
Poverty Map Reports By BBS

(2000-2022) are Now Available in BBS Website (www.bbs.gov.bd)

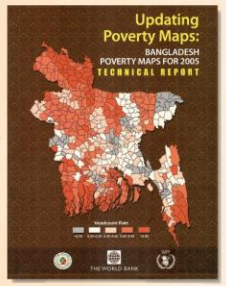
*QR codes in Annex-10

ANNEX 10

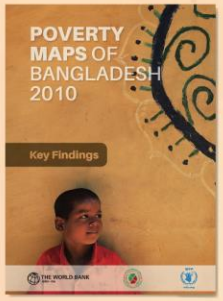
POVERTY MAP OF BANGLADESH REPORTS BY BBS, WFP AND WB



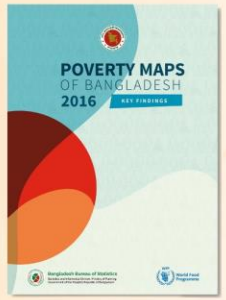
2000



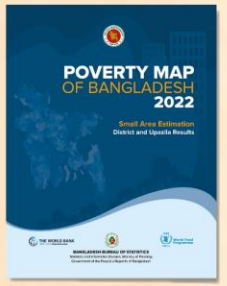
2005



2010



2016



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Way Forward

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The Poverty Map is absolutely a key tool for

- Scalable planning: Expanding or contracting geographic coverage depending on resource availability;
- Geographical targeting: Prioritising areas for humanitarian and development interventions;
- Pre-Post disaster rapid emergency response planning: Poor populations at risk/affected.

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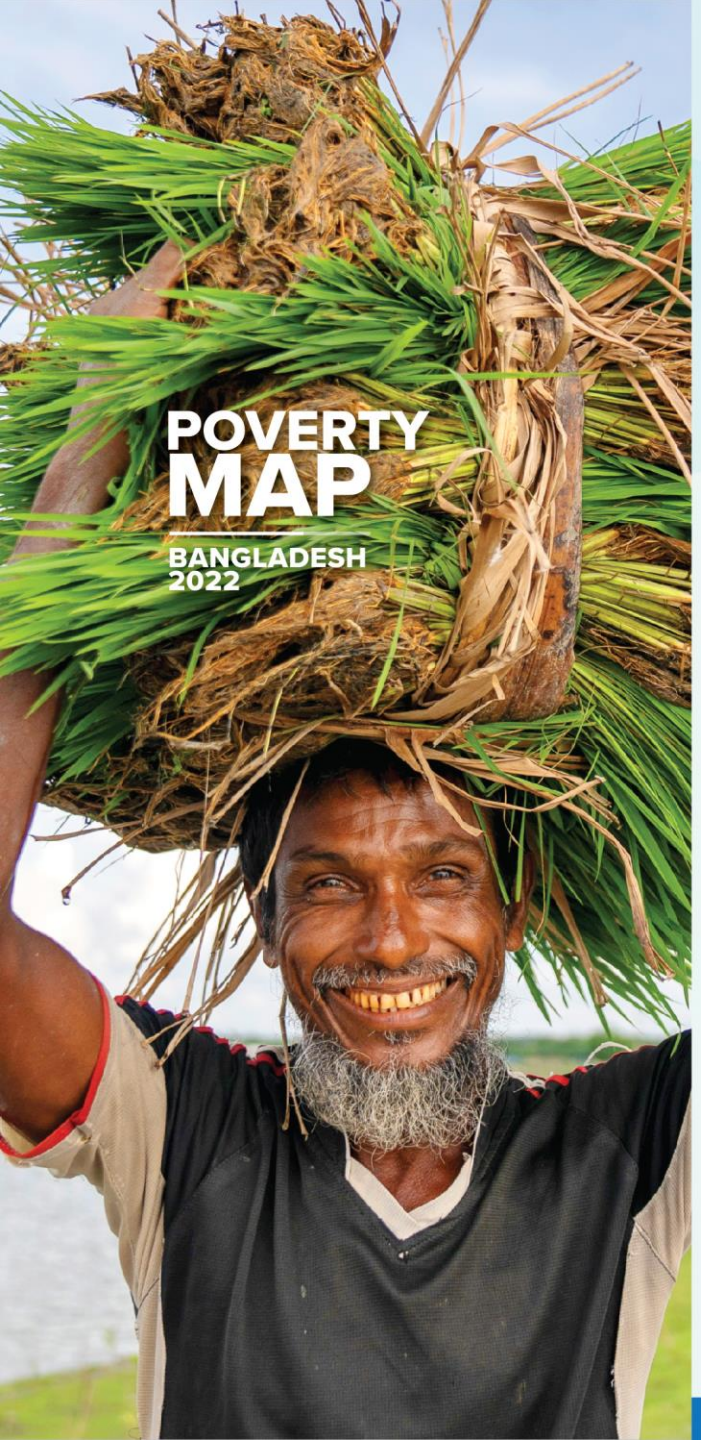
Q & A?



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Thanks

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