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Internal Migration in Bangladesh: Character, Drivers and Policy Issues



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A paper by the

United Nations Development Programme (UNDP), Bangladesh

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List of Acronyms

BBS	Bangladesh Bureau of Statistics
CHT	Chittagong Hill Tracts
CSO	Civil Society Organization
CUS	Centre for Urban Studies
DP	Development Partner
GDP	Gross Domestic Product
GoB	Government of Bangladesh
HIES	Household Income and Expenditure survey
IOM	International Organization for Migration
LDRF	Local Disaster Risk Reduction Fund
MICS	Multiple Indicator Cluster Survey
MDG	Millennium Development Goals
p	Probability Value (statistical parameter)
PMCC	(Pearson's) Product Moment Correlation Coefficient
UNDP	United Nations Development Programme
UNDESA	United Nations Department for Economic and Social Affairs
UNCT	United Nations Country Team (Bangladesh)
Unicef	United Nations Children's Fund
UNFPA	United Nations Fund for Population Activities
WFP	World Food Programme

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1. Introduction and Purpose

Internal migration has become both a major policy concern and a subject of a heated public debate in Bangladesh. It has been identified as both *saviour and villain* of the national developmental story; a driver of economic expansion and modernization, while also the cause of severe urban deprivation and a destroyer of traditional rural life. This tension is not an unusual one for a country undergoing a rapid socioeconomic transition - from a low income agrarian past to a middle income, industrial future. To a great extent migration, industrialization and urbanization are a single symbiotic process, and the underpinning forces are hard to resist. However, they are not beyond control, and policy responses still matter in localities and at the aggregate level. In principal, this paper views internal migration in a positive light, seeing it as essential to economic transformation, and crucially, to the on-going reduction of poverty. Successful management of this process requires that some of its complexity be stripped away, and the key near term drivers and their relative importance are revealed.

This paper therefore explores the nature, causes and dynamics of domestic migration, and specifically the role played by three distinct factors – livelihoods and economy, the quality of public services and the presence of challenging environmental conditions. It presents key findings, conclusions and offers a series of policy recommendations. However, an equally important aim is to generally inform and stimulate debate on migration and the associated policy questions. The supporting analyses employ a set of quantitative methods, and we aim to supplement the largely qualitative literature that has emerged in recent years. Yet at the outset, we underline that the rather weak data resources tend to limit what can be definitively concluded. It is also important to make clear that our purposes of the paper are fairly prosaic – at core we simply seek to map the pattern of movements and to test the three commonly assumed alternative drivers of migration (economy, environment and public service quality).

The paper has three principle sections. The first provides the context - the national background and the body of theory which underpins the research undertaken. The second outlines the methods and analysis employed, and sets out the key findings. Third and finally, we provide conclusions and a series of policy recommendations.

2. Background

This initial section sets out the research context, providing an overview of migratory trends and socioeconomic and environmental pressures in Bangladesh. It is also worth noting that while there have been a large number of contributions to the literature on migration, many are qualitative in nature, and part of our purpose is to bring new insights through the application of very basic analytical techniques using aggregate data¹. In addition to reviewing the discussion of population movements and the economic and environmental conditions, it summarizes the main theoretical frameworks we employ to understand and analyse the main drivers.

2.1 Context

It is undeniable that migration is major a feature of Bangladesh's recent history. Successive studies and policy papers have documented large movements both within and outside the country. Current

¹ An exception is the Centre for Urban Studies (CUS) (2006), *Slums of Bangladesh: Mapping and Census 2005* (2006). Note this was more of mapping then census, as enumeration was done at community level.

estimates put the number of external migrants per year at above 600,000 and the level of inward remittances as approaching a staggering 10% of GDP². Internal migration has generally been thought of as an urbanization phenomenon, and the urbanization rate has been quoted at 3.03% over the period from 1975 to 2009, and this is one of the highest in the world³. In turn, this is typically explained by a dramatic shift from agricultural to industrial production (the former down from 32% to 19% and latter up from 21% to 28% as a share of GDP between 1980 and 2010)⁴, and/ or population flight from areas exposed to serious environmental challenges. In addition, variations in living conditions have also emerged as an issue within discursive accounts of movements (Tavares, 2010).

It is also important to take note of the macro level processes at work. Foremost, the country is nearing the end of its demographic transition and in recent years, annual population growth rates have been falling (but note the decadal data quoted below shows growth). UNFPA projections suggest Bangladesh is now approaching the maintenance level; while its current population level of around 150 million will rise further, it will plateau at around 200 million in the next 15 years⁵. This change will have implications for the level and character of migration, as growing and young populations are more likely to exhibit dynamic patterns of movement.

The second, and equally significant, background macro level process is the economic expansion, and to some extent economic transformation, the country has enjoyed since the early 1990s. Growth has now reached an annual trend rate of some 6 to 6 ½% per annum. This has been accompanied by structural change to higher value-added production, associated with the industrialization process. This has directly driven major socioeconomic changes, of which mass migration is one. Indeed, population movements have both affected the economy and in turn, been affected by it. We return to these questions below, but it is also worth underlining that the growth process has been poverty reducing as Chart 1 shows; the national headcount ratio has fallen from 59% in 1991 to just over 31% in 2010; and while the dollar a day rate has lagged behind the national rate, it too has seen large reductions over time. It is also worth noting - migration internal and external - has made a direct contribution to these outcomes. However, a case can be made for the stronger impact of internal over external migration in poverty reduction, as it is potentially more growth enhancing and its distributional impacts more equitable⁶.

² Overseas migration data is taken from UNCT UNDAF Info database; estimates of remittances (as a percentage of GDP) from UNRC Economic Briefings 2011/ 2012.

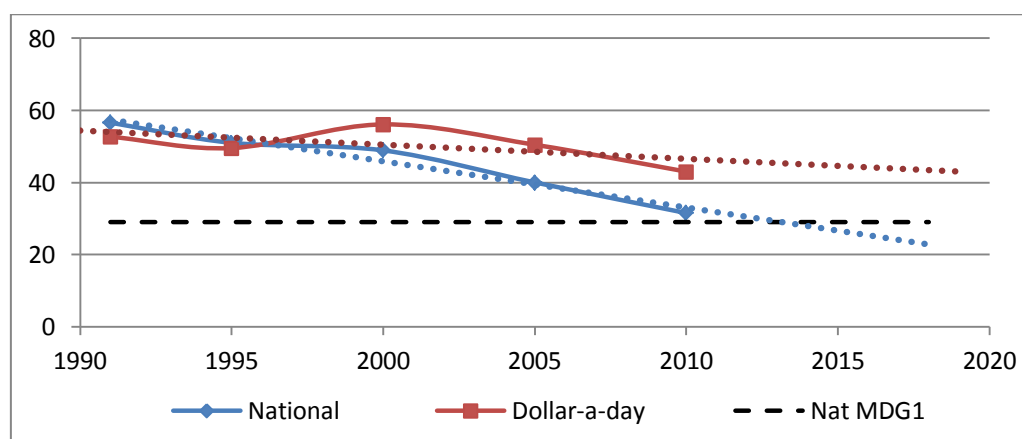
³ Urbanization Prospects Report 2009 (UNDESA), for the period of 1975-2009

⁴ Bangladesh Bureau of Statistics website (see: www.bbs.gov.bd/).

⁵ This is as per UNFPA briefing to the LCG DP Plenary Session Summer 2012. Care is needed with population data, BBS district level estimates (used in this paper) suggest a population of 144 million at mid-point of 2010 (yet alternative BBS sources quote range of between 141 and 148 million).

⁶ Four arguments can be made to support this: (1) Internal migration has a broader income effect whereby smaller sums of money are more evenly distributed across areas and poor families (through internal remittances); (2) It is likely that internal migration will continue to increase at a faster rate; (3) Internal migration generally involves (even) poorer people from (even) poorer regions and has a stronger role to play in achieving the MDGs; and (4) it is an important driver of growth in many sectors.

Chart 1: Poverty Headcount Rates 1990 onward & Projections⁷



One of the few quantitative sources, the Centre for Urban Studies 2005 census of low income settlements finds that a large proportion of slum residents in the city corporation towns had migrated from other districts or their rural hinterlands. As illustrated in Table 1, the proportion of migrants within slums areas varies but is generally high; ranging from 53% in Dhaka (column 1) to 70% in Khulna and Rajshahi (columns 4 and 5). Long distance movements (shown by underlined text) are a major proportion in Dhaka but are rare elsewhere. Coastal belt districts (an area plagued by cyclone and sea flooding) figure highly, particularly in Dhaka (red bold text) and in Khulna and Barisal (columns 1, 5 and 6). It is, however, worth noting these figures are estimated at settlement level and therefore somewhat approximate.

Table 1: Major Districts of Origin of Slum Dwellers by City Corporation (source: CUS, 2006)⁸

1	2	3	4	5	6
Dhaka (53%)	Chittagong (54%)	Sylhet (59%)	Rajshahi (70%)	Khulna (70%)	Barisal (65%)
<u>Barisal (23%)</u>	Chittagong (20%)	<u>Mymensingh (16%)</u>	Rajshahi (70%)	Barisal (36%)	Barisal (65%)
<u>Faridpur (9%)</u>	Comilla (19%)	Sunamganj (14%)		Bagerhat (18%)	
<u>Comilla (9%)</u>	<u>Noakhali (15%)</u>	<u>Comilla (11%)</u>		Faridpur (17%)	
Mymensingh (7%)		<u>Rangpur (10%)</u>			
<u>Rangpur (5%)</u>		Hobiganj (10%)			

Key: Underlining – Out of Division migrants; Red Bold – Coastal belt migrants; Green italics – northern environmentally challenged (Haor and Monga).

⁷ Source: UNCT Economic Briefing Series 2011- 2013 (UNDP).

⁸ Adapted from CUS (2006), Table 4.15, page 48; although the term census is used, a population and area-based mapping may be a better characterization.

It is important to differentiate between seasonal and longer term population movements, and between what might be referred to as *elective* and *enforced* migration. The purpose of the paper is to examine movements which are both permanent and (generally) entered into freely. However it is recognized that differentiating between these two considerations is often difficult in practice⁹.

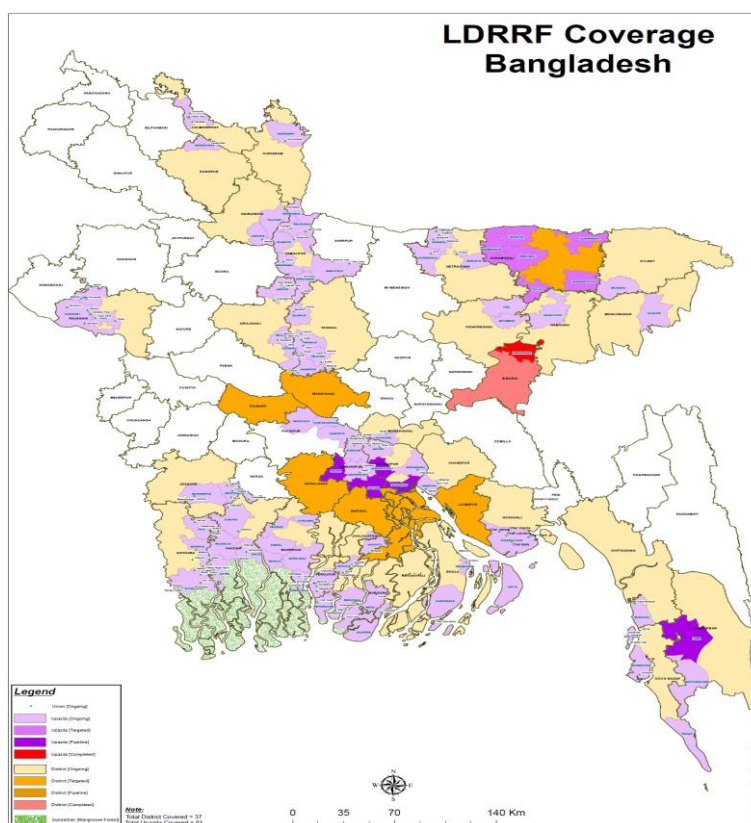
Environmental challenges play a big part in these two considerations. Referring to the first, Bangladesh has a long established seasonal pattern of temporary rural worker movement, associated with the annual cycle of rainy and dry periods. This affects two regions in particular – the *Monga* prone districts in the northwest which suffer prolonged and severe drought during the winter, and the north-eastern *Haor-affected* areas, which face flooding and waterlogging during the monsoon. Within the areas, which are dominated by subsistence agriculture, workers have always moved to secure their livelihoods, albeit temporarily. This was initially to neighbouring agricultural localities, but in the last twenty years this cycle has expanded to include working within the core urban centres. Some evidence has shown that these movements have become more permanent in nature, and therefore lie within the scope of this paper.

While Bangladesh has few administrative restrictions, the extent of environmental pressures (notably within the cyclone-prone coastal belt) does call into question the freedom of migration choices. Indeed, the risks and impacts may be so severe as to preclude human settlement. Exodus from this coastal region is an often cited environmentally-driven source of population flows, and is argued to be more permanent and sustained (see for example Walsham, 2010). However, it is also important to make a further distinction between what environmental commentators describe as *slow-onset environmental damage* and *sudden onset impacts*. Whereas the former involves a progressive degradation of the ecosystem, the latter is acute and event driven. It seems this might be described as a form of enforced movement. Yet also, as commentators such as Walsham (2010) note, these two occur at the same time and place, and they interact with each other. The coastal belt offers a prime example of this, with cyclone risks faced by the self-same areas suffering progressive rises in sea level and salt water inundations.

Before moving on, it is also worth noting large parts of Bangladesh, and perhaps a majority of the land area, is environmentally at risk. Indeed, as UNDP's Comprehensive Disaster Management Project's *Local Disaster Risk Reduction Fund* map of vulnerable areas illustrates (see Chart 2) some 40 of the 64 districts are rated as at risk. Potentially all of these areas are subject to pressures which might drive population losses, but in the analyses employed below we focus on the three generic areas identified above.

⁹ Moreover, it must also be underlined that many temporary movements have an important economic, and therefore, poverty reduction impact (this is through both individual earnings and *internal remittances*).

Chart 2: Environmentally at risk areas (per LDRF)¹⁰



However, most of the existing literature identifies economic forces as underpinning the strongest population movements, and especially in driving migration to the core urban centres of Dhaka and Chittagong. In addition, Bangladesh's economic geography has been dominated by an east-west axis, whereby the east out flanks the west. The country has long been bifurcated by the mighty Jamuna and Padma rivers, but the divide has been reinforced by poorer infrastructure and limited access to markets, and crucially therefore, to the export-based boom which took hold in the last twenty five years. Yet in more recent years, this pattern has begun to breakdown somewhat, notably in the northwest due to the opening of Jamuna bridge and some easing off trade restrictions with India. In addition, there are important specific regional variations. These include both growth poles (such as Sylhet city in the north) and lagging sub-regions (such as the Chittagong Hill Tracts in the far Southeast), which modify the overall patterns.

Taken together, these factors lay bare the unevenness of growth process, and the level of spatial inequality in Bangladesh. Indeed, while the overall income and expenditure distribution has remained fairly static (with a Gini coefficient of 0.32), the spatial component (measured by the ratio of Theil Indices) has grown over the past surveys (BBS, 2011; World Bank, 2008)¹¹. This is unsurprising given the pivotal role internal migration plays within Bangladesh's economy, and to an extent, migration, urbanization and industrialization are symbiotic processes. With large numbers of

¹⁰ See CDMP website: <http://www.cdmp.org.bd/>

¹¹ Gini coefficients have been provided in successive editions of the BBS Household Income and Expenditure Survey; the Gini has stabilized at 0.33 (BBS, 2011). The Theil Index however has only been made available in the World Bank's 2006 Poverty Assessment; the index shows deterioration in the spatial component of around 3% between 2000 and 2005 (UNDP staff estimates based on World Bank, 2008).

rural Bangladeshis providing the labour force for rapidly growing manufacturing activities, chiefly Ready Made Garments, and/ or serving in the large informal sector which has established itself around these industries. Yet as noted this process has been far from even, with the majority of the value added located in core cities. As a result, secondary urban centres have never prospered to the extent that Dhaka and Chittagong have. Moreover, it is only latterly that a tightening of rural labour markets and improvements in agricultural productivity has dispersed some of the gains to other regions.

An equally significant development has been the growth of slum conditions in urban localities, even within the core cities, together with considerable levels of unemployment and under-employment. Clearly, the promise of opportunities and better lives has not been realized in full. Yet in-urban flows have continued apace. In addition to poverty, inequality and social exclusion have emerged, and slums often sit alongside affluent suburbs. As a result, localized intense poverty is hidden within the aggregate data. Urban poverty also has a different character, with high levels of multiple human deprivations, as opposed to the single vector of income measured by national survey instruments. This pocketed nature of urban poverty mirrors the leopard skin pattern which has developed in rural areas, whereby localities with viable land and communications have benefitted from growing domestic demand (also a by-product of economic transformation) while others have not. The overall impact is a migration process which is unbalanced, and while positive in aggregate, has produced unequal outcomes for families and localities. Questions might also legitimately be raised about the sustainability of a process centred on the core cities alone, and their ability to absorb and make best use of surplus labour. It seems likely that at the very least, diminishing returns will set in, and dis-economies such as pollution, congestion and social dislocation will slow the growth potential of the existing economic model.

This presents a *prima facie* case for public intervention to manage and mediate the impacts of population flows. Yet official policy responses to mass internal migration have generally been weak with the authorities often playing catch up in seeking to address substantial and irrevocable changes. Moreover, there is a general reticence within Government to act on rural to urban flows, and especially to the metropolitan core, and this in spite of the development of large urban slums. Governments have even tacitly viewed worsening socioeconomic conditions as a means of choking further flows. As we will see this seems to have little basis in empirical facts. Moreover, this threatens to fundamentally weaken the growth potential of cities, while also effectively sanctioning mass deprivations.

2.2 Theoretical Perspectives

Theoretical understandings of internal migration (noting again we are referring to elective, permanent movements) can be grouped under two broad headings; *geographical push-pull* models, under which movements are governed by a balance of attracting and repelling factors; and *economic models* rooted in productivity and livelihood differentials, notably those offered by Lewis (1954) and Harris and Todaro (1970).

In essence, *push-pull understandings* rely on the weighing of a series of considerations motivating individual migration decisions based on the broad gains at the destination location and losses (or risks) suffered at the starting location. These accounts typically also assume there is an inertial threshold which needs to be overcome prior to relocation – i.e. either by an event, pay-off or change

substantial enough to motivate movement. The factors to be weighed might include the economic (livelihoods, opportunities and higher wages), social (quality of public services, community/ ethnic ties, crime levels and security issues), and the physical (amenity value versus disaster conditions or the threat of them). It is worth noting that push-pull type explanations have been cited most frequently in the Bangladesh context within studies examining the impact of environmental vulnerabilities.

Economic models are rather more sophisticated in their formulation, and certainly more parsimonious, given they are driven by economic differentials between localities (which in turn provide incentives for individuals and families to re-locate). They also offer considerable benefits for the approaches used in this type of paper as they lend themselves to empirical testing. Nevertheless they might be criticized for their narrowness, reducing choices to a rational economic man-type calculus.

Economic approaches can be differentiated between structural and micro level models. Lewis (1954) offers a classical model of migration decisions in low income countries. This is framed part of a long term process of structural change, specifically from an agrarian to industrial society. His model posits a dual sector economy, with a traditional backward sector (subsistence agriculture) and an emergent modern sector (urban-based manufacturing industry). Whereas the former exhibits static, and with population growth, returns, the latter is dynamic, with growing productivity. The widening productivity differential drives higher wage and opportunities in the modern, urban-based sector, and hence mass and hence opportunities and rapid mass migration. The backward sector, where the marginal product of labour is close to zero, possesses an abundant supply of workers. The flow of people therefore also feeds the process of structural change and economic expansion. This continues until rural productivity and wages begin to tighten. For Lewis and others, this cycle is inherently positive and central to national economic development¹². Clearly, his account has a strong resonance with the pattern seen in Bangladesh in recent years.

Empirical criticism of Lewis noting the emergence of unemployment and severe deprivations in urban centres, alongside a questioning of its generalizability, led Harris and Todaro (1970) to provide a micro model rooted in individual migration decisions. For Harris and Todaro, the movement decision was a result of the basic economic differential (reflected in rural versus urban wage levels), but crucially also, the probability that employment could be obtained (given by the level of unemployment). Thus, for rural dwellers the urban premium would be discounted by the probability of finding work. Here flows cease when equilibrium arises, where real wages and unemployment levels are balanced. While Harris-Todaro does not so much ascribe causation, it provides a grounded model which might be tested econometrically. Problematically, the key variables - geographically disaggregated real wages and unemployment and under employment levels - are hard to come by in most LDC contexts (including Bangladesh)¹³.

3. Research Approach and Findings

This substantive section describes the analytical approach taken (the data sources and techniques) and sets out the key research findings. The analysis seeks to provide answers to the core questions

¹² For a technical examination of Lewis see either the original text or Thirlwall (1994), pages 195 - 197

¹³ Similarly for a discussion of Harris-Todaro see Thirlwall, pages 195 to 197, and the original text.

posed by the study – on nature and pattern of population flows over the last twenty years, and the underlying causal factors (variations in economic conditions, environmental constraints and public service quality). The approach is quantitative in nature, and we rely on published data and very basic statistical methods.

3.1 Methods

The research relies on census data at district level, disaggregated into urban and rural totals for the period between 1991 and 2011, hence spanning three national censuses (1991, 2001 and 2011), and also providing two ten year intervals. This is used as a proxy for migration driven population change - the standard (and somewhat problematic) assumption being that changes above/ below the national growth rate are the result of inward/ outward migration¹⁴. It is important to note also, there remains some uncertainty within the 2010 BBS census data, in the following we use a district disaggregation which adds to a total of 144 million¹⁵. Population figures were matched with district level poverty data drawn from the WFP/ BBS poverty mapping exercise (for 2005)¹⁶ to examine the significance of economic factors, and a MDG index as a proxy for the quality of public services. This was taken from the Unicef's Multiple Indicator Cluster Survey (MICS) dataset (see Unicef, 2009).

The analysis was undertaken in two parts, first an examination of the nature of population growth (for flows), concentrating on the key common assumptions made within the public discourse. These are specifically urbanization, east-west movements and other spatial patterns within and between divisions and districts. Second, the three drivers identified above, are tested using standard statistical techniques – principally by cross breaking the data and comparing mean changes, and by calculating correlation coefficients between population change (the dependent variable) and proxy variables for each of the factors under investigation (this was not possible for environmental pressures however). Formally, these can be specified as three testable hypotheses, with the null as the reverse case:

- Population movements are motivated by differentials in economic factors (livelihoods, poverty and opportunities);
- Movements are driven by the quality of public services (schooling and healthcare);
- Movements are driven by poor environmental conditions, including extreme climatic events and disasters.

The research approach varied for the three factors. Cross-break tabulations are provided for each, through which the category means are compared against overall changes. These are specifically for economic conditions, using a set of core districts; for quality of services, using the 18 priority districts identified within the UNCT geographic targeting exercise as MDG lagging; and for environmental challenges – three sub-categories - the coastal-belt districts, the flood prone *Haor* Districts and the seasonally dry *Monga* districts. These are followed-up by statistical analyses and testing. The availability of single proxies for economic conditions (the estimated poverty headcount) and quality

¹⁴ This is a somewhat problematic assumption, as population growth will vary between areas based cultural and social factors, and fertility and fecundity ratios. BBS data suggests household sizes varied between 4.1 for Rangpur and Rajshahi and 5.5 for Sylhet (see: presentation on Bangladesh Census 2011 to the OIC Statistical Commission Turkey 13-15 May 2012 by Md. Shamsul Alam, Director).

¹⁵ Other BBS sources quote population as ranging between 141 and 148 million.

¹⁶ Data obtained from VAM Unit, World Food Programme, Dhaka.

of services (an MDG Index) allowed the use of correlation analysis (the Pearson Product Moment Correlation Coefficient - PMCC). The impact of environmental conditions however, was tested by a difference of means test on the combined group of challenged districts versus the non-challenged districts.

However, it is important to note that these approaches are far from ideal. The use of proxy measures, forced by the poor availability of data, potentially means the key variables and relations are not been mapped precisely. Moreover, the correlation and testing approaches are also questionable on three technical grounds. This is first because they cannot account for the marginal (i.e. the single) contribution of factors, for which more sophisticated techniques would be required. The danger this poses is that any relations found, may jointly include those with other variables. Second, the techniques are also prey to a host of other confounding factors, most notably the possible non-comparability of the districts, and the presence of other cross-cutting relationships. Thirdly, it may not be wholly appropriate to employ parametric testing given we are largely working with population and not sample data. Nevertheless, we are confident the analytical work is sufficiently rigorous to map and test the broad relationships. It is also important to recall that the purpose of this exercise is not to definitively ascribe causation, but rather, to use quantitative data to raise questions and bring additional rigour to the debate over migration.

3.2 Findings: Overall Patterns and Trends

At the surface level, the results tend to confirm the main points trailed in the discussion above. Referring to Chart 2, population growth has continued apace over the past two decades, with an overall increase of 29%, a rural increase of 24% and urban of 49%. This corresponds to annualized rates 1.3%, 1.1% and 2.0 % respectively. Clearly, Bangladesh has also seen both absolute and relative urbanization in this period, with a differential of some 25% between urban and rural growth rates. Moreover, again as seen in Chart 3, the headline figures also show this has been accompanied by movements to the more advanced and less peripheral western divisions. The Eastern Divisions grow by some 36% versus only 20% in the lagging West.

Chart 3: Population Change: Urban/ Rural, East/ West

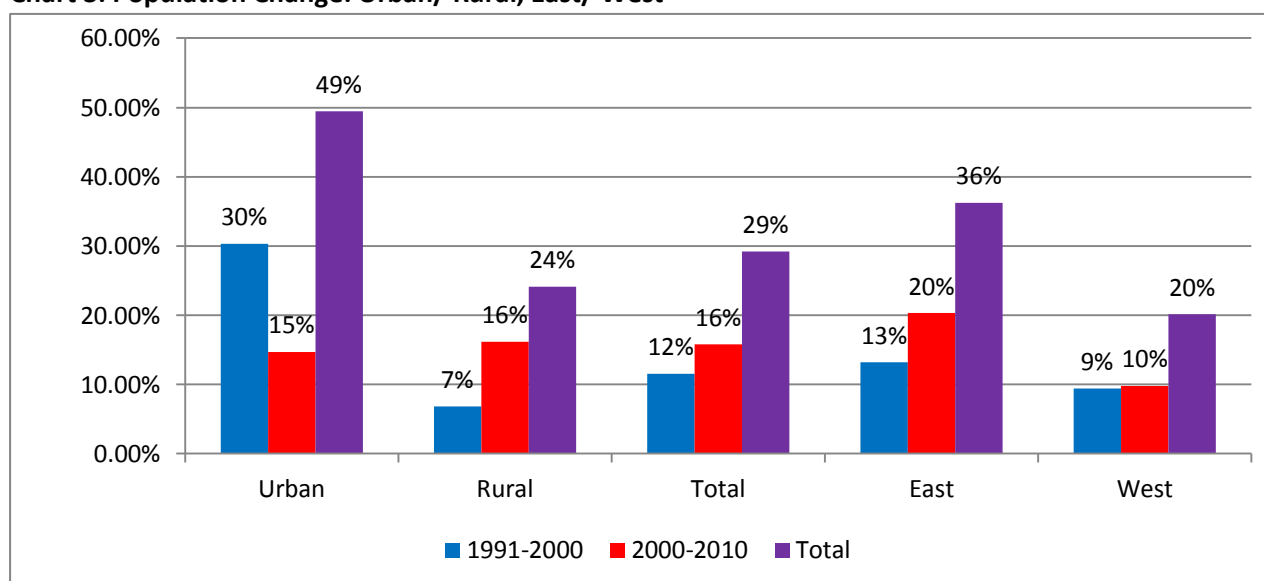
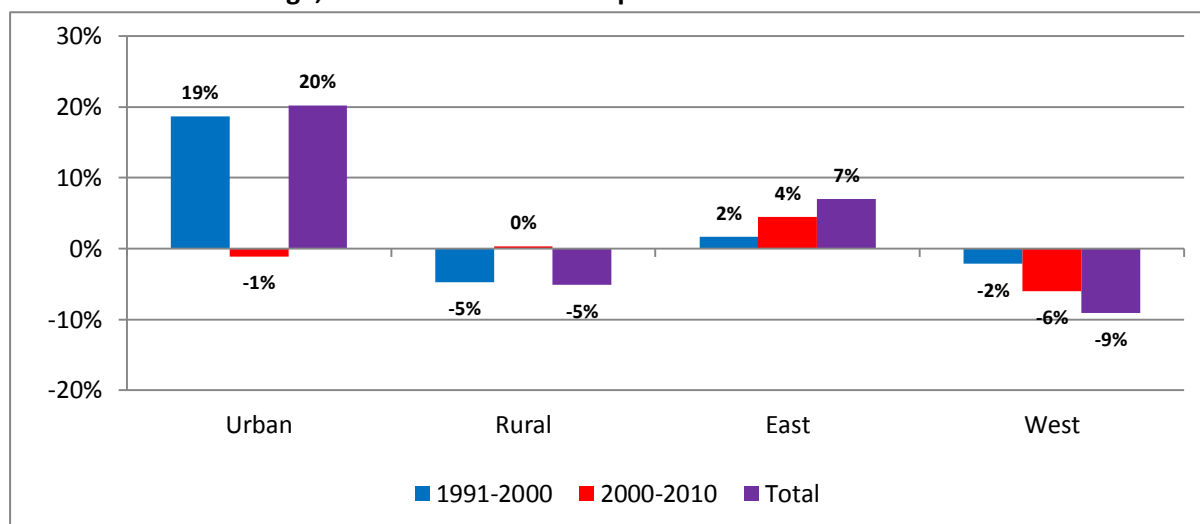


Chart 4: Headline change, differences on national period rate



However, there is also evidence of considerable complexity. Most notable, is the marked difference in patterns between the two decades (again refer to Charts 3 and 4). While in overall terms the trend towards urbanization is clear - the first decade unambiguously exhibits rural-urban flows - there is a major change in the second. Here the data has a more nuanced pattern, with urban and rural growth rates converging at around 16% overall. Moreover, at the district level (see Charts 5 and 6 below), the data shows for the second decade that there is also re-balancing (between urban and rural growth) within individual districts. Yet, referring to Chart 7, it is also the case that the leading population-growth districts largely remain the same in both, but noting that there are one or two specific outliers (which we return to later). Indeed, through time, movements appear to have changed from an across the board pattern of urbanization, to a periphery to core trend. The areas which grow most rapidly in the second decade are those inside the country's core, representing the urban hinterlands of the major cities (of Dhaka and Chittagong). A number of factors may underpin this, ranging from saturation of the urban areas to the emergence of a more productive agricultural economy around the burgeoning cities. We return to these questions in the next section.

Chart 5: District level changes (numbers) Decade 1 (1991-2001)

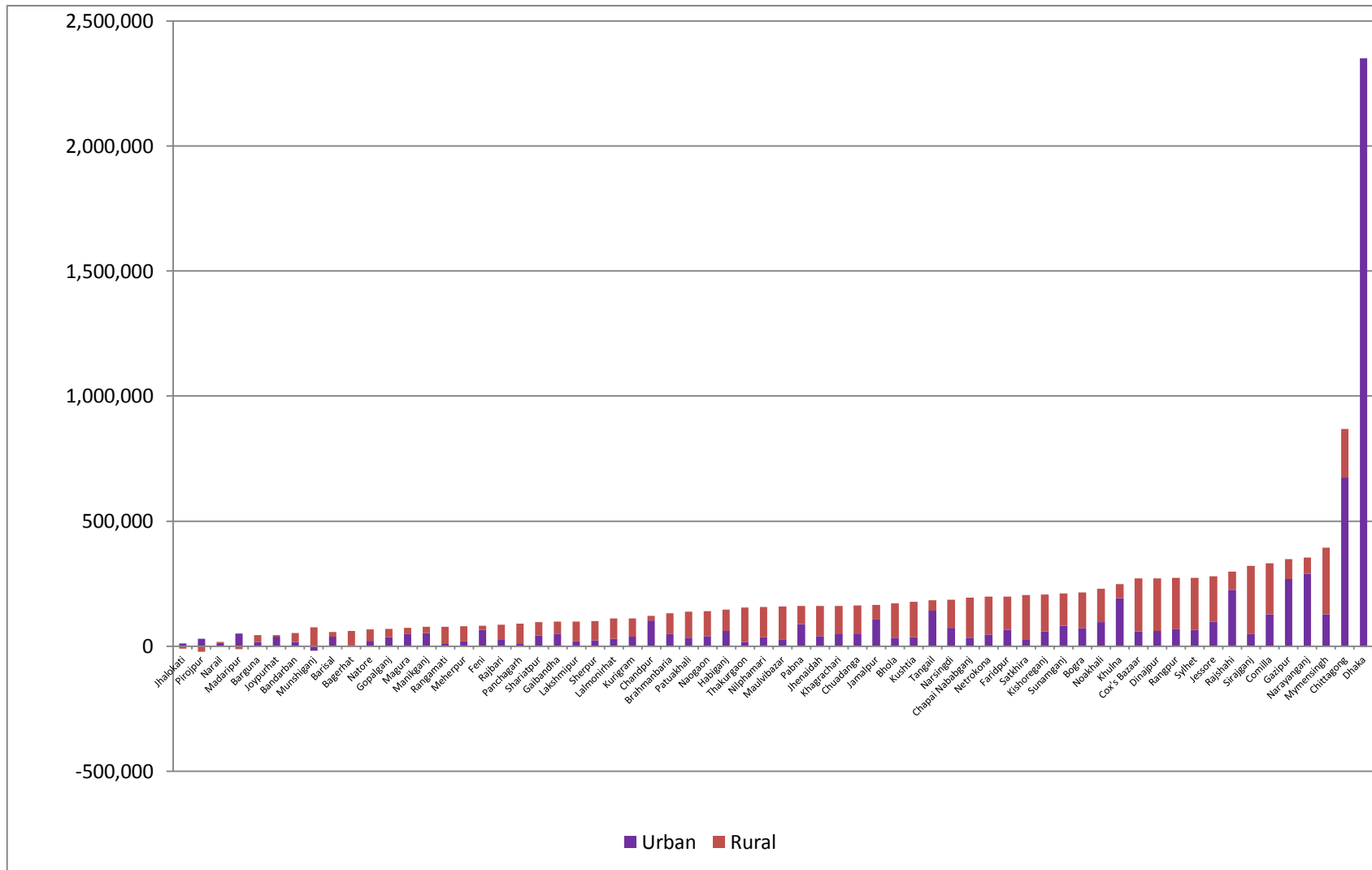


Chart 6: District level changes (numbers) Decade 2 (2001-2011)

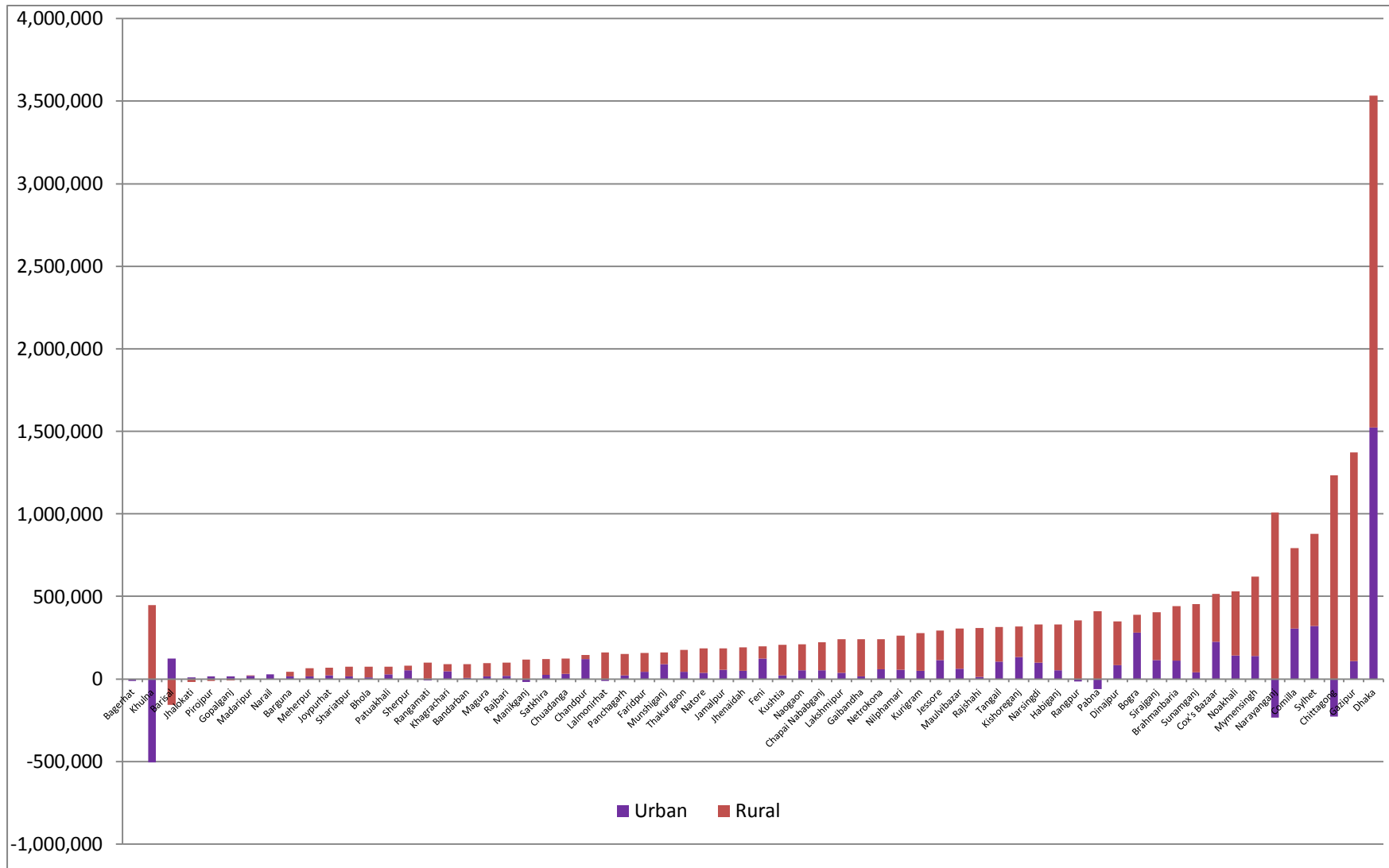


Chart 7: Overall District level changes per decade (numbers)

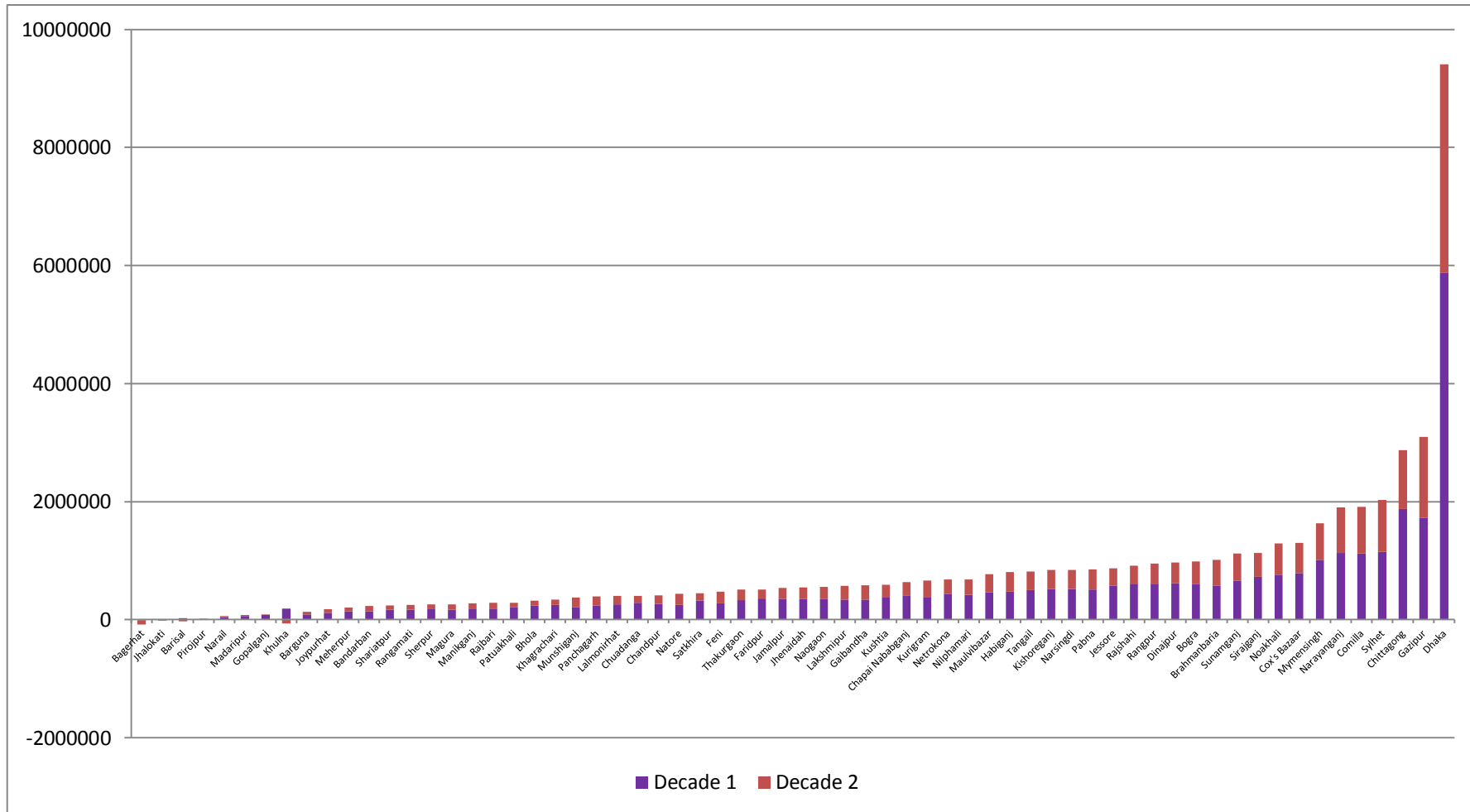
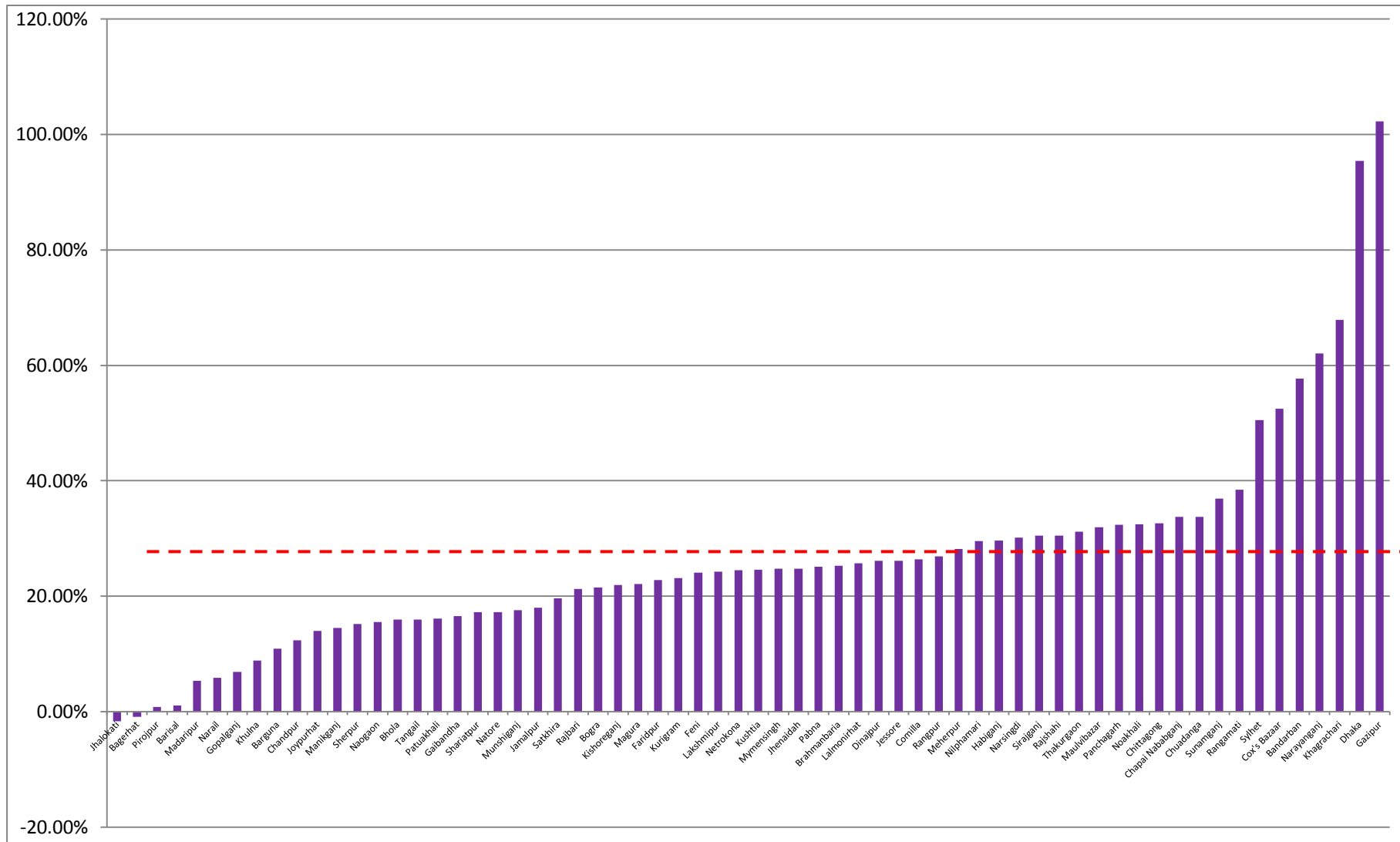


Chart 8: District Level Percentage changes over the full period (dashed line indicates average increase of 29 %)



In addition, it is very important to distinguish between the absolute change (i.e. in numbers) and the relative (percentage) change on the base populations. Referring to the former (as given in Charts 6, 7 and 8), Dhaka, and to a lesser extent, Chittagong and Gazipur, account for the vast majority of population growth. Indeed, it might be argued, in absolute terms that migration is primarily a matter of in-Dhaka, rather than in-urban or even periphery-core movements. Examination of the total relative (percentage) changes, given in Chart 8, tells a rather different story, showing a far larger number of gainers, including some surprises (which we will argue are the product of localized factors). In all, some 21 districts exceed the national average change (shown as a dashed line on the Chart). A consistently strong gainer in absolute and relative terms is Sylhet district, which appears to have gained at the expense of the other more rural districts within its division. However, Cox bazar and Khagrachari in the Chittagong Hill Tracts are also big percentage gainers over the full twenty years, both supported by highly localized factors.

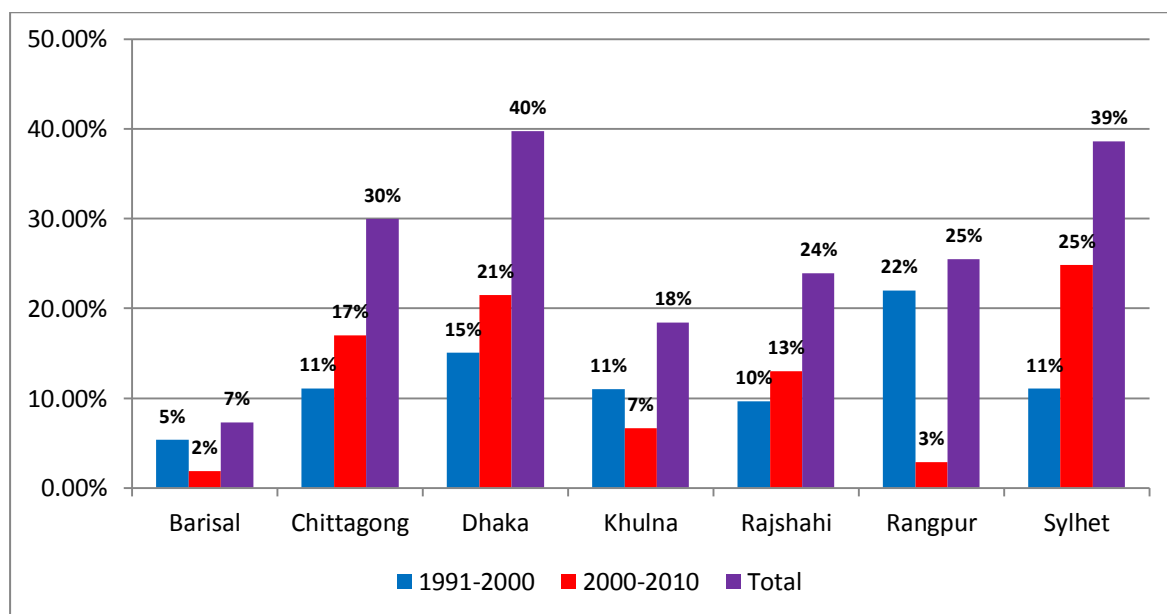
It is also useful to reflect on those areas with weaker population growth. A key feature is poor growth within the Coastal belt. Indeed, the four Charts even show absolute population losses over the period, notably within Bagherat and Jhalokati overall. Equally, a wider number, including Khulna and Barisal, also see losses within the rural areas in the second decade (see Chart 6). Indeed, the period 2001-2011 sees weaker growth relative to the national average in these areas. Again this is a core issue which we specifically test for in the next section.

It is underlined in the analysis which follows that we employ the relative data in order to make a judgment on the drivers at work. The default assumption being that growth rates above the national average reflect in-migration and those below average, out-migration. This is a convenient approximation, but it should also be noted that average divisional household sizes do vary from 4.1 to 5.5 in the 2011 census, and this implies differential population growth rates between regions.

The divisional relative changes are also instructive (shown in Chart 9). Here it is worth recalling the overall national population change for the full period is some 29%. Clearly, Dhaka (up 40%) and Chittagong divisions (up 30%) see substantial population growth, hence implying large inflows. Yet the strength of growth in Sylhet (up 39%) is also interesting, with the division outpacing Dhaka and Chittagong in the second decade (in percentage terms). Only these three Divisions outperform the national average, and all three show a regular and accelerating pattern of growth over the two decades. It is also striking, that both Rangpur and Rajshahi do not perform badly, each lagging the national change by 4 to 5%. Yet in the case of Rangpur, its growth occurs wholly within the first period. As with the district data, the coastal divisions of Barisal and Khulna perform very weakly, posting well-below par population growth, suggesting large outflows, and this declines in the second decade.

Some of the factors driving this complex pattern are likely to be highly localized and lie outside of the three drivers we have identified, and can only be speculated about. For example, the rises in Sylhet may be a result of the huge growth in incomes (supported by overseas remittances) to the Districts within the region. It is also worth recalling that the District level data (again see Chart 8) shows that population growth is concentrated in Sylhet district itself, and specifically, in the urban centres. The district level data shows further highly localized change. Again, particularistic explanations can be offered for these changes such as the post peace accord inflows in the case of the CHT districts; and the boom in tourism and the flight of refugees in the case of Cox's Bazaar.

Chart 9: Divisional Changes (% change on base)



Before progressing with a detailed analysis, it is worth noting that these patterns are not inconsistent with the key drivers which have been put forward. Even the slowing of the rural-urban flows has some fit with the economic models described. It may be that the process predicted by Lewis is coming to end and that economic differentials, which figure within migration decisions, are narrowing. As noted, there may also be some displacement of migrants to the hinterlands of urban areas, and a new agricultural core developing around the major conurbations.

In terms of the large losing districts in the coastal belt, the impacts of environmental pressures are rather more apparent, notably seen in very weak population growth and even losses in the second decade, a period which sees much cyclonic activity. Yet this is not so apparent in the Haor and Monga-affected areas.

3.3 Findings: Key Drivers

This subsection seeks to analyse and probe three key drivers of population movements: differential economic opportunities; the varying quality of public services; and the presence of environmental pressures in challenged localities. Each is estimated through the use of cross break data to compare mean changes in population levels against the overall changes, followed up by correlation and statistical testing.

3.3.1 Economic Conditions

Firstly, with regard to economics and livelihoods, we begin by cross-breaking the data and comparing population growth in the core (defined as the economically favoured districts)¹⁷ versus the overall growth in population. The results, shown in Table 2, provide indicative evidence of economic opportunities playing a role in population change, and therefore, migration patterns. Within the table, a positive difference indicates stronger growth in the economically favoured

¹⁷ The Core Districts are specifically: Chandpur, Chittagong, Comilla, Feni, Noakhali, Dhaka, Gazipur, Manikganj, Munshiganj, Narayanganj and Narsingdi.

districts (see Column 4). This is the case in overall terms and within at least half of the decadal subcategories.

Table 2: Core Districts Population Change versus national change

1	2	3	4
	Core Districts (n=11)	Average Change	Difference (+ve greater growth; -ve lower growth)
Decade 1			
- Urban	+36%	+30%	+6%
- Rural	+5%	+7%	-2%
- Total	+17%	+12%	-5%
Decade 2			
- Urban	+13%	+15%	-2%
- Rural	+36%	+16%	+20%
- Total	+26%	+16%	+10%
Overall			
- Urban	+55%	+49%	+6%
- Rural	+43%	+24%	+19%
- Total	+47%	+29%	+18%

However, there are differences between the two decades, with the urban differential being highest in the first (+6%) and the rural differential in the second (+20%). This is supportive of the changing pattern of population dynamics, which we found in the section above, from one of direct urbanization to a core-periphery pattern. It is worth noting that the core groups were judgmentally selected as the 11 districts surrounding Dhaka and Chittagong, which had substantial industrial bases. This is nevertheless an approximate measure of the more economically dynamic areas, and does not reflect movements wholly outside and wholly within the core.

Correlation analysis offers a better cross-sectional test of any relationships. In an ideal scenario, this should be undertaken (informed by the economic models) between population change and local productivity levels, incomes and the rates of unemployment. However, as many of these variables are unavailable and not of sufficient quality, we use the poverty rate estimated by the BBS and WFP Poverty mapping exercise (based on Household Income and Expenditure Survey and Census data). We select 2005, as these estimates are close to the centre of the 20 year period under examination. As described within the subsection on methods, we use the Pearson Product Moment Correlation Coefficient (PMCC). Moreover, as the poverty estimates are subject to a data generation process, statistical testing has been employed to validate the results.

As the results in Table 3 show, the correlation coefficients are largely right signed (see Column 2); i.e. there is negative relationship between poverty levels and population change (and by assumption migration). Column 3 records the respective p values (the probability the result could have occurred by chance). Those with a 99% significance level are indicated by a single asterisk and those at 95% with double asterisk. As Column 3 shows, the coefficients are generally significant, but especially so

for urban areas in the first decade and for all in the second decade. However, the magnitudes of the coefficients are relatively low (-0.23 to -0.27) and the level of correlation is rather weak.

Table 3: Correlation between district population change and poverty rates

1	2	3
Decade, Category	Correlation (PMCC)	P Value (* 95%; ** 99%)
Decade 1		
- Urban	-0.2599	0.0380**
- Rural	0.0753	0.5542
- Total	0.1640	0.1952
Decade 2		
- Urban	-0.2360	0.0605*
- Rural	-0.2722	0.0296**
- Total	-0.2346	0.0620*

Before considering other factors, it is again useful to recall the discussion on the underpinning theory. Two models were introduced. The first, offered by Lewis, explains movements in terms of differential productivities between urban (modern) and rural (backward) sectors. The second, from Harris and Todaro, provides a micro model depicting movement decisions governed by the probability of accessing higher earnings (i.e. the differential unemployment rates). Of the two, Lewis offers the stronger causal account and posits a process of accelerating rural-urban migration, followed by a peak, and progressive decline in flows, as agricultural productivity begins to rise. This sort of account is by and large consistent in what we see in the data, a rapid urbanization followed by a slowing pace and rural rebalancing. Recent economic and labour market data also support this, the World Bank's recent Poverty Assessment (World Bank, 2013) suggest Bangladesh is approaching what it describes as the Lewis turning point (Box 4.1, page 74). Likewise, the insights offered by the Harris-Todaro model are also somewhat borne out by the data. Here the importance of unemployment rates and perceptions are centre stage. The relative decline in opportunities within urban areas and growing awareness of conditions in the second decade may be pivotal. The changing pattern of flows to the core as opposed to urban areas per se is also consistent with this type of explanation.

3.3.2 Quality of Public Services

The second key driver to be examined is that of the varying quality of public services. This has long been suggested as a motivating factor for internal movements (Tavares for UNDP, 2011). It is also the justification for the *de facto* official response of national authorities, in not prioritizing living conditions and public services within urban slums. This is therefore a very important policy question. However, our findings, find little solid evidence of any such link. Again we employ cross

break data and correlation analysis. Table 4 presents the cross break results, in which we compare population changes in the 18 most underserved areas (defined by Unicef)¹⁸ versus national changes.

Table 4: Cross Break Data for Service Lagging Districts

1	2	3	4
Category	Service-lagging areas change	Aggregate Change	Difference (+ve greater growth; -ve lower growth)
Period 1			
- Urban	+26%	+30%	-4%
- Rural	+8%	+7%	+1%
- Total	+10%	+12%	-2%
Period 2			
- Urban	+31%	+15%	+16%
- Rural	+14%	+16%	-1%
- Total	+17%	+16%	+1%
Total			
- Urban	+64%	+49%	+25%
- Rural	+23%	+24%	-1%
- Total	+28%	+29%	-1%

The expectation would be that service-lagging areas should see lower rates of growth – given by large negative differences in Column 4 of the table. Yet the results show only minor variations in both decades. This is except for the urban category in the second decade which actually shows the reverse - a large positive population gain.

When we follow up with correlation analysis - here matching population movements against a proxy offered by Unicef MDG Index (based on service quality and outcomes), we again find no disenable relationship. This is except for a strong correlation within the first decade on the rural category (see Column 3). Yet this coefficient is positive, implying people are actually moving to worse served areas, and is therefore wrong signed for the hypothesis being tested. On the face of it, this seems a spurious correlation.

¹⁸ Unicef 18 MDG lagging districts: Bandarban, Bhola, Brahmanbaria, Cox's Bazaar, Gaibandha, Habiganj, Jamaipur, Khagrachari, Khishoreganj, Kurigram, Lakshmipur, Mymensingh, Netrokona, Noakhali, Rangamati, Sherpur, Sunamganj and Sylhet.

Table 5: Correlation between Unicef MDG Index and population changes

1	2	3
Decade & Category	Correlation (Pearson Product Moment Correlation Coefficient)	Statistical Significance (P Value - *95%,** 99%)
Decade 1		
- Urban	0.0552	0.6653
- Rural	0.4481	0.0002**
- Total	0.2065	0.1017
Decade 2		
- Urban	-0.1731	0.1713
- Rural	0.1327	0.2958
- Total	-0.1935	0.1255

There is thus, no evidence from this dataset to support the claim that public service quality is a primary driver of migration decisions in Bangladesh. Conceivably, one might still argue that public service variations *indirectly* impact on migration choices via the creation of economic opportunities and resilience to environmental pressures, but even this claim has little support within our data. A confirmation of the null hypothesis still has major policy implications however, regarding purposefully weak official responses to urban deprivation.

3.3.3 Environmental challenges

The third and final question to be examined is that of the impact of environmental challenges on migratory movements. These claims have long been a feature of the Bangladeshi discourse on internal migration, and these pressures are frequently cited (see for example Walsham 2009). Indeed, many see these pressures as *the* defining feature of movements within Bangladesh and are exacerbated by climate change. CUS (2007) also finds within its census of urban low income settlements that that migrants from the coastal belt and the northern Monga-affected districts account for large proportion of slum dwellers within Dhaka (coastal areas 31.9 % and Monga-affected 4.6%). Yet it also has to be recalled that Bangladesh has long been environmentally challenged, and that seasonal patterns of migration are well-established. Our objective here is only to examine permanent relocation and wholly new migratory dynamics, it also worth noting that these considerations move towards the boundary between elective movement and enforced migration. However, it remains a moot point, as to whether disaster events and the risk of disaster events have motivated migration decisions as opposed to chronic environmental challenges, and if any meaningful distinction can be drawn. There is also likely to be considerable interplay between these factors and economic motivations, both due to environmental risk and the marginality of the land in the affected regions.

In appraising the evidence, we recognize that there are multiple challenged environments in Bangladesh; in the interests of parsimony we recognize three areas¹⁹:

- The *coastal zone*, which is beset with cyclone and other climatic risks and slow onset challenges such as salinization and sea water incursion²⁰;
- The *Haor areas* in the northeast²¹, challenged by seasonal severe flooding and remoteness;
- And the *Monga-affected* districts in the northwest²² faced with seasonal drought and an inability to engage in agricultural activities for 3 to 4 months of the year.

The pressures to migrate will vary between each and hence they merit separate appraisal. Again this is done through comparison of cross break data for the effected districts with national population change averages. However, as we have no single metric of the degree of the challenges faced, we have no means of correlating population changes with environmental quality. We do however attempt to provide a basic difference of means statistical test as a follow-up.

The results of cross-break comparisons of the 3 affected areas are provided in Table 6 below. This shows mixed results, with each of the three areas having a very different population signature. The table provides the population changes within each decade by category and differences on the respective national rates in parenthesis. Foremost, only one, the coastal zone (Column 2) shows strikingly lower population growth versus the national average (Column 5), and therefore, is the only category to offer prima facie evidence of out-migration. In contrast, the Haor region actually experiences above average population growth; especially in the second decade and for urban areas (see Column 3). Further examination of the data show this is probably driven by the inclusion of Sylhet district which has one of the largest population gains nationally (driven by economic not environmental factors). Regardless, there is no evidence of population losses in the other districts. The Monga region shows close to average growth, in some categories marginally above trend, in others marginally below (see Column 4).

The data for the coastal zone shows weaker growth in the second decade and this has some fit with the region's history, given that major climatic events – cyclones Sidr and Aila - also took place during this time. Additionally, in relation to the Haor and Monga areas, some caution is required in rejecting the possibility of outflows, as there may be intra-regional movements which are not captured - the urban growth in the northwest districts is at least suggestive of this. Equally, the data (at District level) may not be fine enough to pick up the highly localized nature of environmental pressures in these areas.

¹⁹ These were defined following discussions with UNDP Environment and Climate change specialists.

²⁰ Coastal districts: Barguna, Bhola, Patuakhali, Cox's Bazaar, Noakhali, Bagerhat, Khulna, and Satkhira

²¹ Haor districts: Habiganj, Maulvibazar, Sunamganj and Sylhet.

²² Monga-affected districts Jamalpur, Netrokona, Sirajganj, Gaibandha, Kurigram, Nilphamar, and Rangpur.

Table 6: Cross-break data for Environmentally Challenged Areas

1	2	3	4	5
Decade, category	Coastal (± on national rate)	Haor (± on national rate)	Monga (± on national rate)	All Districts (national rate)
Decade 1				
- Urban	+20% (-10)	+31% (+1)	+24% (-6)	+30%
- Rural	+9% (+2)	+9% (+2)	+8% (+1)	+7%
- Total	+11% (-1)	+11% (-1)	+10% (-2)	+12%
Decade 2				
- Urban	-3% (-18)	+48% (+33)	+17% (+2)	+15%
- Rural	+11% (-5)	+22% (+6)	+13% (-3)	+16%
- Total	+9% (-7)	+25% (+9)	+13% (-3)	+16%
Full Period				
- Urban	+17% (-28)	+94% (+49)	+45% (-4)	+49%
- Rural	+21% (-3)	+32% (+8)	+21% (-3)	+24%
- Total	+20% (-9)	+39% (+10)	+24% (-5)	+29%

As noted, it is difficult to test these findings with more thoroughgoing correlation methods due to the absence of a single metric of environmental pressures. Nevertheless, it is possible to use statistical techniques, notably difference of means tests to establish the significance of these differences. Unfortunately the cell sizes are too small to perform such tests for each of the categories and we are forced to perform a single comparison test between the mean changes for environmentally challenged districts versus the non-challenged ones. The results provided in Appendix C, show there is no evidence to support any differences. However, this might simply be because, as shown above, movements within individual categories are in opposite directions. Additionally, questions can be raised about the value of this parametric test, given that we are arguably dealing with population and not sample data. In sum, it is difficult to glean any further findings from these data, and clearly this is an area for additional work. We can neither accept nor reject the null hypothesis, yet only the coastal zone shows unambiguous evidence of out-flows.

4. Conclusions and Policy Discussion

In this final section we offer summary conclusions, followed up by a series of relevant policy recommendations. It is, however, also important to begin with a proviso, and recall that the purpose of the paper is primarily exploratory, the policy discussion is therefore cautious in approach.

4.1 Conclusions

First and foremost, it is apparent there have been large differentials in population growth across Bangladesh's districts and this is prima facie evidence of internal population movements. Yet there is also considerable complexity, with variations between rural and urban areas, and between the

two decades examined. There is also a number of what might be described as idiosyncratic changes, where local and particularistic factors have been significant in driving population movements.

The changes between the two decades studied are bound-up with big changes in the rural-urban pattern, and its modification into more of a core-periphery model. The first decade between 1991 and 2001 is unmistakably one of urbanization within and between districts; the second in contrast, sees the equalization of urban and rural growth rates. There are continuing movements from West to East and to the core districts (areas in and around the major conurbations). The most striking idiosyncratic patterns and localized drivers are evident in the CHT districts, Sylhet and Cox's Bazaar.

Turning to the three key drivers identified:

- First and foremost, we find that economic factors – differentials in livelihoods and opportunities - are very significant. There is evidence of well-above average population growth in the more economically dynamic core and a significant negative correlation between poverty levels and population changes at the district level. Nevertheless, the magnitude of the coefficients is low, suggesting the presence of other explanatory factors.
- Second with regard to variations in the quality of public services (healthcare, education and so forth) we find no evidence of these playing any role in motivating population movements. Population growth is in line with national averages, and there is no real correlation between an index of service quality and population changes.
- Third, regarding environmentally challenged areas the evidence is mixed. Of the three groups of districts examined (Hoar, Monga and coastal belt) only one, the coastal, exhibits evidence of outflows. This is given by well-below average population growth rates for both decades, especially the second. While there is no evidence in relation to other areas, it is difficult to reject these impacts given data weaknesses and some evidence of intra-district and area flows.

It is important to explicitly note that the quality of the data and the rather basic techniques we use limit the wider conclusions which might be made. The evidence gathered above in the form of cross-break comparisons and correlation adduces association not causation. Equally, the use of population changes as a proxy for migratory movements, and in turn the poverty rates and MDG index as proxies for the independent variables introduces further weaknesses.

4.2 Policy Discussion and Key Recommendations

Foremost, and drawing on the final conclusion above, there is a need to strengthen the evidence base on internal migration. This is vital given the nuanced character and the complexity of the pattern of flows. More significantly, this remains a major policy issue in Bangladesh, and it is disquieting that the statistical resources currently devoted to monitoring population movements is so limited. Much might be achieved through the application of more sophisticated techniques to existing data, but equally crucial is the provision of new primary sources which directly track migrants and provide household level data on motivations for movement²³. This could be partially achieved through the inclusion of additional questions into the census questionnaire. However, a

²³ Useful to also collect supporting data to validate responses i.e.: consumption and income (household income from domestic remittances sent to rural areas), environmental pressures and public service usage (at sending and receiving locations).

more thoroughgoing approach would require a bespoke wide coverage sample survey. A key recommendation is for BBS to provide such an instrument, particularly focused on rural-urban flows, this should also aim to gauge the impact of seasonal and temporary internal movements. In the interim, additional research is merited using the existing sources and the application of more sophisticated techniques.

In spite of clear informational weaknesses, strong policy recommendations can still be made, particularly in terms of macro-level policy responses. Given the primacy of economic motivations, and the importance of migration for on-going economic expansion, better management of migration must be a major focus for Government. There are also questions of distributional equity to be considered, not least the interplay with poverty reduction and the role migration plays in reducing chronic environmental vulnerabilities. It is important that migration is facilitated and managed, bearing down on socioeconomic failures while also realizing the potential gains.

Rural-urban flows, alongside the emergence of severe deprivations in urban areas are a primary policy concern. Insights gleaned from the empirics offer some guide as to how Government might respond better. As such, there is some evidence that rapid urbanization is abating. This is also supported by secondary sources which suggest that agricultural productivity is rising and rural wages are tightening. Nevertheless, there are still significant movements to the core districts, and to the core urban areas. We also know the productivity level in the urban core remains well-above that in rural areas, and it seems the Lewis process has some way to travel. The attainment of both high growth and social equity will require a new strategic focus and oversight of urbanization at the national level. Government should actively plan for more effective and dynamic cities, linked and supported by their hinterlands. This implies a stronger focus on local economic development rooted in private sector growth, with a view to absorbing surplus labour. Equally, at the local level, new forms of decartelization and devolution are required, empowering urban localities to resolve the challenges faced.

Additionally, there is a case for a stronger regional development policy. Its purpose would be to broaden the *footprint* of the current growth model to the secondary cities, and to hasten the development of agriculture and non-farm activities, especially in the more lagging regions. At the heart of this are a series of regional infrastructure improvements, most prominently, the Padma Bridge project. Indeed, economic data and potentially the lack of out-migration in the north-western districts, underlines the value of the Jamuna Bridge in regenerating this lagging region. Yet improved trunk roads, rail and power would also be significant inputs. The State might also provide fiscal incentives, (tax holidays and abatements and where appropriate, award EPZ status) to encourage developments away from the congested core. This should be done cautiously and with market dynamics borne in mind. Interventions might start by promoting growth corridors to affect modest redirections of economic activity, and later expand to wider areas via regional growth centres.

The improving rural economy is a significant dimension of managing the process, and efforts to boost agricultural productivity and off-farm employment offer opportunities for would-be economic migrants. However, policy responses should avoid constraining migration which is developmentally useful, and certainly not include administrative restraints. Specific measures might include building urban-urban linkages (infrastructure, communications and marketing channels) and facilitating effective value chains from primary production into processing and storage, and potentially to export markets. Here our recommendation would be to boost and further the work already being

undertaken on production inputs, storage, distribution and phyto-sanitary standards. Further policy levers might include: securing greater value added through technology transfer; provision of incentives to adopt crops with higher yields and prices; and trade and tariff policies.

Nevertheless, it should be recognized that for some marginal and vulnerable areas, managed out-migration should be part of the policy mix. Government and civil society is already engaged in supporting overseas movements via series of services, and outreach this might be extended to better facilitating movements within Bangladesh, where this would be welfare-enhancing, poverty reducing and developmentally useful.

Taken together, these geographical dimensions are important in ensuring internal migration remains pro-poor. It is also useful to signal again, that although the focus of our analysis was permanent migration, temporary movements (such as young adults moving for a defined period of work and seasonal work patterns) have economic and poverty reduction impacts. This is through both direct earnings and money remitted internally, thus benefiting both the receiving and sending localities. The establishment of outreach support for internal movements would also enhance these gains.

A focus on the consequences of internal migration is also vital – this is at both sending and receiving locations (though the most pressing challenges are likely to be encountered at the latter). First, drawing research based on the economic models, information to support movement decisions by individuals and families might be improved considerably. Better-informed choices might result if authorities tracked unemployment rates and other conditions, and sharing these with potential migrants. They might be offered this information and offering advice via the CSO and local government outreach described above. Second, our finding that public service quality has no real impact on migration decisions is also very significant. This is because it tends to undermine quasi-official neglect of deprivations and poor service delivery in urban slums. Indeed, given that these make no difference to movement decisions, there should be no impediment to Government and development partners intervening to alleviate what are becoming very challenging living and social conditions.

Finally, with regard to environmental challenges, we found mixed evidence of a link with movements and variations between the areas studied, and as such, the policy issues and recommendations also vary between regions. In relation to the Monga and Haor challenged districts there is no strong evidence to suggest that conditions are driving permanent migration. However, data limitations and indications of intra-regional movements, underline that this is an area which merits further research. In the case of the Coastal belt the evidence is far clearer, with a distinct pattern of low population growth and in some cases losses. Although it also has to be recognized that motivations may be operating through the economic channel rather than simply environmental drivers acting in the round. In terms of the right policy response two courses of action present themselves. The first is a familiar one of securing living conditions and livelihoods via a mix of responses. This would be in the economic sphere (as described above) but with a stronger focus on diversifying the local economy away from activities which have been made non-viable by environmental degradation and climate change; and in addition, through promoting broad environmental adaptation and resilience. This implies facilitating family and community level works (in housing, drainage and flood defence), social protection and income support, and public works to secure defences from environmental hazards and promote early recovery. These are already major features of GoB and donor-assisted programmes. Yet secondly, it is also the case that the current population may be above this region's

carrying capacity and facilitating resettlement and opportunities elsewhere, as outlined above, is an appropriate response. This might be done as described above with a clear geographical prioritization.

In closing, the contribution of this policy discussion, and by extension this paper, is to highlight the importance of internal migration to Bangladesh's future development. It is a vital policy concern, worthy of greater analysis and scrutiny, and above all, direct intervention. To reiterate, the overall goal of policy should be to harness its positive dynamics while ameliorating its failures. Government has long recognized the value of external (international) migration, yet recalling summary arguments made at the opening of this paper, internal movements potentially have a stronger contribution to make to the growth process and to poverty reduction. A final recommendation therefore, is for a greater profile be afforded to these issues. There is a need for an open and informed debate, and a suite of policies couched within a national framework, if not a national strategy for domestic migration.

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Appendix A: District Level Populations 1991, 2001 and 2011

		1991 Census			2001 Census			2011 Census		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Barisal	Barguna	71,560	733,404	804,964	87,582	760,972	848,554	103,094	789,687	892,781
	Barisal	357,103	1,942,279	2,299,382	394,567	1,961,400	2,355,967	519,016	1,805,294	2,324,310
	Bhola	200,466	1,331,895	1,532,361	234,302	1,468,815	1,703,117	243,317	1,533,478	1,776,795
	Jhalokati	93,091	600,980	694,071	104,070	590,161	694,231	112,003	570,666	682,669
	Patuakhali	141,220	1,181,442	1,322,662	175,284	1,285,497	1,460,781	201,882	1,333,972	1,535,854
	Pirojpur	137,618	966,276	1,103,894	166,970	944,098	1,111,068	182,631	930,626	1,113,257
	Bandarban	75,979	170,322	246,301	92,766	205,354	298,120	100,423	287,912	388,335
	Brahmanbaria	288,855	1,978,777	2,267,632	336,184	2,062,070	2,398,254	448,493	2,392,005	2,840,498
	Chandpur	211,686	1,938,134	2,149,820	314,102	1,957,127	2,271,229	435,724	1,980,294	2,416,018
Chittagong	Chittagong	2,707,435	3,036,534	5,743,969	3,381,723	3,230,417	6,612,140	3,152,629	4,463,723	7,616,352
	Comilla	407,839	3,855,699	4,263,538	535,289	4,060,268	4,595,557	840,326	4,546,962	5,387,288
	Cox's Bazaar	212,994	1,289,073	1,502,067	272,395	1,501,314	1,773,709	499,011	1,790,979	2,289,990
	Feni	106,142	1,051,975	1,158,117	170,200	1,070,184	1,240,384	293,742	1,143,629	1,437,371
	Khagrachari	121,004	244,665	365,669	171,035	354,629	525,664	215,808	398,109	613,917
	Lakshimpur	206,889	1,184,435	1,391,324	225,426	1,264,475	1,489,901	262,997	1,466,191	1,729,188
	Noakhali	256,532	2,090,478	2,347,010	353,342	2,223,902	2,577,244	496,700	2,611,383	3,108,083
	Rangamati	162,061	268,342	430,403	170,188	337,994	508,182	159,627	436,352	595,979
Dhaka	Dhaka	5,442,503	720,542	6,163,045	7,794,086	717,142	8,511,228	9,317,043	2,726,934	12,043,977
	Faridpur	161,739	1,396,472	1,558,211	227,471	1,528,999	1,756,470	271,100	1,641,869	1,912,969
	Gazipur	659,858	1,023,132	1,682,990	929,770	1,102,121	2,031,891	1,037,574	2,366,338	3,403,912
	Gopalganj	77,190	1,019,813	1,097,003	113,133	1,052,140	1,165,273	128,705	1,043,710	1,172,415
	Jamalpur	224,610	1,718,142	1,942,752	331,264	1,775,945	2,107,209	387,869	1,904,805	2,292,674
	Kishoreganj	297,907	2,090,441	2,388,348	356,941	2,238,013	2,594,954	489,030	2,422,877	2,911,907
	Madaripur	89,287	1,017,264	1,106,551	140,365	1,005,984	1,146,349	157,810	1,008,142	1,165,952
	Manikganj	96,350	1,120,413	1,216,763	148,352	1,145,620	1,293,972	128,710	1,264,157	1,392,867
	Munshiganj	114,481	1,114,908	1,229,389	95,579	1,189,501	1,285,080	186,106	1,259,554	1,445,660
	Mymensingh	533,527	3,562,959	4,096,486	660,331	3,829,395	4,489,726	798,127	4,312,145	5,110,272
	Narayanganj	932,129	886,815	1,818,944	1,221,955	951,993	2,173,948	988,956	1,959,261	2,948,217
	Narsingdi	275,820	1,434,172	1,709,992	349,585	1,546,399	1,895,984	447,645	1,777,299	2,224,944
	Netrokona	141,810	1,648,975	1,790,785	187,839	1,800,349	1,988,188	247,183	1,982,459	2,229,642
	Rajbari	90,960	774,596	865,556	118,891	833,015	951,906	136,042	913,736	1,049,778
	Shariatpur	72,236	913,791	986,027	114,776	967,524	1,082,300	131,044	1,024,780	1,155,824
	Sherpur	113,991	1,064,930	1,178,921	136,171	1,143,371	1,279,542	188,106	1,170,219	1,358,325
Tangail	295,650	2,812,435	3,108,085	438,011	2,852,685	3,290,696	543,785	3,061,298	3,605,083	
Khulna	Bagerhat	203,765	1,285,485	1,489,250	206,554	1,342,477	1,549,031	195,331	1,280,759	1,476,090
	Chuadanga	225,466	618,515	843,981	275,484	731,646	1,007,130	306,157	822,858	1,129,015
	Jessore	303,616	1,888,522	2,192,138	400,851	2,070,703	2,471,554	513,552	2,250,995	2,764,547
	Jhenaidah	190,658	1,229,101	1,419,759	230,392	1,349,098	1,579,490	280,192	1,491,112	1,771,304
	Khulna	1,091,785	1,038,588	2,130,373	1,284,208	1,094,763	2,378,971	777,588	1,540,939	2,318,527
	Kushtia	177,881	1,384,623	1,562,504	214,275	1,525,880	1,740,155	235,526	1,711,312	1,946,838
	Magura	56,690	695,428	752,118	105,323	718,988	824,311	120,414	798,005	918,419
	Meherpur	49,492	461,728	511,220	68,154	523,282	591,436	83,393	571,999	655,392
	Narail	72,188	609,612	681,800	85,809	612,638	698,447	112,352	609,316	721,668
	Satkhira	143,316	1,516,595	1,659,911	171,614	1,693,090	1,864,704	197,616	1,788,343	1,985,959

Internal Migration in Bangladesh: Character, Drivers and Policy Issues

Rajshahi	Bogra	317,101	2,481,697	2,798,798	389,068	2,623,987	3,013,055	670,388	2,730,486	3,400,874
	Joypurhat	84,216	717,687	801,903	121,305	725,391	846,696	143,910	769,858	913,768
	Naogaon	182,869	2,067,731	2,250,600	222,576	2,168,779	2,391,355	275,567	2,324,590	2,600,157
	Natore	171,354	1,283,843	1,455,197	191,826	1,329,510	1,521,336	228,008	1,478,665	1,706,673
	Chapai	235,367	996,229	1,231,596	269,087	1,156,235	1,425,322	320,278	1,327,243	1,647,521
	Nababganj	361,984	1,654,643	2,016,627	449,390	1,726,880	2,176,270	387,675	2,135,504	2,523,179
	Pabna	618,737	1,369,324	1,988,061	843,625	1,443,249	2,286,874	854,619	1,740,578	2,595,197
	Sirajganj	273,832	2,100,080	2,373,912	321,253	2,372,561	2,693,814	436,577	2,660,912	3,097,489
Rangpur	Dinajpur	309,691	2,061,492	2,371,183	370,874	2,271,986	2,642,860	453,699	2,536,429	2,990,128
	Gaibandha	146,716	1,894,224	2,040,940	195,107	1,943,074	2,138,181	210,524	2,168,731	2,379,255
	Kurigram	240,299	1,440,361	1,680,660	278,071	1,514,002	1,792,073	326,494	1,742,779	2,069,273
	Lalmoinirhat	112,261	887,205	999,466	141,361	967,982	1,109,343	129,209	1,126,890	1,256,099
	Nilphamari	199,625	1,216,143	1,415,768	235,839	1,335,851	1,571,690	289,974	1,544,257	1,834,231
	Panchagarh	62,680	683,298	745,978	72,015	764,181	836,196	95,149	892,495	987,644
	Rangpur	388,101	1,881,415	2,269,516	457,234	2,085,207	2,542,441	442,713	2,438,373	2,881,086
	Thakurgaon	101,376	958,146	1,059,522	117,823	1,096,553	1,214,376	161,309	1,228,733	1,390,042
Sylhet	Habiganj	131,626	1,479,708	1,611,334	191,654	1,566,032	1,757,686	244,966	1,844,035	2,089,001
	Maulvibazar	120,931	1,333,069	1,454,000	145,301	1,467,073	1,612,374	208,079	1,710,983	1,919,062
	Sunamganj	134,813	1,667,322	1,802,135	217,006	1,796,732	2,013,738	256,117	2,211,851	2,467,968
	Sylhet	368,116	1,913,787	2,281,903	433,598	2,121,968	2,555,566	753,549	2,680,639	3,434,188
Total		22,455,074	89,000,111	111,455,185	29,256,622	95,098,671	124,355,293	33,563,183	110,480,514	144,043,697

Appendix B: District Population Changes 1991-2001 and 2001-2011

		Period 1 Change 1991- 2000			Period 2 Change 2000-2010			
		Urban	Rural	Total	Urban	Rural	Total	
Barisal	Barguna	22.4%	3.8%	5.4%	17.7%	3.8%	5.2%	
	Barisal	10.5%	1.0%	2.5%	31.5%	-8.0%	-1.3%	
	Bhola	16.9%	10.3%	11.1%	3.8%	4.4%	4.3%	
	Jhalokati	11.8%	-1.8%	0.0%	7.6%	-3.3%	-1.7%	
	Patuakhali	24.1%	8.8%	10.4%	15.2%	3.8%	5.1%	
	Pirojpur	21.3%	-2.3%	0.6%	9.4%	-1.4%	0.2%	
	Bandarban	22.1%	20.6%	21.0%	8.3%	40.2%	30.3%	
	Brahmanbaria	16.4%	4.2%	5.8%	33.4%	16.0%	18.4%	
	Chandpur	48.4%	1.0%	5.6%	38.7%	1.2%	6.4%	
Chittagong	Chittagong	24.9%	6.4%	15.1%	-6.8%	38.2%	15.2%	
	Comilla	31.3%	5.3%	7.8%	57.0%	12.0%	17.2%	
	Cox's Bazaar	27.9%	16.5%	18.1%	83.2%	19.3%	29.1%	
	Feni	60.4%	1.7%	7.1%	72.6%	6.9%	15.9%	
	Khagrachari	41.3%	44.9%	43.8%	26.2%	12.3%	16.8%	
	Lakshmipur	9.0%	6.8%	7.1%	16.7%	16.0%	16.1%	
	Noakhali	37.7%	6.4%	9.8%	40.6%	17.4%	20.6%	
	Rangamati	5.0%	26.0%	18.1%	-6.2%	29.1%	17.3%	
	Dhaka	Dhaka	43.2%	-0.5%	38.1%	19.5%	280.3%	41.5%
Faridpur		40.6%	9.5%	12.7%	19.2%	7.4%	8.9%	
Gazipur		40.9%	7.7%	20.7%	11.6%	114.7%	67.5%	
Gopalganj		46.6%	3.2%	6.2%	13.8%	-0.8%	0.6%	
Jamalpur		47.5%	3.4%	8.5%	17.1%	7.3%	8.8%	
Kishoreganj		19.8%	7.1%	8.7%	37.0%	8.3%	12.2%	
Madaripur		57.2%	-1.1%	3.6%	12.4%	0.2%	1.7%	
Manikganj		54.0%	2.2%	6.3%	-13.2%	10.3%	7.6%	
Munshiganj		-16.5%	6.7%	4.5%	94.7%	5.9%	12.5%	
Mymensingh		23.8%	7.5%	9.6%	20.9%	12.6%	13.8%	
Narayanganj		31.1%	7.3%	19.5%	-19.1%	105.8%	35.6%	
Narsingdi		26.7%	7.8%	10.9%	28.1%	14.9%	17.4%	
Netrokona		32.5%	9.2%	11.0%	31.6%	10.1%	12.1%	
Rajbari		30.7%	7.5%	10.0%	14.4%	9.7%	10.3%	
Shariatpur		58.9%	5.9%	9.8%	14.2%	5.9%	6.8%	
Sherpur		19.5%	7.4%	8.5%	38.1%	2.3%	6.2%	
Tangail		48.2%	1.4%	5.9%	24.1%	7.3%	9.6%	
Khulna		Bagerhat	1.4%	4.4%	4.0%	-5.4%	-4.6%	-4.7%
		Chuadanga	22.2%	18.3%	19.3%	11.1%	12.5%	12.1%
		Jessore	32.0%	9.6%	12.7%	28.1%	8.7%	11.9%
	Jhenaidah	20.8%	9.8%	11.3%	21.6%	10.5%	12.1%	
	Khulna	17.6%	5.4%	11.7%	-39.4%	40.8%	-2.5%	

Internal Migration in Bangladesh: Character, Drivers and Policy Issues

Rajshahi	Kushtia	20.5%	10.2%	11.4%	9.9%	12.2%	11.9%
	Magura	85.8%	3.4%	9.6%	14.3%	11.0%	11.4%
	Meherpur	37.7%	13.3%	15.7%	22.4%	9.3%	10.8%
	Narail	18.9%	0.5%	2.4%	30.9%	-0.5%	3.3%
	Satkhira	19.7%	11.6%	12.3%	15.2%	5.6%	6.5%
	Bogra	22.7%	5.7%	7.7%	72.3%	4.1%	12.9%
	Joypurhat	44.0%	1.1%	5.6%	18.6%	6.1%	7.9%
	Naogaon	21.7%	4.9%	6.3%	23.8%	7.2%	8.7%
	Natore	11.9%	3.6%	4.5%	18.9%	11.2%	12.2%
	Chapai Nababganj	14.3%	16.1%	15.7%	19.0%	14.8%	15.6%
	Pabna	24.1%	4.4%	7.9%	-13.7%	23.7%	15.9%
Rangpur	Rajshahi	36.3%	5.4%	15.0%	1.3%	20.6%	13.5%
	Sirajganj	17.3%	13.0%	13.5%	35.9%	12.2%	15.0%
	Dinajpur	19.8%	10.2%	11.5%	22.3%	11.6%	13.1%
	Gaibandha	33.0%	2.6%	4.8%	7.9%	11.6%	11.3%
	Kurigram	15.7%	5.1%	6.6%	17.4%	15.1%	15.5%
	Lalmonirhat	25.9%	9.1%	11.0%	-8.6%	16.4%	13.2%
	Nilphamari	18.1%	9.8%	11.0%	23.0%	15.6%	16.7%
	Panchagarh	14.9%	11.8%	12.1%	32.1%	16.8%	18.1%
	Rangpur	17.8%	10.8%	12.0%	-3.2%	16.9%	13.3%
	Thakurgaon	16.2%	14.4%	14.6%	36.9%	12.1%	14.5%
Sylhet	Habiganj	45.6%	5.8%	9.1%	27.8%	17.8%	18.8%
	Maulvibazar	20.2%	10.1%	10.9%	43.2%	16.6%	19.0%
	Sunamganj	61.0%	7.8%	11.7%	18.0%	23.1%	22.6%
	Sylhet	17.8%	10.9%	12.0%	73.8%	26.3%	34.4%
Total		30.3%	6.9%	11.6%	14.7%	16.2%	15.8%

Appendix C: Environmental Statistical Testing Outputs

Results are given for a two tailed difference in means test, with the null hypothesis specified as no difference, and the alternative as a statistically significant difference. This was estimated for all environmentally challenged districts (the affected group)²⁴ against all non-challenged districts (the control group)²⁵. As the data shows, in no category is the difference statistically significant (see Column 4). The null is accepted therefore.

1	2	3	4
Decade & Category	Challenged % Change (n=18)	Non-Challenged % Change (n=47)	Statistical Significance (P value/ 2 tailed test)
Decade 1 (1991-2001)			
- Urban	+25%	+29%	0.3400
- Rural	+8%	+8%	0.6646
- Total	+10%	+10%	0.7040
Decade 2 (2001-2011)			
- Urban	+22%	+21%	0.9341
- Rural	+14%	+21%	0.2981
- Total	+13%	+14%	0.7433

²⁴ Challenged districts are specifically: Barguna, Bhola, Patuakhali, Cox's Bazaar, Noakhali, Bagerhat, Khulna, Satkhira, Habiganj, Maulvibazar, Sunamganj, Sylhet, Jamalpur, Netrokona, Sirajganj, Gaibandha, Kurigram, Nilphamar, and Rangpur.

²⁵ Non-challenged are all others.