PRE-DISASTER SECONDARY DATA

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Nature of disaster: River Flooding

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CLIMATE AND GEOGRAPHY

- Bangladesh is 147,570 km² and consists of a flood plain made up of the Ganges, Brahmaputra, and Meghna rivers flowing into the Bay of Bengal.
- The river delta comprises over 230 rivers and tributaries.
- Two thirds of its land areas is <5 metres below sea level, however, the southeast is hilly (WB 2011).
- The average temperature in the cooler months is 12-25° C (November – May) and is 23-35° C (June – September). Humidity averages 70% (BBC 2011).
- Bangladesh is globally considered one of the most vulnerable countries to climate change. Inland monsoon flooding and intense tropical cyclones are the main climate related hazards (BCCSAP 2009).

POPULATION PROFILE

- The population is 149,772,364, the eighth largest in the world. It is expected to rise to 230 million by 2050 (Census 2011 WB Indicators).
- Disaggregated pre-crisis demographic and socio-economic data from the 2011 Census is available on the Humanitarian Country Task Team's web platform (HCTT).
- Population density is 1,014 people/km², compared 411 in India, 189 in Nepal, and 119 in France. This makes Bangladesh the eighth most densely populated country in the world (WB Indicators).
- 39.7% of the population is <18 years (CEA 2013).
- 7% of the population is over the age of 60, of those 11% is over 80 (UNDESA 2012).
- The average household size is 4.4 persons (urban 4.4 and rural 4.3) (Census 2011).
- 15.6% are female headed households (Census 2011).
- 73% of the population is rural (WB Indicators).
- Bangladesh is 146 of 187 on the Human Development Index, indicating a low level of human development (UNDP 2012).
- The capital Dhaka was ranked the second worst city in the world to live in based on education, health care, infrastructure, culture and environment, and stability (Economist Intelligence Unit 2013).
- The literacy rate is 54.1% for men and 49.4% for women.
- The youth (14–24 years) literacy rate is 75.4%, showing a significant improvement in literacy (CEA 2013 Census 2011).
- The female teenage marriage rate is 32.5% (CEA 2013).

ADMINISTRATIVE DIVISIONS

- Bangladesh is administratively divided into seven Divisions and 64 Districts.
  - Districts are further divided into Upazilas (also known as Thanas). Official data from the BBS (2011) reports 491 Upazilas. This figure does change as Upazila boundaries are redrawn (combining Upazilas or dividing them) a 2012 estimate from the Local Government Engineering Department (LGED) gives the number of Upazilas as 518.
  - These are further divided into Union Parishads of which there are 4,451 in Bangladesh.
- Disaster Management Committees exist at the District, Upazila, and Union level (although the level of activity of these DMCs varies).
- Key local government positions responsible for disaster management are:
  - District Relief and Rehabilitation Officer (DRRO) who reports centrally to the Department of Disaster Management
  - Project Implementation Officer (PIO), who reports to the DRRO and exists at Upazila level
  - Upazila Chairman, an elected representative at Upazila level
  - Union Parishad Secretary, a secretary of the Union level Disaster Management Committee
  - Union Chairman and members who are locally elected to represent at the Union level.

HEALTH INDICATORS

- The crude birth rate is 17.88 per 1,000 (Census 2011).
- The crude death rate is 4.8 to per 1,000 (Census 2011).
- Fertility rate is 2.2 (Census 2011).
- The infant mortality rate is 37 per 1,000 live births (WB Indicators).
- Maternal mortality rate is 240 per 100,000 (WB Indicators).
- Non-communicable diseases account for 52% of all deaths (WHO 2011).
- Drowning is the leading cause of death for children in Bangladesh aged 2-10 years (WHO 2011,UNICEF 2012).
- HIV prevalence is under 0.1% with an estimated 7,500 PLHIV in Bangladesh (UNAIDS2012).
- 9.07% of the population has a disability (8.1% male and 10% female) (HIES 2010).

ECONOMY AND MARKETS

- GDP growth was 6.1% in 2012.
- Agriculture comprises 19% of the GDP and 23% of export, with rice the staple (MoA, GOB 2013).
- Obstacles such as lack of electricity, land disputes, extreme congestion, and lack of urban planning have hindered economic growth. However, the economy has begun to gain strength, with the potential to generate $40 billion in exports annually from the clothing industry (The Economist 2012).
- Off shore and on shore natural gas reserves may bring future prosperity to Bangladesh (BBC 2012).
- Fluctuating yields, particularly in rice harvests, are associated with climatic conditions and frequency of natural disasters (floods and cyclones). Even when these disasters are low-profile, they can have a devastating impact on food security (UNICEF 2009).

SOCIO-CULTURAL CHARACTERISTICS

- 98% of the population is Bengali (UNHCR 2011, CARE 2011).
- 89.5% of the population are Muslims, with Hindus comprising under 10%, and smaller populations of Adivasis, Biharis, Christians, and Ahmadiyyas (UNHCR 2011, CARE 2011).
- In Khulna and Satkhira Districts, there are two ethnic minority groups, the Mundas or Mahtas.Dalits (untouchables) along with Mundas and Mahtas are socially and economically marginalized making them vulnerable to natural shocks (Solidarites 2013).
- Dalits and Munda/Mahtasare routinely discriminated when accessing post-disaster assistance. This includes Dalits not being welcome in cyclone shelters. Dalit NGOs are routinely excluded from networks and coordination with other local NGOs (INTRAC 2010).
- Attacks on minority groups persist. Minorities continue to be subject to violence and other human rights abuses (RDC 2010).
- The Rohingya are an ethnic, linguistic, and religious minority, numbering between 200,000 and 500,000 in Bangladesh. They mostly live in the South East (IRIN 2013).

MEDIA

- Television is the most popular source of news and entertainment in urban Bangladesh. Urban access to television is 91%, compared to rural areas where access to television is 67% (InfoAsAid 2012).

- Radio ownership has fallen steadily in recent years, from 36% in 1999 to 15% in 2011 (InfoAsAid 2012).
- A 2011 Survey indicated that 73% of radio listeners tuned into stations on their mobile phones, but only 34% still listened to programmes on a radio set (InfoAsAid 2012).
- One in five Bangladeshis do not watch TV or listen to radio at all (InfoAsAid 2012).
- 27% of females and 13% of males do not watch TV, listen to radio, or are reached by any other media on a regular basis (InfoAsAid 2012).
- 40% of Bangladeshi men and 14% of women read newspapers at least once a week (InfoAsAid 2012).

MOBILE PHONES

- The mobile network covers 98% of the population (InfoAsAid 2012).
- Some *mobile holes* exist in the sparsely populated Chittagong Hill Tracts in the southeast, the mangrove swamps of the Southern Sundarbans in the southwest, and in the extreme northwest (InfoAsAid 2012).
- At end February 2012, there were 87.9 million active mobile subscribers (InfoAsAid 2012).
- 66% of all persons aged 15+ years own at least one mobile phone with an active SIM(InfoAsAid 2012).

POVERTY PROFILE

- Poverty is concentrated in three geographic areas: the northwest, which is affected by droughts and river erosion; the central northern region, which is subject to serious seasonal flooding that limits crop production; and the southern coastal zones which are affected by soil salinity and cyclones (IFAD, 2011).
- Determinants of poverty include:
  - Land Ownership: the chronically poor do not own cultivable land and depend on volatile daily wage incomes. 4.6% of Bangladeshis are landless. 60.5% are functionally landless, owning under ½ acre (HIES 2010).
  - Literacy: poverty rates are higher, in both rural and urban areas, when household heads are illiterate (JBIC 2007).
- Gender: women's wages are half of those of men, and women's employment is often temporary (JBIC 2007).However, poverty levels are lower for female headed households. Using the upper poverty line, the rate is 32.1% for male headed households and 26.6% for female headed households (HIES 2010).
- Monthly income for female-headed households is significantly lower than their male-headed counterparts. Almost all (96%) households reported that men are the only income earners in the household. Out of necessity, relatively more women from the poor are engaged in income earning activities (WFP).
- The average monthly income in 2010 was Tk. 11,479 (rural = Tk. 9,648 and urban = Tk. 16,475). There is a significant underreporting of income (HIES 2010).
- The average monthly expenditure in 2010 was Tk. 11,200 (rural = Tk. 9,612 and urban = Tk. 15,531), representing an increase in real expenditure of 36% from 2005 – 2010 (HIES 2010).

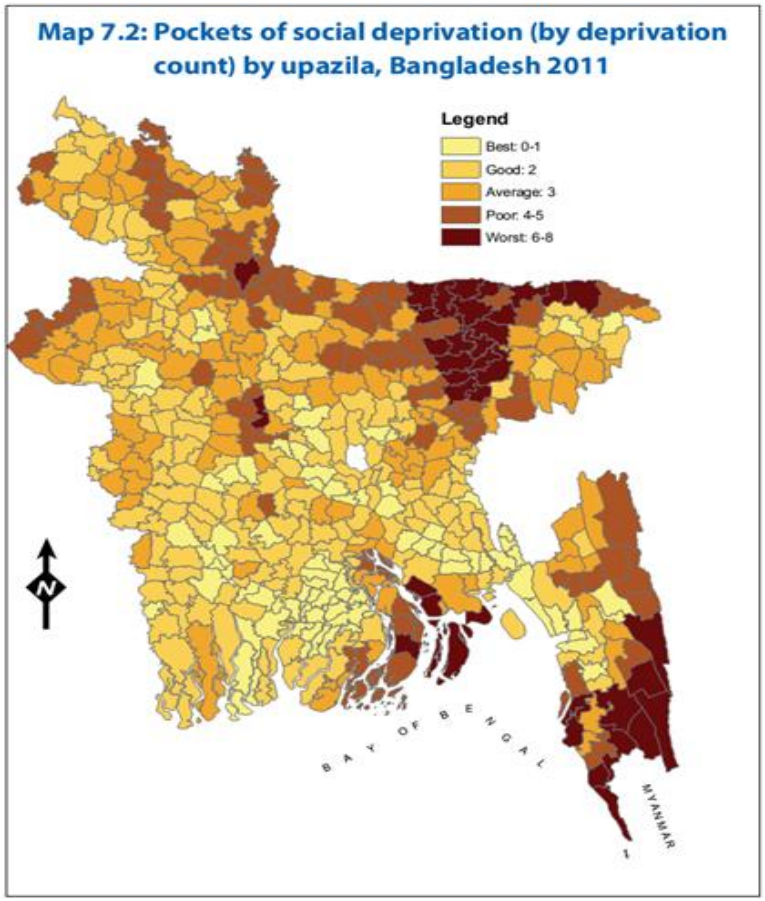


Figure 1 Source: (CEA 2013).

- Families receiving remittances have an income on average 82% higher than families not receiving remittances. Poverty rates are 61% lower for remittance receiving families (HIES 2010).
- 32% of the population has taken loans from financial and non-financial institutions, friends, and money lenders (HIES 2010).
- Per-capita income varies significantly by region. Coastal and *char* households have the lowest per-capita income; northwest and drought-prone households enjoy the highest income and expenditure figures (WFP).
- The recently updated social deprivation map, provides a different picture than the poverty map, due to the different indicators used.
- Social deprivation is concentrated in the north, northeast, southeast, and to a lesser extent south central areas. The best performing districts are Khulna and Barisal, while Sylhet consistently lags behind (CEA 2013).

DISASTER MANAGEMENT FRAMEWORK

- Disaster Management 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. Bodies which support Disaster Management include the following, many of these are only activated when an emergency is declared by the government (SOD 2010):
  - The National Disaster Management Council is headed by the Prime Minister and is responsible for formulating new policy and delivering directives on all concerns.
  - The Inter-Ministerial Disaster Management Coordination Council is responsible for implementing policy and is headed by the Minister of Disaster Management and Relief.
  - The National Disaster Management Advisory Council is headed by an experienced person nominated by the Prime Minister.
  - The National Platform Disaster Management for Disaster Risk Reduction coordinates and provides necessary facilitation to relevant stakeholders.
  - The Focal Point Operation Coordination Group of Disaster Management is head by the DG of DDM to review and coordinate the activities of various departments/agencies related to disaster management and also to revive the Contingency Plan prepared by concerned departments.
  - The NGO Coordination Committee of Disaster Management headed by the DG DDM reviews the coordinates the activities of concerned NGOs.
  - The Committee for Speedy Dissemination of Disaster Related Warning/Signals head by the DG DDM to examine, ensure and find out the ways and means for the speedy dissemination of warning/signals among the people.

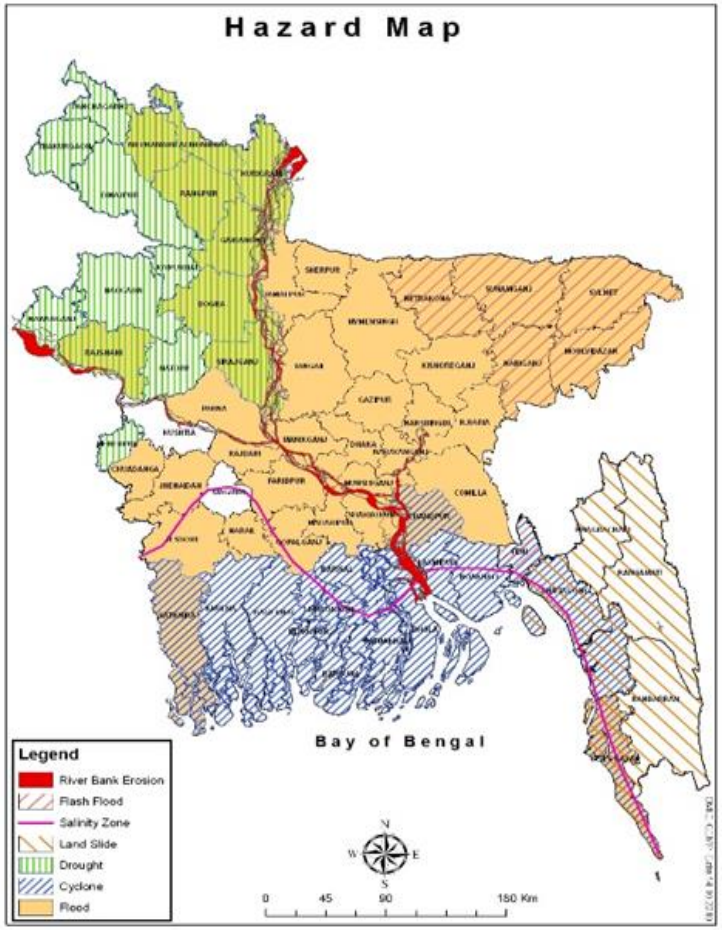


Figure 2: DMIC/CDMP 2010

DISASTER MANAGEMENT REGULATORY FRAMEWORK

- In 2012 a Disaster Management Act was passed, creating the framework for disaster Risk Reduction (DRR) and emergency response management.
  - The National Disaster Management Policy is a strategic policy document describing the broad national objectives and strategies for disaster management.
  - The 2010–2015 National Plan for Disaster Management outlines the systemic and institutional mechanisms for DRR and emergency response management.
- The Guidelines for Government at all Levels (Best Practice Models) are available to guide the Government's DRR and emergency response management.
- The Standing Order on Disasters (SOD) outlines the national management arrangements and describes the detailed roles and responsibilities of the relevant government bodies at the central and local level (SOD 2010).
- Quantitative information on a disaster in the initial days comes from the Government via their:
  - SOS forms which provide information on approximate loss, damage and emergency requirements, including affected, dead and missing.
  - D-Forms include detailed assessment on damage and loss.
- Government sitreps based on this information are published on the DMIC website.
- All INGOS and NGOs require Government approval for new projects. An FD6 is used in non-emergency situations and takes a minimum of 45 days to be approved. If a disaster has been declared by the Government, a fast-track system allows for use of the FD7 which can be approved in 24 hours.

DISASTER MANAGEMENT COORDINATION STRUCTURES

- The Local Consultative Group Mechanism (LCG) is one of the key the structures through which the Government engages in dialogue with development partners (www.lgcbangladesh.org).
- There are thematic 18 LCG Working Groups (in addition to the LCG Plenary) including the Disaster and Emergency Relief (DER) which is co-chaired by the Ministry of Disaster Management and the UN Resident Coordinator.
- The DER is mandated to ensure effective coordination of national and international stakeholders around all aspects of the disaster management cycle.
  - DER membership consists of senior decision makers from UN agencies, donors, and a representative of both the INGOs and NGOs.
  - The DER is co-chaired by the UN Resident Coordinator and the Secretary, Ministry of Disaster Management and Relief.
- Within the LCG DER, the Humanitarian Coordination Task Team (HCTT) is a working group which provides an operational level forum for coordinated disaster preparedness, response, and recovery across sectors.
- Membership of the HCTT includes: all cluster lead agencies, two donor representatives, three elected representatives of the INGO Forum Emergency Sub Group, one representative of the NGO community and IFRC
- In Bangladesh, clusters have been constituted, with Government approval, to engage on disaster preparedness. (This does not imply formal UN Cluster activation). Currently the clusters that have been formed are: WASH, food security, early recovery, health, nutrition, education, logistics, and shelter.
- Cross cluster coordination takes place through the HCTT around preparedness. Clusters are designed to also operate as sub-sets of the relevant thematic LCGs.
- The INGO Forum is a voluntary grouping of all INGOs operating in Bangladesh. The INGO Emergency Sub Committee consists of senior staff of the INGOs that have a humanitarian operational capacity.

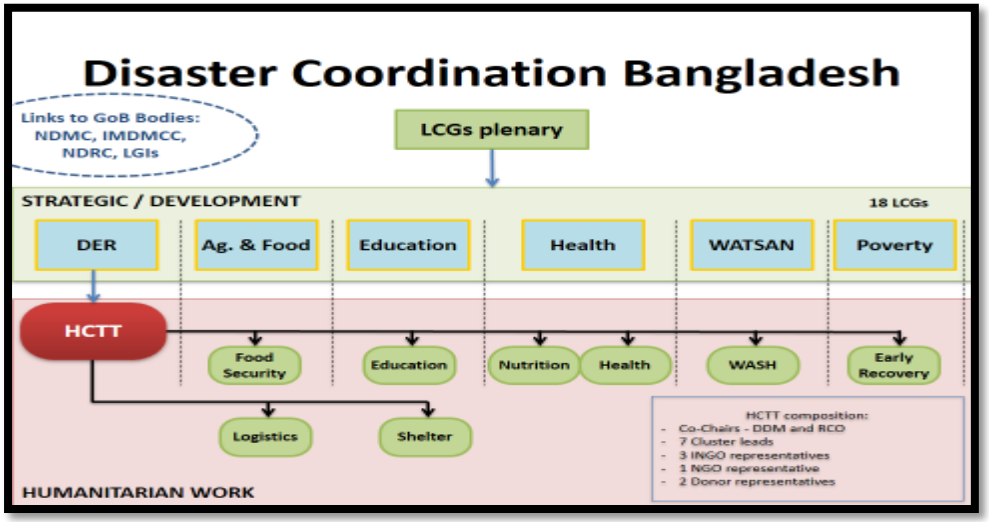


Figure 3 JNA (unpublished)

INFORMATION AND KNOWLEDGE MANAGEMENT

- There are multiple data sources in Bangladesh. For the purposes of disaster management in Bangladesh the key nationally and internationally recognised data sources are:
  - The Census 2011 (Census 2011)

  The Household Income and Expenditure Survey (HIES 2010)
  - The Multiple Indicator Cluster Survey (MISC 2009)
- These sources have been heavily drawn on for the purposes of this review. A new MICS will be published by the end of 2014.
- The Bangladesh Bureau of Statistics holds a wealth of information provided by surveys and monitoring undertaken by different government departments. The core data is not easily accessible, which means mining data at any scale is too time consuming at the start of an emergency. During the process of writing these Secondary Data Reviews clusters were asked to identify key baseline indicators from secondary data that they require to carry out thorough needs assessments. Some of these are already available and others will need to be a work in progress. The status of these baselines has been highlighted within the document.
- Information Management is handled both within organisations, UN agencies, INGOs and NGOs as well as in different government departments. For the purposes of Disaster Management there is a Disaster Management Information Centre (DMIC), which is currently in the process of transitioning out of CDMP into the Department of Disaster Management. The information needs of development partners involved in disaster management and the products and services which DMIC can provide is still a work in progress.
- Extracting lessons learnt on disaster response was a key constraint to the secondary data review. There is limited information publically available on low profile disasters. Cyclone responses have the greatest amount of lesson learning, but much is focused on internal and external operational issues, rather than critical analysis of programmatic, strategic, assessment, and coordination issues. This analysis is done, but retained within internal agency documents, such as progress and donor reports, making it difficult to access.

There is a specific difficulty regarding available secondary data on river floods. The last mega floods in Bangladesh were in 2007. This was before the Disaster Management Act and before the cluster system for preparedness was established. The floods were then quickly followed in November 2007 by Cyclone Sidr. It has been reported that agencies struggled to manage two major disasters at the same time. Additionally, resources allocated for lesson learning and documentation have been focused on Cyclone Sidr. It has therefore been difficult to find up-to-date river flood data and information. This is a concern as reported effects of climate change and water management in Bangladesh and its northern neighbours have, if anything, increased the threat.

FLOODING PROFILE

- There are different ways of classifying and categorising floods along geographic and geophysical characteristics. In Bangladesh floods are most commonly classified as:
  - Flash floods which affect both the hilly areas of the south east and can cause landslides and the Haor Basin area of the north east.
  - River flooding, also known as monsoon flooding, an annual event which can be extreme some years
  - Waterlogging is the name given to the phenomenon in the southwest of Bangladesh where river flooding is unable drain and causes prolonged flooding.
- Widespread and prolonged flooding can lead the population to become extremely vulnerable and can bring devastation to crops, livestock, and property as well as disrupt livelihoods and cause loss of life and livelihoods options (Paul and Routray 2010).
- Climate change is expected to cause glaciers to melt therefore increasing the amount of water flowing through Bangladesh this combined with greater levels of precipitation and rising sea levels will lead to increased areas of land flooded and for longer periods of time (INTRAC 2010 CDMP 2009).
- Bangladesh uses both structural (embankments, levees, and polders) and non-structural (flood warning and awareness raising) mitigation techniques (Paul and Routray 2010).
- Structural mitigation methods are increasingly recognised as being financially and environmentally unsustainable. Indigenous flood management methods are increasingly being sought (Paul and Routray 2010).
- The delta system has an international dimension as dams constructed and flood gates opened upstream in India have major effects on flooding in Bangladesh (INTRAC 2010).
- Rising levels of river water is also caused by increased silt (INTRAC 2010).
- Floods by nature are complex events caused by a range of human vulnerabilities, inappropriate development planning and climate variability (ADPC, 2005 in (ALNAP 2008).
- Critical infrastructure such as government buildings, schools, health clinics remain situated in high risk locations and will be continuously at risk to damage and flood inundation unless risk mitigation work is undertaken (GoB 2007).

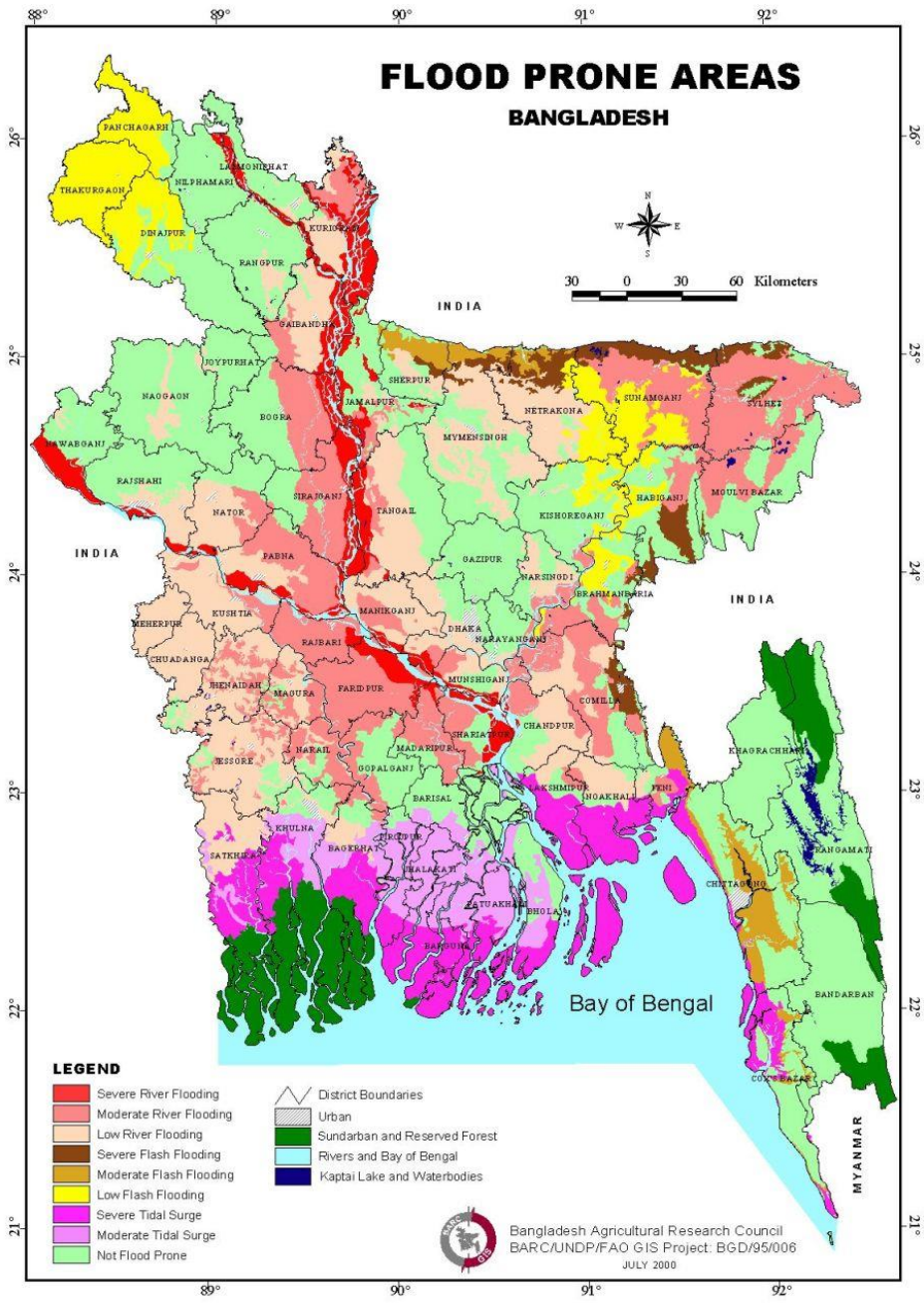


Figure 4, Source: FAO

RIVER FLOODING IN BANGLADESH

- Flooding occurs annually in Bangladesh. *Normal*river flooding in Bangladesh is beneficial to the ecosystem; the alluvium that comes with flooding and seasonal variability in water level and flow aid in the balance of the ecological system. *Normal* seasonal flooding is within the usual coping mechanisms of the population (Khan 2008).
- In 1988, 1998, 2004 and 2007 Bangladesh experienced devastating flooding, well beyond the annual norms. In 1998 the flooding lasted for 10 weeks, from July – September and affected 30 million people, which was 68% of the population (WB 2005).

Bangladesh experiences an annual monsoon from April – October with 80% of annual rainfall occurring during the monsoon (CDMP 2009 BMD).

- The average precipitation during the rainy season, June-August, is 321-437 mm per month (BBC 2011).
- In 2007 people lost food grains domestic animals, homesteads, and lives and options for livelihood were paralyzed. They remained marooned without food and drinking water until relief arrived (GoB 2007).
- Following the 2007 floods, damage caused by the flooding could be categorized as direct and consequential. For example the failure of the flood protection system (direct impact) resulted in far reaching consequential impacts in household health and food security (GoB 2007).

RIVERINE EROSION

- Riverbank erosion is caused by heavy rainfall, heavy rainfall upstream, and increased flow of water.
- Bangladesh lost more than 1,000 km² of land along the major rivers during the last 30 years, land which would have provided living space for about one million people. Following the 2007 floods, for example, the Jamuna River widened by about 8-12 km. 256 hectares of land in Gaibandha and 622 hectares of land in Sirajganj have been lost to erosion on an annual basis between 1973 and 2009 (GoB 2007 Unnayan).
- The Brahmaputra –Jamuna River faces ongoing erosion at a rate of 160 m per year.

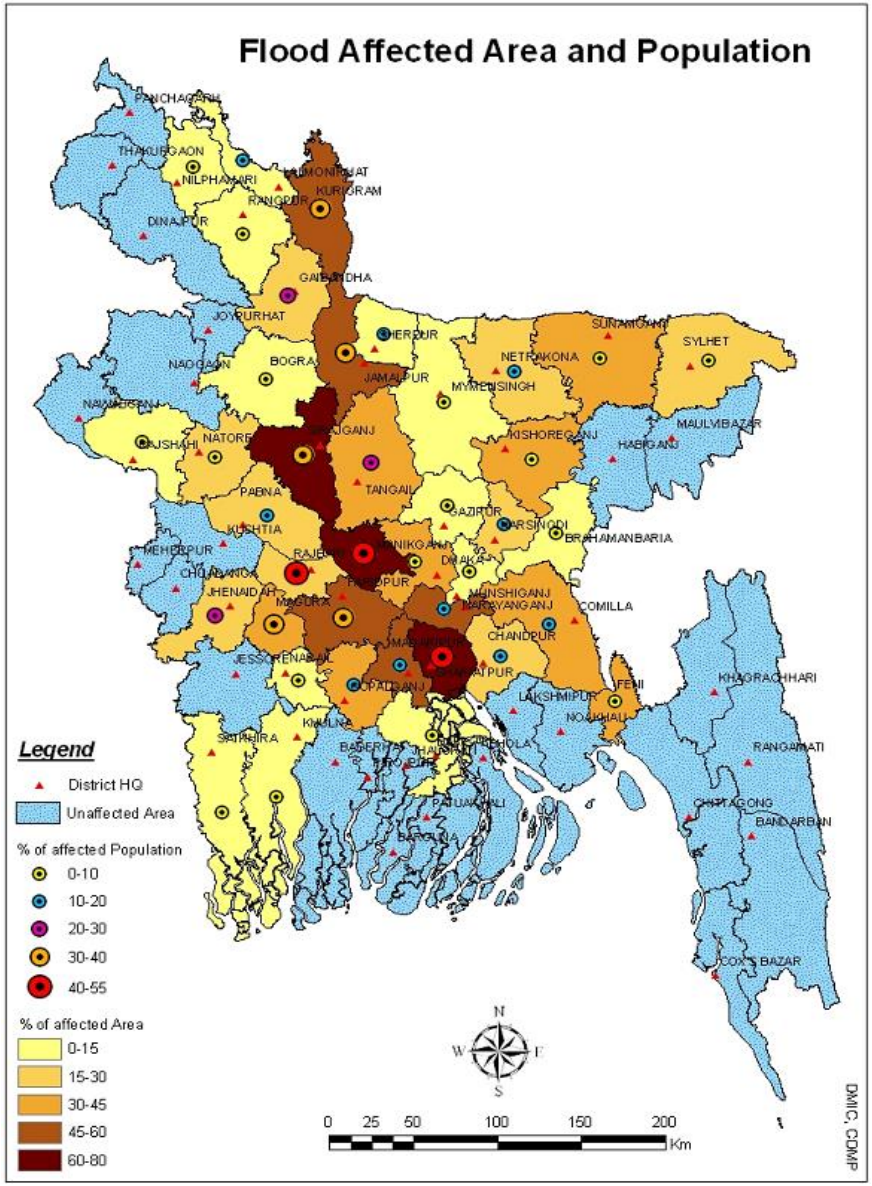


Figure 5: Areas Affected by flooding in 2007, source: DDM

- Between 1973 and 1992, the river migrated westwards at an average of 50 m per year (Unnayan).
- The flat delta lands of Bangladesh offer little resistance to the hydraulic forces of its rivers, particularly during periods of high flow. As a consequence, rivers such as the Jamuna run wide rather than deep: easily 10 km wide at places during high water, yet rarely in channels with sides deeper than two or three meters (LJ).
- It is in the nature of large braided rivers such as the Brahmaputra and the Jamuna to erode banks and at the same time to deposit silt on the riverbed, so that new riverine islands are formed. However, these transboundary rivers are changing with more erosion and less island-building in recent years, and this trend is accelerating. Hypotheses to explain this include (3rdPole 2013):
  - Water flows in rivers that come down from the Himalayas have been increasing due to higher rate of glacier melt in the mountain range and the Tibetan Plateau, due to global warming.
  - There are hydropower projects under construction in both Brahmaputra and Teesta river basins. During construction, the water is channelled through another part of the river, but a lot of the silt gets held back because it cannot use a channel that is narrower than usual. As a result of the decreased silt flow, island building downstream is reducing, while the erosion continues at the same or even a slightly accelerated rate.
- 1.6 million people have been made homeless due to riverbed erosion between 1973 and 2009 (Unnayan).
- Increased intensity of rainfall and unplanned interventions result in the erosion rate increasing (Unnayan).
- Out-migration has been noted in areas susceptible to riverbank erosion. This is sometimes step migration to nearby areas first and then moving further away or migration to Bogra (the largest nearby centre) or the urban centres of Dhaka and Chittagong (Unnayan).

LOCATION OF RIVER FLOODING

- River floods are the most common type of floods in Bangladesh and refer to both the "normal" annual inundation of up to 25% of the country as well as extreme flooding which can inundate up to 70% of the country (WMO 2003).
- River flooding is also referred to as monsoon flooding.
- In 2007, 46 districts (out of 64 districts) were affected, representing 32,000 square km of land and up to 16 million people.

FLOOD EARLY WARNING SYSTEMS

- The Bangladesh Flood Forecast and Warning Centre (FFWC) has a comprehensive forecasting and warning system in place. The FFWC is part of the Bangladesh Water Development Board, which is active from April - October.
- The FFWC disseminates flood warnings during monsoon season. The warning is related to the measured and forecasted water levels and the danger levels: a) normal flood: water level is more than 100 cm below danger level; b) moderate flood: water level is between 100 cm below danger level and 100 cm above danger level; and c) severe flood: water level is 100 cm above danger level (FFWC).
- Warnings are disseminated through a daily flood bulletin, by e-mail, on the FFWC home page, in newspapers, and on radio and television (FFWC).
- A regular inundation map is produced by the FFWC and available on their website (FFWC).

Flooding Data from 2005 Source: (Em-Dat 2014).

Start	Location	Type[1]	Killed	Affected
September 2009	national	General Flood	n/a	250,000
October 2010		General Flood	15	500,000
July 2009	Dhaka, Comilla, Rajshahi, Habinganj	General Flood	16	500,000
August 2008	Bogra, Sirajganj (North)	General Flood	12	615638
June 2008	Cox's Bazar, Chittagong	General Flood	16	20,002
July 2007	46 Districts	General Flood	1,230	16,000,000
June 2006	Sylhet, Zakiganj, Kanaigh	General Flood	n/a	76,000
July 2005	Kurigram, Gaibandha, Lalmanirhat	General flood	23	1,000,000

[1] The term "General Flood" is understood to mean river/monsoon flooding in this context.

EARLY RECOVERY

- The Early Recovery cluster is part of the humanitarian coordination structure that is formed to:
  - Address issues not addressed by other clusters such as livelihoods; governance; security and rule of law; and crosscutting issues such as environment, gender etc.
  - Improve preparedness and coordination of early recovery interventions
  - Sensitize and contextualize the concept of early recovery.
  - Facilitate all sectors to move into the recovery phase.
- Early Recovery as a *principle* is inherent in the mandate of every cluster.
- There are four pillars of Early Recovery: livelihoods; governance; environment; and community infrastructure.
- To ensure that Early Recovery is an integral part of all clusters, an Early Recovery Network, comprising of focal points from each existing clusters, is managed under the auspices of the UN Resident Coordinator.

THE EARLY RECOVER FACILITY (ERF)

- In Bangladesh, there is a pooled fund in the form of the Early Recovery Facility (ERF).
- The ERF was established by UNDP as a way of financing and implementing emergency response and early recovery efforts to disasters in order to close the gap between the relief phase and long-term recovery.
- There is a programme branch to the ERF which funds early recovery activities and a policy development and capacity building of government branch.
- The ERF is sufficiently flexibility that it can support and complement national efforts during times of emergency response, when necessary.
- To support the government in times of crisis, ERF has pre-approval to spend up to $60 million at its disposal to be able to quickly respond to emergencies based on build back better approaches.
- The ERF has pre-approval from the Government and does not require additional approval post-disaster.
- The ERF has 49 INGO and NGO partners who are pre-approved and do not require further approvals to commence work.

EDUCATION

EDUCATION KEY CHARACTERISTICS

- Bangladesh has made great gains in education, as per the HDI. But national progress hides regional disparities (CEA 2013).
- Nationally, BANBEIS is responsible for the collection (including annual enrolment data), dissemination, documentation, and publishing of educational information (BANBEIS, accessed 2014).
- There has been an increase in the national primary enrolment rate from 50% in 2007 to 97% in 2013 (DPE).
- The national education policy is for children to start school at the pre-primary level, age 5, using nationally approved minimum standards and curriculum (Education Cluster).
- Just under one in five (18.9%) Bangladeshi girls attended secondary school in 2008. 47% of enrolment in Government secondary schools were girls, and 18% of enrolment in non-government schools was female (BANBEIS).
- Drop-out rates vary according to source and method of measurement. The 2013 ASPR cites a drop-out rate of 27%, but a completion rate of 75% (ASPR 2013). In comparison, the CEA notes that 23% of children aged 6 to 10 are out of school (CEA 2013).
- There is a correlation between remoteness, social deprivation, and out of school children rates. Levels between girls and boys is comparable, and child labour does not appear to be the cause of children dropping out of school (CEA 2013).
- The dropout rate is high due to children's need to help with farming and household chores, child-unfriendly teaching-learning methods, overcrowded classrooms, and unattractive educational environment (UNICEF).
- Of the children interviewed in a 2011 UNICEF study, over 5% of children aged 5-11 are in child labour, increasing to 14% for 12-14 year old children. The proportion of child labourers among children attending school is about 6%, but increases to 22% for children not attending school. Boys are three times more likely to be involved in child labour than girls. Among boys aged 12-14 years, 23% was involved in some economic activity (UNICEF, unpublished 2012)[2].

[2] From UNICEF *Out of School Children, 2011-12,* unpublished.

CHILDREN WITH DISABILITIES

- The mandate for implementing Education For All lies with the Ministry of Education and the Ministry of Primary and Mass Education, but the education of children with disabilities is managed by the Ministry of Social Welfare and is seen as a matter of charity, not a human rights issue (UNICEF 2013).
- In 2012, there were 89,994 children with disabilities at school (ASPR 2013).

National Education Rates	Figures	Source
PRIMARY SCHOOL		
Gross intake rate	106%[3]	(MISC 2009)
National primary school attendance	81% - (83% girls and 80% boys)	(MISC 2009)
School attendance rate for 5 year olds	22%	(MISC 2009)
National attendance rates for the poorest quintile	77% - (82% girls and 73% boys)	(HIES 2010 and Education Cluster)
Primary national enrolment rate	97% - (99% girls and 95% boys)	(ASPR 2013)
Completion rate for five-year primary education cycle	67%	(BANBEIS, 2001)
SECONDARY SCHOOL		
Net Attendance Rate	54% - (59% girls and 50% boys)	(CEA 2013)
Dropout rate	66% girls and 58% boys	(BANBEIS,2007)

SCHOOL YEAR

- The school calendar for primary and secondary school runs from January to December. Exams are at the end of the year.
- At the Union there are adaptable school calendars, which officials can adjust due to disasters, but few diverge from the standard calendar.

EDUCATION COORDINATION

- The Education cluster for preparedness is operational and co-led by UNICEF and Save the Children. The cluster has agreed to meet on a bi-monthly basis.
- Currently there is not an Education cluster website.

[3] Indicating either that students are double enrolled and/or attendance rolls are not accurately compiled.

- Primary Education falls under the remit of the Ministry of Primary and Mass Education (MoPME). It is operationalized through the Directorate of Primary Education (DPE) (Education Cluster).
  - The MoPME and DPE are responsible for all Government primary schools and non-registered Government primary schools.
  - The Bureau of non-formal education operates under DPE and is responsible for schools run by civil society. The bureau is working on an equivalency framework so children from non-government schools are able to sit exams. Currently, only children in BRAC schools are able to sit exams. Government primary schools are free, but students must pay for books, pens etc.
  - *Ebtedayee* Madrasa schools are managed by the Madrasa Education Board but recognized by DPE and included in the Annual School Census (ASC). These schools teach with a mixed religious and government curriculum. *Coumi* Madrasa schools do not follow the government curriculum and are not included in the DPE ASC.
- Secondary Education falls under the remit of the Ministry of Education and is operationalised by the Directorate of Secondary and Higher Education.

PRE-CRISIS BASELINE EDUCATION DATA

- There is no integrated management information system for non-formal primary education (ASPR 2013).
- Baseline indicators have been selected to provide the baseline for Phase 1 and Phase II assessment (see table on next page).

IMPACT OF RIVER FLOODING ON EDUCATION

- Greater importance must be placed on enabling play and education to continue throughout floods. It is apparent that children's mental well-being is significantly improved if they are able to process and release stress through structured play (SC 2006).
- In the initial aftermath of the 2007 floods, an estimated 1.5 million children, or around 10% of the country's 80,000 primary schools had been affected (IRIN 2007).
- In 2006, UNICEF stated that the initial estimates were that less than 5% of all primary schools were affected due to flooding (IRIN 2007).

Pre-Crisis Baseline Education Data	
Baseline Indicator	**Notes**
Disaggregated demographic data	2011 Census data, available in excel on HCTT web platform. Disaggregated to Union level.
List of schools in the affected area	Data not currently available with the cluster
Number of student's in the affected area	Data not currently available with the cluster
Primary school National Attendance Rate	Data collected for Annual School Survey. Disaggregated data not currently available with the cluster
Secondary National Attendance Rate	Data collected for Annual School Survey, Disaggregated data not currently available with the cluster
At least one toilet in the school	Data collected for Government Primary Schools for the Annual School Survey. Disaggregated data not currently available with the cluster
Separate girls and boys toilets	Data collected for Government Primary Schools for the Annual School Survey. Disaggregated data not currently available with the cluster
Potable water supply[4]	Data collected for Government Primary Schools for the Annual School Survey. Disaggregated data not currently available with the cluster
No. of schools acting as cyclone shelter	Data available with the WASH cluster
Drop-out rate	Data collected for Government Primary Schools for the Annual School Survey. Disaggregated data not currently available with the cluster

SCHOOL CLOSURE

- At least 19% of schools in both flood and cyclone areas experienced over four weeks of school closure in 2007 (Plan and SCI 2010).
- Irregular attendance is a significant problem caused by loss of learning material (Plan and SCI 2010).
- At least 3% of the students dropped out as a direct result of floods and cyclones, with a negligible gender difference (Plan and SCI 2010).
- Other reasons for dropout include (Plan and SCI 2010):
  - Temporary relocation as a result of disaster
  - Engagement in family income immediate after a disaster
  - Early marriage
- Girl children, especially girls in class four and five, face specific challenges accessing education during disasters due to: household responsibilities; early marriage; and privacy related issues such as absence of separate toilets in the school (Plan and SCI 2010).
- Save the Children and Plan identified the following impacts of floods on education (Plan and SCI 2010):
  - Physical impediment to access
  - Loss and damage of learning materials
  - Damage to physical structures

GAPS IN INFORMATION

- Documented lessons learnt from previous flooding.
- Accurate information on school closure due to floods.
- Figures on numbers of schools beyond registered and non-registered.
- Access to core data from which the ASPR and BANBEIS take their figures.
- Information and lessons learnt on impact of river flooding on education.

FOOD SECURITY AND LIVELIHOODS

KEY CHARACTERISTICS OF FLOOD AFFECTED AREAS

- The geographical area affected by river flooding is large and covers a number of different agro-ecological zones. Each zone needs to be studied separately to provide a meaningful overview of key characteristics.

FOOD SECURITY AND LIVELIHOODS COORDINATION

- The Food Security cluster meets regularly in Dhaka. Technical Working Groups are set up on an *ad hoc* basis to work on particular issues (including needs assessment).

[4] There is no standardised water quality testing in Bangladesh. The focus of the school water supply is to ensure there is water available for hand washing not drinking water (UNICEF KI).

- The cluster is co-led by WFP and FAO in Dhaka. District focal points in all coastal belts are a work in progress and will be rolled out in 2-3 pilot districts during 2014. The cluster has up-to-date mapping in the form of a 4W (using the new standardised IMWG tool).
- There is a comprehensive cluster website, http://foodsecuritycluster.net/
- As reflected in the contingency plan, all cluster members have agreed on[5] (FSC Contingency Plan 2013):
    - A standardised recommended response package for dry food for the first 7 days (immediate response)
    - A recommended short-term (week 2-8) standardised food package (food only)
    - A recommended short-term (week 2-8) standardised package (cash and food mix).

PRE-CRISIS BASELINE FOOD SECURITY AND LIVELIHOODS DATA

- The VAM Unit in WFP is preparing a compendium of proxy indicators/variables of food security and nutrition along with their disaggregation level and source, not published yet (KI, VAM, 2014).
- The VAM unit has also requested the Bangladesh Bureau of Statistics (BBS) to generate food security related proxy variables at Upazila level from the 2011 Census. (KI, VAM, 2014).
- Key indicators to provide a baseline for Phase 1 and Phase 2 assessments have been agreed by the FSC Technical Working Group as: Additional pre-crisis data should include seasonal price trends and access to markets.

Baseline Indicator	Notes
Demographic data	Census data, available in excel on HCTT web platform in excel. Disaggregated to union level.
Poverty levels	Available from WFP, in excel. Disaggregated to Upazila level.
Livelihood groups	The JNA is in discussion with the cluster and the information management working group about where and how to access this data.
Number of landless	Disaggregated to Division level in the HIES.

[5]The above applies to cyclone based emergencies but it is anticipated that these packages will be recommended for flooding as well.

IMPACT OF RIVER FLOODING

- The most affected households affected by September 2012 flooding reported adopting the following coping strategies which are commonly used during disasters (FSC 2012):
    - Distress selling of assets
    - Migration to non-affected areas to work (e.g. as agricultural day labour, rickshaw puller, household help and non-agricultural day labour
    - Advance selling of labour
    - Taking loans from NGOs and Mohajans (local money lenders) and borrowing from relatives
    - Reduction of meal frequency and meal size.

FOOD SECURTY AND LIVELIHOODS RESPONSE LESSONS LEARNT

- Cash and food for work programmes proved to be the most appropriate intervention in restoring household food security following the 2007 flood (DFID 2007).
- Persons affected by the 2007 floods, preferred receipt of rice and dhal during the relief phase over *chira*and *gur(ready to eat food that does not require cooking)*, which while meeting instant food needs were perceived as a snack and therefore not a substitute for cooked food. Dried food was also seen to make them thirstier and increase their need for drinking water (DFID 2007).
- The process of cooking food during the immediate relief phase was observed to act as a communal bonding process (DFID 2007).
- Where transport and packaging of emergency dry food rations such as *chira* and *gur* present problems logistically, in areas of high risk to annual flooding, according to officials, it would be feasible for the government to stockpile and pre-position supplies of rice and dhal in regional warehouses prior to the start of the monsoons and utilize these supplies in the event of flooding (DFID 2007).
- Given that the consumption of rice and dhal is more culturally acceptable, distributing traditional foods immediately after any given disaster would improve people's well-being, restore social capital and communal coping strategies, and

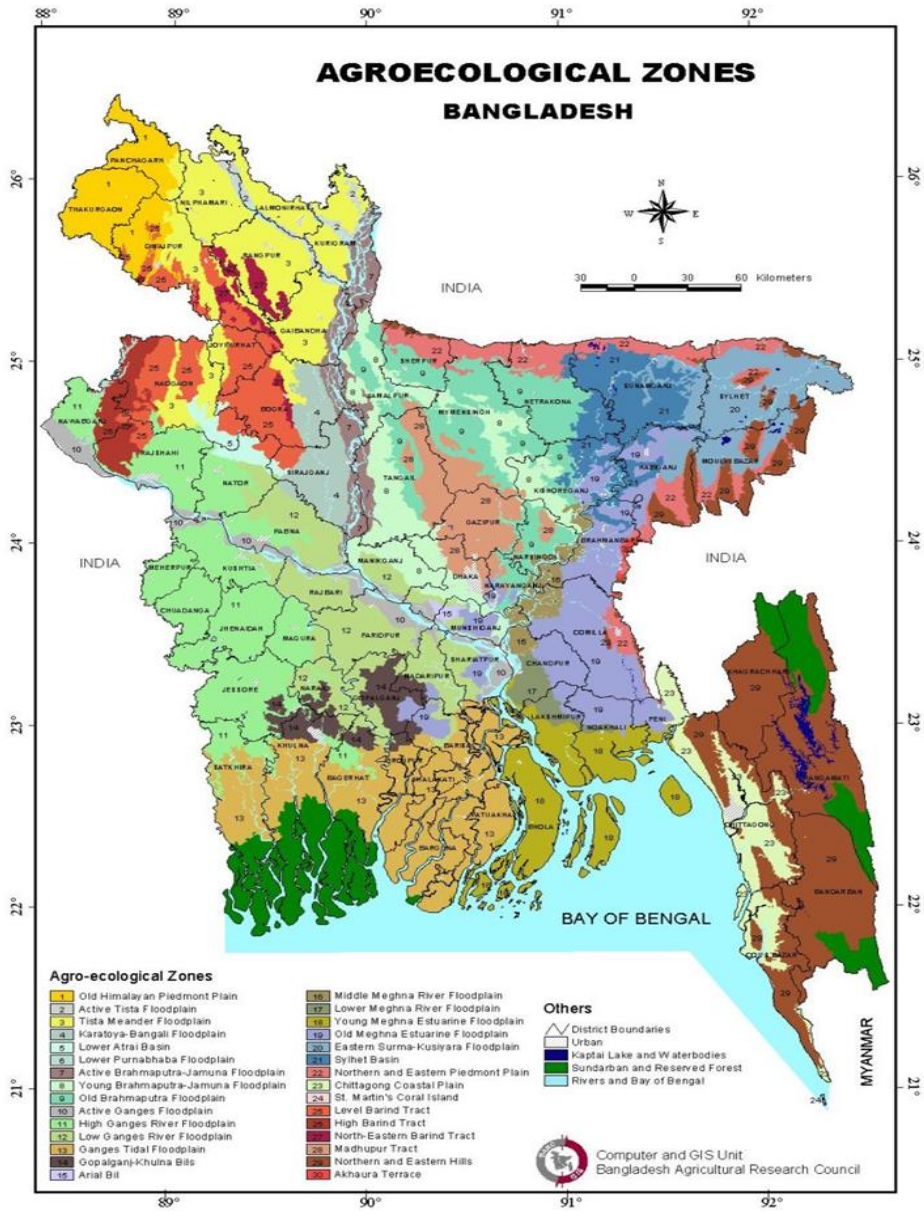
could reduce logistic costs associated with preparing and distributing dry food rations such as *chira* and *gur* (DFID 2007).

- In addition, surplus stockpiled commodities of rice and dhal not distributed for disaster needs could be sold off commercially after the monsoon/flood risk period and the income contribute towards a contingency fund for subsequent seasonal stockpile requirements (DFID 2007).
- Cooking fuel is more of an issue after floods than after cyclones, but households visited in the Char areas emphasized that they were used to storing firewood and trying to keep it dry for the monsoon season (DFID 2007).
- In response to the immediate needs, flood affected communities reported that more emphasis should have been given to food items that can be cooked. This was particularly the case where communities took refuge in public buildings and people had access to pots and fuel to cook collectively (DFID 2007).

KEY INFORMATION GAPS

- Baseline figures for seasonal migration
- Give the difficulties in putting together an overall picture of the food security and livelihoods picture in river flood prone areas the pre-crisis baseline data should be developed to improve the shared understanding of the areas.
- Further review to be done on all different zones affected by river flooding.

Figure 6; Source: Bangladesh Agricultural Research Council



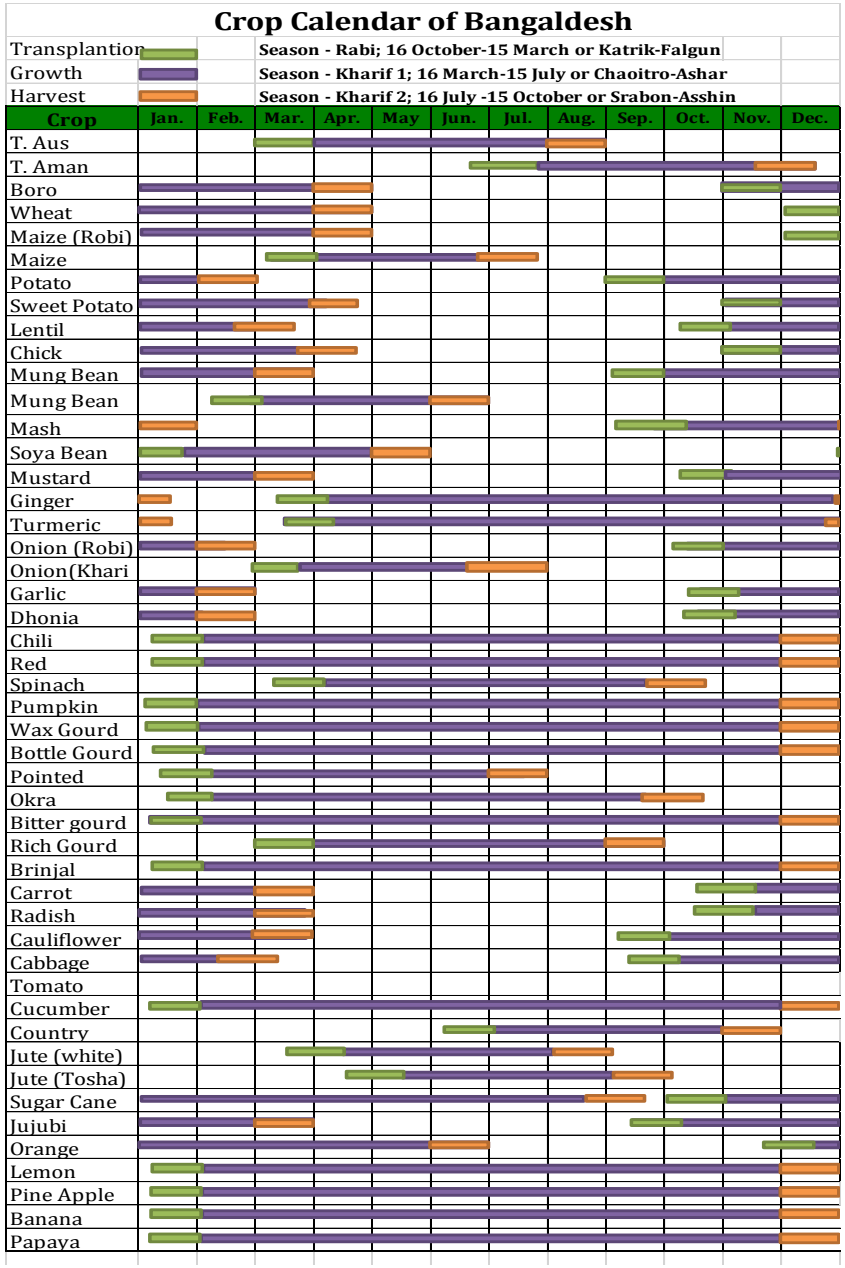


Figure 7: FSC Cluster 2014

HEALTH

KEY CHARACTERISTICS

- Health service provision is through the Government, the private sector, and the NGO sector.
- The health services provider structure is built on the country's administrative pattern which follows the national government, divisional, district, Upazila, Union, and Ward administrations (Health Sector Profile 2010).
- Bangladesh faces many challenges in improving the health of the population, particularly the poor and vulnerable. Maternal and neonatal mortality, although decreasing, are not reducing at an acceptable rate (Health Sector Profile 2010).
- Health care is provided for free at the community clinic level (Health Bulletin 2012).
- The for-profit sector is a key service deliverer for all income groups (providing 30% of services to the poorest two quintiles). There is a modest role played by the NGO sector which typically provides less than 10% of services for all income groups (with slightly more for the poorest quintile) (Health Sector Profile 2010).

MATERNAL HEALTH

- The maternal mortality rate is 194 per 100,000 (BMMS 2010).
- Antenatal care for women by medically trained personnel increased from 33% 1999-2000 to 55% in 2011 (HPNSDP 2013).
- An estimated 73% of births are attended by non-medically trained persons (UNFPA 2013).
- In 2010, 76% of deliveries still took place in the home (UNFPA 2013).
- Close to 7,000 mothers dying each year due to pregnancy-related causes (UNFPA 2013).
- Nearly two-thirds of all maternal deaths are the direct result of obstetric complications (UNFPA 2013).
- Unmet need for family planning has increased from 11% in 2004, to 17% in 2007(UNFPA 2013).

CHILD HEALTH

- The infant mortality rate is 36 per 1,000 live births (SVRS 2010).
- Drowning is the leading cause of death for children aged 2-10 years, followed by pneumonia, and malnutrition (UNICEF 2005).

- Drowning, usually occurs close to home, in and around the local community, and the majority of drowning deaths occur during sunny weather. It is a neglected form of child mortality and often goes unreported (UNICEF 2012).
- The leading causes of mortality for infants are pre-term birth, pneumonia, and birth asphyxiation (UNICEF 2005).
- The leading causes of morbidity for infants are acute respiratory infections (ARI), diarrhoea, and malnutrition (UNICEF 2005).
- The leading causes of morbidity for children aged 1-17 are ARI, diarrheal diseases, and fever UNICEF (UNICEF 2005).
- The Bangladesh Health and Demographic Survey(BDHS) 2007 indicates that only about 37% of sick children receive care from a trained provider, with girls and the poor having lower rates(BDHS 2011).
- 86% of children 12 – 23 months are fully vaccinated; the figures is 85% for girls and 87% for boys(BDHS 2011).
- Coverage for measles is 88%, the GoB target is 90% (BDHS 2011).

DISEASE

- Diarrhoea is highly prevalent throughout the year, but typically spikes in April and October (Icddr,B I/V 2013).
- The main public health diseases are tuberculosis, malaria, dengue and soil-transmitted helminthiasis (WHO 2010).
- Dengue Fever has increased due to rapid urbanisation and high urban and peri-urban population density (CDC 2012).
- There is no routine surveillance of levels of *aedes* mosquitoes which carry dengue (CDC 2012).

NON-COMMUNICABLE / CHRONIC DISEASE

- Non-communicable diseases account for 52% of all deaths, 27% due to cardiovascular disease and 9% to cancer (WHO 2011).
- Injuries account for 10% of all deaths (WHO 2011).

HIV

- HIV prevalence is under 0.1% with an estimated 7,500 PLHIV in Bangladesh (UNAIDS 2012).

DISABILITY

- 9.07% of the population has a disability (8.1% male and 10% female). The figure is 9.63% in rural areas and 7.49% in urban areas (HIES 2010).
- Disability caused by injury, after infancy, is more than twice as likely to happen to boys as to girls (UNICEF 2005).

HEALTH COORDINATION

- In Bangladesh, WHO-BAN has been leading the UN DER (Disaster and Emergency response) health Cluster and ensuring health sector coordinating mechanisms involving UN agencies, NGOs, CBOs, Health authorities, donors, and community members, including between the centre and the field, and other sectors/clusters.
- The Health cluster responds to both emergencies and to assess health sector preparedness activities on an ongoing basis (ERM 2012).
- The Health cluster responds to both emergencies and to assess health sector preparedness activities on an ongoing basis (ERM 2012).
- The Ministry of Health and Family Welfare (MoHFW) is responsible for the implementation, management, coordination and regulation of national health and family planning related activities, programs and policies.
- The MoHFW regulates the private and NGO sector.

HEALTH PRE-CRISIS BASELINE DATA

- All Government health facilities are mapped in this link Health Infrastructure in Bangladesh.
- Health Data is available through the Health Management Information System

CONTINGENCY PLANNING AND PREPAREDNESS

- The Emergency Preparedness and Response Programme is an active unit of Directorate General of Health Services for adequate disaster preparedness activities and response to emergencies (EPR 2013).
- Health cluster information management tools such as UN-DER Health Cluster Standard Operating Procedures, post disaster disease surveillance for morbidity and mortality, Agency Inventory format, and the 3W were developed and finalised in 2012 (ERM 2012).
- The Directorate General Health Services, WHO, and other stakeholders manage a buffer stock of drugs and medical supplies which in the past have been used

during emergencies at district and Upazila levels, including emergency drugs (antibiotics, IV fluids, antipyretics, analgesics, topical ointments, drops, nebulizer, anti-snake venom injections etc.) (Health Cluster 2013).

- Guidelines exist for health professionals and community health volunteers for disaster preparedness and response and are available through the health cluster (EPR 2012).

IMPACT OF RIVER FLOODING ON HEALTH SERVICES

- Post disaster disease outbreaks can be triggered by damaged water and sanitation systems. Diarrhoea, ARI, and skin-eye-ear infections are common in post disaster situations (ERM 2012).
- The public health needs of the affected population increase as a consequence of people living under open sky, lack of safe drinking water, and damage to sanitary systems (KI Health Cluster 2013).
- A study by the Human Development Research Council in 2008 after the mega floods of 2007 had the following findings on the impact of the floods on deliveries (UNFPA 2008):
  - Non-availability of transport in and around all flood-affected areas and disruption of communications seriously hindered women's ability to access health facilities for deliveries.
  - There was insufficient skilled/experienced personnel to assist delivery of babies.
  - In *Beribandh* or in road-side shelters, the situation was the most unacceptable. These places were dirty and unhygienic. People co-existed with livestock, and there was no place for delivery, excepting open spaces under the cover of *shareeo*r bed-sheets.
  - None of the pregnant women and lactating mothers received any relief related to reproductive care.
- Recommendations from the study included (UNFPA 2008):
  - Flood shelters should have increased separate accommodations for pregnant mothers. At least one room should be earmarked for child delivery.
  - Medical services for the pregnant women and lactating mothers should be introduced along with those against diarrhoea and other common diseases during floods.
  - In designing such relief operations, particular needs of pregnant women and lactating mothers should be taken into account and prioritised.
  - Transportation arrangements should be made for pregnant womenfor them to go to hospitals/clinics and safely and without delay when needed during floods.
  - Motorized country boats should be arranged for transport to health centres in flood-prone locations.
  - Mobile *boat hospitals* should be equipped with all related facilities and trained staff for maternal and infant health to promote access to safe child birth facilities in the flood affected areas.
  - Flood-time support to rural pregnant mothers, especially during the third trimesters, should be augmented in lower terrain areas, e.g., in the Gaibandha and Kurigram districts.
- During the 2007 floods in Bangladesh, more patients than ever before attended the ICDDR,B health centre in Dhaka for treatment of water borne diseases. Most of the patients lived in Dhaka city. The centre identified Dhaka's continued population growth, which has forced increasing numbers of low-income households to live in areas with poor water and sanitation, as a contributing factor (ICDDR,B, 2007 in (ALNAP 2008).
- The adverse human health consequences of flooding are complex, far-reaching and difficult to attribute to the flood event itself. The main health impacts are deaths, injuries and mental health illnesses during the flood event itself, during the restoration process, or from knock-on effects brought about by damage to major infrastructure including displacement of populations (WHO accessed 2014).
- The immediate health impacts of floods include drowning, injuries, hypothermia, and animal bites. Health risks also are associated with the evacuation of patients, loss of health workers, and loss of health infrastructure including essential drugs and supplies. In the medium-term, infected wounds, complications of injury, poisoning, poor mental health, communicable diseases, and starvation are indirect effects of flooding. In the long-term, chronic disease, disability, poor mental health, and poverty-related diseases including malnutrition are the potential legacy (NIH 2010).
- Increased rates of diarrhoea (including cholera and dysentery), respiratory infections, hepatitis A and E, typhoid fever, leptospirosis, and diseases borne by insects have been described as occurring after floods in developing areas. Malnutrition caused by inadequate supplies of food and problems with distribution compounds the effects of disease (BMJ 2000).

- Flood-related injuries may occur as individuals attempt to remove themselves, their family, or valued possessions from danger. There is also potential for injuries when people return to their homes and businesses and begin the clean-up operation (e.g., from unstable buildings and electrical power cables) (Oxford 2005).

KEY INFORMATION GAPS

- Lessons learnt documentation remains scant.
- An agreed list of pre-crisis baseline data.
- Snake and animal bites are frequently cited as health concerns during floods but little information exists to provide an understanding of the numbers affected by this as compared to *normal* non-flood times.
- it is difficult to track the increase in health seeking behaviour and the reasons for health seeking behaviour during floods as data on people accessing GoB and NGO health services is not easy to find.
- The number of maternal and infant deaths during flooding periods as compared to non-flooding periods not available.

INFRASTRUCTURE / LOGISTICS

LOGISTICS KEY CHARACTERISTICS

- The inland water system in Bangladesh is 8,705km long with 3,060km of main cargo routes. The network is reduced to 5,200km in the dry season (data from 2006) (GoB 2008).
- Over 87 million passengers are carried annually and more than 58 million ton of cargo is transported annually.
- Main roads are under the jurisdiction of the Roads and Highways Department. Smaller roads, which make up 91% Bangladesh's roads, are under the jurisdiction of the Local Government Education Department (GoB 2008).
- 9.5% of roads are paved (GoB 2008).
- There are three international airports in Dhaka, Chittagong, and Sylhet (Airport Authority 2013).
- There are a further 13 domestic airports; Barisal, Comilla, Cox's Bazar, Ishurdi, Jessore, Khulna, Rajshahi, Rangpur, Saidpur, Sandwip, Shamshernagar and Thakurgaon (Airport Authority 2013).
- 56.1% of the population has access to electricity. The figure is 52.8% in urban areas and 13.6% in rural areas (CEA 2013).
- Demand for electricity drops after a major emergency due to the damage to housing and small and medium scale industries (GoB 2008).

Seasonal Effect on Transport (Logistics Cluster 2013)

Transport	Comments	From month	To month
Road Transport	Availability of trucks for transportation of material is affected due to the mango season which clashes with the Boro Season	May	July
Road Transport	Mangoes are grown and available on the eastern part of the country. Being a perishable product, it fetches a better rate for the transporters for delivery, which in turn affects the movement of the crops in Boro seasons. Road transportation is first choice when delivering relief material.	June	July
Rail Transport	Rail is used for transporting relief material. Movement of trains is affected during floods due to water logging on the tracks.	July	October
Air Transport	Air transport is seldom used for distribution of relief material due to the presence of a good road network. Air services are sometimes affected due to poor visibility conditions on account of severe monsoon or weather conditions in winter.	November	February
Waterways transport	Port operations are hampered only during extreme floods. Most relief material into Bangladesh is transported by sea. Inland river transportation is used to transport relief material in Bangladesh due to the presence of a river port and a good river transport network.	January	December

LOGISTICS COORDINATION

- The Logistics cluster is led by WFP.
- The Logistic Cluster meetings are held on monthly bases with participation from UN and INGOs.

CONTINGENCY PLANNING AND PREPAREDNESS

- Logistics cluster contingency plan is being prepared, as of March 2014.
- The Directorate of Food has set up an early warning system for floods which enables Local Supply Depots and the Central Stores Depots to adopt contingency measures (Logistics Cluster 2013).
- The Water Development Board passes regular information on water levels due to incessant rains and floods to the Directorate of Food who in turn passes on this information to the districts (Logistics Cluster 2013).
- During an alarm situation, the Central Stores Depots and Local Supply Depots erect a Baffle Wall up to three feet at the entrance of the *godowns*/warehouses to prevent water from entering inside (Logistics Cluster 2013).
- There are numerous warehouses owned (leased) by UN and INGOs throughout the country that are identified and mapped for emergency preparedness.

IMPACT OF RIVER FLOODS ON ACCESS

- Following the 2007 floods, critical infrastructures and means of communication were disrupted (GoB 2007).
- Floods make roads impassable, destroy bridges, increase the danger in travelling on and crossing rivers, and increase the costs of boat transportation when roads cannot be used. This impedes access to all key services including health and education as well as markets.
- Information is a right that enables people to claim other rights. Access to information allows a community's own recovery plan to drive the recovery process. It is essential, therefore, that an affected population can receive useful information (IFRC, 2005 in (ALNAP 2008).

INFORMATION GAPS

- The Logistics Capacity Assessment will be updated at the end of March 2014
- Impact of destroyed roads and waterways on the response and early recovery.
- There is no analysis of availability of key relief items for a major emergency.

NUTRITION

NUTRITION KEY CHARACTERISTICS

- Child <5 nutrition has decreased since the 1990s, but the rate of reduction has been slow (UNREACH, Unpublished).
- Chronic stunting and wasting are persistent challenges (UNREACH, Unpublished).
- The pattern and change in wasting has been small and inconsistent.

BDHS National Nutrition Data		
Type of Malnutrition	**2007**	**2011**
Wasting	17%	16%
Severe wasting	3%	4%
Stunting	43%	41%
Severely stunted	16%	15%
Underweight	41%	36%
Severely underweight	12%	10%

- The main causes of under nutrition are inadequate hygiene (hand-washing) and inadequately diversified diets of mothers and young children (KI, Nutrition cluster, 2014).
- Due to maternal malnutrition and early pregnancy, one in five babies is born with a low birth weight (WFP 2012).
- Seasonality remains an important issue in malnutrition. Summer months see higher levels of malnutrition, connected with childhood morbidity and restricted access to food. This matches the cyclone and flooding season which leads to increased diarrhoeal diseases which in turn is linked to increases in malnutrition (UNICEF 2009).
- The coastal belt has the greatest prevalence of underweight children, including wasting and acute malnutrition. This is also the case for underweight girls, but not underweight women (FSNSP 2013).

NUTRITION COORDINATION

- Nutrition falls under the Ministry of Health. The Institute of Public Health Nutrition (IPHN) is responsible for formulating policy and strategies for nutrition

activities, programmes, research, training, and surveillance. It hosts the National Nutrition Services (NNS) which aims to reduce the prevalence of malnutrition among the people of Bangladesh with special emphasis on children, women, adolescents, and underprivileged sections of society (IPHN).

- The Nutrition cluster for preparedness meets on a monthly basis, coordinated by UNICEF and co-chaired by IPHN.
- Sub-national cluster coordination mechanisms have been established, with District disaster focal points identified, and district disaster management committees trained on nutrition in emergency.
- The 3W mapping and cluster contact list has been updated and is available via the Nutrition cluster.

PRE-CRISIS BASELINE NUTRITION DATA SURVEILLANCE

- Nutrition data is collected by a number of different actors including, the BDHS, the Food Security Nutritional Surveillance Project (FSNSP) and individual agencies.
- FSNSP provides up-to-date seasonal information on nutrition and food security. The data is collected for the post Aman season (February – April), Monsoon (June – August) and post Aus Harvest (October – December) (FSNSP 2013).
- A set of standard nutrition indicators have been integrated into routine Health Management Information System which will substantially increase nutrition data available from monthly health clinic reports, including information on coverage of essential nutrition interventions, and the anthropometric status of children. This information will allow trend analysis at disaggregated levels, which is critical to early warning.
- IPHN/NNS recently established a Nutrition Information and Planning Unit to regularly monitor and analyse the nutrition situation based on a diverse range of sources, including routine information from the Health sector, FSNSP surveillance, surveys, etc.

NUTRITION DISASTER PREPAREDNESS

- In collaboration with the Ministry of Food and Disaster management, the NNS is developing a guideline for disaster preparedness that aims to prevent and treat malnutrition after disasters. Once completed, all health workers will be trained to respond to the nutritional needs of the population in an emergency. A strong emphasis is for Health Workers to promote, protect, and support breastfeeding and appropriate complementary feeding and hygiene among children <2 (IPHN).
- The Nutrition cluster maintains a district level inventory of stocks pre-positioned by cluster members, including anthropometric equipment and essential nutrition supplies.
- A detailed Nutrition cluster contingency plan is being finalised
- The nutrition cluster has established a Rapid Nutrition Assessment Team (RNAT) which is expected to lead post disaster rapid nutrition assessments and nutrition surveys
- Phase three JNA assessment guidelines for nutrition are under development.
- The Nutrition cluster has contributed to setting standards for scaling-up a full set of direct nutrition interventions needed to prevent under-nutrition and micronutrient deficiencies, through development of job aids and tools under the *Nutrition in Emergencies* national training module.

IMPACT OF RIVER FLOODS ON NUTRITION

- Pre-existing high malnutrition rates could increase vulnerability of children <5 in the event of a disaster, and in light of the high prevailing rates of malnutrition, the nutrition situation could easily and quickly deteriorate after a major flood.
- In a disaster, a lack of shelter and/or water will result in decreased hygiene, often with limited available space where women feel comfortable to continue breastfeeding and/or engage in complementary feeding (KI, Nutrition cluster, 2014).
- In a disaster, food crops and markets are destroyed and/or disrupted resulting in less access to diversified nutritious food leading to inadequate energy and micronutrient intake (KI, Nutrition cluster, 2014).
- Lack of shelter/water and disruption to livelihoods are typically the first sectors to be compromised when a disaster hits which is why under-nutrition often aggravates soon after an emergency (KI, Nutrition cluster, 2014).
- Flooding maynot directly and immediately impact nutrition, but they create situations that increase vulnerability and can lead to a rise in under nutrition in a short amount of time, complicated by factors such as inadequate hygiene, a lack of shelter for private and safe spaces for women to breastfeed or feed children, and inaccessibility to nutritious food. The nutrition situation of pregnant/lactating women and children, who are most vulnerable, should be closely monitored at all times (KI, Nutrition cluster, 2014).

LESSONS LEARNT

- Concurrent sectoral interventions implemented post disaster will go a long way in mitigating and reducing the deterioration of nutritional status.
- Nutrition sensitive strategies should be mainstreamed into responses of key sectors (KI, Nutrition Cluster, 2014):
- Food security/livelihoods to ensure vulnerable populations have access to and consume adequately diversified nutritious diets.
- Shelter to ensure mothers have safe, private, and hygienic spaces to breastfeed infants and young children.
- WASH to ensure caregivers hand wash with soap before handling of food and feeding to avoid contamination and subsequent illness in children that can lead to under-nutrition.
- Health to ensure essential health and nutrition services are delivered by health providers at quality and scale to vulnerable populations (including micronutrient supplementation, counselling and promotion, disease management, management of acute malnutrition, etc.).
- A holistic approach to mitigate the impact of flooding on IYC's nutrition status involves combining (Blackwell 2010):
  - Provision of relief for nutritionally vulnerable groups during flooding
  - Support to mothers in their working role
  - Breastfeeding counselling and support to lactating mothers with difficulties
  - Preventing malnutrition in <2 year old children.

INFORMATION GAPS

- Impact of floods on nutrition status
- Lessons learnt from previous nutrition responses.

SHELTER

SHELTER KEY CHARACTERISTICS

Shelter Types in Bangladesh	
Pucca	Fully brick structures
Semi-pucca	Floors and/or walls made of brick and the rest made from tin (metallic sheet)
Kutcha	Floors made of soil and roof and walls made of tin
Jhupri	Floors made from soil and roof/walls made from bamboo

- Shelter responses are usually comprised of emergency shelter, transitional shelter, and permanent housing.
- There is no clear written definition of *partially* or *completely destroyed* houses, the consensus among shelter cluster partners is:
  - *Partially damaged* is where any component of a house (roof/ wall/foundation/column) is damaged, but the house is repairable.
  - *Completely destroyed* is when the house is severely damaged or washed away and cannot be repaired.

EMERGENCY SHELTER

- Temporary shelter for emergency response is defined as *a temporary structure which provides adequate shelter for a short period of time immediately after the event* (Shelter TWG).
- Where possible, shelter materials used for emergency responses should be appropriate for early recovery. This can be difficult due to the different needs for building on embankments and on flat ground (Shelter Cluster TWiG 2009).

TRANSITIONAL SHELTER

- Transitional shelter/semi durable shelter for transitional response is defined as *a structure which provides adequate shelter which covers a period of time from the emergency phase until longer term durable solutions can be provided. If required they can be dismantled and relocated* (Shelter Cluster TWG).
- Transitional shelter interventions must consider land rights issues. In Bangladesh, where population density is high it can be difficult to get Government approval for transitional shelter sites due to political concerns, resentment by host

populations, fear the site may become permanent, or fear the value of the land may be reduced (unpublished UNDP).

- Types of transitional shelter include dispersed settlements, collective centres, and cluster transitional shelter.

Main Features of Standardised Transitional Shelter(Shelter TWG 2013)	Flooding and cyclones in inland and coastal areas
Plinth	Height variable Above 1 ft HFL, 5" Brick wall with 10" X 10" brick pillar
Columns and frame	10 No RCC (5 in x 5 in with T section)
Wall Cladding	CGI + Bamboo Mat
Trusses and CGI fixing	Timber truss , Tin Screw (Bolt), Cyclone strap
Foundation	Below 1.5 ft GL , T Shape
Roof shape	hipped
Roof slope	30- 35 degree
Length of Canopy	1.5 ft
Plinth space for veranda	6ft wide extended earth filling
Ceiling	bamboo mat
Window	3 No (Beneficiary choice)
Door	2 No (Beneficiary choice)
Height (PL to Ceiling)	minimum 7 ft
Latrine	Single Chamber, minimum 5 to 7 ring, Bamboo/ wooden Pole, .24 mm CI sheet for wall cladding, 0.30 mm CGI sheet, Ramp, fero-cement work
Gender	Partition, Two no of door, secured toilet
Disability	Staircase/ramp
Age	Staircase/ramp (Railing for older people)

PERMANENT HOUSING

Permanent housing for recovery is defined as *a permanent structure built to normal national standards appropriate for the exposure to hazards* (Shelter TWG).

SHELTER COORDINATION

- The Shelter cluster is led by UNDP during non-emergency periods and led by IFRC during emergency responses.
- The shelter cluster for preparedness is established and meets regularly. There is a Technical Working Group who meet on a regular basis.
- There is a website which is a resource for humanitarian agencies working in the Shelter sector (Shelter Cluster).
- The location of NFIs is still under discussion in Bangladesh between the shelter cluster, early recovery cluster and the food security cluster (KI, Shelter TWG, 2014).
- The shelter cluster are in the process of agreeing a standard shelter kit package.

PRE-CRISIS BASELINE SHELTER DATA

Baseline Indicator	Notes	Location
Disaggregated demographic data	2011 Census data, available in excel on HCTT web platform. Disaggregated to Union level.	JNA Baselines
Type of housing	2011 Census data, available in excel on HCTT web platform. Disaggregated to Union level.	JNA Baselines
Land Ownership	Disaggregated to Division level in the HIES. The JNA is in discussion with the cluster and the information management working group about where and how to access this data.	n/a

PRE-POSITIONING AND CONTINGENCY PLANNING

- There are pre-positioned shelter items, by both cluster members and the Government. These are currently in the process of being mapped.

IMPACT OF FLOODS

- Many flood affected people camp out on roofs, roads, embankments or bamboo structures etc. Children in these situations are extremely vulnerable and are less likely to receive assistance than children in flood shelters as they are harder to identify and harder to reach (SC 2006).

- Following the summer 2007 flooding, according to the Ministry of Primary and Mass Education, of the 4,603 primary schools still affected on 19 August 2007, 4,444 remained closed, and 292 were being used as flood shelters (IRIN 2007).

LESSONS LEARNT

- Transitional shelter responses are unable to include landless families, thereby leaving out the most vulnerable members of the community. The chronic complexity of land reform and landlessness should not be underestimated and a *quick-fix* of these issues following a disaster is unlikely (KI Shelter Cluster TWG 2014).
- One constraint to assessing shelter damage after tropical storm Mahasen was distinguishing between houses damaged by the storm and the chronic problem of sub-standard housing (Shelter Cluster 2013).
- Untangling the real number of shelters in need of assistance has been challenging in Bangladesh with conflicting numbers in need of assistance reported by different organizations.
- There must be identification of how self-recovery is expected to explain the gap between the planned responses and identified needs. The joint UNDP assessment of December 2008 found that an estimated 43% (a range of 10% to 81% across affected districts) of families rebuilt or rehabilitated their housing themselves.
- While self-recovery is an important sign of resilience, one concern expressed with the large number of self-built emergency shelters is that they will not withstand the monsoon. Self-recovery must not be undermined, but rather monitoring and support of repair should be provided (KI, Shelter TWG, 2014).
- Difficulties in accessing remote communities, transporting materials (i.e. damaged roads etc) and accessing materials were obstacles to an effective shelter response.
- Lessons learnt by Oxfam after cyclone Sidr (which are considered relevant for shelter responses to other disasters as well as cyclones) include (unpublished Oxfam GB):
  - Shelter kits took too long to arrive, were too heavy and unsuitable, for example many contained metal elements which are not recommended for use in a high salinity and humid region.
  - People needed non-traditional skills to use the materials which required external assistance.
  - An increase in child marriage and polygamous marriages were two of the unintended outcome of OGB's policy of giving all transitional shelter kits to women headed households and handing over materials to the woman in the household.
  - OGB assumed that a household was a single generation plus children. This meant extended families had to split up to each get a kit, thus eroding traditional support structures. If they did not split up different generations had to share rooms, which is not in keeping with local custom.

KEY INFORMATION GAPS

- Data from previous responses on migration and displacement, including, numbers who migrated as a result of the disaster and length of time displaced into collective shelters.

WASH

WASH KEY CHARACTERISITCS

- Water quality in Bangladesh is compromised by the presence of arsenic detected in 61 of 64 districts of Bangladesh. It is at dangerous levels for at least 20 million people. In 2006, contamination levels were estimated to be 20% at source and 12% at point of consumption. The Bangladesh acceptable level of arsenic in drinking water is <50 micrograms per litre; the WHO global standard is <10 micrograms per litre (UNICEF 2009).
- Up to 53% of the coastal region suffers from saline intrusion in surface water (Haque 2006).
- There are no systematic mechanisms for water quality monitoring and surveillance in Bangladesh (UNICEF 2009a).
- Only one third of secondary towns have piped water, and where it exists it is often contaminated due to leakages and intermittent supply (UNICEF 2009a).
- There are greatly varying figures on sanitation coverage due to different terminology for improved sanitation (UNICEF 2009a):
- The National Sanitation Strategy aims to have 100% of the population with access to sanitary latrines by 2015. Currently, 60% of the population has latrines, 32% hygienic and 25% unhygienic (DPHE).

WASH COORDINATION

- Nationally, the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives is responsible for the overall development of the Water Supply and Sanitation (WSS) sector.
- The Department for Public Health Engineering (DPHE) is responsible for implementation of GoB WSS projects.
- The DPHE is represented down to the Upazila level. At the Union level, there is a Union WASH Committee.
- The WASH cluster for preparedness is functioning and is coordinated by UNICEF's WASH department and co-coordinated the DPHE.
- The WASH cluster has allocated WASH District Focal Agencies for the nine cyclone prone Districts whose role is to (WASH Cluster ToRs):
  - Coordinate with the DPHE, other actors, and the District Relief and Rehabilitation Officer
  - Plan and implement responses, including leading on JNA Phase III assessments, contingency planning, and implementing agreed cluster action plans
  - Train and capacity-build to ensure skills transfer at the District level and to ensure local actors are familiar with JNA tools.
  - Monitor and report to the national cluster.
- Accountability is to the national cluster and no message or action should be taken on behalf of the cluster without discussion with the national cluster.
- The WASH cluster website is currently under construction.
- There is no comparable data on hygiene practices.

PRE-CRISIS DATA

- The WASH cluster has selected these pre-crisis indicators for the cyclone prone districts. These will also be required in flood prone districts (WASH cluster 2014):

Indicator	Notes
Number of water points	Government only
Arsenic contamination	
Sanitation coverage including	Unimproved, improved, shared and open defection
Number of primary schools	Government, registered non-government and community schools
Number of flood shelters	Total number, capacity and other use
Toilets in shelters	Separate male/female, which floor and water supply
Water supply in shelters	

Bangladesh Sanitation Definitions (MISC 2009)	
Hygienic sanitation facilities – GoB	**Improved sanitation facilities - WHO/UNICEF JMP**
Facilities that are individual or shared by maximum of two households	Individual facilities
Flush or pour-flush toilet/latrine to: ▪ Piped sewer ▪ Septic tank	Pit latrine with a slab and water seal
Pit latrine with a slab and water seal	Pit latrine with slab and lid, no water seal
Pit latrine with slab and lid, no water seal	Pit latrine with a slab and flap, no water seal
Pit latrine with a slab and flap, no water seal	Pit latrine with a slab but no lid nor water seal
VIP latrine	VIP latrine
Composting latrine	Composting latrine

- The data sources used for the pre-crisis data are:
  - The Multiple Indicator Cluster Survey (MISC 2009)
  - The Bangladesh Health and Demographic Survey (DHS 2011)
  - World Bank: Hard-to-Reach Areas (Hard-to-Reach 2011).
- There is currently no repository or mapping of hygiene baseline, however operational agencies in cyclone affected areas have hygiene surveys which they can share.

LIMITS OF PRE-CRISIS DATA

- The WASH cluster did not include hygiene baselines, as these are not included in any national/international surveys, which provide geographically disaggregated data.
- The indicators do not provide information on whether WASH facilities within cyclone shelters are currently functioning or not functioning.
- National level surveys are not annual, therefore at times data is out of date.
- Disaster responses in certain areas can dramatically alter coverage, which is not reflected in this data.

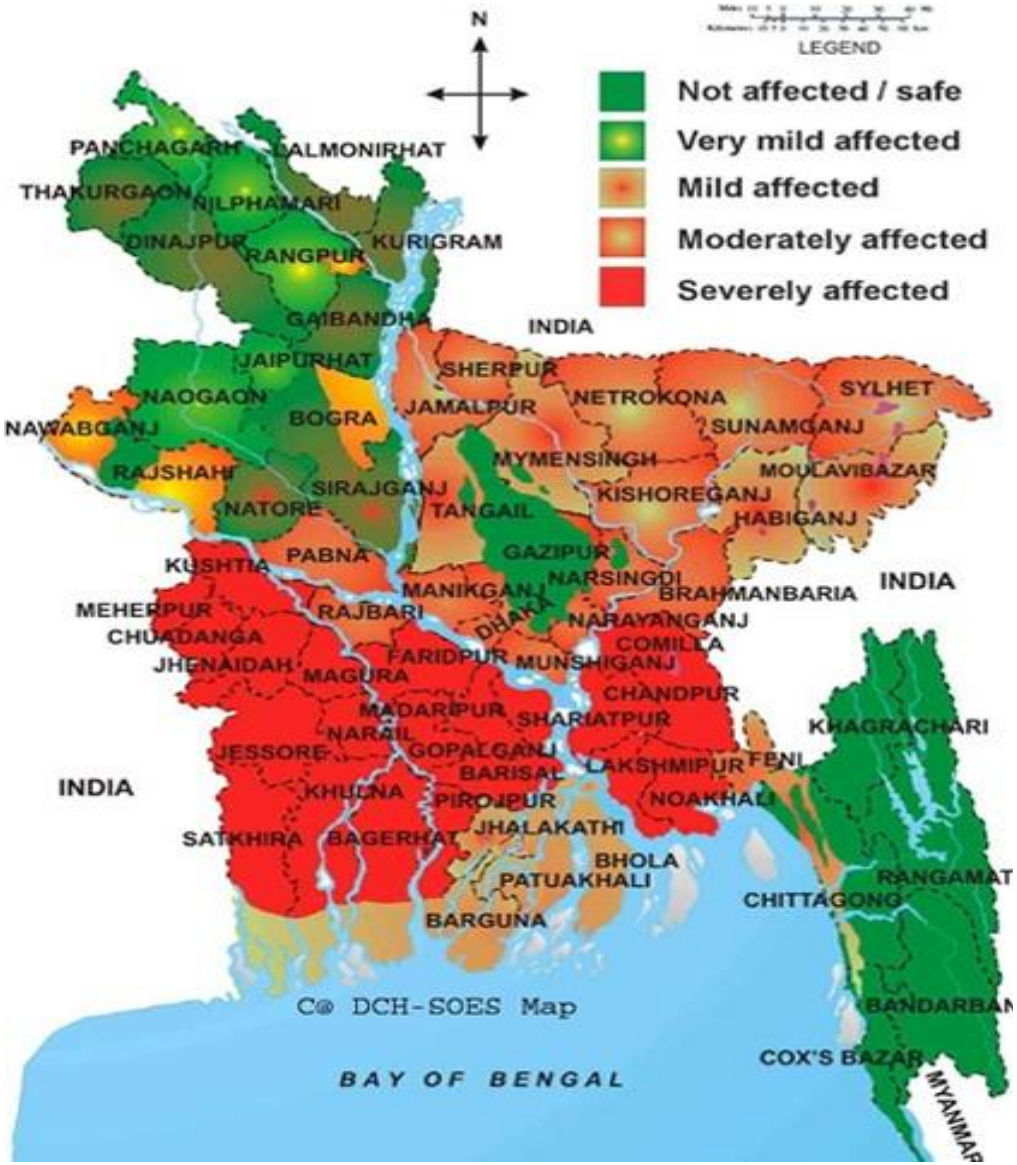


Figure 8: Arsenic Map

CONTINGENCY PLANNING

- There is an up-to-date list of prepositioned supplies, government, UNICEF, and cluster members.

IMPACT OF RIVER FLOODING ON WASH

- Water points are inundated and latrines are washed away
- Flood shelters have inadequate WASH facilities, which is a concern from a public health perspective as well as protection perspective (SC2006).
- In areas where there is little available land, displaced people will continue to have inadequate WASH facilities.

GAPS IN INFORMATION

- Documented evidence on the impact of floods in different regions on WASH facilities.
- Lessons learnt from WASH interventions.
- Information on which water sources are most/worst impacted by floods and how to detect if a water source has been corrupted.