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Population Dynamics in the South-West of Bangladesh

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19.1 Introduction

During the last decades, Bangladesh has undergone a demographic transition, with declining fertility accompanied by lower mortality and increased life expectancy. During this time, total fertility rate (TFR) dropped from 6.36 in 1950–1955 to 2.23 in 2010–2015 and is projected to reach 1.67 in 2050–2055 (UN 2013). While life expectancy has shown important improvements, maternal and child mortality remain high by international

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standards. Malnutrition, which is a key cause of child mortality and poor health, continues to constitute a key public health challenge. Population trends have been uneven across different geographic areas, and this uneven progress towards demographic transitions is likely to be further challenged by the consequences of environmental and climate change (Szabo et al. 2015a). This chapter examines key population dynamics in the south-west coast of Bangladesh with a specific focus on the components of population change, that is, fertility, mortality and migration, and discusses future population prospects and resulting policy implications.

Existing literature highlights the complex interlinkages between population dynamics, human well-being and sustainability (de Sherbinin et al. 2007; Hummel et al. 2013; Szabo et al. 2016b). For example, population density has been found to be both positively and negatively associated with economic growth and individual well-being (Tiffen 1995; Ahlburg et al. 2013). On one hand, population growth and population density may have a positive effect on people's quality of life because of greater provision of and accessibility to services, such as food, water and healthcare. On the other hand, however, rapid population growth, including growth of populations in urban areas, caused by natural increase and rural to urban migration, is likely to pose important challenges to the sustainability of urban settlements (Szabo et al. 2016b). Urbanisation is also linked to high mobility and migration rates, which are likely to contribute to increased household income, and thus poverty reduction through provision of remittances (Ratha 2013).

This chapter focuses specifically on the population dynamics and prospects in the study area (see Chap. 4, Fig. 4.2). In this region, the interlinkages between population dynamics and sustainability have been and are likely to continue to be of critical importance. The impacts of environmental and climate change, combined with a relatively rapid pace of urbanisation, and falling fertility and mortality rates will mean that economic growth of the region and Bangladesh, as a whole, will be affected (Szabo et al. 2015a). Past evidence suggests that population growth in the area has been accompanied by improved human well-being (Hossain et al. 2016). This has been possible, at least partially, because of the contribution of local ecosystem services. For example, Hossain and Szabo (2017) estimated that in the Narail district north of the study area, the total yearly market output of provisioning services was approximately USD 173 million. Examining population dynamics and prospects in the region will allow better local and national planning, thus contributing to further development of the country.

19.2 Population Growth and Structure

The total population of the south-west coast of Bangladesh is around 14 million which accounts for ten per cent of the national population. The most populous districts are Khulna and Barisal which includes the two cities of the same names, while the least populous districts are Jhalokati and Barguna. However, Jhalokati has the highest population density, approximately 966 people per square kilometre, while Bagerhat district is the least dense at around 373 people per square kilometre (Szabo et al. 2015a). Both Barisal and Khulna Divisions have experienced substantial population decline, while Dhaka and Chittagong (outside of the study area) had a net increase in terms of the share of total national population (Szabo et al. 2015a) (also see Fig. 19.1). The coastal districts

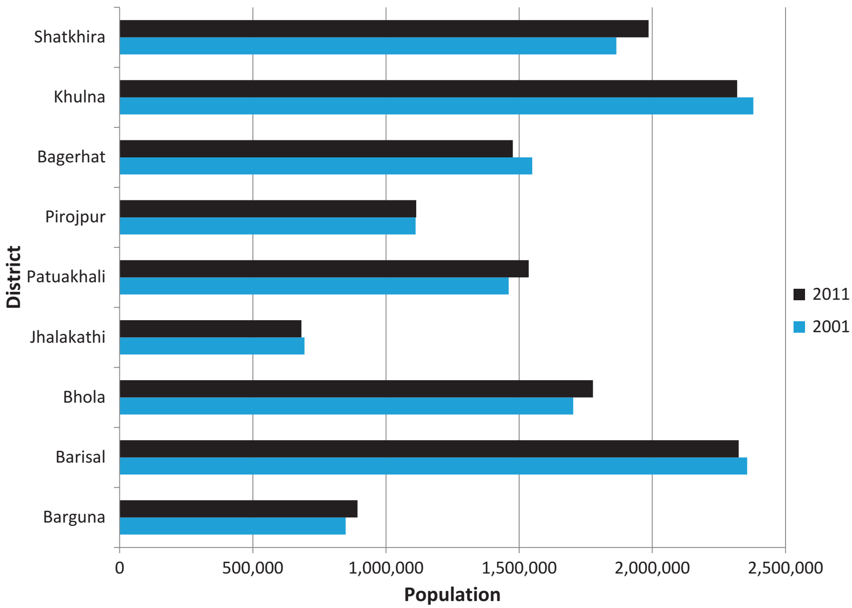

Fig. 19.1 Population change in the study area between 2001 and 2011

appear to have relatively low rates of population growth; within all the districts the annual average growth rate has decreased between 2001 and 2011 compared to the intercensal period 1991–2001 (BBS 2012). For the entire south-west, the average annual population growth rate decreased from 1.03 to 0.15 per cent (Szabo et al. 2015a). Moreover, four districts—Barisal, Jhalokati, Bagerhat and Khulna—have seen a negative average annual growth rate between 2001 and 2011. Thus, in order to understand the demographics of this area, it is important to examine the interplay of the different components of population change, namely, fertility, mortality and migration.

In terms of population structure (Fig. 19.2), while the current population of the region is relatively young, the declining fertility rates have already had an effect on the population pyramid. More specifically, it can be seen that the bottom of the pyramid (ages 0–4) is significantly smaller compared to the two adjacent age groups. The female and male populations show approximately the same distribution, suggesting no

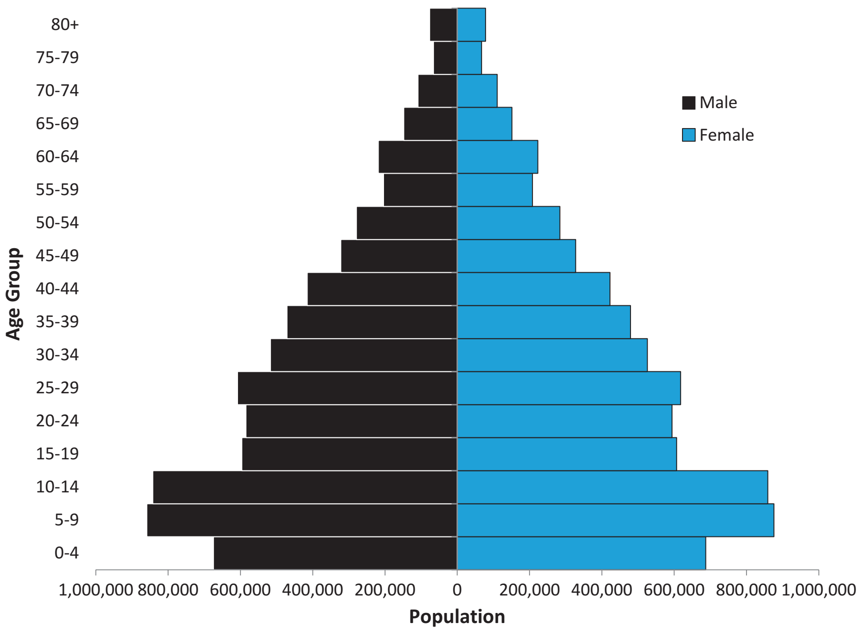

Fig. 19.2 Population structure in the study area in 2011

disproportionate out-migration from one gender group. It is however important to highlight that this population structure is expected to change as Bangladesh, and the study area, continue undergoing the demographic transition. In particular, given both low fertility rates and rising environmental vulnerability, it may be expected that the population pyramid will dramatically change.

19.3 Components of Population Change

19.3.1 Fertility

Recent changes in fertility patterns have arguably been the most significant factor affecting population change in Bangladesh, including the south-west coast of the country. The coastal delta region is currently experiencing rapid demographic transition, and because of the continuous decline in TFR and consequently natural growth rate, the region is likely to see a less rapid population increase or even, in the long term, a population decline. As can be seen in Fig. 19.3, fertility rates have been decreasing since the early 1990s in both Khulna and Barisal Divisions. In Khulna, TFR dropped from 3.1 in 1993/1994 to 1.9 in 2014, while in Barisal it declined from 3.5 in 1993/1994 to 2.2 in 2014

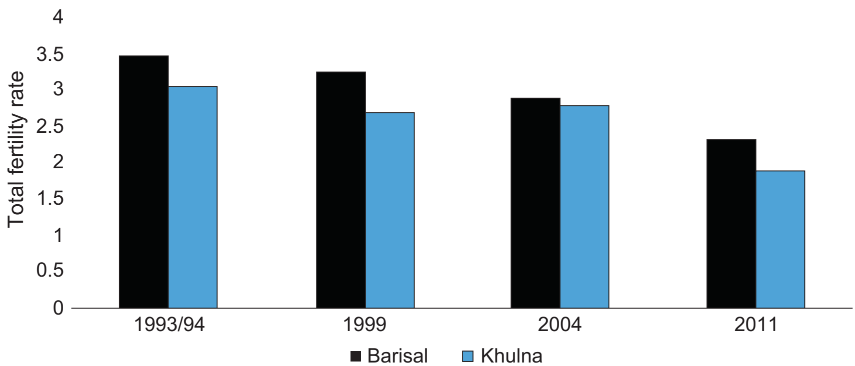

Fig. 19.3 Recent trends in total fertility rate in Barisal and Khulna Divisions (Reproduced with permission from Szabo et al. 2015a)

(Mitra et al. 1994; NIPORT et al. 2016). There exist interesting inter-district differentials in age-specific fertility with Satkhira showing the highest level of adolescent fertility and Pirojpur the highest level of fertility in older ages (40–49).

Factors affecting fertility levels in Bangladesh as a whole have been examined extensively given the relatively rapid pace of demographic transition since the 1970s. Less evidence exists regarding the specific study area; however, it is sensible to assume that similar factors apply at least at a strategic level. In his comparison of socio-economic development across South Asia, Asadullah et al. (2014) highlighted that the decline in fertility was mainly possible because of the increasingly easy access to contraceptives and reproductive health social awareness campaigns. Similarly, Chowdhury et al. (2013) point out that contraceptive use amongst couples in Bangladesh increased from less than 10 per cent in 1970 to 61 per cent in 2010, which led not only to a lower TFR but also contributed to reductions in mortality rates and gains in the overall socio-economic development. The recent trends in TFR indicate that the delta population is likely to experience smaller households and changing household-level dependency ratios. A recent paper by Szabo et al. (2016b) examining demographic patterns in a larger delta region covering almost five divisions highlighted a declining trend in average household size, from 5.1 in 2000 to 4.8 in 2010.

19.3.2 Mortality

Infant mortality and under-five mortality rates are overall lower when compared to the national average, with districts such as Barguna and Satkhira having the lowest infant mortality (Table 19.1). This might be explained by the fact that in some very important socio-demographic indicators, Barisal and Khulna Divisions show better scores than other divisions. For example, Barisal has the lowest percentage of ever-married women aged 15–49 with no education (15.1 per cent), followed by Khulna Division (21.6 per cent) (NIPORT et al. 2016). Moreover, if Bangladesh is divided into west and east, then the west (including the study area) has already achieved replacement fertility, while the divisions in the east such as Sylhet and Chittagong are lagging behind (Rabbi and Kabir 2015).

Table 19.1 Selected maternal and child mortality indicators (based on NIPORT et al. 2012)

		Indicator				
		Infant mortality	Neonatal mortality	Under-five mortality	Married female adolescents aged 15–19	Current use of contraception (any method)
Division	District	Deaths per 1,000 live births			Percentage	
Barisal	Barguna	30	20	41	52	68
	Barisal	45	29	58	35	62
	Bhola	35	24	54	43	66
	Jhalokati	39	32	56	36.4	60
	Patuakhali	41	33	64	46	65
	Pirojpur	46	37	55	38	63
Khulna	Bagerhat	49	37	60	41	67
	Khulna	46	31	53	43	68
	Satkhira	31	21	32	50	70
Study area (average)		40	29	53	43	66
National		45	32	56	41	63

The two districts of Barguna and Satkhira have done relatively well in some of the development indicators as well, which may at least in part, help to explain the lower infant mortality within the study area (Table 19.1). For example, within the Barisal Division, Barguna has the second highest percentage of girls (79.4 per cent) aged 12–15 who completed primary education, the highest percentage of mothers receiving check-ups within two months of delivery (40.6 per cent), as well as within the first two days by any healthcare provider (NIPORT et al. 2012). In addition, the current use of contraception (any method) is relatively higher in the study area (approximately 66 per cent compared to the national average of 63 per cent) (NIPORT et al. 2011; also see Table 19.1). It is reasonable to expect such factors to play an important role in decreasing infant and under-five mortality.

Life expectancy figures for the study are scarce. According to World Health Organization (WHO) data, in Bangladesh the current life expectancy for females is 73.1 and 70.6 for males (compared to 57.7 for females and 56.7 for males in 1985–1990) (WHO 2014; UN 2013). Based on mortality data from the most recent population census, current life expectancy in the study area was estimated. According to these estimates, life expectancy for males varies from 70.9 for Khulna Division to 68.2 in Barisal Division; for females, life expectancy at birth was 73.1 in Khulna and 69.8 in Barisal. These considerable improvements in life expectancy can be explained by a number of factors, as highlighted by Chowdhury et al. (2013).

Environmental factors can affect mortality and population health in different ways. In terms of negative effects, direct factors such as cyclones and flooding can cause death and disease. There were between 225,000 and 500,000 deaths as a result of the 1970 Bhola cyclone; 3,300 and 190 deaths are associated with Cyclones Sidr (2007) and Aila (2009), respectively. The largest flood in Bangladesh in 1998 led to 138,000 deaths and affected 52 per cent of the entire population of Bangladesh at that time (Cash et al. 2013). Other than such rapid onset hazards, slow onset hazards also have the potential to affect population health indirectly. For example, salinisation of water and soil affects water quality for both agriculture (ultimately leading to food insecurity) and domestic consumption. Salinity in drinking water has been found to be associated with increased risk of pre-eclampsia and gestational hypertension in the coastal population of Bangladesh (Khan et al. 2014), while Dasgupta et al. (2016) suggest that salinity in drinking water is a significant determinant of infant mortality in coastal Bangladesh.

However, it should be acknowledged that through socio-economic development and adaptation, coastal Bangladesh is better prepared to cope with the aftermath of natural hazards and environmental disasters (Cash et al. 2013; Haque et al. 2012). In particular, over the last 50 years Bangladesh has learned how to adapt to cyclones, contributing to significant declines in cyclone-related deaths; for example, setting up cyclone shelters and low tech but reliable early warning systems (Haque et al. 2012). These advances in tackling mortality rates can be attributed to enhanced disaster management, greater focus on poverty reduction, a key vulnerability factor, interventions which draw on social capital of the coastal communities and identifying and targeting main drivers of mortality (Cash et al. 2013).

19.3.3 Migration

Migration is arguably the most complex and challenging component of population change as it is influenced by a diverse set of drivers. Black et al. (2011) identify five families of drivers of migration in the form of economic, political, social, demographic and environmental. Such "micro-scale" and "meso-scale" factors result in macro-scale effects in terms of population growth and distribution across a country. However, according to the classic economic model, migration decision-making process depends on individual choice (Harris and Todaro 1970). Nevertheless, research in the last four decades in this area has found that the process of decision making often depends on the family or household situations well as on the presence of social networks (Jampaklay et al. 2007; Winkels 2008). There is evidence that the migration decision-making process is not undertaken by individuals alone, but it occurs at a group level. This suggests that the classic push and pull factors may operate within a larger social context (Seto 2011).

In Bangladesh migration is a historical phenomenon. Migration patterns are not homogenous within the coastal districts as local push factors may influence people's decision to migrate. The census of 2011(BBS 2012) reports that 9.7 per cent of the total population of Bangladesh are lifetime internal migrants. Using a residual method, a crude net migration rate of around minus 4.5 persons (per 1,000 population) for Barisal Division and around plus 1 person (per 1,000 population) for Khulna Division for the year 2001 was estimated (Szabo et al. 2015a). However, calculations for 2010/2011 revealed an increase in out-migration rates, with a crude net migration of minus 12.5 persons (per 1,000 population) for the Barisal Division and minus 5.5 persons (per 1,000 population) for the Khulna Division, meaning that more people are leaving these divisions than are coming in as migrants.

Environmental stresses, economic vulnerability and prospects of remittance income are thought to result in high out-migration rates in coastal areas (Szabo et al. 2015b; Szabo et al. 2016a). As the Ganges-Brahmaputra-Meghna (GBM) delta constitutes a vulnerable social-ecological system (Sebesvari et al. 2016), there is a relatively high potential for migration. A large portion of internal migration in Bangladesh is not permanent, being either seasonal or temporary. A study in Bangladesh has shown that migrant characteristics, environmental change-related factors, conflict and adaptation strategies, as well as social networks —all have significant impacts on temporary migration (Joarder and Miller 2013). Migrants who had been previously working in agriculture or fishing are more likely to migrate permanently. Households who had reported asset loss due to environmental hazards have a higher probability of becoming permanent migrants, while events such as loss of livestock and crop failure were associated with higher likelihood of becoming temporary migrants.

Another study found that permanent migration from hazard-prone areas are quite low despite the major threats with the exception of erosion of land on which people live or where salinity intrusion makes agriculture impossible (Penning-Rowsell et al. 2013). Certain pull factors encouraging families and people to stay behind are quite strong, and migration as a response to natural hazards may be viewed as a last resort (Penning-Rowsell et al. 2013). Nevertheless, a modelling study by Hassani-Mahmooei and Parris (2012) suggests likely changes in population densities across

Bangladesh due to migration from drought-prone western regions and cyclone- and flood-prone areas in the south, towards northern and eastern districts. The model predicted between three and ten million internal migrants in Bangladesh by 2051, by considering drivers such as incidences of extreme poverty, socio-economic vulnerability, demography, historical drought, cyclone and flooding patterns.

19.3.4 Urbanisation

Evidence suggests that the coastal delta region is not only particularly vulnerable in terms of environmental risks but also experiences unique demographic and urbanisation dynamics (Szabo et al. 2015a). While Bangladesh as a country has undergone a rapid process of urbanisation during the last decade (2011–2011), the coastal delta region saw a slight decline both in terms of urban population size and the proportion of urban population. In 2001, the study area had approximately 2.8 million urban dwellers which accounted for around 20 per cent of the total population in coastal delta (Table 19.2). By 2011, the population declined to 2.5 million, almost 19 per cent of the overall population in the study

Table 19.2 Proportion of urban population across nine districts in the study area (Compiled using data from BBS 2012)

		Year			
		2001		2011	
Division	District	Total urban population	Per cent urban (2001)	Total urban population	Per cent urban (2011)
Barisal	Barguna	87,582	10.32	103,094	11.55
	Barisal	394,567	16.75	519,016	22.33
	Bhola	234,302	13.76	243,317	13.69
	Jhalokati	104,070	14.99	112,003	16.41
	Patuakhali	175,284	12.00	201,882	13.14
	Pirojpur	166,970	15.03	182,631	16.41
Khulna	Bagerhat	206,554	13.33	195,331	13.23
	Khulna	1,284,208	53.98	777,588	33.54
	Satkhira	171,614	9.20	197,616	9.95
Total		2,825,151	20.23	2,616,006	18.55

area. This decline was caused primarily by population dynamics in the Khulna district which experienced a large decline in its urban population, almost 40 per cent during the intercensal period (2001–2011). While without a detailed analysis it is difficult to determine why such a steep decline occurred, it is sensible to assume that both low fertility rate and high level of out-migration contributed to this pattern.

The recent district level census report (BBS 2012) confirms the findings presented in Table 19.2. While in 2001 the level of urbanisation in Khulna district was over 54 per cent, it was only 34 per cent in 2011. Comparatively, in the remaining districts of the Khulna Division (Bagerhat and Satkhira) the proportion of urban population remained at similar levels. In Barisal Division, the Barisal district saw the most rapid pace of urbanisation, with over 22 per cent of its population residing in urban areas in 2011, compared to nearly 17 per cent in 2001. These patterns of urbanisation show that overall the study area is highly diverse in terms of its internal dynamics. Further systematic qualitative or survey research is needed to elaborate the factors affecting urbanisation processes in the coastal delta.

19.4 Future Scenarios and Policy Recommendations

Population projections for the south-west coast of Bangladesh are uncertain: ongoing processes will continue towards urbanisation and demographic transitions. Szabo et al. (2015a) developed population projections based on three sets of assumptions about the excepted direction of change for different demographic components. These scenarios were aligned with the overall sustainability scenarios and named Business As Usual (BAU), Less Sustainable (LS) and More Sustainable (MS). The results of two out of three projection scenarios show that the population of the study area is likely to experience a significant decline before 2050 (Szabo et al. 2015a). Only in the MS scenario (one which presupposes lower rates of out-migration), population was expected to see a slight increase (Fig. 19.4).

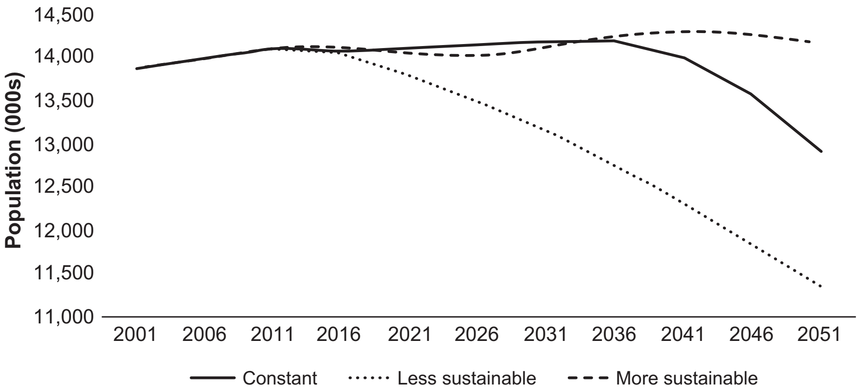

Fig. 19.4 Scenarios of population change in the GBM delta (Reproduced with permission from Szabo et al. 2015a)

It was also found that in the next decades the population structure in the coastal GBM delta will undergo considerable change regardless of the projection scenario. These future demographic trends can be explained by declining fertility, greater life expectancy and high rates of out-migration. The two key aspects of this shift will entail an ageing population and a declining proportion of younger people. More specifically, the proportion of 65 and over is likely to increase from 5.7 per cent in 2011 to 15 or 16 per cent in 2051 depending on the projection scenario. At the same time, the proportion of children and youth (ages 0–14) would decline from 34 per cent to 15 per cent under LS scenario and 16 per cent under the BAU and MS scenarios.

19.5 Summary

The demographic trends and projections presented in this chapter have important implications for the wider context of ecosystem services and sustainability in the delta region. First, they suggested the need for tailored district level policy interventions. While the demographic outcomes diverge, the policy priorities are common across the delta region: there is a need to enhance public services and public health, protect vulnerable populations and generate routes out of poverty building on sustainable resource use and mobility. Second, given the distinct demographic patterns of the study area, and the likelihood that migration will continue at some level regardless of rural interventions, the policy planning process should prioritise designing specific measures linked to population distribution at the regional and country level. The recent out-migration from the coastal GBM delta area has an important impact on other urban areas, such as Khulna and Dhaka, including the clustering of new populations in slums and informal settlements. Finally, given the interconnectedness of environmental and social factors and the impact of climate change on human well-being, it is critical to develop integrated strategies to reduce the vulnerability of disadvantaged groups. These groups may include migrants in destination areas (mostly urban centres) and those facing the challenges of ecosystem service decline and environmental degradation in rural areas.

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