POVERTY MAPS OF BANGLADESH 2010

Key Findings

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Foreword

Poverty maps are powerful visuals that enable government, civil society and development partners to identify poorer areas with greater accuracy. In Bangladesh, there is considerable demand from policy makers, planners, and researchers for more disaggregated poverty estimates to better understand the geographical variations and spatial inequality in growth and poverty.

Responding to this demand, the Bangladesh Bureau of Statistics initiated the poverty mapping exercise in September 2012. The World Bank and the World Food Programme (WFP) are pleased to have had the opportunity to contribute to this updating exercise.

The initiative produced poverty estimates for key sub-national administrative units using data from both the 2010 Household Income and Expenditure Survey (HIES) as well as the 2011 Population Census, and we hope the maps produced will strengthen the targeting of policy interventions and programs, building on the improved knowledge of local conditions.

Poverty estimates for Bangladesh based on both the HIES and the poverty mapping exercises show that Rangpur and Barisal divisions have the highest incidence of poverty, while Chittagong and Sylhet have the lowest. The poverty maps have also been compared with other correlates of poverty – such as educational attainment of household heads and the average agricultural wage rate of laborers. The aim is for this mapping exercise to help policy makers make better informed decisions about poverty reduction initiatives and design programs that serve those who need help the most.

With strong commitment, sound policies, and effective government, Bangladesh has enormous potential to offer its people a better, brighter future. We look forward to furthering our partnership with the Government of Bangladesh and development partners to jointly tackle development challenges faced by the people of Bangladesh – to end poverty and boost shared prosperity in the country.

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The World Bank team involved in preparation of the Poverty Maps included Faizuddin Ahmed, Naomi Ahmad, Mehar Akhter Khan, Dean Jolliffe, Mehrin A. Mahbub, Iffath Sharif, Nobuo Yoshida, and Salman Zaidi (task leader), working under the guidance of Vinaya Swaroop (Sector Manager, SASEP) and Johannes Zutt (Country Director, Bangladesh, Nepal, and Bhutan). The World Food Programme (WFP) team included Mahabubul Alam, Nusha Choudhury, and Kayenat Kabir, working under the guidance of Christa Räder (Country Representative, WFP). The BBS team included Md. Zahidul Hoque Sardar, Dipankar Roy, AKM Tahidul Islam, Md. Abdul Latif, Dinesh Roy, Enayet Hossain, Md. Rezaul Karim, and Md. Jibon Miah. Faizuddin Ahmed spearheaded the extensive analytical work to derive the regionally disaggregated poverty estimates using the 2010 HIES and 2011 Population Census data sets. Mahabubul Alam and Faizuddin Ahmed prepared the various poverty maps presented in this report using GIS software.

The team acknowledges the leadership and support of Mr. Md. Nojibur Rahman (Secretary, Statistics and Informatics Division) and Mr. Golam Mostafa Kamal (Director General, Bangladesh Bureau of Statistics). The team would like to thank members of the technical committee and the steering committee, who carefully reviewed both the methodology used as well as the results of the Poverty Mapping work. The team is also grateful to the UK Department for International Development (DFID) and International Fund for Agricultural Development (IFAD) for their financial support for the preparation and publication of the Poverty Maps.

Introduction

Poverty mapping is a statistical exercise to estimate the incidence of poverty at sub-national levels to enable the government, civil society organizations, and development partners to accurately identify locations with a relatively higher concentration of poor people. Due to the considerable demand from policy makers, planners, and researchers for more disaggregated poverty estimates, the current poverty mapping exercise was initiated in September 2012 by the Bangladesh Bureau of Statistics (BBS), the World Bank, and the World Food Programme (WFP) to produce reliable poverty estimates for key sub-national administrative units (zila and upazila) using data from both the 2010 Household Income and Expenditure Survey (HIES) and the 2011 Population Census.[1] According to this latest population census conducted by BBS, the total population of Bangladesh was about 150 million. For administrative purposes the country is divided into 7 divisions, 64 districts, and 544 upazilas /thanas.

The HIES is conducted by BBS every 4-5 years, and is the main source of data for official poverty related statistics in Bangladesh. The World Bank has provided extensive technical assistance to BBS over the past two decades to help improve the quality and timeliness of data collected through this survey. The official poverty estimates are computed from the HIES at the National and Division-level only due to the limited sample size of the survey.

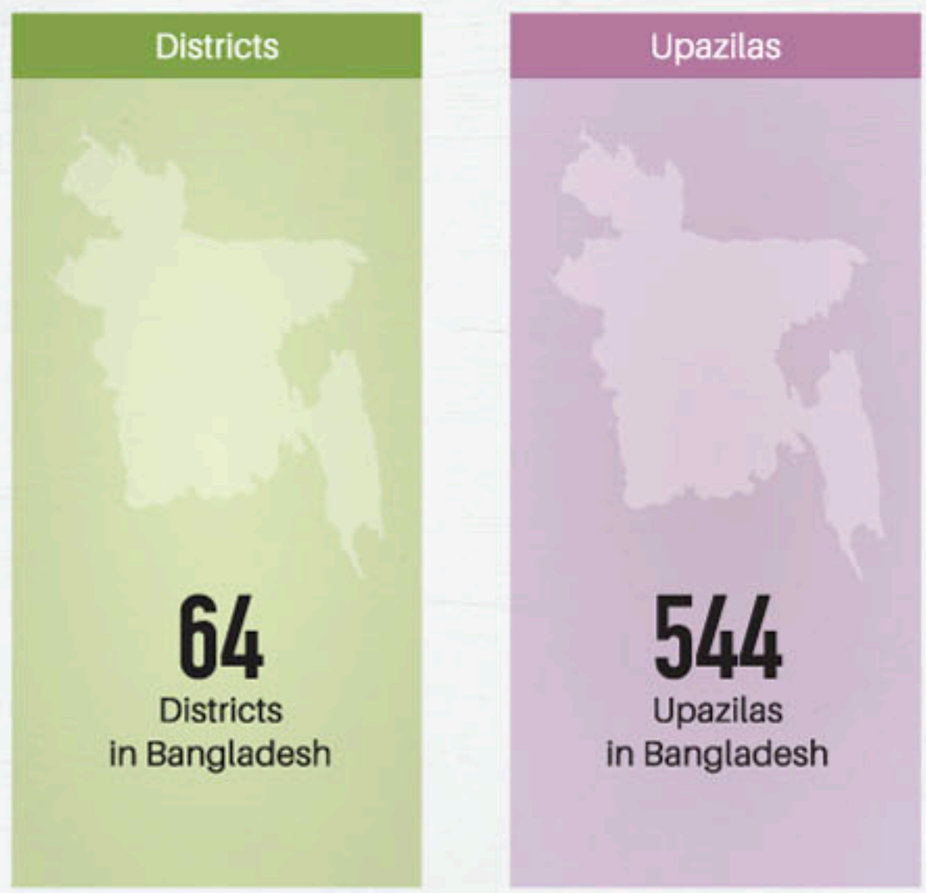
According to the latest 2010 HIES based estimates, poverty incidence in Bangladesh varies from a low of 26.2 percent in Chittagong division to a high of 42.3 percent in Rangpur division. Similarly, extreme poverty incidence (i.e. estimates based on the lower poverty line) varies from 13.1 percent in Chittagong division to 27.7 percent in Rangpur division.

[1] Two other such poverty mapping exercises have been carried out earlier in Bangladesh using data from (i) the 2000 HIES and 2001 Population Census and (ii) the 2005 HIES and the 2001 Population Census.

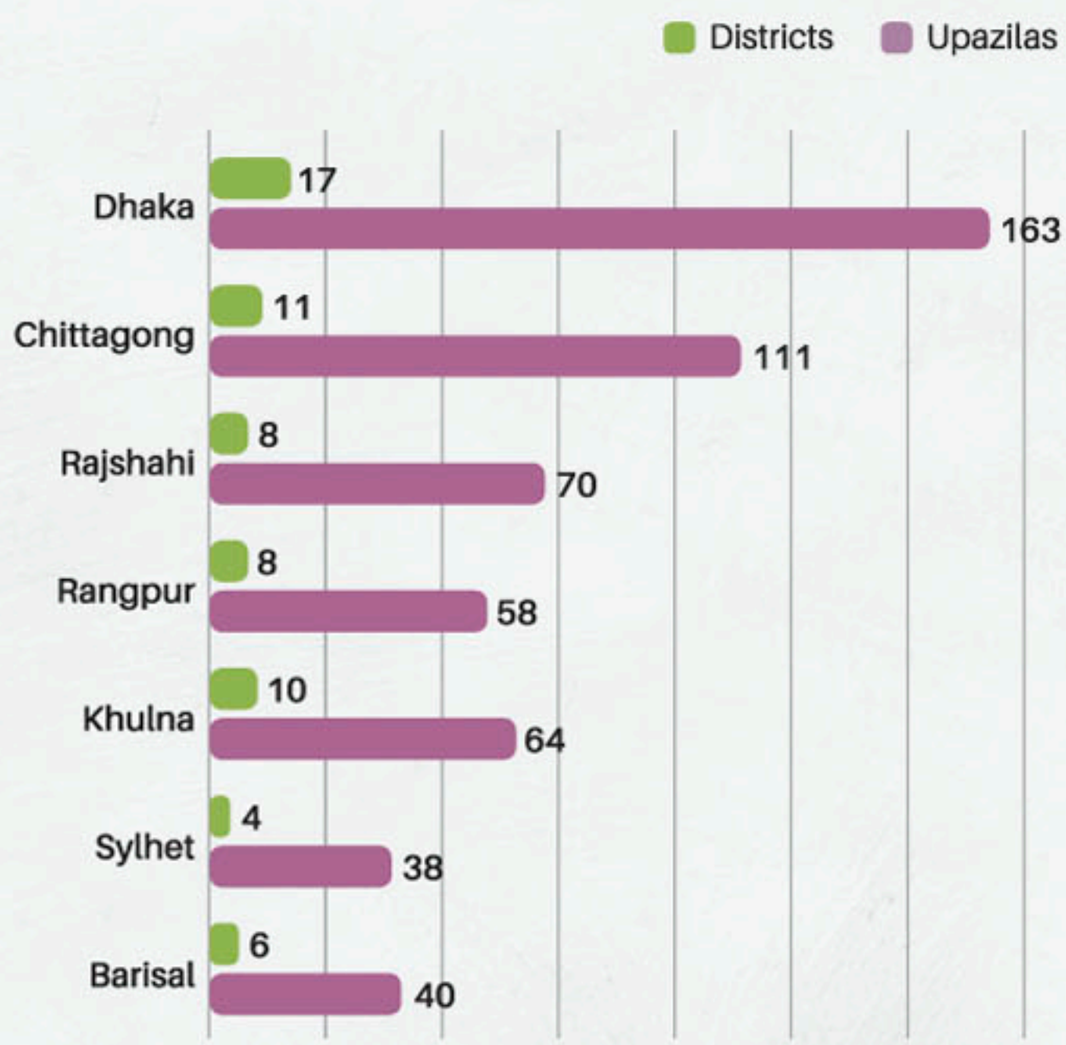
[2] The definition of the upper and lower poverty lines can be found in the 2013 *Bangladesh - Poverty Assessment: Assessing a decade of progress in reducing poverty, 2000-2010.*

Administrative Structure of Bangladesh

Districts and Upazilas in number

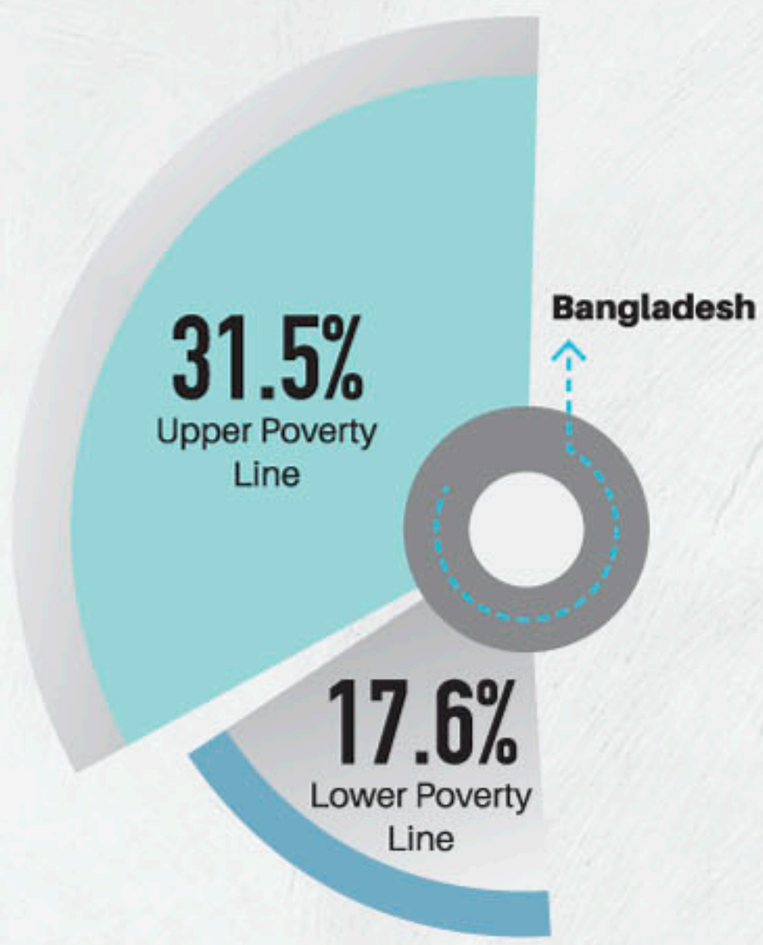


By Division

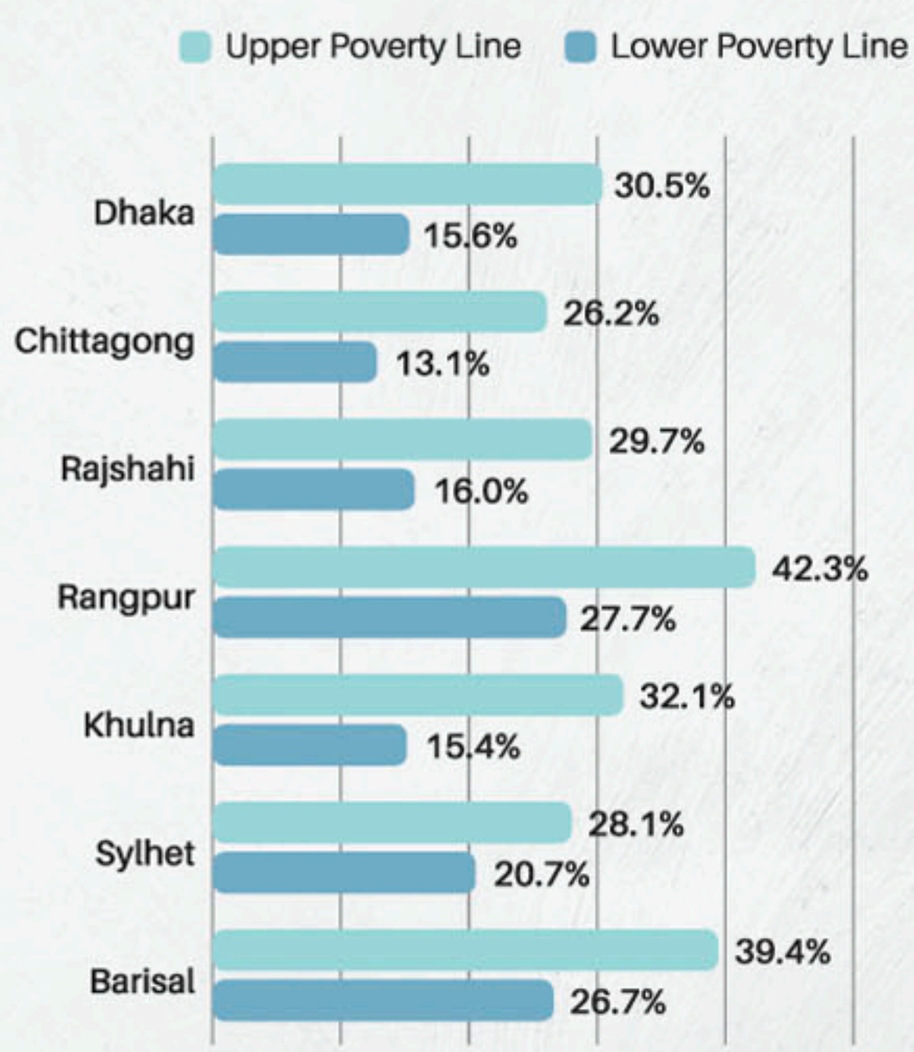


Upper and Lower Poverty Estimates for Bangladesh (2010 HIES)[2]

Headcount Poverty Rate (Bangladesh)
Percent



Headcount Poverty Rate (Division)
Percent



Source: 2013 Bangladesh Poverty Assessment, World Bank

Poverty Mapping Methodology

The poverty mapping methodology used in this exercise is the so-called ELL method developed by Elbers et al. (2003) using Small Area Estimation (SAE) techniques. The ELL method, which has been widely tested and validated around the world, takes advantage of the strengths of both sources of data used in such exercises.

The HIES includes the extremely rich data collected in an integrated household survey, including expenditure data. However this is for a relatively limited sample of households. On the other hand, the Population Census includes all households in the country, but collects data on a limited set of topics. The two data sets, HIES and Population Census, have common set of explanatory variables. The SAE technique uses the parameter estimates from a consumption model derived using the 2010 HIES data to predict/simulate consumption data for each census household. These predicted/simulated consumption data for all 2011 census households are then used to estimate poverty rates at the zila and upazila level using the same poverty lines used to derive the official poverty estimates using the 2010 HIES data.[3]

Poverty estimates for the Bangladesh Poverty Map and Extreme Poverty Maps were derived by using the upper and lower poverty lines in the HIES 2010 published by BBS, which were also used in the World Bank's latest Poverty Assessment.[4] The spatial distribution of poverty in Bangladesh at the upazila level is presented in the two maps on the next pages.

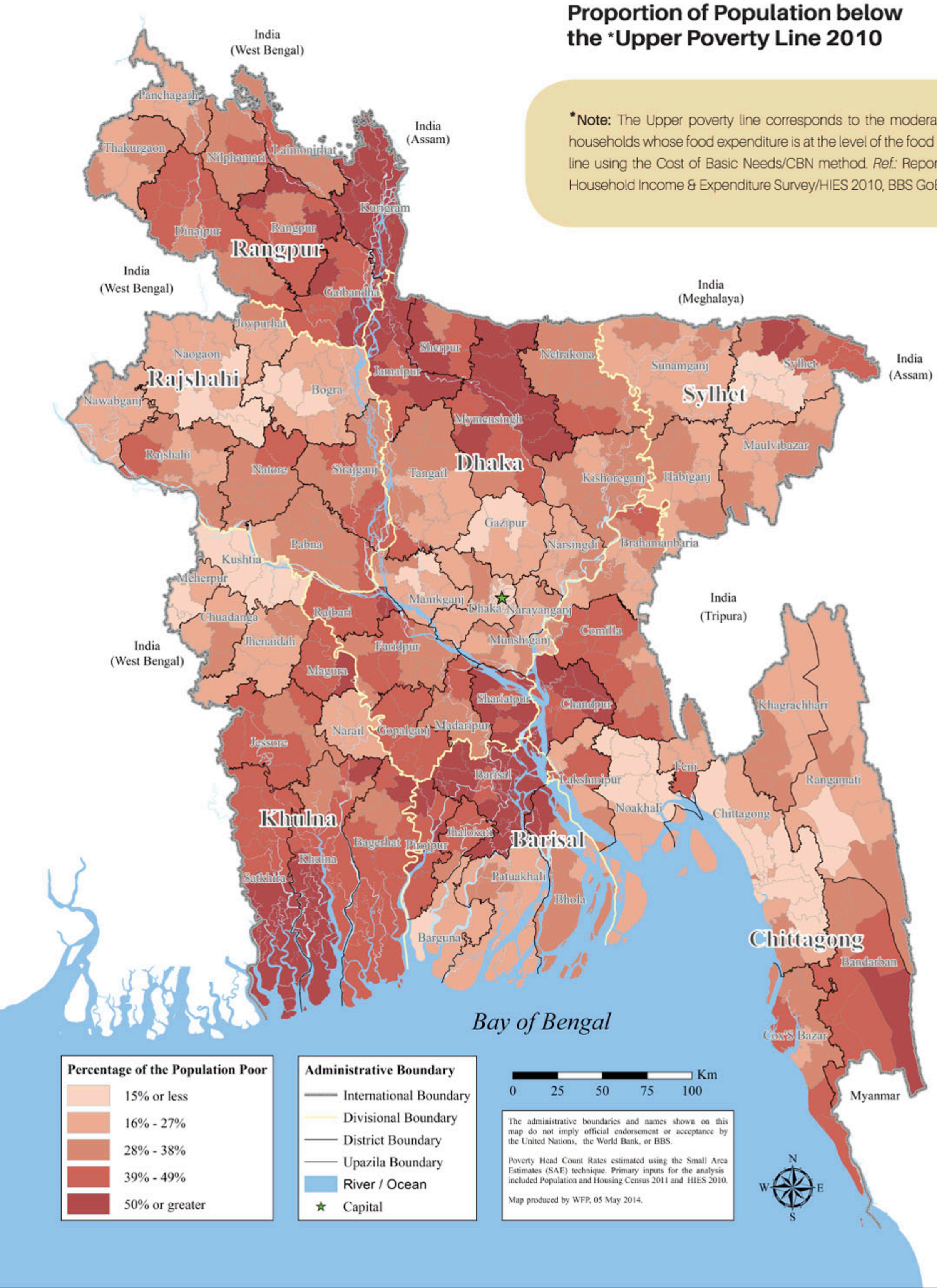
[3] Further details on methodology used to derive these estimates can be found in the Poverty Mapping technical report (available upon request from the World Bank Dhaka Office).

[4] Bangladesh - *Poverty Assessment: Assessing a decade of progress in reducing poverty, 2000-2010.* World Bank 2013.

Bangladesh Poverty Map

Proportion of Population below the *Upper Poverty Line 2010

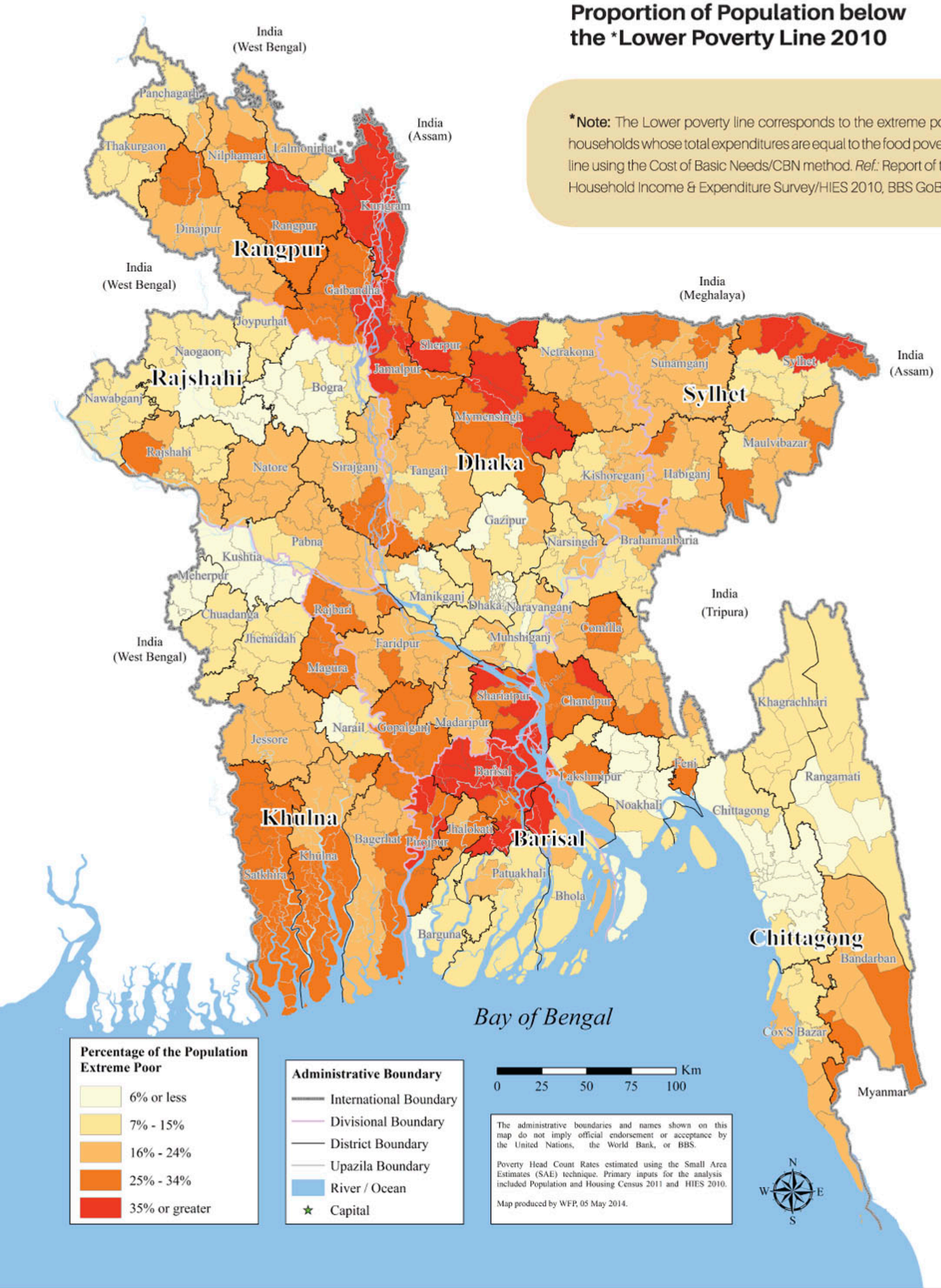
***Note:** The Upper poverty line corresponds to the moderate poor households whose food expenditure is at the level of the food poverty line using the Cost of Basic Needs/CBN method. *Ref.:* Report of the Household Income & Expenditure Survey/HIES 2010, BBS GoB.



Bangladesh Extreme Poverty Map

Proportion of Population below the *Lower Poverty Line 2010

***Note:** The Lower poverty line corresponds to the extreme poor households whose total expenditures are equal to the food poverty line using the Cost of Basic Needs/CBN method. *Ref.:* Report of the Household Income & Expenditure Survey/HIES 2010, BBS GoB.



Results at a Glance

Division Level Poverty Estimates

The poverty estimates derived through this Poverty Mapping exercise are quite close to those obtained from the 2010 HIES. The minor differences between these two sets of estimates (as summarized in the table below) are partly to be expected, since the methods used in the Poverty Mapping exercise match predicted consumption (i.e. not poverty rates) at the Mauza/Mahalla level in the two data sets – i.e. 2010 HIES and 2011 Population Census.

Comparison of Poverty Estimates: 2010 HIES and Poverty Mapping

Division	HIES	Poverty Mapping Exercise	
	2010 Poverty Headcount (in percent)	**2010 Poverty Headcount** (in percent)	**Number of Poor** (as % of overall population)
Bangladesh	**31.5**	**30.7**	**100.0**
Dhaka	30.5	30.5	32.3
Chittagong	26.2	26.1	16.8
Rajshahi	29.7	27.4	11.6
Rangpur	42.3	42.0	15.0
Khulna	32.1	31.9	11.4
Sylhet	28.1	25.1	5.7
Barisal	39.4	38.3	7.3

- Poverty estimates for Bangladesh based on both the HIES and the poverty mapping exercises show that Rangpur and Barisal divisions have the highest incidence of poverty, while Chittagong and Sylhet have the lowest incidence.
- Because of their large overall populations, Dhaka division (32.3 percent) and Chittagong division (16.8 percent) have the highest share of Bangladesh's poor.
- Compared to other divisions, Sylhet division has both the lowest headcount rate (25.1 percent) as well as the lowest number of poor people (5.7 percent of the country's poor).

Zila Level and Upazila Level Poverty Maps

As the following maps on the next pages illustrate, the resolution of spatial variation in poverty incidence improves considerably on moving from the division to zila level and upazila level poverty maps - there is considerable spatial variation in poverty incidence within individual divisions.

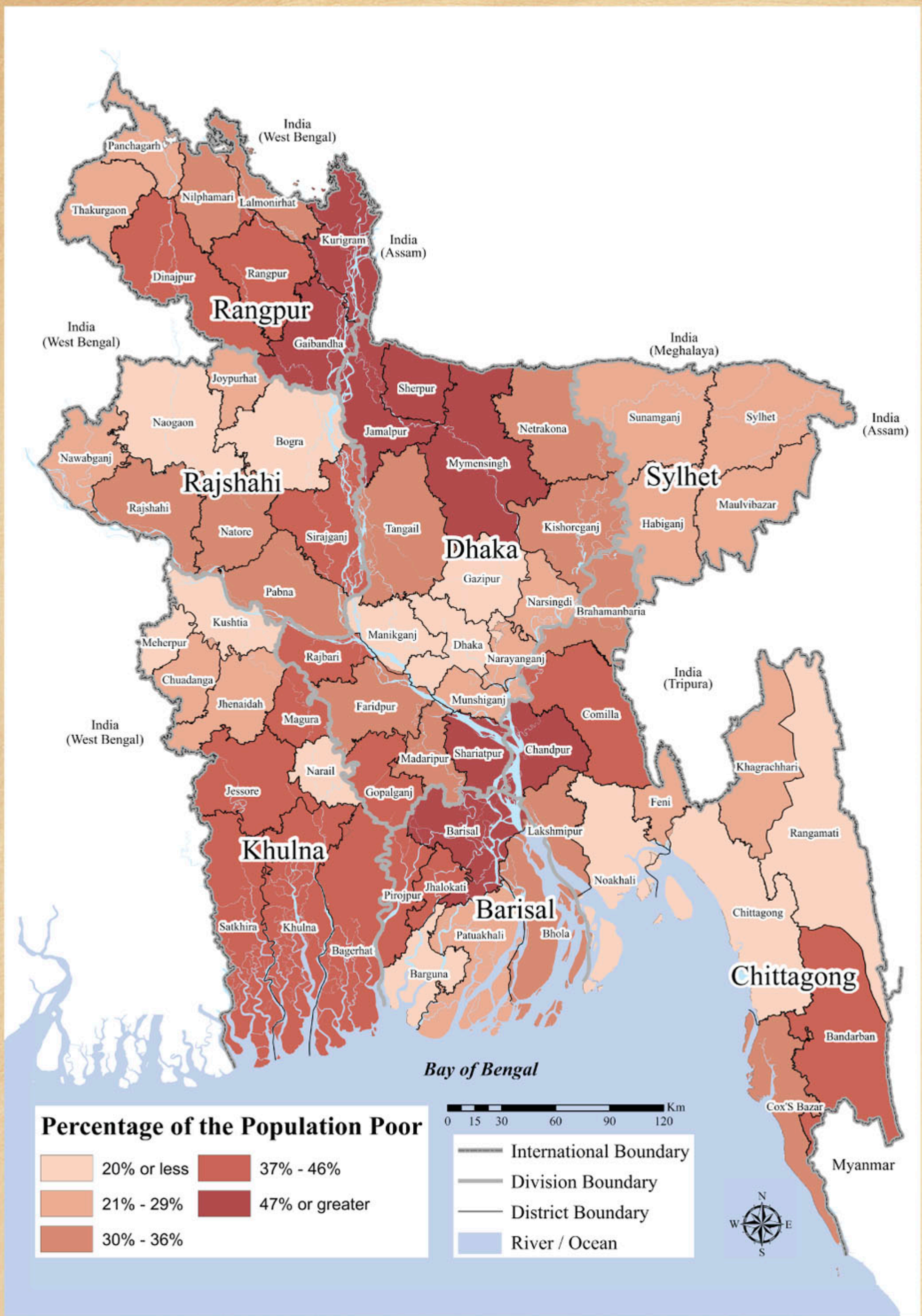
Key features of the variation in poverty incidence at the zila level are highlighted below

Division	Average Poverty Rate (in percent)	Minimum Rate (in percent)	Maximum Rate (in percent)
Dhaka	30.5	15.7 Dhaka district	52.6 Shariatpur district
Chittagong	26.1	9.6 Noakhali district	51.0 Chandpur district
Rajshahi	27.4	16.6 Bogra district	38.7 Sirajganj district
Rangpur	42.0	26.7 Panchagarh district	63.7 Kurigram district
Khulna	31.9	3.6 Kushtia district	46.3 Satkhira district
Sylhet	25.1	24.1 Sylhet district	26.0 Sunamganj district
Barisal	38.3	19.0 Barguna district	54.8 Barisal district
Overall Bangladesh	**30.7**	**3.6 Kushtia district**	**63.7 Kurigram district**

- Poverty incidence in the 10 poorest upazilas in Dhaka division is 55 percent or higher; by contrast, poverty incidence in the 10 richest upazilas is less than 4 percent.
- Similarly poverty incidence in the 6 poorest upazilas of Chittagong division is 50 percent or higher, while that in the 6 richest upazilas is less than 4 percent.
- Even the poorest division of Bangladesh has considerable spatial variation in concentration of poverty: the incidence of poverty in the 11 richest upazilas in Rangpur division is lower than the national average; by contrast, poverty incidence in the 7 poorest upazilas is more than twice the national average (i.e. it is 60+ percent).
- While Sylhet division is amongst Bangladesh's most well-off regions, over 50 percent of the population of Gowainghat upazila lives below the national poverty line; similarly, 3 upazilas in Khulna division have a poverty rate of 50 percent or higher.

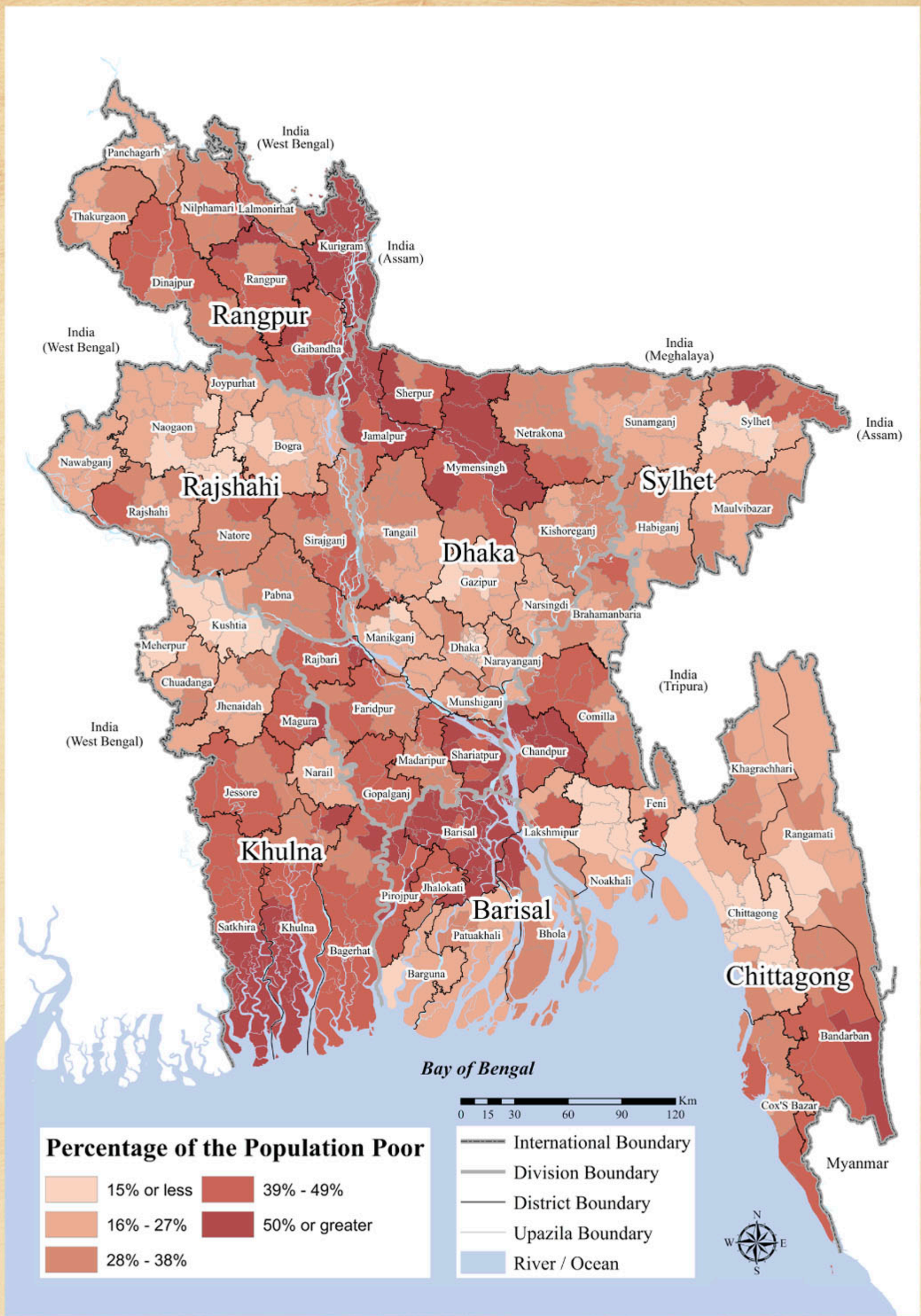
Zila Poverty Map

HCR Upper Poverty Line



Upazila Poverty Map

HCR Upper Poverty Line



Key Correlates of Poverty Incidence in Bangladesh

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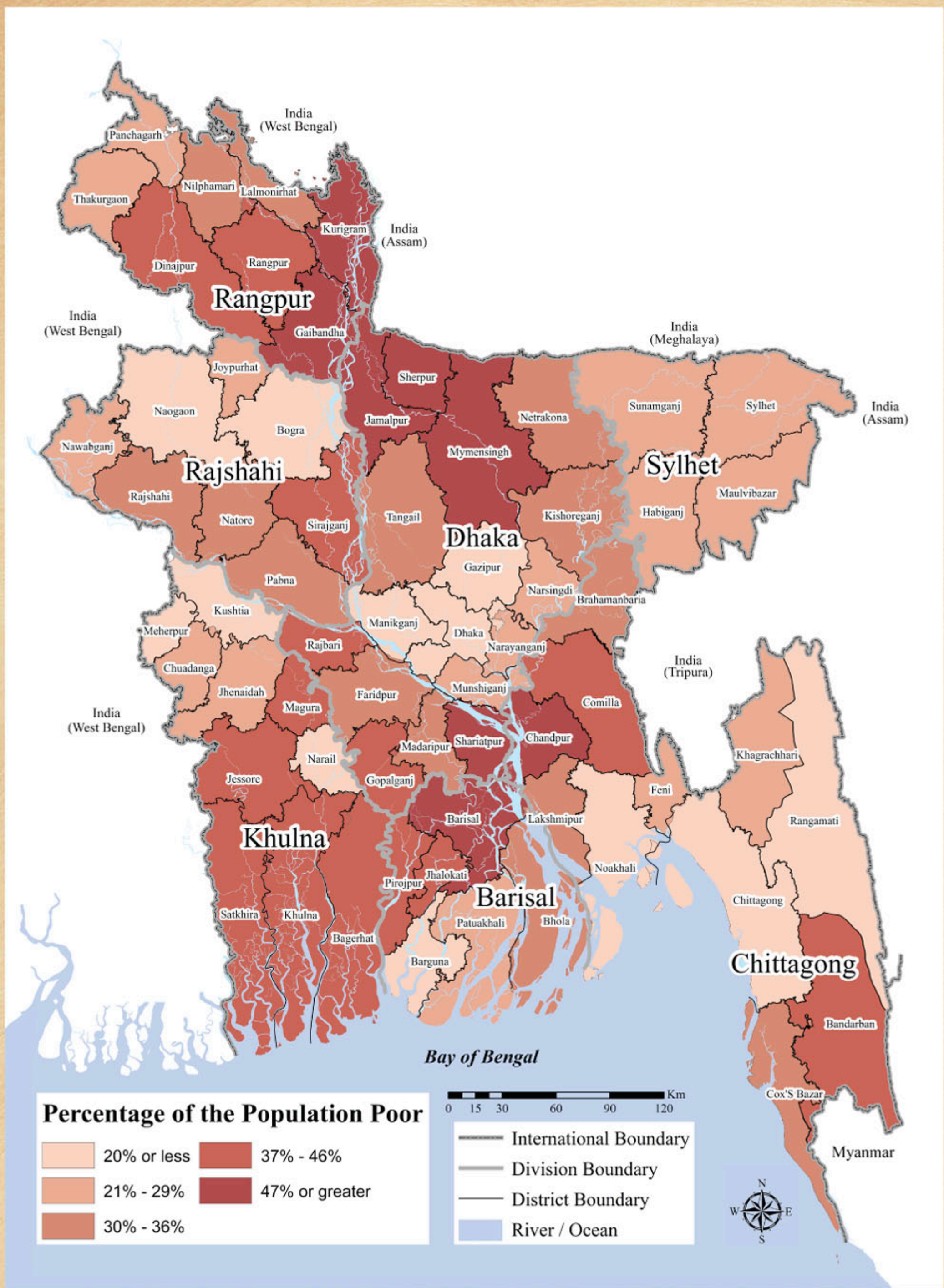
The reliability of the poverty maps can be evaluated by comparing the estimates obtained from the poverty mapping exercise with the results of the Perception Survey on Relative Prevalence of Poverty commissioned by the WFP in 2014 in 16 districts across Bangladesh. The results reveal a very high correlation between the two sets of poverty estimates, and provide strong corroborating evidence of the robustness of disaggregated poverty estimates obtained from the Poverty Mapping exercise.

The poverty maps can also be compared with other geographic and regional characteristics that are likely correlated with poverty incidence.

The Poverty Map and Average Agricultural Wage Rate of Male Laborers

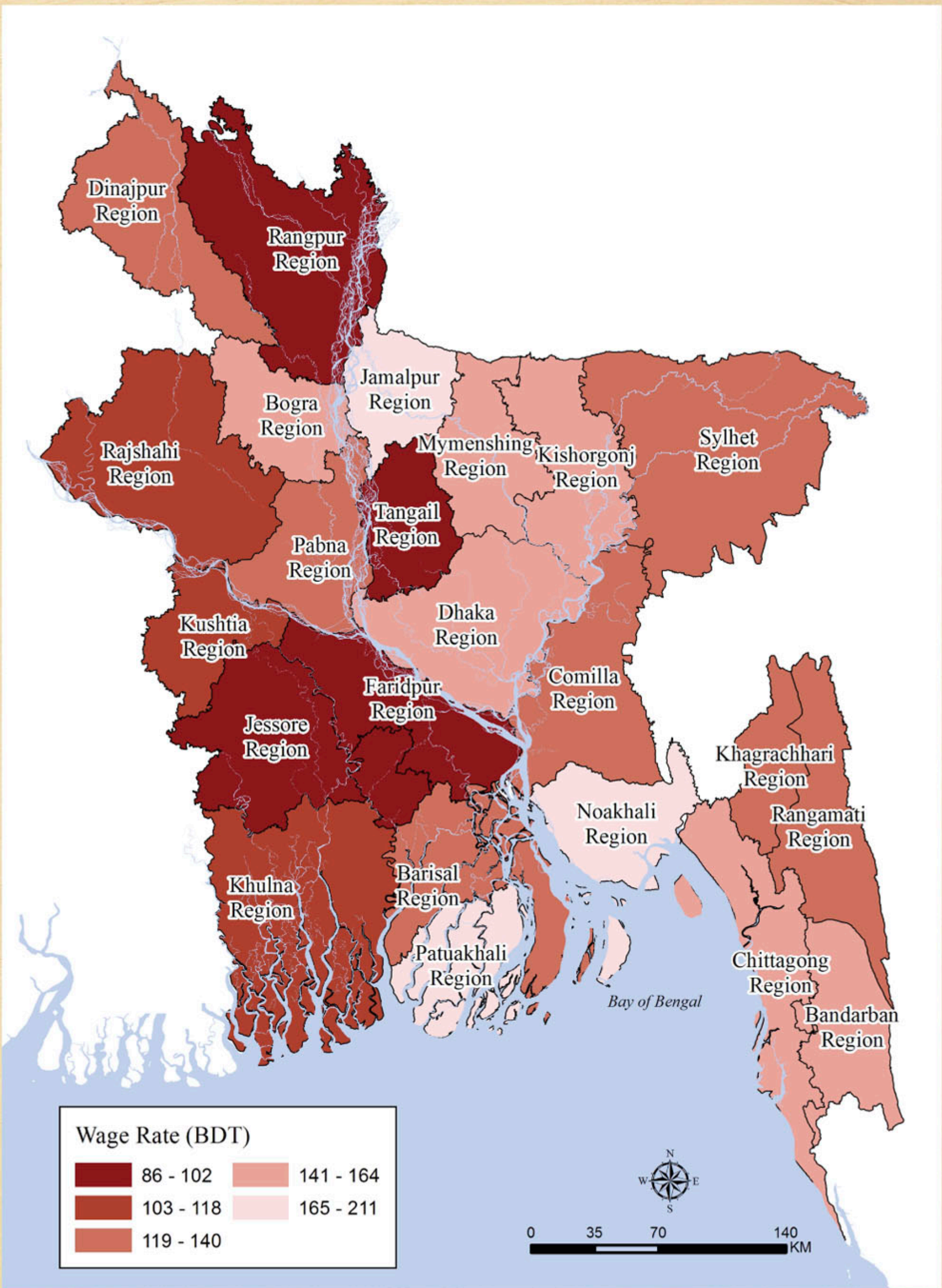
Zila Poverty Map

HCR Upper Poverty Line



The maps contrast poverty rates with average agricultural wages rates (BBS data), and illustrate the negative association between these two variables. Darker areas on the maps correspond to areas with high poverty rates and low wage rates.

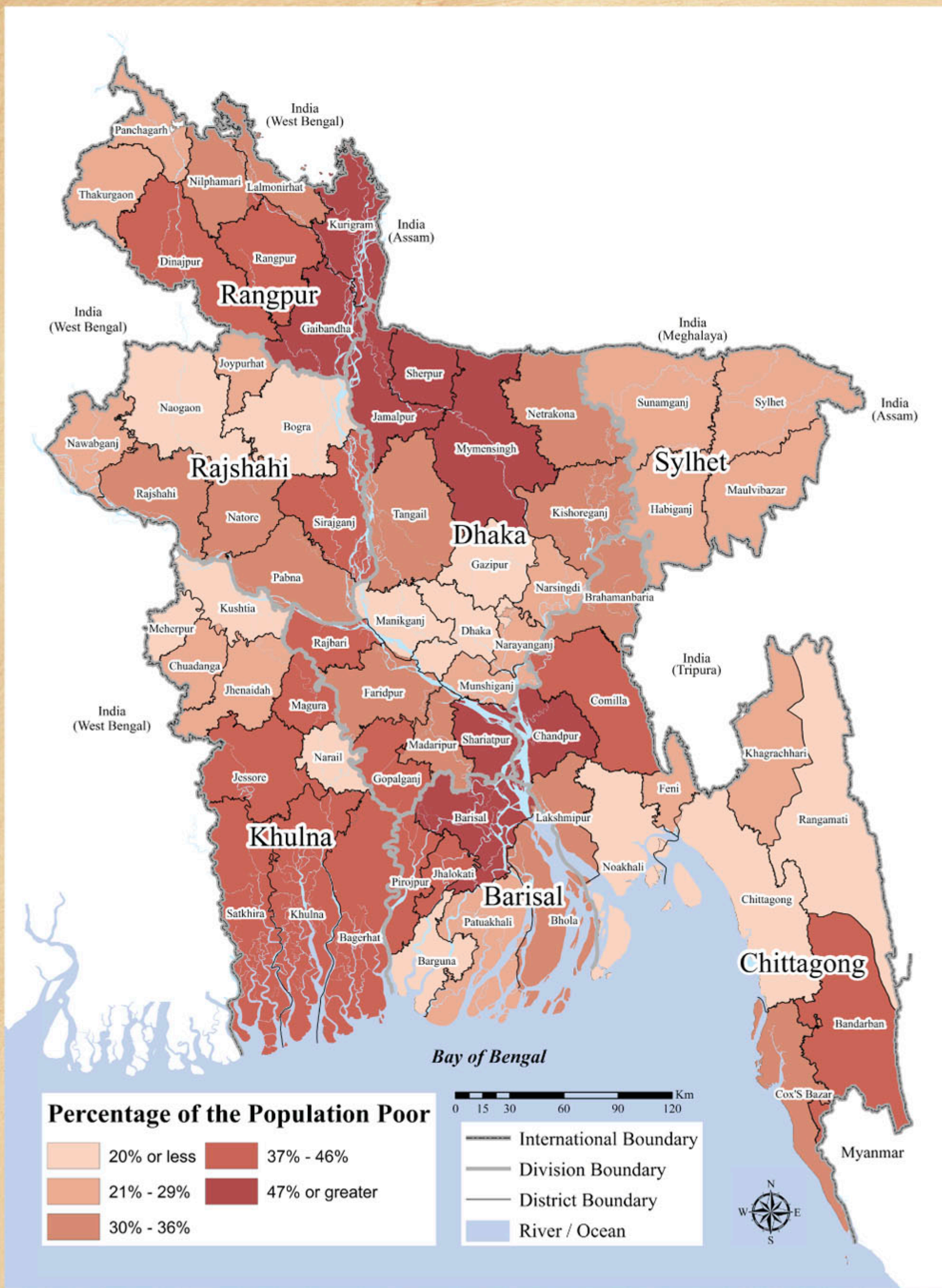
Average Agriculture Wage Rate



The Poverty Map and Educational Attainment of Household Heads

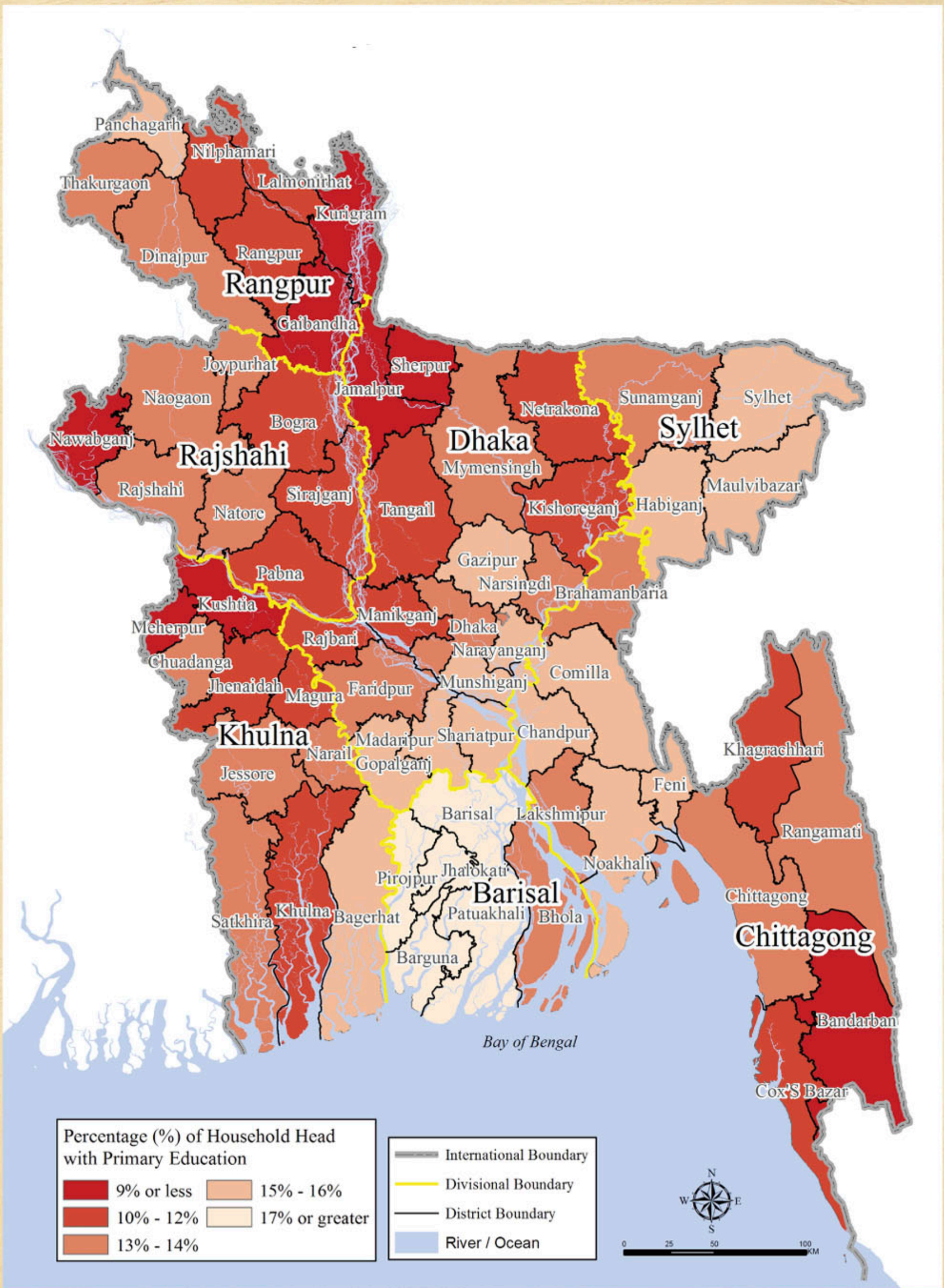
Zila Poverty Map

HCR Upper Poverty Line



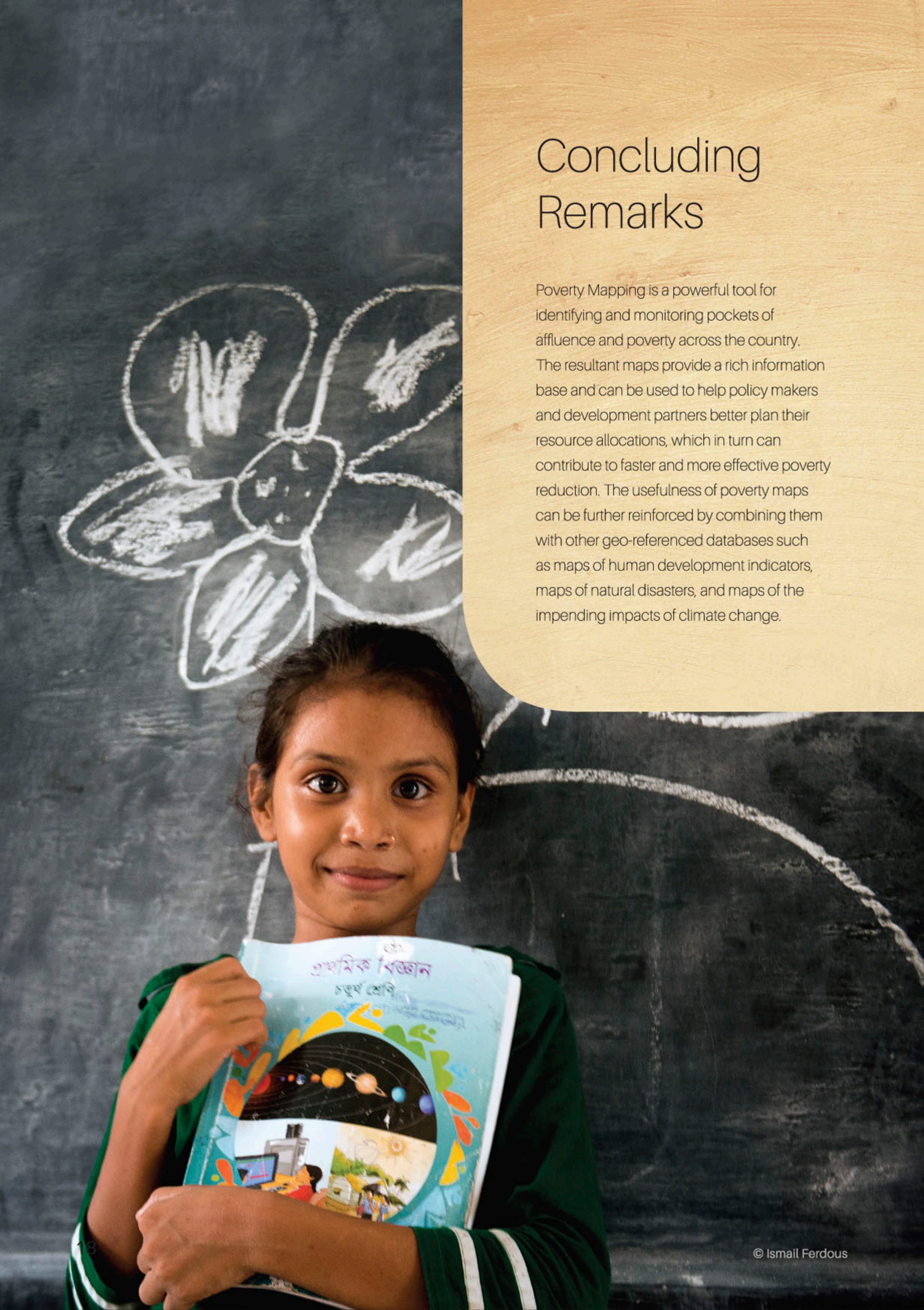
The maps compare poverty rates with educational attainment of household heads (2011 Population Census data). Darker areas on the maps correspond to areas with high poverty rates and lower rates of completion of primary education. As the maps show, districts in north and southeastern Bangladesh whose poverty rates are high also suffer from low primary school completion.

Household Head Completed Primary Education



Concluding Remarks

Poverty Mapping is a powerful tool for identifying and monitoring pockets of affluence and poverty across the country. The resultant maps provide a rich information base and can be used to help policy makers and development partners better plan their resource allocations, which in turn can contribute to faster and more effective poverty reduction. The usefulness of poverty maps can be further reinforced by combining them with other geo-referenced databases such as maps of human development indicators, maps of natural disasters, and maps of the impending impacts of climate change.



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