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Floods and Rural-Urban Migration in Bangladesh

In Bangladesh, about 3.5 million people were affected by major floods in August and September 2014, among whom more than 325,000 people were displaced (IFRC 2014). The country is highly vulnerable to natural hazards of all types – cyclones, tornadoes, storm surges, droughts, floods, earthquakes, riverbank erosion, and landslides. Floods are the most common natural hazard affecting Bangladesh, with about 20 million people present in zones subject to flooding (Gemenne *et al.* 2011, p.59). Indeed, the majority of Bangladesh is made up of low-lying floodplains, and the country is crossed by more than 230 waterways which bring water from the Himalayas in the north to the Bay of Bengal in the south.

Natural hazards and extreme climatic events are becoming more and more frequent as a result of climate change, making Bangladesh an “impact hotspot” (IDMC 2015). For instance sea-level rise, caused by global warming, is already threatening major urban areas, infrastructure, livelihoods, food production and access to drinking water (PIK 2013). Combined with the country’s political and socio-economic challenges, this high exposure to natural disasters makes Bangladesh particularly vulnerable to the long-term effects of climate change, including migration (IDMC 2015).

As this study will examine, environmental factors – natural disasters and slow onset events – are a major cause of migration from rural to urban areas, which can be qualified as a coping strategy in a context of high economic hardship in rural Bangladesh. When taking into account climate change and the growing urban economy in the country, continued rural-urban migration – both temporary and permanent – seems inevitable (Walsham 2010, p.20). Today, Bangladesh has one of the highest rates of urbanization and rural-urban migration is the most important factor behind it (Uddin and Firoj 2013, p. 90). Massive migration to urban areas leads to rapid and unplanned urbanization in cities such as the capital Dhaka, and has emerged as an important subject of concern because of its negative economic, social, environmental and human health impacts.

This paper aims to analyse the phenomenon of rural-urban migration in Bangladesh, using the 2014 floods as a case study. The objective is first to describe the floods that occurred in August and September 2014 in the country, and to examine their consequences, notably in terms of rural-urban migration. The paper will subsequently evaluate the features of rural-urban migration in Bangladesh, the impacts it triggers and the policies that could be implemented to cope with this phenomenon.

1. THE AUGUST-SEPTEMBER 2014 FLOODS IN BANGLADESH

1.1. A brief overview of floods in Bangladesh

On average, at least one fifth of Bangladesh’s territory is flooded every year, and this proportion may increase to almost three quarters in the event of catastrophic floods (Agarwala *et al.* 2003) (table 1). Flooding is the result of a complex series of factors, the two most important of which are the increased inflow of water from upstream catchment areas caused by heavy monsoon rainfall, and the low floodplain gradient. In addition, the congestion of drainage channels, tides and storm surges in coastal

areas, and polders – land reclaimed from a body of water, such as a lake or the seabed – increase the intensity of floods outside protected areas. Different combinations of these factors give rise to different types of flooding (Ahmed and Mirza, 2000).

Table 1. Major floods in Bangladesh and their impacts (1974-2014)

	Area inundated (square kilometers)	Proportion of total area (%)	Cost of damage (million Taka)	Population affected (million persons)	Deaths (number of persons)
1974	52,720	35	28,490	30	1,987
1984	28,314	19	4,500	20	553
1987	57,491	38	35,000	30	1,657
1988	89,970	62	> 100,000	47	2,379
1998	> 100,000	74	> 120,000	55	1,050
2004	> 58,000	40	> 200,000	36	750
2007	32,000	21	> 75,000	14	649

Sources: Choudhury et al. 2003; Government of Bangladesh 2008; Dewan 2015.

Flooding usually begins in flashy rivers – rivers which respond “very quickly to rainfall, the flow of water rising rapidly to a high peak before receding similarly” (Scottish Natural Heritage 2015) – in the hilly areas during the pre-monsoon months of April and May. Called “flash floods”, they may occur several times a year and are caused by waters from the hilly upstream rushing to the plains with high velocity. These flash floods are sudden and last only from a few hours to a few days. On a slightly longer time scale, when local rainwater is increasingly accumulated on the land by the rising water levels in adjoining rivers, so-called “rainwater floods” may occur. They typically occur between June and August, and vary from year to year depending on the water levels in the rivers that control drainage from the land. For instance, the major flood in 1987 in northwest Bangladesh was mainly caused by excessive rainfall occurring throughout the monsoon season, and was aggravated at times by flash floods passing down the Teesta River as well as other rivers entering Bangladesh from the northwest (Ahmed, A.U. 2006).

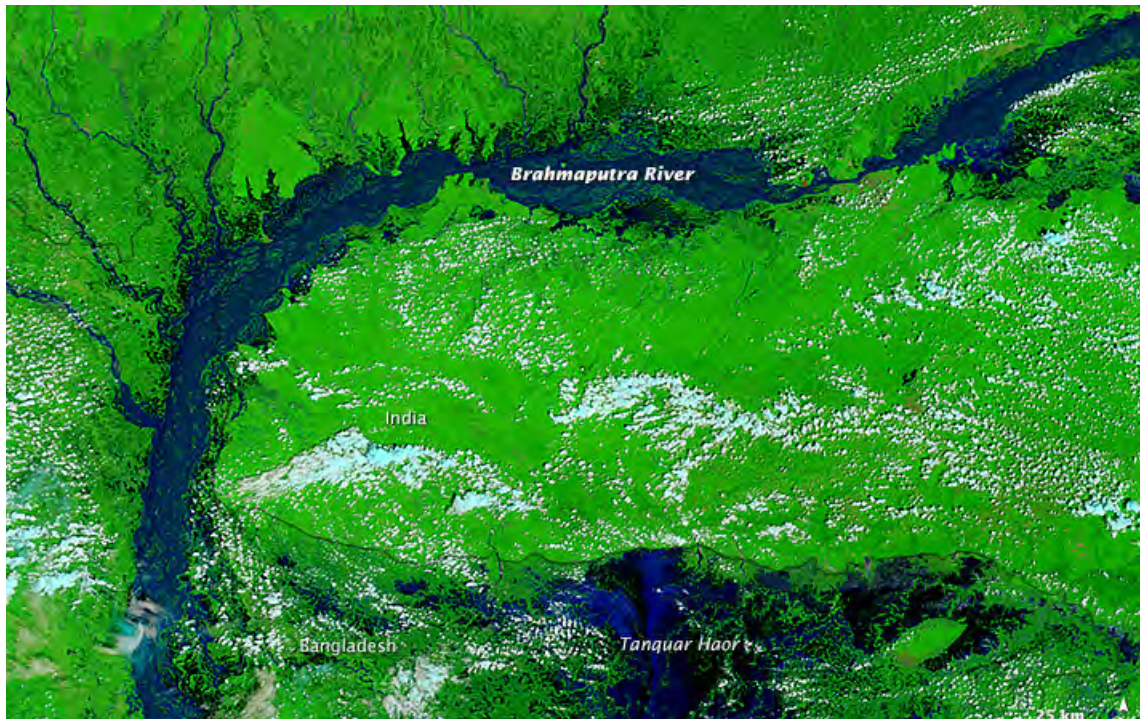
According to projections, climate change is very likely to increase the level of rainfall during the monsoon season (IPCC 2014). Such an increase will undoubtedly lead to more frequent and more severe flooding (Ahmed, A.U. 2006). In addition, more frequent flooding will aggravate already existing drainage problems, including the diminution of river gradients over time, as more and more sediments are brought down and accumulate. Consequently, the conveyance capacity of these rivers will diminish significantly, this in turn increasing the frequency and duration of flooding. According to Ahmed (2006, p.23), “[t]he ‘best-estimate’ scenario for the year 2030 is that monsoon rainfall could increase by 10 to 15 per cent. For the scenario year 2075 the average rainfall in monsoon will increase by about 27 per cent with respect to the base year. In the coastal areas there will be stronger-than-usual backwater effect due to sea level rise induced high oceanic stage, resulting into retardation of discharge flow, particularly along the confluence points of the major rivers. As a consequence, the risk of riverine and rainfall-induced high intensity floods with prolonged duration, as in the case of flood 1998, will increase significantly”.

Map 1. North western part of Bangladesh on August 29, 2014



Source: <http://earthobservatory.nasa.gov/IOTD/view.php?id=84299>

Map 2. North western part of Bangladesh on September 8, 2012



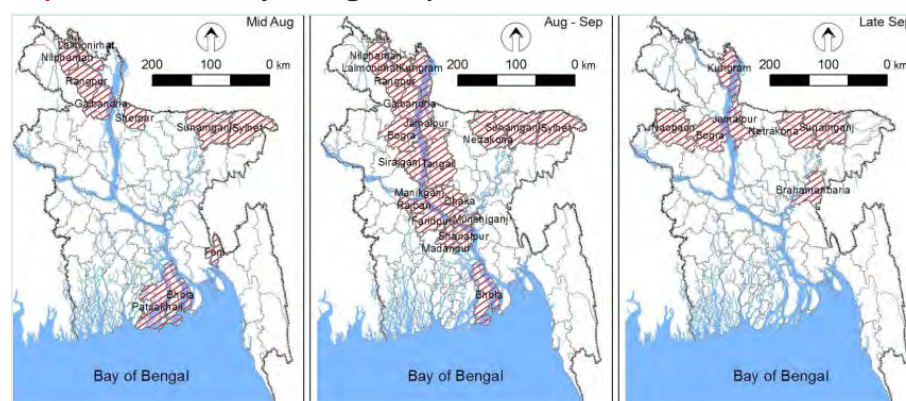
Source: <http://earthobservatory.nasa.gov/IOTD/view.php?id=84299>

1.2. Description of the August-September 2014 floods

From the middle of August 2014, a combination of the arrival of meltwater from the Himalayas and heavy monsoon rainfall in the country's main river basins triggered severe flooding in north-western Bangladesh. The districts of Lalmonirhat, Kuri-gram, Nilphamari, Rangpur, Gaibandha, Bogra, Sirajganj, Jamalpur, and Sherpur were affected. This was followed some days later by another episode of heavy rain, which provoked flooding in the districts of Sunamganj, Sylhet and Netrokona in the north-east of the country, and later in districts in the centre of the country (Munshiganj, Tangail, Faridpur, Manikganj, Rajbari). The Moderate Resolution Imaging Spectroradiometer (MODIS) of NASA's Terra satellite captured map 1 on 29 August. It shows flooding along the Brahmaputra River and Tanquar Haor, a large wetland region in the north-western part of the country. For comparison, map 2 shows the same area on 8 September 2012, a more typical year (NASA 2014).

Between 19 September and the end of the month additional flooding hit several districts in the country, affecting 400,000 more people and increasing the plight of the people already affected by floods in August (IFRC 2014) (map 3).

Map 3. Areas affected by the August-September 2014 floods



Source: <http://reliefweb.int/sites/reliefweb.int/files/resources/MDRBD014OU1.pdf>

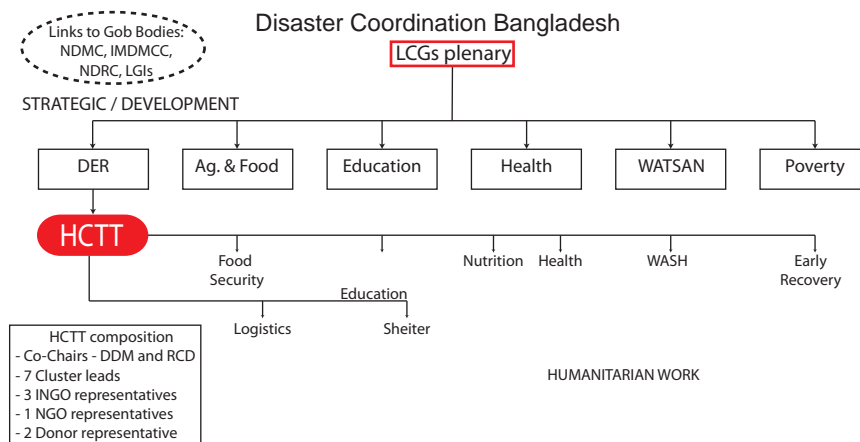
1.3. Policy response

In Bangladesh, managing such natural disasters is the responsibility of the Ministry of Disaster Management and Relief. Within the Ministry, the Department for Disaster Management (DDM) has a policy and advisory role. When the government declares an emergency, the Local Consultative Group Mechanism (LCG) is one of the key structures through which the government engages in dialogue with development partners, which are able to provide a humanitarian response (The JNA Consolidation Project 2014). In addition to the LCG Plenary, there are eighteen thematic LCG Working Groups, including the Disaster and Emergency Relief (DER). The DER, which is co-chaired by the UN Resident Coordinator and the Ministry of Disaster Management, is mandated to ensure the effective coordination of national and international stakeholders around all aspects of the disaster management process. DER membership consists of senior decision makers from UN agencies, donors, and NGO representatives. Within the DER, the Humanitarian Coordination Task Team (HCTT) is a working group that provides an operational level forum for coordinated disaster preparedness, response, and recovery across sectors.

Clusters have been constituted, with government approval, to address disaster preparedness. They bring together international organisations, NGOs, and donor organisations. There are currently eight different clusters, which are coordinated

by the HCTT: WASH (Water Sanitation and Hygiene), food security, early recovery, health, nutrition, education, logistics, and shelter.

Graph 1: Disaster management coordination in Bangladesh



Source: The JNA Consolidation Project 2014

In response to the August-September 2014 floods, the HCTT conducted a Joint Needs Assessment (JNA) in the nine districts that were the most affected (Kurigram, Sirajgonj, Gaibandha, Jamalpur, Bogra, Lalmonirhat, Rangpur, Sherpur and Nilphamari). This JNA consisted of an initial assessment of the number of people affected and the relative accessibility of water, food, sanitation, education, markets and health facilities. It mobilised 183 staff from 28 organisations, who visited about 300 locations in four days (from 25-28 August). Assessment teams in the field transmitted data to the team in Dhaka, which established a 50-page report by 8 September. This report established the scale of the disaster, the number of people affected and the worst affected areas, as well as their immediate and ongoing needs. Due to its time frame, many limitations could be found in this report, which were highlighted in the document itself: “While it does provide an overall quantitative picture of the disaster and the key priorities as identified by Union officials, it does not give voice to affected communities” (p.5).

Following the release of the JNA, a coordinated emergency response plan was implemented by the UN and the different clusters, in support of the Government of Bangladesh’s relief operations. Responding agencies reached approximately 75,000 households with emergency cash and food assistance, in addition to the 4,650 metric tonnes of food and over 10 million Taka of assistance provided by the Government in the five worst affected districts (Bogra, Gaibandha, Jamalpur, Kurigram and Sirajgonj).

1.4. Impacts

According to Government reports and the IFRC, in total about 3.5 million people were affected by the August-September floods across the country, of whom more than 325,000 people were displaced (IFRC 2014). A total of 56 people were reported dead and more than 100 people injured. About 34,000 homes were destroyed and approximately 200,000 damaged. The climatic situation was returned to normal at the beginning of October, but it has been described as “the worst flooding since the ‘mega floods’ in 2007”, when more than 10 million people were affected (IFRC 2014).

The socio-economic impacts of these floods were significant, particularly because they struck poor and rural regions of the north-western and central-northern parts of the country. Populations in these areas are especially vulnerable to the effects

of infrastructure destruction and crop losses, and will therefore take longer to recover. The floods caused widespread damage to croplands and destroyed much of the in-ground rice harvest in the five most affected districts (Bogra, Gaibandah, Jamalpur, Kurigram and Sirajgonj). The Government has estimated that over 86,000 ha of cropland and seedbed were been damaged across the five districts (Bangladesh Food Security Cluster 2015), with significant implications for the concerned districts' food security. These impacts were aggravated by the fact that the same regions were hit by floods during both the 2012 and 2013 cropping seasons, and by the relatively high domestic rice prices that have limited access to food for the poorest people (FAO 2014). In addition, the decline in agricultural production has caused a drop in agricultural employment opportunities and wages (Bangladesh Food Security Cluster 2015). The combination of declining wages and lack of employment meant that for several months the average monthly income was below the average monthly food expenditure. Many households decided to take out loans in order to cope with the situation, therefore increasing their debt; for instance, in Bogra district, average loans reached almost 8000 Taka (*ibid*). Indebted households are even more vulnerable since their capacity to invest in livelihood recovery or to cope with unforeseen shocks is significantly reduced. According to a survey conducted in the districts of Bogra, Gaibandah, Jamalpur, Kurigram and Sirajgonj, other coping strategies consisted of livelihood change, support from relatives, selling of advanced labour or of households assets, and recourse to savings (*ibid*). Migration (to both surrounding areas and further afield) was only cited as a coping strategy by 4 per cent of households (table 2). However, according to the report, "men were increasingly migrating to seek employment opportunities elsewhere". Also, it is possible that the combination of debt levels and sustained economic hardship will cause more migration, particularly rural-urban migration, as demonstrated by previous cases (see section 2.1).

Table 2: Coping strategies adopted by 324 households surveyed in affected areas

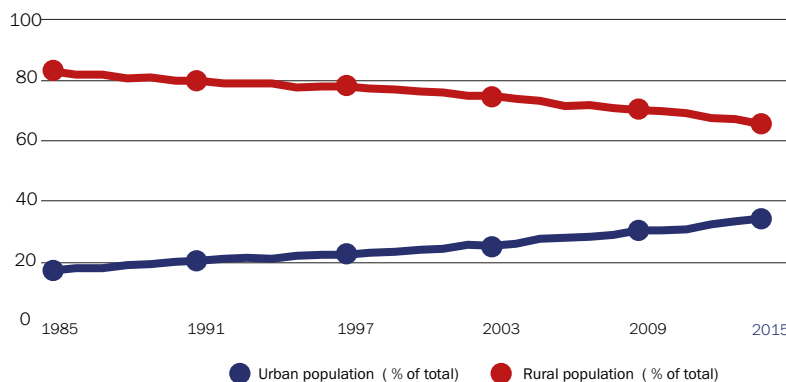
	# of Household	Percent
Taking loan at high interest	85	26
Livelihood change	70	21,5
Support from relatives	48	15
Selling of advance labour	41	12,5
Spending savings	26	8
Selling houseshorld assets	16	5
Migrated to surrounding areas	9	3
Remittance from relatives	7	2
Making children work	5	2
Selling productive assets	4	1
Migration	4	1
Making other members work	3	1
Tempory work	3	1
Other	3	1
Total	324	100

Source: Adapted from Bangladesh Food Security Cluster 2015, <<http://foodsecuritycluster.net/document/food-security-nutrition-shelter-and-early-recovery-assessment-flood-affected-areas-north>>.

2. CONTEXTUALIZATION: RURAL-URBAN MIGRATION IN BANGLADESH

In Bangladesh, current urban population growth rate is around 4 per cent per year (World Bank 2015). Major urban areas have experienced a tremendous increase in size and population since the 1970s: in 1974, 1.6 million people were living in urban areas, rising to 22.3 million in 1991, 32.5 million in 2001, and 47.7 million in 2011. Today, more than 53 million people live in urban areas, representing about 34% of the total population (World Bank 2015) (graph 2).

Graph 2: Evolution of urban and rural populations in Bangladesh (1985-2014) (% of total population)



Source: Author, using data from the World Bank (2015)

The capital and largest city, Dhaka, is home to almost 15 million people and is one of the most densely populated cities in the world (Zaman *et al.* 2010), with a density of about 20,000 inhabitants per square meter. Rapid urbanisation in Bangladesh is seemingly inevitable, notably due to the extremely unfavourable land-population balance in the country. Thus, “[t]he question is not whether Bangladesh should urbanize; the question is how Bangladesh will handle the challenges of urbanization” (Hussain 2013). While in the majority of the world’s countries the growth of the urban population is mostly due to natural population increase (the net excess of births over deaths) (Tacoli 2009), in Bangladesh the combined re-classification of settlements from rural to urban and rural-urban migration plays a major role (Alam and Rabbani 2007; Uddin and Firoj 2013). It has been estimated that rural-urban migration accounts for about two-thirds of total urban growth (Bhuyan *et al.* 2001; Hermman and Svarin 2013), and that since the end of the 1990s Dhaka has received between 300,000 and 400,000 rural migrants annually (Bangladesh Bureau of Statistics 2001; Friedman 2009). As such, it is necessary to analyse and to understand the patterns of and the reasons behind rural-urban migration, the key driver of urbanisation in the country.

2.1. Factors: Why do people migrate from rural areas to urban centres?

Rural areas in Bangladesh, where agriculture is the dominant sector, are characterized by an increasing lack of economic opportunities. As stated by Zaman *et al.* (2010, p.9), “the agriculture sector is no longer able to absorb the surplus labor force entering the economy every year”, therefore encouraging people to seek employment in urban areas. The high population/land ratio and the growing phenomenon of landlessness contribute to this lack of economic opportunities in rural areas (Ullah 2004; Uddin

and Firoj 2013). In contrast, urban areas and particularly the two largest cities, Chittagong and Dhaka, concentrate economic activities such as garment industries, financial and banking services, administrative headquarters and civil employment (Islam 1999). More importantly, around 80 per cent of all employment in a city like Dhaka is in the informal sector (Bangladesh Bureau of Statistics 2010), which plays a central role in the rural-urban migration context given – as will be examined below – the fact that it constitutes the best opportunity for new migrants to rapidly find a job. Thus, in urban areas, migrants can find diversified job opportunities, regardless of skills (Hossain 2001). Finally, in the famous model of rural-urban migration theorized by Todaro (1969), migration is directly linked to the wage differentials between rural and urban areas and the probability of finding a job in the city. In Bangladesh, the rural wage rate has been lower than the urban wage rate for several decades (Herrmann and David 2009), even if the differential has been decreasing significantly over the last few years (IFPRI 2013). Of course other factors, such as marriage and dependency relations, also cause rural-urban migration, but they are much less important than economic factors.

In addition, natural disasters play a significant role in explaining rural-urban migration in Bangladesh. According to Herrmann and David (2009, p.1), “[t]he principle factor that encourages people to leave their homes in the country side is the frequent recurrence of natural disasters, which undermine agricultural development and cause food crisis”. Indeed, the average yields of the main crops have been stagnating and sometimes declining over the last 20 to 30 years (*ibid*). Migration to cities can therefore serve as a coping strategy for households that have lost their income and/or place of residence because of a natural disaster (The Government Office for Science 2011). Sudden natural disasters, like the August-September 2014 floods, are not the only issues at stake. Slow onset environmental events, such as saline intrusion in the southern part of the country or riverbank erosion, may significantly affect rural life and agricultural productivity, therefore playing an important role in the decision to move (IOM 2010; Uddin and Firoj 2013).

FOCUS: FLOODS AS A FACTOR OF RURAL-URBAN MIGRATION

According to the International Organization for Migration (IOM), “while there is good data on initial displacement as a result of floods there is less evidence on longer-term impacts of floods on migration decisions. Evidence from India suggests that floodplains are characterized by a variety of migration dynamics, including periodic movements to high ground for shelter and temporary work as well as permanent migration where people’s livelihoods are more severely affected” (Walsham 2010, p.10). In that sense, a real “flood-migration nexus” has been identified in Bangladesh, “both at the national level with an increasing displacement of rural populations to urban areas and at the international level with important migration to India” (Gemenne *et al.* 2011, p.62). For instance, a 2007 study demonstrated that in rural areas of northern Bangladesh affected by floods in 2005 the majority of migrants relocated to urban areas. In this case, rural-urban migration proved to be an effective coping strategy, enabling “potentially vulnerable households to avoid a debt cycle” (Rayhan and Grote 2007, p.82). In the same vein, the phenomenon of “landless farmers” migrating to urban centres is increasingly reported (Rahman and Manprasert 2006; IRIN 2010). In such cases, floods reoccurring year after year reduce the quality and the yields of the crop fields. When farmers start to struggle to make a living, they sell their field, thus becoming “landless farmers”. As the financial situation of these landless farmers becomes worse and worse, many of them permanently migrate to urban centres in order to find other sources of revenues. In Bangladesh, areas that are particularly prone to flooding are often also home to the poorest – and thus more vulnerable – populations (map 4), making the “flood-migration nexus” particularly important in such areas.

It is important to emphasise that a distinction between rural-urban “environmental migrants” and rural-urban “economic migrants” is obviously not relevant since social, demographic, economic and environmental factors are highly intertwined. What is clear is that on top of economic, social and/or demographic factors, natural disasters create the conditions for migration to occur (Hagerly 2008).

2.2. Impacts of rural-urban migration

Rural-urban migration is traditionally regarded as a natural process of economic development, allowing urban industrial growth to benefit from the surplus manpower released from the rural sector (Bhuyan *et al.* 2001). In a country like Bangladesh, where appropriate policies to govern rural-urban migration are lacking, this process generates many negative impacts on the development of both cities and villages.

2.2.1. Slums

As stated by Jahan (2012, p.189), “urban benefits fail to touch the majority of the poor migrants”. The first problem is that because the majority of rural-urban migrants are particularly poor, many of them cannot afford to live in the formal residential areas of the host city. Therefore, a large proportion of rural-urban migrants end up in slums (Uddin and Firoj 2013). For instance, it has been estimated that in Dhaka about 3.4 million people live in 4,966 different slums (Ishtiaque and Mahmud 2011), and that in the middle of the 1990s 93 per cent of slum dwellers in Dhaka were from rural areas (Majumder *et al.* 1996). In these slums, social, sanitary and environmental conditions are extremely poor: solid waste management is almost inexistent, and people often lack access to clean water, making them vulnerable to water borne diseases (Alom and Khan 2014). It is striking to note that in Bangladesh’s urban areas the percentage of the population using improved drinking water sources and improved sanitation facilities have been stagnating over the last two decades (see tables 3 and 4), due to the fact that the majority of urban growth is located in slums where sanitary conditions are very poor.

Table 3: Percentage of population using improved drinking water sources in Bangladesh (1990-2012)

Year	Total	Urban	Rural
1990	77	87	77
1995	78	87	75
2000	79	86	77
2005	81	85	79
2010	81	85	80
2012	85	86	84

Source: McInerney and Magar 2014, http://pages.uoregon.edu/aweiss/intl442_542/2014%20Bangladesh%202.pdf

Table 4: Percentage of population using improved sanitation facilities in Bangladesh (1990-2012)

Year	Total	Urban	Rural
1990	39	58	34
1995	42	58	37
2000	47	58	43
2005	51	57	49
2010	56	57	55
2012	57	58	55

Source: McInerney and Magar 2014, http://pages.uoregon.edu/aweiss/intl442_542/2014%20Bangladesh%202.pdf

2.2.2. Job opportunities

Even if Bangladesh's fast-growing urban economy strongly relies on rural-urban migrants, the development of the non-agricultural sector is not sufficient to absorb the large number of migrants relocating to cities (Herrmann and Svarin 2009). Therefore, many rural-urban migrants end up working in the informal sector, especially those with the lowest levels of education. Migrants who find jobs in the informal sector of urban areas typically work as drivers, rickshaw pullers, mechanics, hawkers, carpenters, barbers, daily labourers or personal servants (Jahan 2012). These jobs are low-paid and as a result migrants working in the informal sector are often not able to break free from the cycle of poverty and to afford housing in the formal sector (Mohit 2012).

In parallel, rural-urban migration may be a factor of "brain drain" from rural areas to urban centres. Indeed, when considering Bangladesh as a whole, rural-urban migrants tend to be relatively young and more educated than the average national educational level (Bhuyan et al. 2001). Thus, rural-urban migration contributes to the draining of individuals who could have had a positive impact on the rural economy, and has therefore been identified as a factor that impedes rural development (*ibid*).

2.2.3. Environmental risks

Finally, when discussing the general impacts of rural-urban migration, it is important to note that in many cases, rural-urban migrants find themselves in situations not only of social and economic vulnerability, but also of environmental risk. In the country's two main cities, Dhaka and Chittagong, which are highly prone to flooding, most of the slum dwellings are built with non-durable materials, such as bamboo, wood, thatch, straw and scraps, which are not resistant to extreme climatic events (floods, cyclones, rapid erosion, etc.) (Jahan 2012). In addition, slums are usually located in zones that are particularly dense and prone to flooding, such as low lying areas along riverbanks in the case of Dhaka (*ibid*). This increased vulnerability caused by environmental factors exacerbates the process of circular poverty in which rural-urban migrants are trapped.

Thus, given the sustained flux of rural-urban migration in Bangladesh and its negative consequences in social, economic and environmental terms, improved urban planning and rural-urban migration management is clearly of the utmost importance. The final section of this paper will therefore try to provide some policy recommendations.

2.3. Policy recommendations

In Bangladesh, international and internal migration has significantly increased over the past three decades (Bangladesh Bureau of Statistics 2008). While the

Government intervenes quite strongly in international migration management, policy-makers pay scant attention to internal migration (National Food Policy Capacity Strengthening Programme [not dated]). As such, many recommendations have been proposed by various experts and organizations so that all parties concerned by the process of rural-urban migration – migrants, source communities and destination communities – can benefit. These recommendations may be grouped around two main ideas: (1) ensuring well-balanced development between rural and urban areas, which takes into account rural-urban migration; and (2) thoughtful urban planning.

2.3.1. Ensuring well-balanced development between rural and urban areas

In 2011 the Government of Bangladesh published a draft of the country's national urban policy for the coming years, entitled "National Urban Sector Policy" draft. This document mentions that, "[t]he policy recognizes the existing spatial or regional imbalance in the pattern of urbanization in the country and also the rapid pace of urban population growth, particularly of Mega City Dhaka and other large cities". It also indicates that, "rural to urban migration plays a key role in urbanisation and that it has both positive and negative consequences. To achieve balanced urbanisation rural urban migration [should] be properly guided to avoid over concentration of population in one or few cities". As argued by Momen (2012, p.64), "properly guided" rural-urban migration is hardly feasible "given the constraints of the macroeconomic policy environment". However, several paths of action do exist.

Given that rural-urban migration mostly arises due to the lack of economic opportunities in rural areas, it appears that "the policy of stopping out-migration and inducing reverse migration becomes equivalent to the policy of poverty alleviation through the creation of employment and income generating activities in the rural areas" (Bhuyan et al. 2001, p.14). The investment in rural areas should thus take two complementary forms. Firstly, the government should continue to support the modernisation of the agricultural sector, with the purpose of increasing agricultural productivity (Herrmann and Svarin 2009). According to the International Fund for Agricultural Development (IFAD), while rice is the dominant crop an increase in its production is "limited by farmers' lack of access to critical production tools such as high-yielding rice seeds" (IFAD 2014, p.2). In the same vein, the fishing industry is "under-utilised", and fishermen should be provided with more resources such as "technologies for farming nutrient-rich small fish and better access to open bodies of water, in order to expand production, which will improve incomes and nutrition" (*ibid*). Increasing agricultural productivity will also require more efforts to be made in terms of adaptation to natural hazards and diversification of agricultural production (Herrmann and Svarin 2009; IFAD 2014). For instance, farmers should be encouraged to use crops that are more tolerant to floods, drought and/or salinity, and more research should be conducted on these topics. Secondly, Bangladesh should aim to develop rural industries and rural infrastructure, as well as improving health and education facilities, so that people do not need to go to cities to find such services (Bhuyan 2001).

In parallel, the development of secondary cities should be encouraged. Indeed, regionalization (i.e. decentralization) of economic growth is necessary to ensure a balanced development of the country (Jahan 2012). This could be achieved by establishing industrial estates and educational facilities and by encouraging private investment in semi-urban centres (Bhuyan 2001).

Finally, in addition to these measures that are meant to act on the root causes of rural-urban migration, an integrated policy on internal migration remains essential. Such a policy should adopt a proactive approach and address existing challenges but also anticipate future ones (Herrmann and Svarin 2009).

2.3.2. Thoughtful urban planning

Concerning urban centres, action must first be taken with regard to slums. As a priority, slums should be legally recognized and slum dwellers should be provided with a legal identity, so that they can benefit from utility services, social security and safety net programmes (Herrmann and Svarin 2009). Subsequently, incentives should be provided to facilitate housing for migrants, with an emphasis on private sector housing initiatives (Zaman et al. 2010). Slum upgrading programmes should also be encouraged, as they present several advantages over sites-and-services projects – such as the preservation of existing economic systems and community structures (Mohit 2012). An important part of the strategy should be directed towards job creation, because it would allow slum dwellers to move into formal housing. As stated by the IFAD (2014, p.2), “[w]ith most of the labour force engaged in low-income, low-productivity jobs in the informal sector, the challenge will be to boost income and productivity, and to transfer labour to the formal sector”. More generally, urgent improvement is needed in land use planning, as well as in property valuation and taxation when slums are transformed into private real estate (Zaman et al. 2010).

In order to address the sanitary issues and the environmental risks discussed above, health services and basic infrastructure should be developed in urban areas that lack them. A possible short-term solution to provide better health services in slums is the implementation of Public-Private Partnerships (PPP). Indeed, contracting out health service delivery to the private sector or NGOs has already been tested in Bangladesh, with relatively positive results (Mohit 2012). Concerning natural disaster prevention and management, the short-term needs entail the creation of more drainage systems that could diverge the surplus of water and therefore avoid floods (World Bank 2005). Moreover, the improvement of flood prevention in major urban areas is an urgent priority. Notably, the government should create a hierarchical chain of command that would be under a single, regulatory department, in order to put a stop to the current level of disorganisation in flood prevention and reduction (McInerney and Magar 2014).

CONCLUSION

In Bangladesh, rural-urban migration is a critical phenomenon whose magnitude and consequences for both rural and urban areas are significant. The factors behind such a phenomenon are multiple and complex, being, as demonstrated in this article, economic, demographic, social and environmental in nature. Flooding is one of the major causes of rural-urban migration in Bangladesh, as shown by the above discussion of the characteristics and consequences of the floods that occurred in August and September 2014. While only some of the people in affected areas decided to leave the affected zones in the immediate aftermath of the disaster, its impacts have to be considered in the broader context which characterizes Bangladesh, namely a country which is recurrently affected by natural disasters, whose rural economy is struggling and whose urban areas have to deal with multiple risks.

In this particular context, cities in Bangladesh can be considered to be faced with a “double jeopardy future: they must respond to swelling populations, whilst also experiencing increased threats from future environmental change” (The Government Office for Science 2011, p.149). As such, the focus of policy makers should be on addressing both the causes of rural-urban migration – because they are evidence of the problems that exist in rural areas – and its negative consequences. Rural-urban migration should therefore not be seen as an inherently negative phenomenon, but rather as an effective coping strategy that can ease people out of situations of vulnerability when properly managed and planned.

REFERENCES

BOOKS, REPORTS AND PRESENTATIONS

- Agarwala, S. et al. 2003, *Développement et changement climatique au Bangladesh : accent sur l'inondation des côtes et la région des sundarbans*, OCDE, Paris.
- Ahmed, A.U. 2006, *Bangladesh. Climate Change Impacts and Vulnerability. A Synthesis*. Climate Change Cell, Department of Environment, Dhaka.
- Ahmed, A.U. and Mirza, M.M.Q. 2000, "Review of Causes and Dimensions of Floods with Particular Reference to Flood '98: National Perspectives", In Ahmad, Q.K., Chowdhury, A.K.A., Imam, S.H. and Sarker, M. (Eds.), *Perspectives on Flood 1998*, The University Press Limited, Dhaka.
- Bangladesh Bureau of Statistics 2010, "Measuring the informal employment in Bangladesh", presented at the Regional Workshop on MAP on Decent work in ASIA, Bangkok, Thailand, 28-30 June 2010, <http://www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/meetingdocument/wcms_144767.pdf>.
- Bangladesh Food Security Cluster 2015, *Food security, nutrition, shelter and early recovery assessment in flood affected areas of north-west Bangladesh August 2014*, <<http://foodsecuritycluster.net/document/food-security-nutrition-shelter-and-early-recovery-assessment-flood-affected-areas-north>>.
- Bhuyan, A.R., Khan, H.A.R. and Ahmed, S.U. 2001, *Rural Urban Migration and Poverty: The Case for Reverse Migration in Bangladesh*, Centre on Integrated Rural Development for Asia and the Pacific, Dhaka, Bangladesh.
- Food and Agriculture Organization (FAO) 2014, *GIEWS Country Brief. Bangladesh*, accessed on 22 March 2015, <http://reliefweb.int/sites/reliefweb.int/files/resources/BGD_6.pdf>.
- Gemenne, F., Brücker, P. and Ionesco, D. (Eds.) 2012, *The State of Environmental Migration 2011*, Institute for Sustainable Development and International Relations (IDDRI) / International Organization for Migration (IOM).
- Guha-Sapir, D., Hoyois, P. and Below, R. 2013, *Annual Disaster Statistical Review 2012: The Numbers and Trends*, Centre for Research on the Epidemiology of Disasters (CRED), Brussels.
- Herrmann, M. and Svarin, D. 2009, "Environmental pressures and rural-urban migration: The case of Bangladesh", MPRA Paper No. 12879.
- Hossain, M.Z. 2001, "Rural urban Migration in Bangladesh: A micro Level Study", paper presented at the Brazil IUSSS Conference, 20-25 August 2001.
- International Displacement Monitoring Center (IDMC) 2015, *Bangladesh: comprehensive response required to complex displacement crisis*, accessed 28 February 2015, <<http://www.internal-displacement.org/south-and-south-east-asia/bangladesh/2015/bangladesh-comprehensive-response-required-to-complex-displacement-crisis>>.
- International Federation of Red Cross And Red Crescent Societies (IFRC) 2014, *Emergency appeal operations update. Bangladesh: Floods*, accessed 8 March 2015, <<http://reliefweb.int/sites/reliefweb.int/files/resources/MDRBD014OU1.pdf>>.
- International Fund for Agricultural Development 2014, *Investing in rural people in Bangladesh*, accessed 29 March 2015, <<http://www.ifad.org/operations/projects/regions/pi/factsheets/bd.pdf>>.
- IPCC 2014, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)], IPCC, Geneva, Switzerland.
- Islam, N. 1999, *Urbanization, Migration and development in Bangladesh: recent Trends and Emerging Issues*, Paper I, Centre for Policy Dialogue, Dhaka.
- Majumder, P.P., Mahmud, S. and Afsar, R. 1996, *The squatters of Dhaka city: dynamism in the life of Agargaon squatters*, University Press Limited, Dhaka.
- National Food Policy Capacity Strengthening Programme [not dated], Research proposal, accessed 12 April 2015, <<http://www.nfpccsp.org/agridrupal/sites/default/files/file/12%23ToR%20FS%20and%20Migration%20FINAL.pdf>>.
- Potsdam Institute for Climate Impact Research and Climate Analytics (PIK) 2013, *Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience*, World Bank, Washington DC.
- The Government Office for Science 2011, *Foresight: Migration and Global Environmental Change*, Final Project Report, London.
- The JNA Consolidation Project 2014, "Pre-Disaster Secondary Data", accessed 15 March 2015, <<http://www.acaps.org/img/documents/p-pre-disaster-secondary-data---river-flooding---march-2014.pdf>>.
- United Nations Conference on Trade and Development (UNCTAD) 2006, *The Least Developed Countries Report 2006: Developing Productive Capacities*, New York and Geneva.
- Walsham, M. 2010, "Assessing the evidence: environment, climate change and migration in Bangladesh", *International Organization for Migration (IOM) Report*, International Organisation for Migration, Dhaka, pp. 1-70.
- World Bank, Human Development Unit 2005, *Bangladesh: Attaining the Millennium Development Goals in Bangladesh*, accessed 10 April 2015, <<https://openknowledge.worldbank.org/bitstream/handle/10986/8627/318460rev.pdf?sequence=1>>.

- Zhang, X., Rashid, S., Ahmad, K., Mueller, V., Lee, H.L., Lemma, S., Belal, S. and Ahmed, A. 2013, "Rising Wages in Bangladesh", International Food Policy Research Institute (IFPRI), accessed 11 April 2015, <<http://www.ifpri.org/sites/default/files/publications/ifpridp01249.pdf>>.

ARTICLES

- Alam, M. and Rabbani, M.D.G. 2007, "Vulnerabilities and responses to climate change for Dhaka", *Environment & Urbanization*, Vol. 19, No. 1, pp. 81-97.
- Alamgir, J. 1993, "Rural-Urban Migration in Bangladesh: Theoretical Approaches to Understanding Internal and External Dynamics", *The Journal of Social Studies*, Vol. 59.
- Alom, M. and Khan, Z.H. 2014, "Environmental and Social Impact Due to Urban Drainage Problems in Dhaka City, Bangladesh", *International Journal of Engineering and Advanced Technology (IJEAT)*, Vol. 3, pp. 128-32.
- Braun Van, J. 2004, "Towards a renewed focus on Rural Development", *Agriculture & Rural Development*, Vol. 2, No. 2, pp. 4-6.
- Dewan, T.H. 2015, "Societal impacts and vulnerability to floods in Bangladesh and Nepal", *Weather and Climate Extremes*, Vol. 7, pp. 36-42.
- Friedman, L. 2009, "A city exploding with climate migrants", In *Bangladesh: Where the Climate Exodus Begins*, Environment & Energy Publishing, Washington D.C.
- Hagerly, D.T. 2008, "Bangladesh in 2007: Democracy interrupted, Political and Environmental challenges ahead", *Asian Survey*, Vol. 48, No. 1, pp. 177-183.
- Harris, J.R. and Todaro, M.P. 1970, "Migration, Unemployment, and Development: a Two-sector Analysis," *The American Economic Review*, Vol. 60, pp. 126-142.
- International Organization for Migration (IOM) 2009, « Changement climatique et déplacement au Bangladesh – Une crise silencieuse? », accessed 22 February 2015, <<http://www.iom.int/cms/fr/sites/iom/home/news-and-views/feature-stories/feature-story-listing/climate-change-and-displacement-in-bangl.html>>.
- IRIN 2010, "BANGLADESH: Landless numbers on the rise", accessed 20 March 2015, <<http://www.irinnews.org/report/89399/bangladesh-landless-numbers-on-the-rise>>.
- Ishtiaque, A. and Mahmud, M.S. 2011, "Migration Objectives and their Fulfillment: A Micro Study of the Rural-Urban Migration of the Slums of Dhaka City", *Malaysian Journal of Society and Space*, Vol. 7 No. 4, pp. 24-29.
- Jahan, M. 2012, "Impact of rural urban migration on physical and social environment: The case of Dhaka city", *International Journal of Development and Sustainability*, Vol. 1, No. 2, pp. 186-194.
- McInerney, B. and Magar, R.T. 2014, "Urban Environmental Challenges and Poverty Alleviation. Bangladesh", accessed 25 March 2015, <http://pages.uoregon.edu/aweiss/intl442_542/2014%20Bangladesh%202.pdf>.
- Mohit, M.A. 2012, "Bastee Settlements of Dhaka City, Bangladesh: A Review of Policy Approaches and Challenges Ahead", *Procedia - Social and Behavioral Sciences*, Vol. 36, pp. 611-622.
- Momen, S. 2012, "Questioning the Paradigms and Theories Underlying the New Urban Sector Policy of Bangladesh", *Journal of Bangladesh Institute of Planners*, Vol. 5, pp. 59-67.
- Rahman, M.D.H and Manprasert, S. 2006, "Landlessness and its Impact on Economic Development: A Case Study on Bangladesh", *Journal of Social Sciences*, Vol. 2, No. 2, pp. 54-60.
- Rayhan, I. and Grote, U. 2007, Coping with Floods: Does Rural-Urban Migration Play any Role for Survival in rural Bangladesh?, *Journal of Identity and Migration Studies*, Vol. 1, No. 2.
- Tacoli, C. 2009, "Crisis or adaptation? Migration and climate change in a context of high mobility", *Environment & Urbanization*, Vol 21, No. 2, pp. 513-525.
- Todaro, M.P. 1969, "A Model of Labour Migration and Unemployment in Less Developed Countries," *The American Economic Review*, Vol. 59, No 1, pp. 138-148.
- Uddin, N. and Firoj, M. 2013, "Causes and Consequences of Rural- Urban Migration in Bangladesh: An Empirical Study in Chittagong City", *International Journal of Ethics in Social Sciences*, Vol. 1 No. 1, pp. 89-104.
- Ullah, A.K.M.A. 2004, "Bright City Lights and Slums of Dhaka city: Determinants of rural-urban migration in Bangladesh", *Migration Letters*, Vol. 1, No. 1, pp. 26-41.
- Zaman, A.K.M, Alam, K.T. and Islam, J. 2010, "Urbanization in Bangladesh: Present Status and Policy Implications", *ASA University Review*, Vol. 4 No. 2, pp. 1-16.

PRESS ARTICLES

- Hussain, Z. 2013, "In Bangladesh, the Alternative to Urbanization is Urbanization", accessed 25 March 2015, <<http://blogs.worldbank.org/endpovertyinsouthasia/bangladesh-alternative-urbanization-urbanization>>.

WEBSITES

- Bangladesh Bureau of Statistics, accessed 10 April 2015, <<http://www.bbs.gov.bd/home.aspx>>.
- National Aeronautics and Space Administration (NASA) 2014, *Earth Observatory*, accessed 1 March 2015, <<http://earthobservatory.nasa.gov/IOTD/view.php?id=84299>>.
- Scottish Natural Heritage 2015, *Rivers and their catchments: an overview*, accessed 27 October 2015, <<http://www.snh.org.uk/publications/online/advisorynotes/18/18.htm>>.
- World Bank 2015, *World DataBank*, accessed 20 March 2015, <<http://databank.worldbank.org/data/home.aspx>>.