



# Bangladesh: Agriculture Insurance Situation Analysis



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# Executive summary

**Agriculture is key in Bangladesh but highly exposed to risks.** Agriculture is a source of employment and livelihood for nearly 1 in 2 adults in Bangladesh and contributes about 16% to GDP. Contribution to agricultural GDP comes mainly from crop production (63%) but also from fisheries (23%), as well as livestock and poultry (14%). There are about 15 million farm households in Bangladesh and a further 13 million landless households who work as sharecroppers or farm labourers and the most important staple food crop grown is paddy (rice). While Bangladesh has made major progress post-independence in agriculture, it still faces major challenges of maintaining food security due to its high population growth rate and major exposure to natural disasters and climate change. Bangladesh is one of the world's most exposed countries to natural disasters, including floods, cyclones, and drought which have large impact in agriculture. For instance, Cyclone Sidr of 2007, destroyed 0.69 million hectares of cultivated crop lands and killed over 460,000 head of livestock and poultry.

**The Government provides significant support to agriculture, but currently provides limited support to the development of agriculture insurance.** This year's budget for the Ministry of Agriculture is about USD 1.5 billion, and most of the resources are focused on subsidies for agricultural inputs such as fertilizer, seeds, and irrigation.

**While the Government and external donors spend large amounts of money in the aftermath of disasters – average annual costs of disasters are US\$300 million - the funding gap is still high and can reach more than USD 1.5 billion in bad years.** Tropical Cyclones and floods are the major cause of donor post-disaster expenditures, accounting for 40% and 38% of donor expenditure.

**In spite of Government's efforts, credit to agriculture is still constrained and represents 3% of total lending.** While financial inclusion in Bangladesh is high compared to peers in South Asia and Low Income Countries, 60% of adults are still financially excluded<sup>1</sup>, most of them in rural areas and involved in agriculture. International experience shows that insurance could potentially help unlock access to agriculture credit.

**Agriculture insurance provision in Bangladesh is very low:**

- **Several MFIs are offering micro-insurance products linked to credit including livestock-credit insurance, but in the absence of reinsurance agreements, these programs might not be able to cope with shocks that kill large numbers of animals.** Some milk cooperatives and social enterprises, have indicated strong interest in developing livestock insurance products for their milk producers.
- **The Ministry of Livestock and Fisheries and Department of Fisheries have identified a need to develop suitable aquaculture insurance products.** Initial work is being focused on the shrimp sector given its importance to farmers located in the southern coastal regions of Bangladesh and the high risk exposure to tropical cyclone damage and tidal surge.

<sup>1</sup> Source: Global Findex 2012

- **Crop insurance is not currently offered but two donor-supported initiatives are under implementation.** On the supply side, there is a lack of knowledge and experience of the potential of agricultural services by the insurance companies and thus a lack of technical expertise in the design, rating and implementation of agricultural crop, livestock and fisheries insurance products. Several decades ago the public insurer Sadharan Bima Corporation piloted small crop, livestock and aquaculture insurance programs, but these programs were terminated following poor underwriting results. Currently, there are two weather based crop index insurance initiatives under implementation: one is led by the government-owned insurance company Sadharan Bima Corporation, SBC, and supported by the Asian Development Bank, ADB, and the other is led by private-sector company Green Delta and supported by the World Bank Group.
- **An innovative flood index insurance program has been piloted by Oxfam, an international NGO, for the past two years in selected villages in Sirajganj District.** This fully subsidized index insurance program made claim payments to over 700 households in 2014 following severe floods in August and September 2014.

**If agriculture insurance programs were to be developed in Bangladesh, the overall legal, regulatory and supervisory insurance environment would require strengthening.** Created four years ago with only 45 staff and low actuarial expertise, the Insurance Development and Regulatory Authority of Bangladesh (IDRA) faces capacity constraints to supervise the 77 insurance companies of Bangladesh. Potential WBG support to strengthen the capacity of IDRA and government-owned insurance companies is currently being explored.

**Based on this preliminary assessment and discussions with key stakeholders, the WBG will prepare a technical report and policy briefing for BFID on four potential types of agricultural insurance programs which have been identified through this situational analysis as priority solutions for further investigation.** The four priority areas identified for further investigation are: (1) Livestock insurance for commercial dairy farmers and poultry farmers; (2) Insurance cover for shrimp producers and artisanal fishermen; (3) Crop insurance linked to credit for small and marginal cereal farmers; and (4) Fully subsidized flood-index insurance for the most vulnerable rural households. The diagnostic reports will also analyze potential institutional frameworks that could be considered for agricultural insurance in Bangladesh, paying specific attention to the potential roles for the Government and insurers.





# 1. Introduction

## 1.1. MOF Request to the World Bank Group

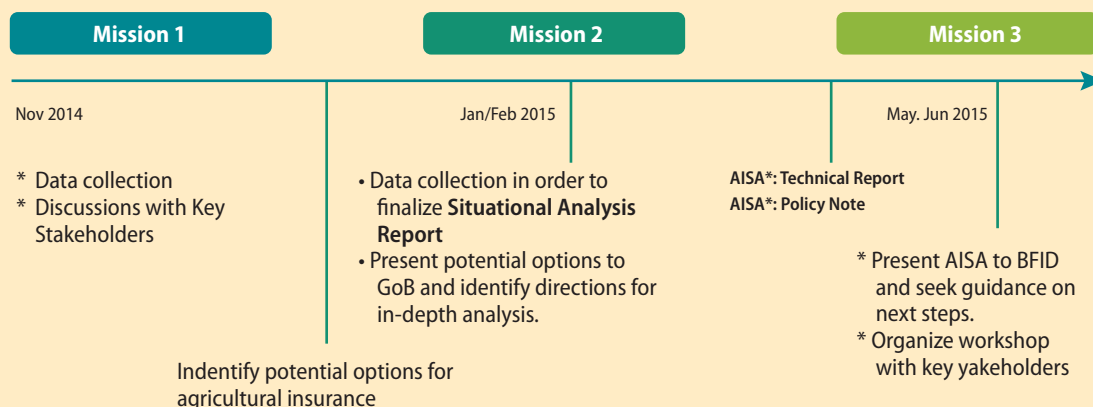
In November 2014, the WBG received a letter of request from the Secretary, Bank and Financial Institutions Division (BFID), Ministry of Finance for a diagnostic study to investigate the potential for agricultural insurance to: (1) Reduce the ex-post fiscal burden on the government; (2) Improve farmer's resilience to shocks; and (3) Support the expansion of agricultural credit.

The World Bank Finance and Markets Global Practice is responding to this request by conducting an agricultural insurance diagnostic study led by a team of Bangladesh-based financial sector experts and international agricultural insurance experts, and primarily financed by the Disaster Risk Financing and Insurance Program (DRFIP), a partnership between the World Bank Group and the Global Fund for Disaster Risk Reduction (GFDRR). The mission of the DRFIP is to support financial strategies to minimize the cost and optimize the timing of meeting post disaster funding needs without compromising sustainable development, fiscal stability, or wellbeing.

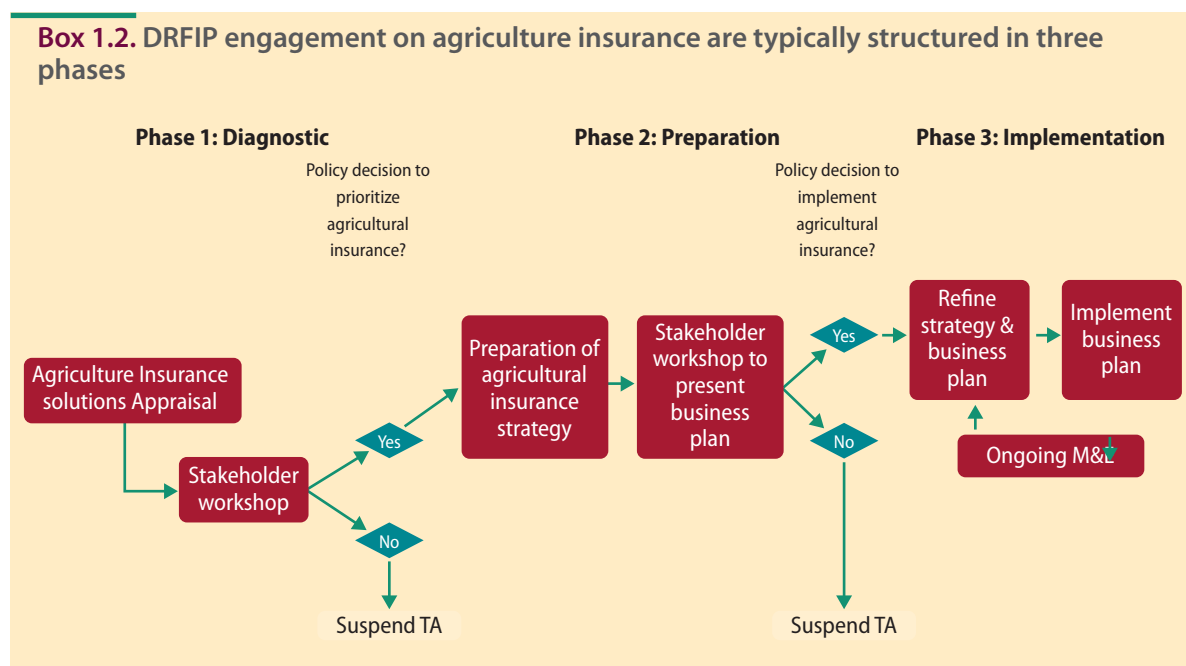
The diagnostic team has completed the second of three missions, and on this basis expects to deliver the diagnostic report in May or June 2015 (See Box 1.1). This diagnostic report, or "Agriculture Insurance Solutions Appraisal" will suggest three to four agricultural insurance options for BFID to consider, and will include fiscal costing and economic impact analysis of each option. This report will build on the comprehensive review of opportunities and challenges for the development of agriculture insurance in Bangladesh conducted by the WBG in 2010.

### Box 1.1. The 6-month diagnostic phase will lead to the presentation of the Agricultural Insurance Solutions Appraisal to BFID

#### Diagnostic: Agricultural Insurance Solutions Appraisal (AISA)

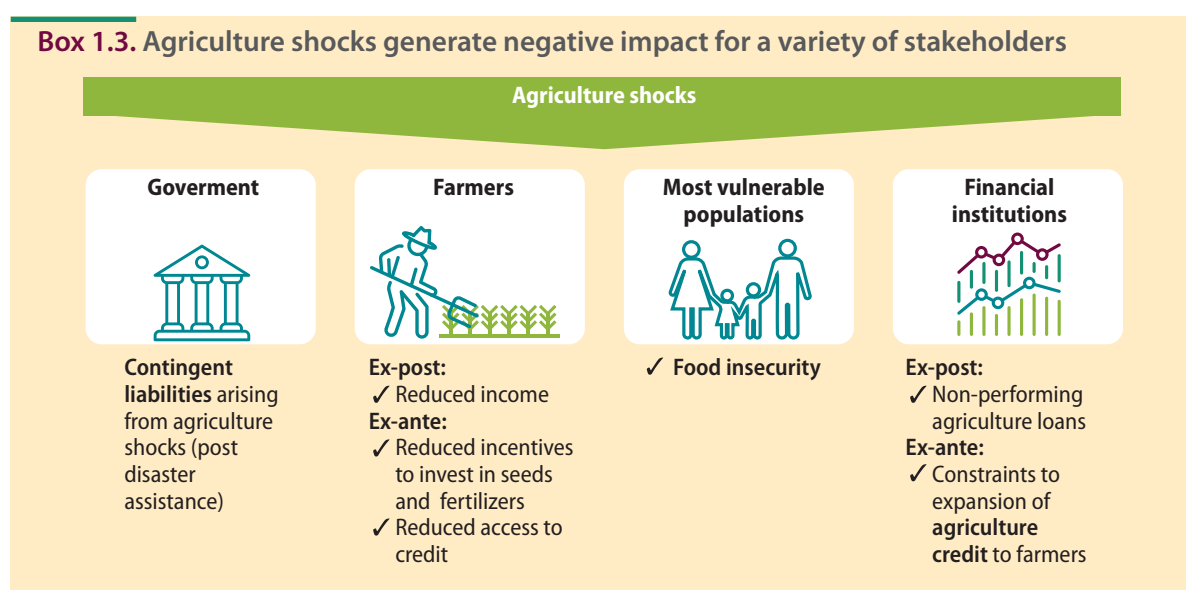


This diagnostic phase of work could potentially be followed by preparation and implementation phases of work (See Box 1.2).



## 1.2. Scope and Objectives of the Agriculture Situation Analysis

Before the identification of agriculture insurance solutions, this situation analysis aims at providing an up-to-date overview of the potential for agriculture insurance in Bangladesh. Indeed, this report analyses the impact of agriculture shocks for a variety of stakeholders (see the range of stakeholders in Box 1.3), discusses current opportunities and challenges for agriculture insurance, identifies past and existing initiatives, and describes the broader context of existing programs undertaken by the Government for agriculture development and for disasters. In particular, this analysis focuses on the (1) agricultural production and risk exposures in Bangladesh, (2) Government policies for Agriculture and Disaster Management, (3) Agriculture credit landscape, (4) Agriculture Insurance landscape, and (5) Opportunities for agricultural insurance and potential role for Government.



Source: World Bank Group







# 2. Overview of agriculture production, risk exposures and impacts

## 2.1. Importance of agriculture in Bangladesh

**Bangladesh is a low income country with one of the highest population densities in the world.**

With land area of 130,170 km<sup>2</sup> and a 2014 population of 158.5 million, the population density reaches 1,218 persons per km<sup>2</sup>.<sup>2</sup> Bangladesh is classified as a low-income country with GDP of US\$ 150 billion and GDP per capita of US\$ 958 in 2013. Over the past five years, GDP grew at an average of 4.92% per annum. The poverty head count was 31.5% of population in 2010.<sup>3</sup>

**The share of agriculture in the overall economy has decreased over the past 20 years, but it continues to be the major source of employment and livelihood for nearly 1 in 2 adults in Bangladesh.**

Agriculture's contribution to the economy has declined from about 27% of GDP in 1995 to 16.3% of GDP in 2013. In 2013, the rural population was 105.3 million or 67.3% of the total population.<sup>4</sup> In 1995, a total of 34.5 million adults (over 15 years age) were employed in agriculture or 64% of the total labour force, but this had declined to 25.7 million persons in 2010 or 48% of the labour force. Over this period there has been a corresponding growth in manufacturing, transport and other sectors (BBS 2013).

**There are about 15 million<sup>5</sup> farm households in Bangladesh, most of them with very small farms, and a further 13 million landless households who work as sharecroppers or farm labourers.**

According to BBS sample survey statistics in 2005 there were a total of 28.2 million rural holdings of which 15.1 million (54% of total) were classified as farm holdings owning more than 0.04 acres and a further 13.1 million holdings (46% of total) classified as non-farm holdings with no land or a maximum of 0.04 acres. The average farm size is small with an average of 1.2 acres (0.51 Ha) per farm household (HH). A very high proportion or 88% of farmers are classified as small, owning less than 2.5 acres (1 Ha);

<sup>2</sup> WorldData Bank. <http://databank.worldbank.org/>

<sup>3</sup> WorldDataBank

<sup>4</sup> WorldData Bank

<sup>5</sup> BBS 2011, based on 2005 Agricultural Sample Survey Data

10% of farms are medium owning between 2.5 and 7.5 acres (1 Ha to 3 Ha) and very few or less than 1% of farmers own more than 7.5 acres (BBS 2011) (Table 2.1).

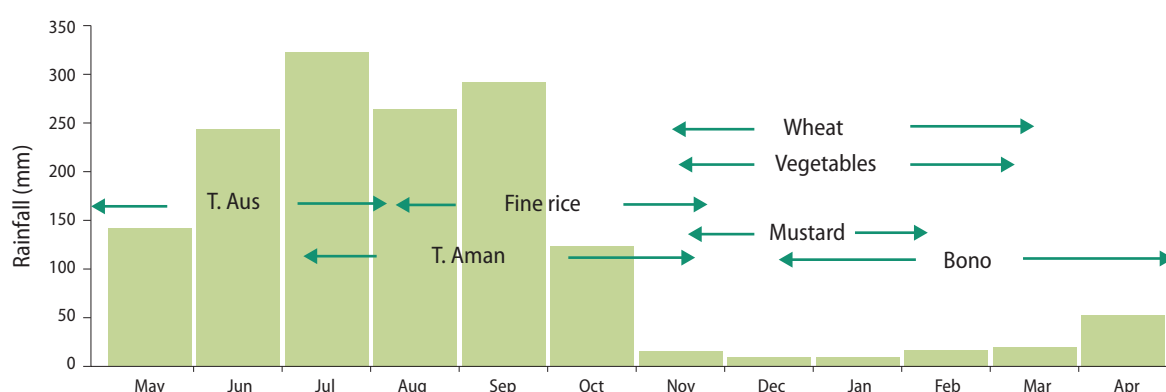
**Table 2.1. Farm size distribution in Bangladesh (2005)**

Type of Holding	Land holding (Acres)	Number Holdings	% HHs
All Rural Households		28,165,700	100%
Non-Farm Holdings	No land or < 0.04 Acres	13,076,613	46%
Farm Holdings	> 0.05 acres	15,089,087	54%
Small Farms	0.5 < 2.5 acres	13,361,350	88%
Medium Farms	2.5 < 7.5 acres	1,560,774	10%
Large Farms	>7.5 acres	176,962	1%
Total Farm Holdings		15,099,086	100%

Source: BBS 2011

**Bangladesh experiences a monsoon climate with marked summer season rainfall from May to October, followed by a dry winter season from November to March and crops can be grown in three seasons if irrigation is available.** The seasons include: (i) the monsoon *Kharif* or *Aman* season from July to October when rain-fed *Aman* paddy is grown, the winter *Rabi* or *Boro* season when a wide range of crops including *Boro* paddy are grown under irrigation between November and February and then a much shorter *pre-Kharif* or *Aus* season from April to July when *Aus* paddy is grown on a much smaller scale in regions which have residual irrigation at transplanting and which also receive early season rains in April/May (Figure 2.1).

**Figure 2.1. Bangladesh: Rainfall Distribution and Cropping Seasons**



Source: ADPC & FAO 2007

**Paddy (rice) is the most important staple food crop grown in Bangladesh grown by nearly all farmers.** Paddy is grown in all three cropping seasons: the summer monsoon or *Aman* crop is the largest crop which currently accounts for about 13.6 million acres (72 percent of net cultivated area); the winter or *Boro* season rice crop, which is grown under irrigation accounts for 10.8 million acres (57% of net cultivated area); and finally *Aus* rice, which is grown on a much smaller scale in about 2.6 million acres (14% of net cultivated area). In the *Kharif* monsoon season maize and jute are also grown, while in the *rabi* season irrigated wheat is the second most important crop after *Boro* rice with an average cultivated area of about 0.94 million acres or about 5% of net cultivated area. Other irrigated *Boro* crops include potatoes, pulses, barley and horticultural and vegetable crops. About 13.1 million acres or 5.3 million<sup>6</sup> hectares are equipped for irrigation equivalent to about 69% of net cultivated area.

**Livestock including dairy cattle, buffalo, goats and poultry play a very important role in Bangladeshi mixed-farming systems as a source of employment, assets, cash income, and improved**

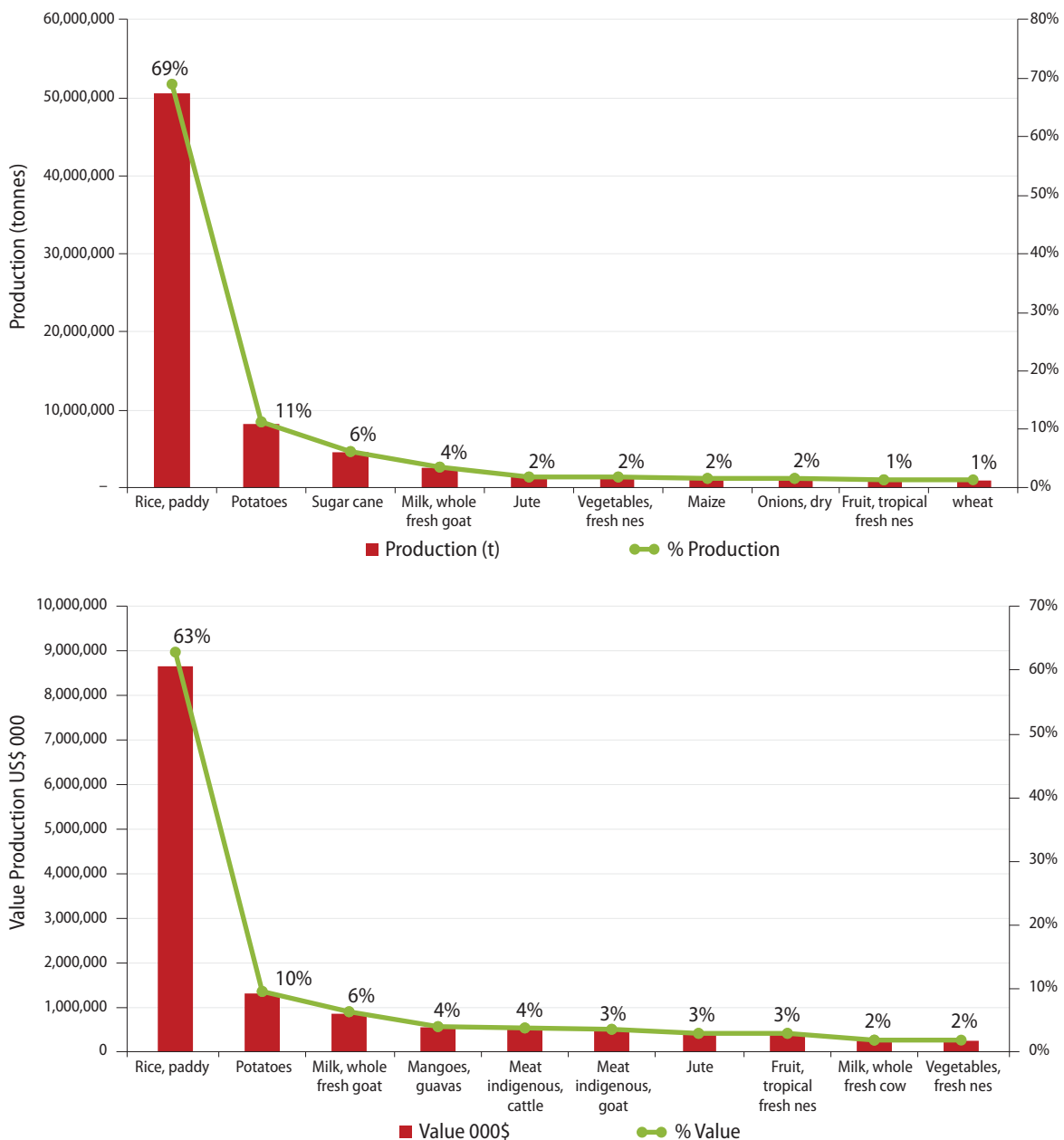
6 FAOSTAT Economic Indicators for Bangladesh: 2012 irrigated area.

**nutrition, particularly for landless households and female farmers.** Overall the livestock and poultry sectors contribute about 1.8% of GDP and 14.1% of Agricultural GDP and it is the third largest export earner, mainly in the form of hides (DLS 2013-14 estimates).

**The fisheries sector also plays a very important role in the economy of Bangladesh contributing 4.4% of GDP and 22.8% of agricultural GDP.** Fish provide about 60% of all protein consumed in Bangladesh and about 10% of the population (15 million people) depend directly or indirectly on fisheries for their livelihoods (DOF 2014). Bangladesh is among the top ten exporters of shrimps and this is the second largest foreign currency earner after the garment industry with 2009/10 exports valued at US\$ 412 million (Worldfish 2010).

**Agricultural output continues to be dominated by paddy rice production, but non-traditional cash crops such as potato and maize production for poultry and animal feed, milk production and sales (goats and cattle), sales of animal meat and vegetables are now appearing in the list of the top ten commodities produced in Bangladesh.** Figure 2.2. shows that in 2012 paddy production accounted for 69% of total output and 63% of the value of the top ten commodities produced in Bangladesh. This was followed by potatoes (11% of output and 10% of value of production).

**Figure 2.2. Bangladesh: Top Ten Agricultural Commodities produced in 2012**



Source: FAOSTAT

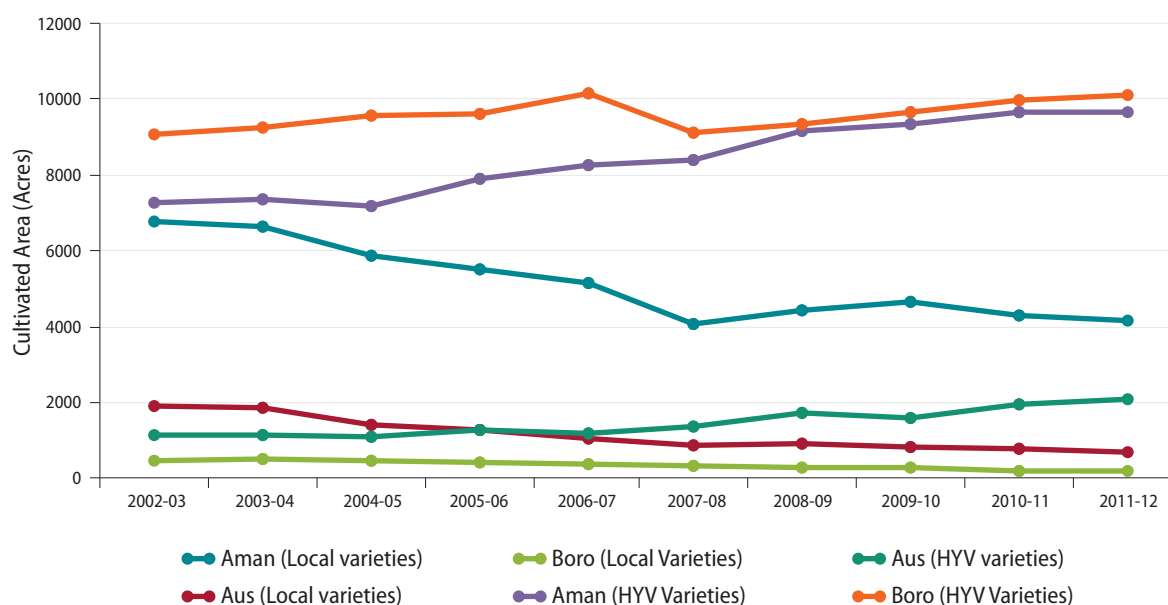
## 2.2. Overview of agricultural production and trends

### Agriculture - Cereals

Since independence in 1971, Bangladesh has successfully managed to move from chronic food shortages to self-sufficiency and to triple its rice production from 10 million Metric Tons (MT) to about 34 million MT in 2012. It is the world's sixth largest producer of rice. This has been achieved mainly by productivity gains through irrigation, the adoption of High Yielding Varieties (HYV) of rice and increased fertilizer use. Today, 8.44 million ha of irrigated crops are cultivated annually, which is over 7 times more than in 1990; HYVs have been adopted in 75% of the total rice cropped area (Bishwajit et al 2013) and fertilizer consumption has increased dramatically due to fertilizer subsidies from 0.36 Kg/Ha in 1995 to 298 Kg/Ha in 2007 (Bangladesh Economic Update 2014).

Over the past decade the cultivated area of HYV paddy has increased significantly while there has been a corresponding reduction in the area of local varieties. In 2002-03, 65% of the total paddy area of 26.6 million acres was devoted to HYV varieties, but by 2011-12 HYV's accounted for 88% of total planted paddy area of 26.9 million acres. Over this period the cultivated area of *Aman* local paddy has shown the greatest decline (Figure 2.3).

**Figure 2.3.** Cultivated area of local and HYV paddy varieties by season (Acres)

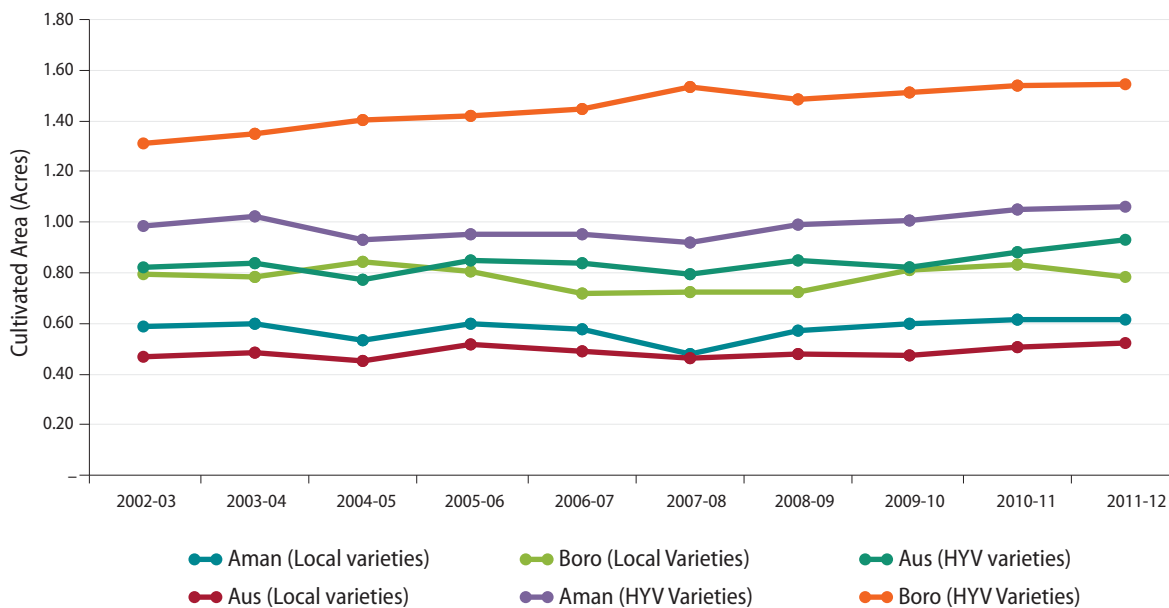


Source: BBS 2014

Average yields of paddy grown in Bangladesh are comparable with other rice producing countries in the region<sup>7</sup> and according to BBS 10 year data 2002-03 to 2011-12, range from about 0.5 to 0.75 MT/Acre (1.25 to 1.85 MT/Ha) for local varieties and between about 1.0 to 1.5 MT/Acre (2.5 to 3.75 MT/Ha) for HYV varieties. The highest average yields are achieved in irrigated *Boro* HYV paddy. Over the past decade average yields of local varieties have hardly changed, but average yields of HYV *Boro* paddy have increased by about 18% over this period (Figure 2.4).

<sup>7</sup> According to FAOSTAT data, Bangladesh rice (paddy) yields are however higher than most South Asian Countries. Rice yield in Bangladesh in 2013 is 4,375 kg/ha, compared to 3,659 kg/ha in India, 3,885 kg/ha in Philippines, 3,134 kg/ha in Thailand, and 5,572 kg/ha in Vietnam.

**Figure 2.4 . Average Yields in local and HYV varieties of Paddy (MT/Acre)**



Source: BBS 2014

**Other cereals include wheat and maize - this latter crop is increasingly cultivated for poultry feed.** The cultivated area of wheat has remained unchanged at about 0.9 million acres over the past decade. Maize which was hardly cultivated 10 years ago has increased to nearly 0.5 million acres in 2011-12. (See Annex 3 for further analysis of paddy, wheat and maize yields).

**While Bangladesh has made major progress post-independence in agriculture, it still faces major challenges of maintaining food security into the future due to its high population growth rate and major exposure to natural disasters and climate change.** Bangladesh’s population is growing at about 1.8 million people per year requiring an additional 300,000 MT of rice a year (Bishwajit et al 2013). Issues relating to natural disasters and climate change and their projected impacts on crop production and yields are addressed further below.

### Livestock and Poultry

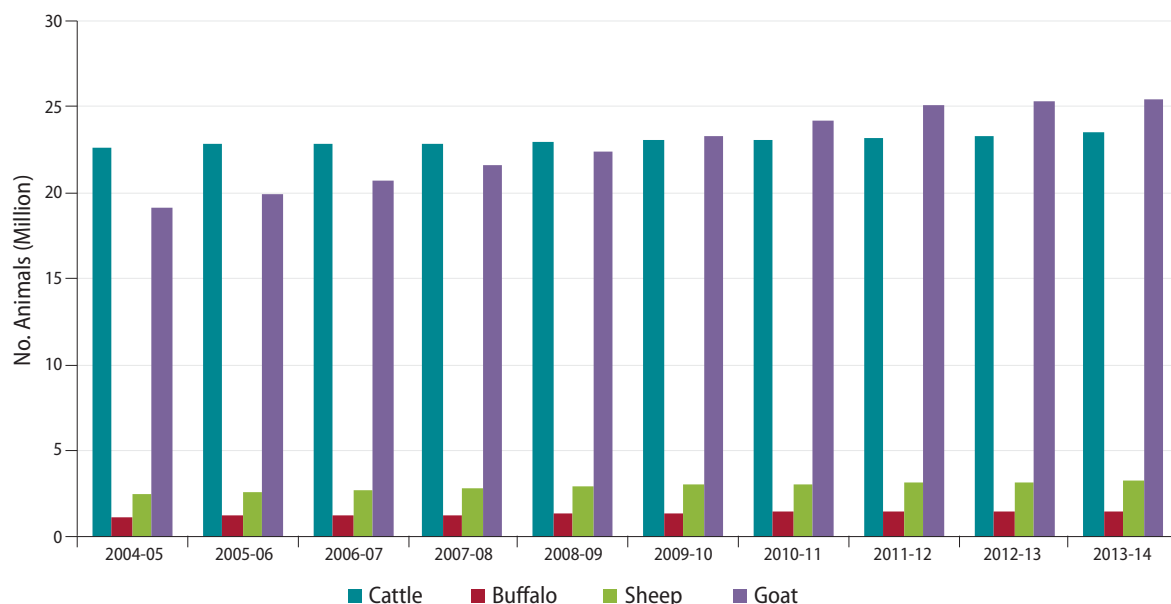
**A high proportion of the rural population is involved in small-scale livestock and poultry production both for on-farm consumption and for sale of meat and hides, milk and eggs.** According to the 2009 national livestock and poultry survey, 10.4 million HHs (36% of the 28.7 million total rural HHs) own cattle with a total of 26.8 million head of cattle and implied average of 2.6 cattle per HH owning cattle and on average 1.5 cows per HH (BBS 2010). The study estimated that only 4.06% of the cattle herd was comprised of improved/crossbreed cattle. Goats are owned by 6.4 million HHs (22% of total rural HHs), with a total of 16.248 million goats and implied average of 2.5 goats per HH followed by much smaller numbers of buffalo, sheep and swine. Chicken are owned by 15.5 million HHs (54% of rural HHs) with 2009 estimated national flock size of 112.4 million birds<sup>9</sup> (average of 7.2 chicken per HH). Ducks are owned by nearly 30% of rural households (BBs 2010). A large proportion of the rural population are involved in small-scale livestock and poultry production both for on-farm consumption and for sale of meat and hides, milk and eggs.

**Over the past decade there have been significant increases in goat and poultry production and ownership while the number of cattle has remained constant.** Figure 2.5 presents Department of Livestock, DLS, statistics for national livestock numbers. Over the past ten years the number of goats has increased from 19.2 million to 25.4 million animals or an average increase of 1.9% per year, while the cattle herd has only increased by about 0.2% per year to about 23 million head of cattle in 2013-14.

8 It is noted, however that the BBS estimate of 16.24 million goats is much lower than the 2008-09 DLS-MOFL estimate of 22.40 million head of goats and reported in BBS 2013 and also much lower than the DLS latest figure for 2013-14 of 25.4 million head of goats as reported in Figure 2.5.  
 9 This compares with DLS\_MOFL’s estimate of 228.0 million chicken in 2008-09 (BBS 2013).

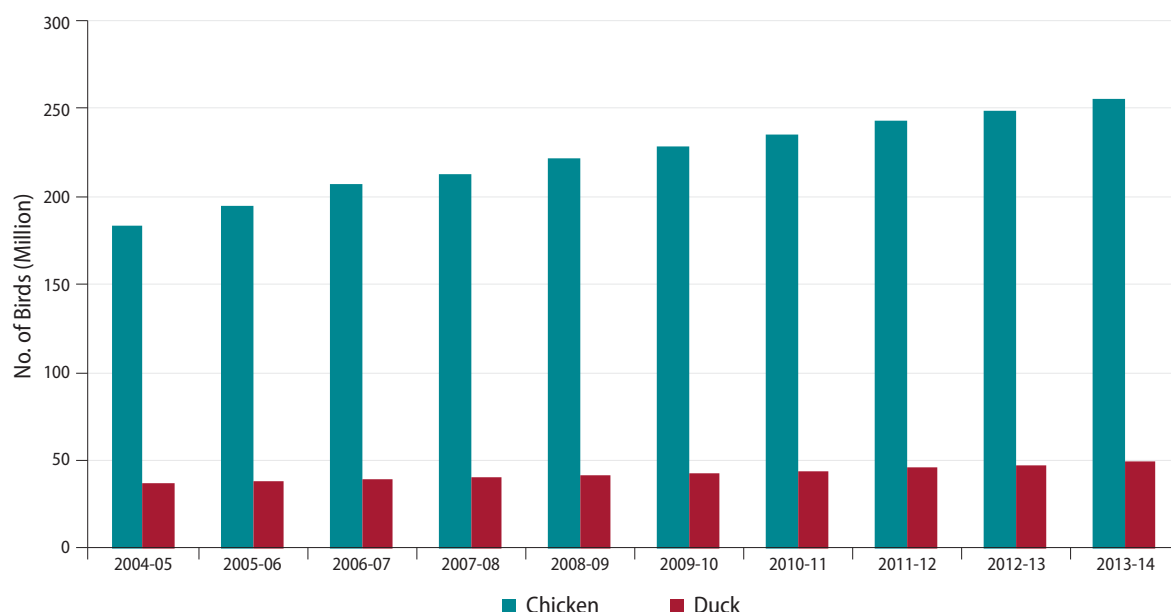
Poultry production and ownership has increased significantly from 184 million birds in 2004-04 to 255 million birds in 2013-14 or an annual average increase of 2.1% (Figure 2.6).

**Figure 2.5. Bangladesh National Livestock Trends past 10 years (Million Animals)**



Source: DLS 2015

**Figure 2.6. Bangladesh National Poultry Trends past 10 years (Million Birds)**



Source: DLS 2015

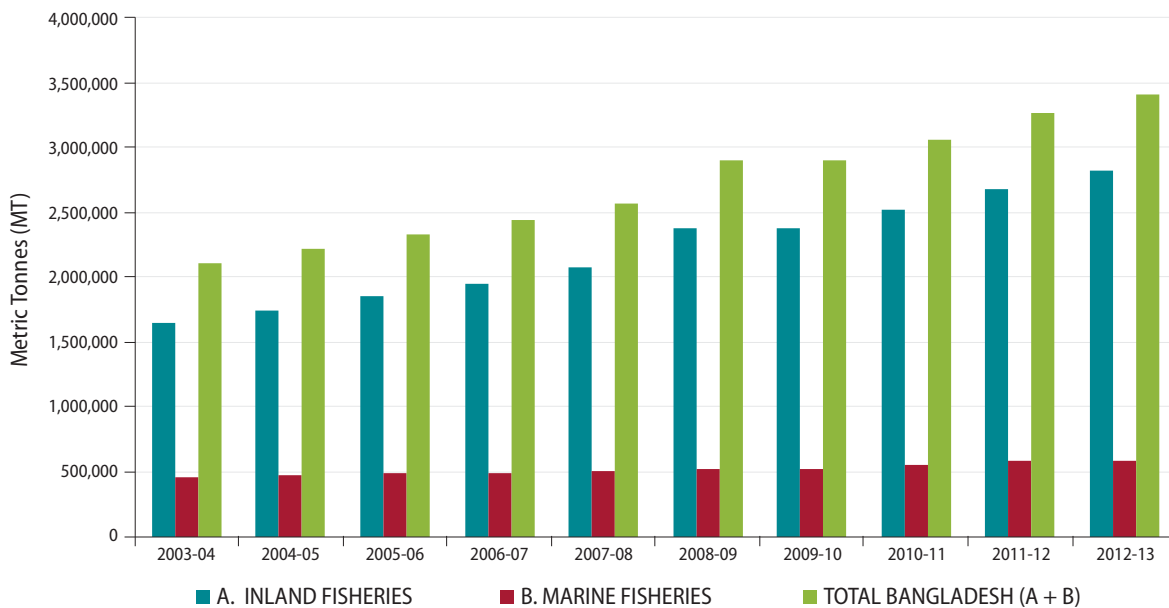
The major challenges for the development of the livestock sector in Bangladesh include lack of feed, incidence of disease and poor genetic stock. The Department of Livestock Services, DLS-MOLF is actively working to address these issues.

### Fisheries

The fisheries sector is very diversified including a marine fishing industry which is dominated by about 60,000 small-scale artisanal inshore fishermen; inland river fisheries (capture) and then a very large aquaculture or fish farming sector including both fresh water pond production of fin fish (carp, tilapia, cat fish and other species) and coastal shrimp and prawn farming. More than 4.25 million HHs are involved in homestead fish pond production.

Over the past decade the fisheries sector has experienced growth rates in production of between 4.8% and 7.3% per year and in 2012-13 the country produced 3.41 million tonnes of fish (DOF 2014) (Figure 2.7).

**Figure 2.7.** Contribution of Inland and Marine Fisheries to Total Fish Production (Metric Tonnes)



Source: DOF 2014

**In 2012-13 the Inland aquaculture or fish farming sector accounted for 1.86 million MT of fish production or 55% of total fish production in Bangladesh.** Fish farming has grown rapidly over the past 10 years from 0.91 million MT (44% of total annual fish production) in 2003-04 to 1.86 million MT (55% of total) in 2012-13. The bulk of the farmed fish is fin-fish accounting for 1.65 Million MT or 89% of 2012-13 aquaculture production, while shrimp and prawn production accounted for 0.20 million MT or 11% of farmed fish production (See Annex 4 for further details).

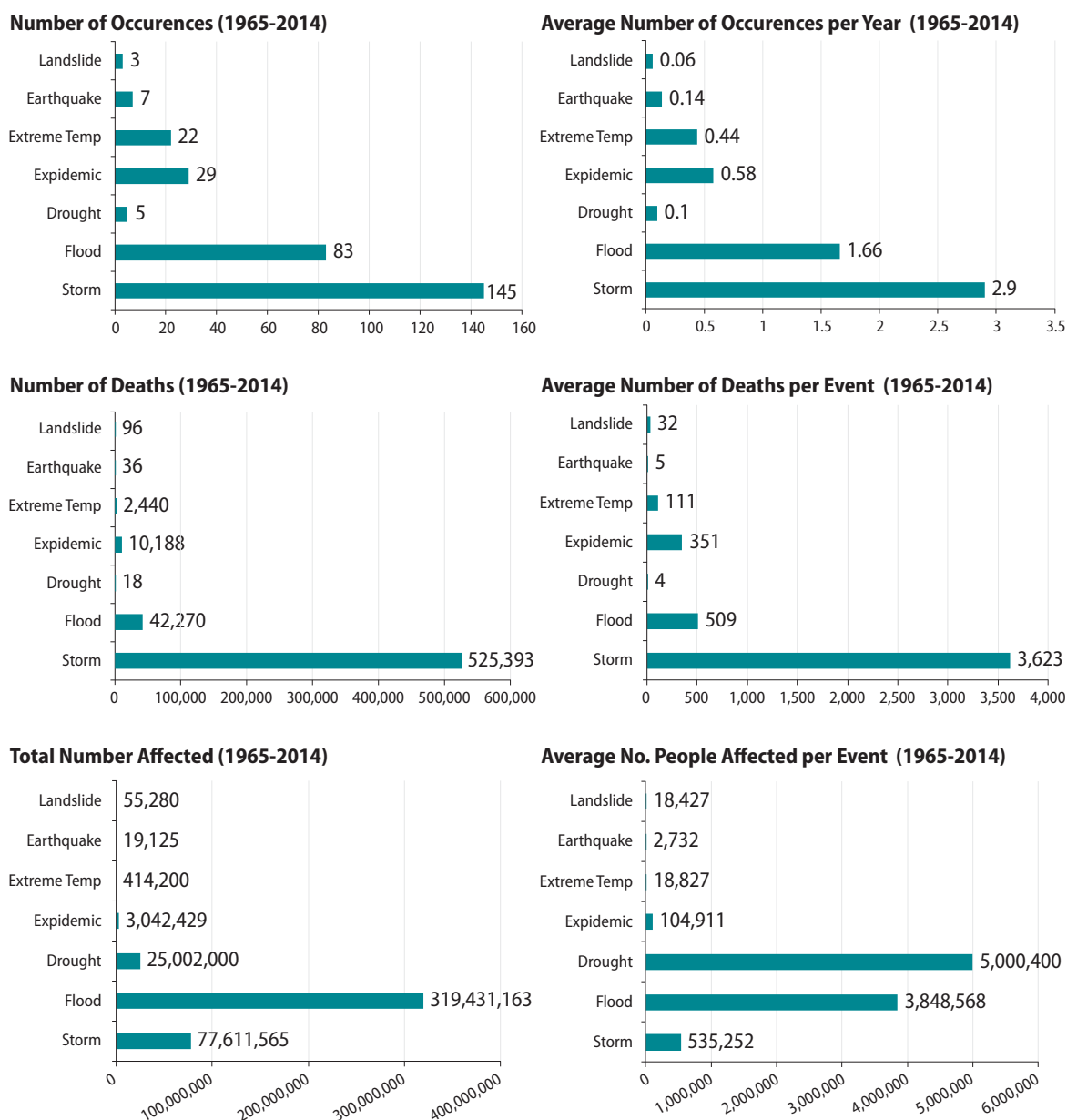
**Black tiger shrimps (*penaeus monodon*) known as Bagda in Bangladesh have been cultivated in since the early 1970's and currently (2012-13 statistics) there are about 300,000 shrimp producers farming an area of about 210,000 Ha.** Salt water shrimp farming is concentrated in the south western coastal regions of Bagerhat, Khulna and Satkhira. Most shrimp are produced in former low lying rice fields (termed *Gher*) using low cost "extensive" cultivation systems where the shrimps depend on naturally produced organisms for their nutrition and annual yields are low and in the order of 160 to 230 Kg/ha. Some shrimp farmers adopt improved extensive or semi-intensive production systems using certified shrimp larvae which are fed on supplementary feeds and annual yields are between 350 to 500 Kg/ha. There are currently only a handful of intensive commercial shrimp farmers who adopt aeration and drainage of water between cycles and adjustments to water quality and who achieve average yields as high as 2,000 Kg/ha. Most of the commercial shrimp hatcheries supplying the industry with larvae are located around Cox's Bazar in the south eastern Bangladesh. Annual shrimp production is currently about 69,000 MT per year (DOF 2014). In addition, giant freshwater prawns (*Macrobrachium rosenbergii*) known as Golda are farmed in about 65,000 Ha with 2012-13 production of about 44,000 MT (DoF 2014). Frozen shrimps and prawns are very important export commodities accounting for 50,333 MT or 81% of the value of all fish exports in 2012-13 (DOF 2014).

## 2.3. exposure to natural disasters

### Natural Disaster record

Bangladesh is one of the World's most exposed countries to natural disasters, including floods, cyclones, droughts, and earthquakes. According to data collected by the Centre for Research on the Epidemiology of Disasters (CRED), over the past fifty years Bangladesh has experienced 145 storm events causing 525,393 deaths (mainly due to storm surge) and affecting 77.6 million people, followed by flooding with 83 recorded events affecting over 319 million people and with 42,270 reported deaths (Figure 2.8).

Figure 2.8. Bangladesh: Reported Natural Disasters and Impacts, 1965 to 2014



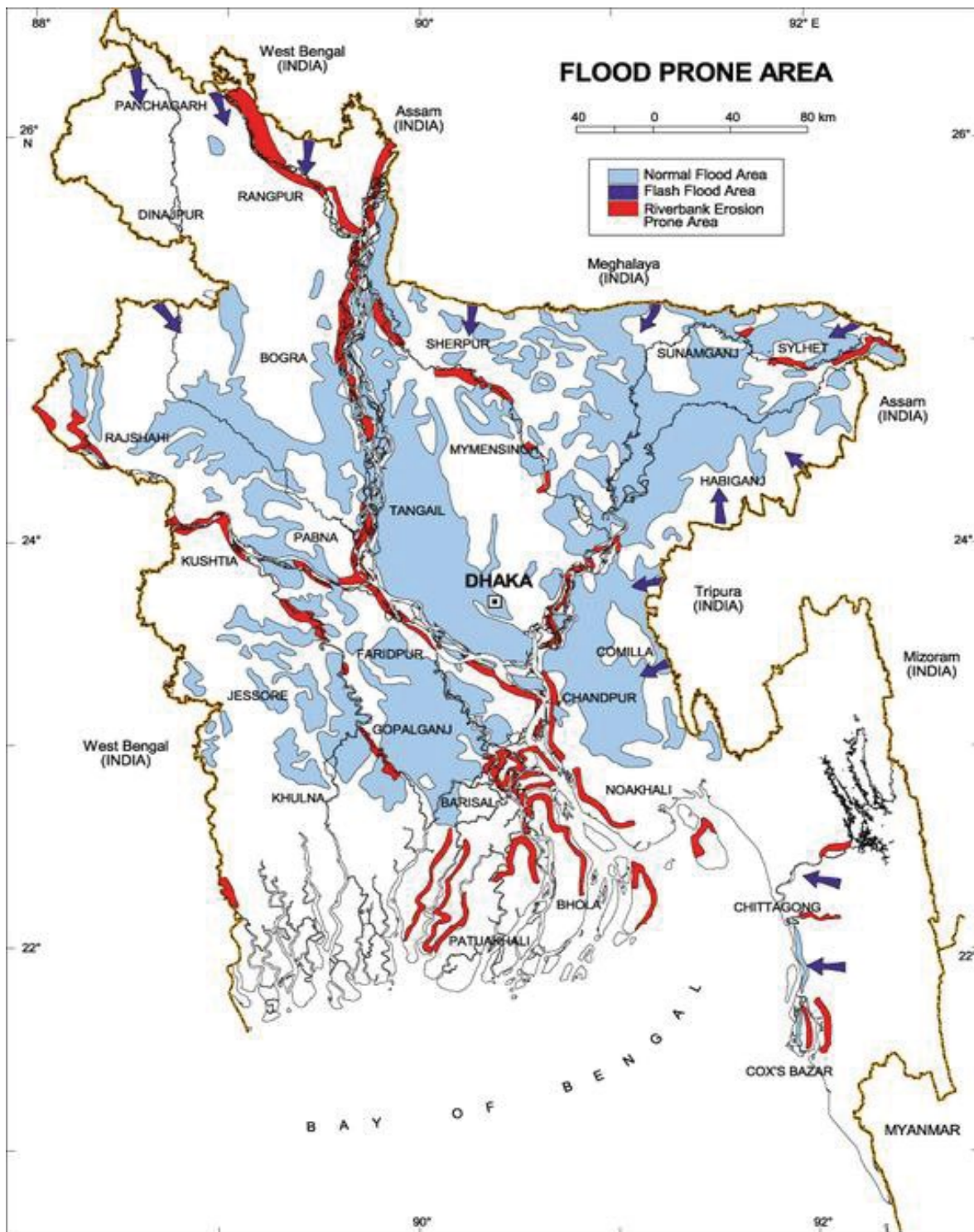
Source: EMDat <http://www.emdat.be/>

**Bangladesh faces a very severe flood exposure.** Eighty percent of the country consists of low-lying flood plains bisected by three major rivers: the Ganges, the Brahmaputra, and the Megna. Flooding is a recurrent event and up to 30 percent of the country is subject to annual flooding during the summer monsoon season, which is generally beneficial to agriculture (See map in Figure 2.9). Major flood events can, however, affect more than 60 percent of the country and cause extreme damage to infrastructure, loss of life, and loss of crops and livestock and fisheries. Recent major floods occurred in 1988, 1998, 2004, and 2007. The 2007 floods directly affected 46 Districts and over 14 million people,



caused 970 human deaths, affected 2.2 million acres (0.89 million hectares) of agricultural land, and caused 1,459 livestock deaths and damage to over 1 million houses and to nearly 31,000 km of roads (Disaster Management Bureau, DMB, 2008).

**Figure 2.9.** Flood Map of Bangladesh



Source: Banglapedia: National Encyclopedia of Bangladesh

Bangladesh is very exposed to tropical cyclones that originate in the Bay of Bengal and that are usually associated with storm surge which can lead to major casualties in the coastal regions as evidenced by the death toll of 300,000 persons in a 1970 cyclone. Over the past 50 years, cyclones have been the major cause of loss of life accounting for 525,393 deaths or 91% of all reported deaths (Figure 2.8). Cyclones also cause major damage to agriculture, and under Cyclone Sidr of 2007, a total of 0.69 million hectares of land were partially or totally destroyed and over 460,000 head of livestock and poultry were killed (DMB 2008).

**Bangladesh is also vulnerable to recurrent droughts, and between 1949 and 1991 droughts occurred in Bangladesh 24 times with 11 very severe drought years,** with a worst drought year in 1979 when 42 percent of the area of the country was affected (DMB 2008) According to another source, between 1960 and 1991, droughts occurred in Bangladesh 19 times: very severe droughts hit the country in 1951, 1961, 1975, 1979, 1981, 1982, 1984, 1989, 1994, 1995 and 2000 and droughts have typically affected about 47 percent of the country and 53 percent of the population (ADPC & FAO 2007)<sup>10</sup>. Reference to Figure 2.8 shows that on average slightly over 5 million people have been affected by each reported drought event over the past 50 years. The western regions of Bangladesh are most susceptible to drought.

**In addition, there is an appreciable hail exposure to agriculture in much of the country, especially at the time of harvest of winter season (Boro) crops.** Other perils include excess temperatures, low temperatures, and crop and animal pests and diseases (World Bank 2010).

**Shrimp (& prawn) production in Bangladesh is highly exposed to tropical cyclone and associated storm surge, flooding and diseases including since 1993 White Spot Disease caused by White Spot Syndrome Virus (WSSV).** WSSV can cause up to 100% mortality in shrimps.

### **Climate change**

**Climate change is identified as a critical factor, which will impact negatively on agricultural crop production and yields in Bangladesh over the next 40 years.** In 2009, the World Bank conducted a study into the effects of climate change on the production of aus, aman, and boro paddy crops in Bangladesh.<sup>11</sup> Over the period to 2050, average CO<sub>2</sub> levels, temperatures and precipitation will increase in the monsoon season, and this will have positive effects on Aus and Aman paddy yields. However, increased precipitation will result in an increased exposure to catastrophic flood events and the overall impact will be to reduce Aus and Aman paddy cultivated area and rice production. The biggest negative impacts of climatic change will be on the production and yields of boro paddy. Sea level rises will also result in lost crop production particularly in southern Bangladesh. The study estimated that overall agricultural GDP would be 3.01 percent lower each year as a result of climate change (US\$8 billion in lost value-added).

**Sea level rises could have devastating consequences to crop production and fisheries (fish and shrimp production) in coastal regions of Bangladesh.** Several recent studies have predicted that sea-level rises of close to 1 meter or more could occur by the turn of the century as a result of, for instance, faster melting of the Greenland ice sheets. A one-meter rise in sea level could, for instance, flood 17% of Bangladesh's land area and affect at least 15 million people, causing the total loss of the *sundarbans* or coastal mangroves resulting in river bank erosion, salinity intrusion, flood, damage to infrastructure, crop failure, destruction of fisheries, loss of biodiversity and loss of livelihoods for the affected farmers, fishermen and salt producers (Mahmood 2011; Hossain & Hossain (undated), Uzzaman undated; IFPRI 2013).

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## **2.4. Impact of disasters on agriculture (damage & costs)**

### **Overall Impact of natural Disasters**

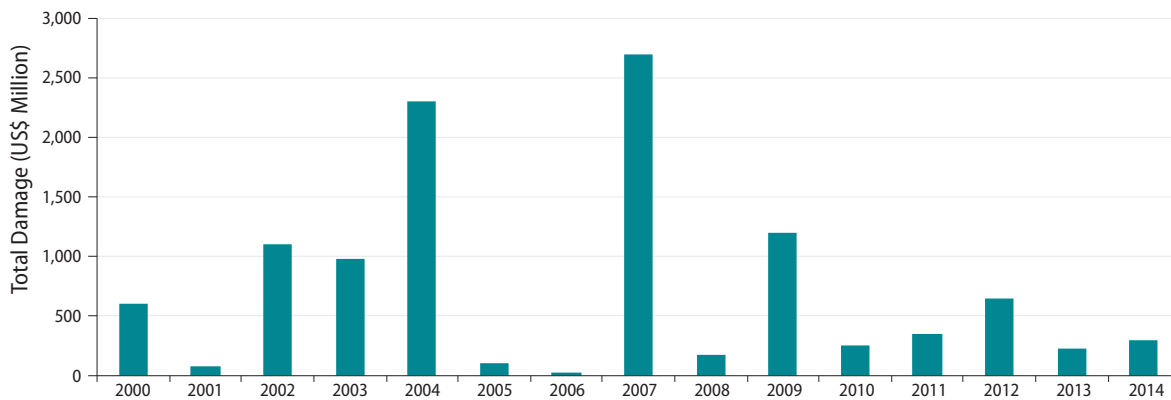
**The costs of natural disasters are very high in Bangladesh.** Over the past 15 years the annual average total damage to property and infrastructure, agriculture and other productive sectors due to floods, cyclones, storms, earthquakes and other natural perils has been valued at US\$ 736 million per year (Air Worldwide and ADPC 2014). Over this period, damage has exceeded US\$ 1 billion in four years: in 2001 due to floods, in 2004 due to floods with losses valued at US\$ 2.3 billion, in 2007 when the damages from Cyclone Sidr were estimated at US\$ 2.7 billion and in 2009 when damages associated with Cyclone Aila amounted to US\$ 1.2 billion (Figure 2.10). Between 2000 and 2013 more than 90% of the total value of damage has been caused by floods and cyclones (Air Worldwide and ADPC 2014).

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<sup>10</sup> The CRED EM-data in Figure 2.7 under-report the true extent of droughts in Bangladesh.

<sup>11</sup> World Bank 2009a, Implications of Climate Change Risks on Food Security in Bangladesh, (draft final), South Asia Region, Sustainable Development Department, ARD, 10 June 2009.

**Figure 2.10. Natural Disasters in Bangladesh 2000 to 2014: Value of Damages (US\$ Million)**



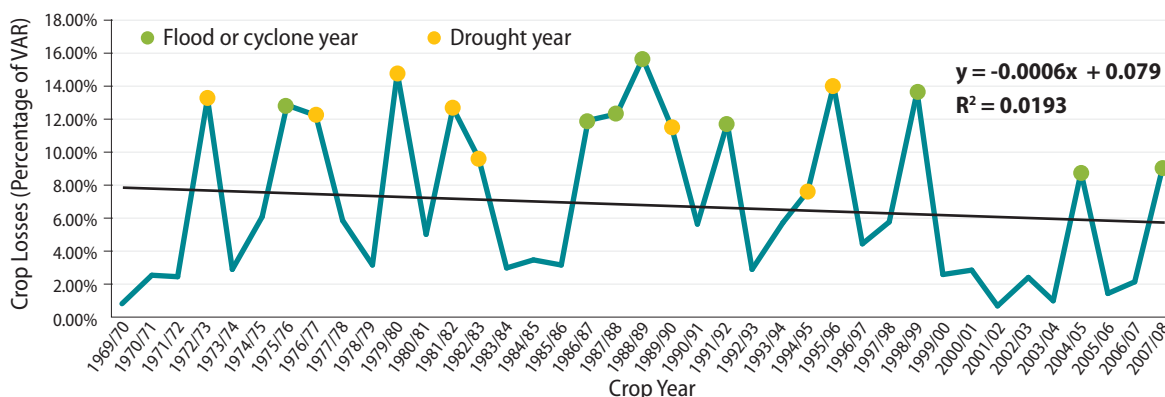
Source: Air Worldwide and ADPC 2014

### Damage to the agricultural crop, livestock and fisheries sectors

#### Crop losses

A comprehensive study for paddy and wheat, the two most important crops grown in Bangladesh over the 39 year period (1969/70 to 2007/08) estimated that on average almost US\$ 375 million or 6.4% of the total value of these crops is lost each year due to a combination of natural disasters including flood, cyclones and droughts. In 2010 the World Bank conducted an analysis of variance in national crop production and yields for paddy (six crops according to variety and season) and wheat for 39 years of crop production data. The study calculated that in a normal or average year the losses in paddy and wheat production and yields due to natural perils are equivalent to 6.4 percent of the value of national production of these crops, or BDT 25.5 billion (US\$375 million). In 1988/89 which was the worst loss year in this 39 year time-series, losses due to flooding were as high as 15.5 percent of the value of national paddy and wheat crop production or BDT 62 billion (US\$910 million). The study noted that in recent years there had been a slight but statistically insignificant trend for reduced crop losses and which may be related to the major investments made by GoB in improved flood control and drainage and crop irrigation infrastructure (Figure 2.11). Finally, the study estimated that the 1 in a 100 year Probable Maximum Loss, PML, for rice and wheat grown in Bangladesh might be as high as 24% of the value of the national crop, equivalent to a financial loss of BDT 94 billion ( US\$ 1.4 billion) (World Bank 2010).

**Figure 2.11. Bangladesh : Estimates of Annual Value of Crop Losses in Paddy and Wheat (as percentage of Value at Risk)**



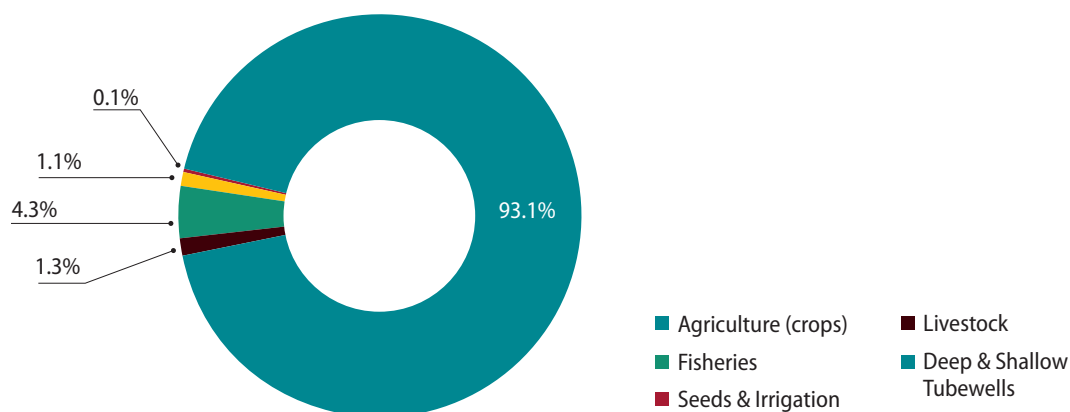
Source: World Bank 2010

#### Bangladesh experienced very severe crop losses during the 2007 Floods (See Figure 2.12).

Floods occurred in 2 waves from 26 July- 7August and 5 to 15 Sept resulting in major flooding Brahma-putra, Meghna and Jamuna river basin areas . In total, 46 districts were affected with about 16 million people or nearly 3 million HHs affected with 649 deaths. The total value of losses in the agricultural crop, livestock fisheries and forestry sectors was valued at BDT 72.5 billion or about US\$ 1.1 billion. In the food and agriculture sector a total of about 1.12 million ha of cropland were either partially or fully

damaged in this flood with severe losses in Aus paddy harvest and Aman planted paddy jute and vegetables with losses valued at BDT 42.2 billion or 93.1% of total agricultural sector losses. For the forestry sector estimated damage and losses was Taka 37.80 million (0.1% of total) which included damage of trees, nursery and infrastructures. Additional damages were incurred to irrigation equipment (pumps, wells, canals etc).

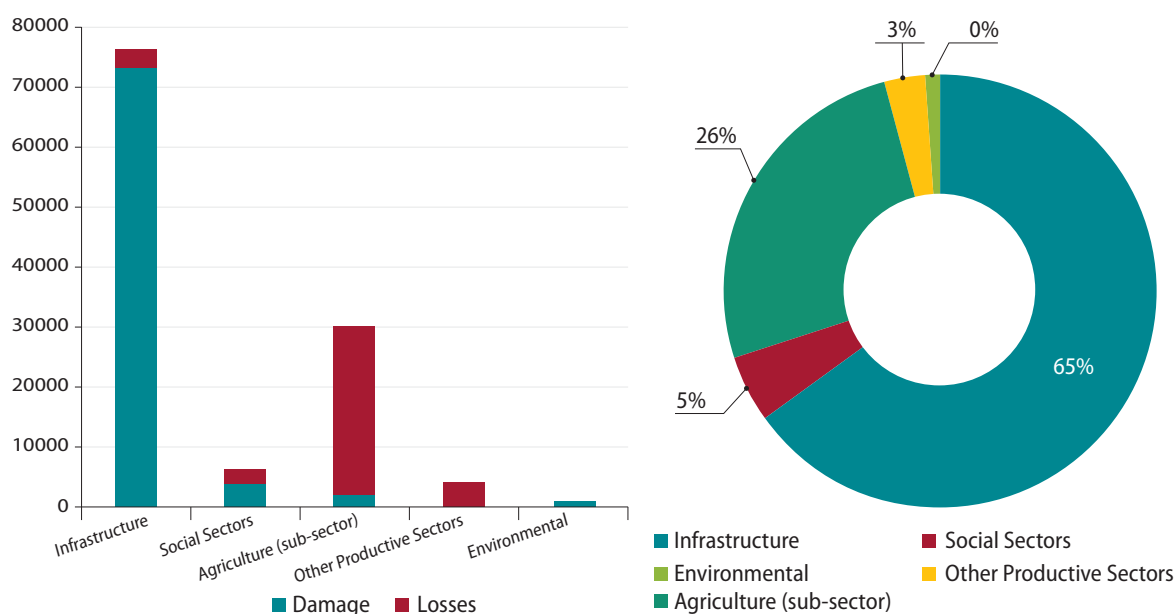
**Figure 2.12. 2007 Flood Losses and Damage to Agricultural Sector (BDT 72.5 Billion; US\$ 1.1 billion)**



Source: DMD/MOFDM 2007

**In November 2007, Cyclone Sidr caused major damage to infrastructure (housing and property) and production losses in the agricultural sub-sector.** Sidr was a Super Cyclone that at landfall on 15 November 2007 was a category 4 storm, with a diameter of nearly 1000 km and sustained winds of up to 240 km per hour and a storm surge between 3.5 to 6.0 metres at different locations. Cyclone Sidr claimed 3,406 lives and 1,001 people were reported missing (GOB 2008). The Joint Damage, Loss and Needs Assessment (JDNLA) preliminary estimate of the damages and losses from Cyclone Sidr amounted to BDT 115.6 billion (US\$ 1.67 billion)<sup>12</sup>. The major damage and losses valued at BDT 73.2 billion (US\$ 1.06 billion) or 65% of total values were incurred by the infrastructure sector including housing, transport, electricity and water, followed by the agricultural sub-sector with total damage and losses valued at BDT 30.2 billion (US\$ 438 million) or 26% of total values (see Figure 2.13 a and b) (GOB 2008).

**Figure 2.13. Cyclone Sidr Value of Damage and Losses by Sector**

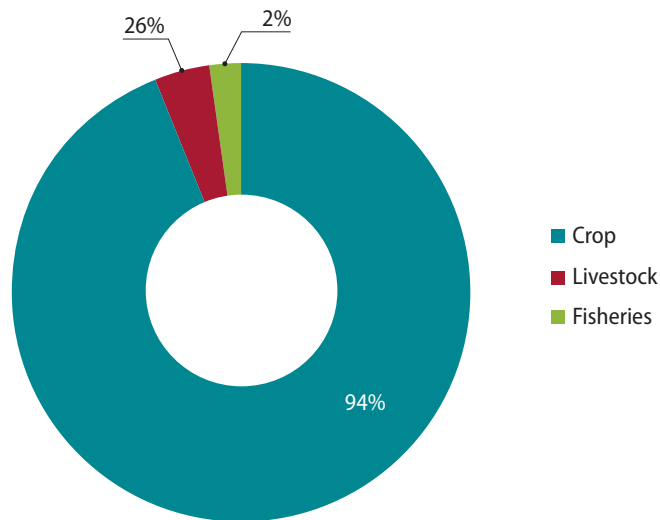


Source: GOB 2008

<sup>12</sup> It is noted that these preliminary estimates of damage and losses from Cyclone Sidr were subsequently revised upwards by US\$ 1 billion to US\$ 2.7 billion.

The crop-sub sector was severely affected by Cyclone Sidr: 2.2 million families were affected with losses valued at BDT 30.2 million (US\$ 438 million) or 94% of the total value of damage and losses in the agricultural sector (Figure 2.14).

**Figure 2.14.** Cyclone Sidr: Damage and Losses in the Crop, Livestock and Fisheries Sub-Sectors (Percent of Total Values BDT 30.2 billion)

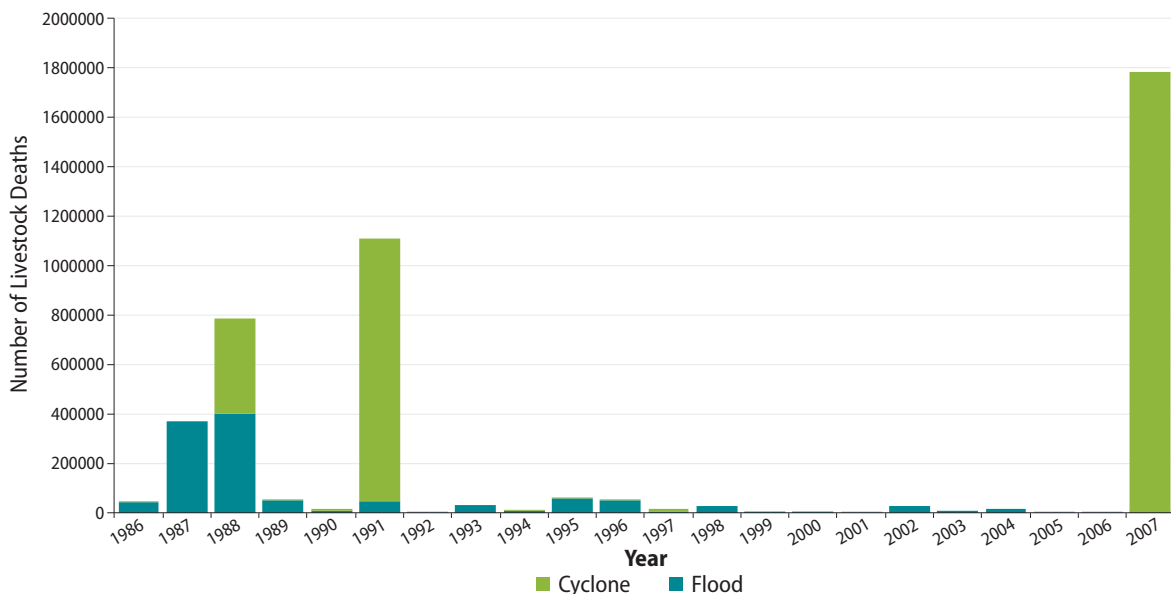


Source: GOB 2008

### Livestock losses

**Severe losses are also incurred in livestock during major cyclone and or flood events.** According to BBS reported data between 1986 and 2007 a total of 1.1 million head of livestock (cattle, water buffalo, sheep, goats and poultry) were killed by floods while a much higher figure of 3.2 million animals were killed by cyclones and associated storm surge. The largest single loss of livestock was reported under Cyclone Sidr in 2007 with 1.78 million dead animals (Figure 2.15).

**Figure 2.15.** Livestock losses due to Flood and Cyclones (No. of Heads)



Source BBS

**For livestock the value of losses includes not only the market cost to replace the dead animal, but also the loss of production and income from sales of output.** In the case of the 2007 floods, the livestock losses included deaths of animals and poultry due to drowning and loss of milk, meat and egg production and infrastructural damage to cow sheds etc valued at BDT 609 million (1.3% of the total losses in the agricultural sector (DMD/MOFDM 2007). Under Cyclone Sidr most of the livestock

losses were caused by tidal surge that drowned the animals and poultry. There was also destruction of animal and poultry sheds and fodder and pasture. The estimated value of damage to the livestock sector was BDT 1.3 billion (US\$ 19.3 million) or 4.4% of agricultural sector total losses (GOB 2008).

### **Fisheries sector**

**Cyclones and associated storm result in high losses in the fisheries sector.** For example, Cyclone Bhola in 1970 led to between 0.3 and 0.5 million human deaths, while approximately 20,000 fishing boats were also destroyed.

**Under the 2007 floods the fisheries sector losses were estimated at BDT 1,965 million (4.3% of total) which included losses from fish fingerlings, fishes, shrimp, and fisheries infrastructures (DMD/MOFDM 2007).**

**Cyclone Sidr in 2007 caused extensive damage to southern districts including the most important shrimp producing areas located in the south west of the country.** Sidr caused damage and losses to ponds, *dighis* and *ghers*, damage to fishing boats and nets and losses of capture fish and fish farmed fish and shrimps. Damages and losses in the ten most badly affected districts were provisionally estimated at BDT 463 million (US\$ 6.7 million) or 1.5% of total agricultural sector losses.







# 3. Government policies for agriculture and disaster management

## 3.1. Government policy and expenditure on agriculture

In order to ensure food security and to reduce poverty, the GOB is committed to achieving self-sufficiency in food through sustainable growth of the agriculture sector as envisaged in the National Strategy for Accelerated Poverty Reduction (NSAPR), the National Agricultural Policy (NAP) and the Millennium Development Goals (MDGs). Adopted in 1999, the NAP aims at creating an enabling environment for sustainable growth of agriculture and focuses on: (1) Developing and harnessing improved technologies through research and training, (2) Increasing productivity and generating income and employment by transferring appropriate technologies and managing inputs, (3) Promoting competitiveness through commercialization of agriculture, (4) Establishing a self-reliant and sustainable agriculture adaptive to climate change. GOB has taken several steps in order to increase agricultural productivity and to ensure fair price of crops and agro-products. In particular, emphasis has been given to investments in expansion of irrigation facilities, removal of water logging, drainage system in low lying areas (*haors*), production and supply of high quality and high yielding seeds, fertilizers, integrated pest management, mechanization of agriculture, agricultural extension, agricultural marketing, agricultural credit, women's participation in agriculture sector, agricultural education, and training.

**The 2014-15 budget for the Ministry of Agriculture is about 1.5 billion USD<sup>13</sup>, and most of the resources are focused on subsidies for fertilizer, seeds, irrigation and other agricultural inputs.** Over the past few years the Ministry of Agriculture budget has been between 5 and 9% of national budget, and reached nearly BDT 15,000 Crore or 2 bn USD in 2012 (Table 3.1). For 2014-2015, the proposed allocation to agricultural input subsidies was Tk. 9,000 crore or 1.2 billion USD. Seeds are produced and distributed by the Bangladesh Agriculture Development Corporation (BADC) while fertilizers are distributed through union and block level sales representatives. Over the past year, agricultural input assistance cards have been provided to 15 million farmers which will facilitate the distribution of inputs.

<sup>13</sup> In 2014, sectoral allocation to Ministry of Agriculture was 12 390 crore BDT

**Table 3.1. Annual budget allocation to the Ministry of Agriculture**

	2009	2010	2011	2012	2013	2014
Ministry of Agriculture Budget (in Crore Taka)	7,350	8,438	9,760	14,822	12,279	12,390

Source: Budget 2014-2015, Ministry of Finance

**Going forward, a 5-year Agriculture Plan for 2016-2019 sets ambitious targets for agriculture production.** Indeed, in order to keep pace with the population growth, it is estimated that agriculture must grow at a constant rate of minimum 4-4.5% per year. Rice production is therefore planned to increase by 23% over the course of the five year plan<sup>14</sup>. Given Bangladesh's shrinking land resource base, GoB plans to achieve these targets through an increase in agricultural productivity. Particular attention will be given to develop and adopt technologies and improved agricultural practices and make available quality inputs (seed, fertilizer, chemicals and implements) in ecologically vulnerable areas such as saline, flood and drought prone locations. Strategic priorities of the 5-year plan are further described in Box 3.1.

### Box 3.1. Bangladesh Agriculture Five Year Plan (2016-2020)

Bangladesh Agriculture Five (2016-2020)	
<b>Sustainable Agriculture</b>	Integrated pest management (IPM) program will be intensified through pest's surveillance, monitoring and early warning against pest attacks, advisory service to farmers and quality control of pesticides
<b>Crop Zoning and land use</b>	Focus will be given on comprehensive land use planning through integration of economic, ecological, social and cultural values in production program.
<b>Agricultural inputs</b>	Emphasis will be given on creating facilities and infrastructure support for hybrid seed production and marketing (including training for farmers and investment in research).
<b>Precision agriculture and use of water resources</b>	Precision agriculture will be promoted to ensure optimization of inputs use and maximization of returns while preserving resources and reducing environmental risk. Irrigation efficiency will be ascertained and modern water management technology will be promoted to enhance irrigation efficacy and water productivity through optimal use of available water resources.
<b>Good practices</b>	Standard setting, certification and accreditation will continue to be the main focus for safe food production and marketing at local and export markets.
<b>Farm mechanization</b>	GOB will support field demonstration of agricultural tools and machinery, will provide subsidies on key machinery, and training to operators and mechanics.
<b>Post harvest management</b>	GOB will support agro-business facilities for handling, storage, processing and packaging of farm products
<b>Value chain</b>	GOB will improve marketing services with a view to ensuring fair returns to the growers for their produces. The establishment of HORTEX, a private board for value chain promotion for high value commodities, is an important institutional development.
<b>Agricultural credit</b>	Lower interest rate for agricultural credit especially for pulse, oilseed and spice crops will be continued
<b>Research</b>	Priority will be given to address the problem areas (hills, coastal, haor and barind areas) that are more prone to weather vagaries and that have proportionately high populations of poor and vulnerable people.
<b>Extension</b>	Extension services will address skill gap, productivity gap and agricultural diversification. Research-extension-farmers linkages will be further strengthened.
<b>Women</b>	Access to infrastructure services, information, skill and knowledge development training, credit and other business development services will be promoted for women

Source: Bangladesh Agriculture Five Year Plan (2016-2020)

<sup>14</sup> Rice production to increase from 43mmt to 53 mmt over the 5-year plan.

## 3.2. Government policy for disaster management and fiscal costs of disasters

**Bangladesh's natural disaster management system has significantly improved over time, especially since the 1991 cyclone that claimed nearly 140,000 lives.** This has been the result of a gradual shift from a response-based approach to a strategy that incorporates elements of greater emergency preparedness and risk mitigation. Bangladesh's Poverty Reduction Strategy Paper<sup>15</sup> provides for strengthening disaster management and risk reduction, mainstreaming Disaster Risk Management into national policies and developmental processes, and enhancing community capacity for disaster preparedness and risk reduction. However, GOB relies heavily on external assistance to finance post-disaster losses.

**Bangladesh has developed a National Plan for Disaster Management (NPDM) 2010-2015.** The NPDM outlines a model to guide disaster risk reduction and emergency response management efforts and is based on three components: (1) Defining and re-defining risk environments, (2) Managing the risk environment, (3) Responding to the threat environments. In addition to this plan, several Standing Orders have been adopted in 2010 in order to define role and responsibilities of all stakeholders<sup>16</sup>.

**The institutional framework for disaster risk management includes a variety of stakeholders both at national and sub-national level (see Box 3.2).** At the apex level, the National Disaster Management Council is multi-sectoral and inter-disciplinary, with public, private and civil society participation and provides policy guidance towards disaster risk reduction and emergency response management in Bangladesh. The Ministry of Food and Disaster Management (MoFDM) through the Disaster Management Bureau (DMB), is responsible for coordinating Bangladesh's national disaster management plans and programs across all ministries, agencies (including NGOs), and sectors. The Directorate of Relief and Rehabilitation (DRR) under MoFDM assists the Ministry of Food and Disaster Management on policy formulation and implementation of programs/ policies. At sub-national levels, disaster management activities are coordinated mainly by the District Disaster Management Committee (DDMC), the Upazila Disaster Management Committee (UZDMC) and the Union Disaster Management Committee (UDMC).

**Government response to disasters is mainly based on assessment of needs collected through the "D form" (See Annex 1).**

**The MoA and MoFL are responsible under their own budgets for providing affected farmers, fishermen, and livestock owners with post-disaster medium- and long-term financial assistance after major natural cyclone, flood, or drought events, which are declared a disaster.** Field extension staff of these ministries are responsible for assessing damage to crops and livestock, and compensation payments are coordinated through the District administration system. Relief assistance may either be in kind in the form of seeds and insecticides, poultry and livestock, or cash payments.

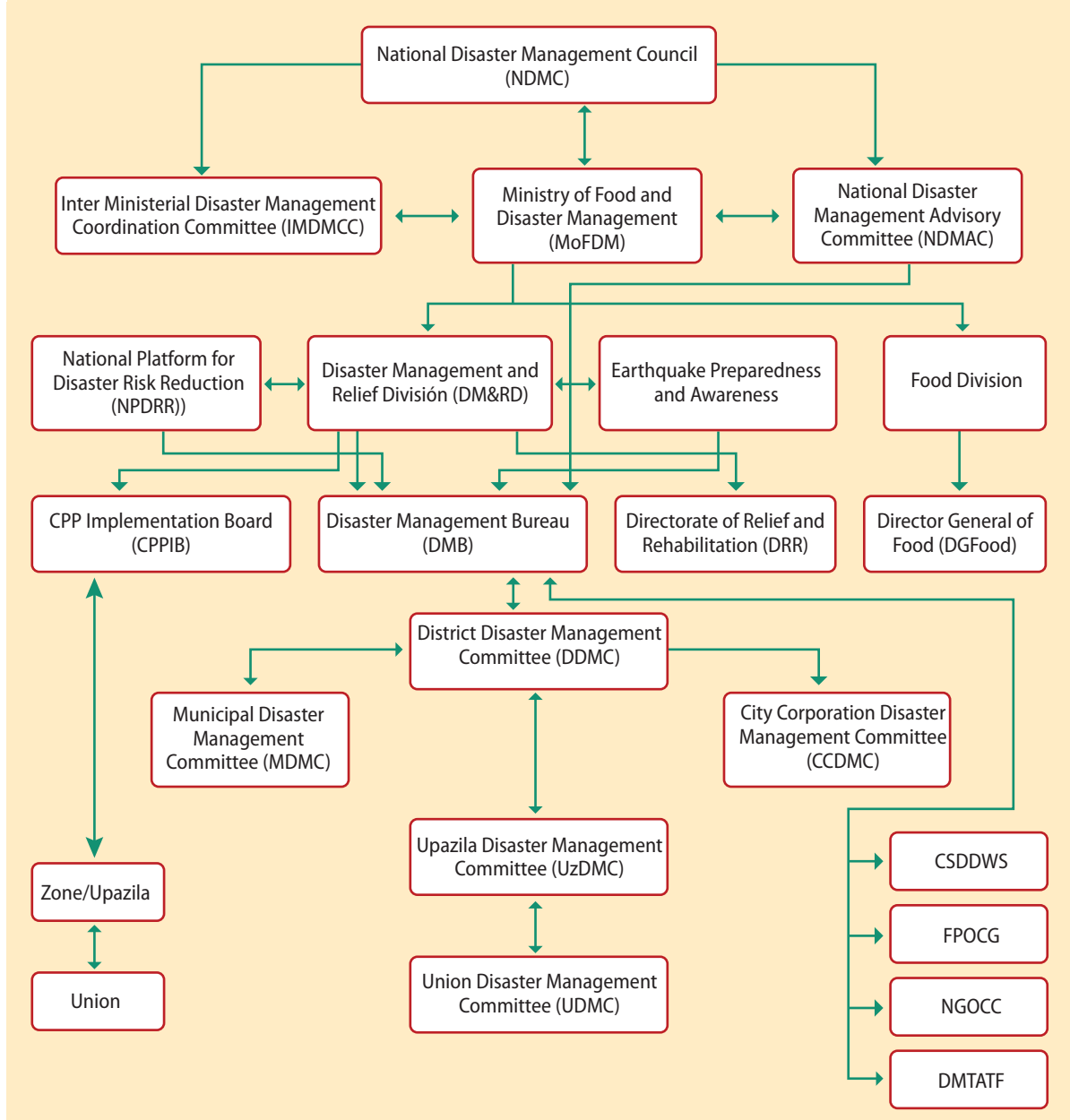
**Disasters in Bangladesh place a significant burden on Government budget and external assistance.** In the aftermath of Cyclone Sidr, recovery and reconstruction needs were estimated at 1.3 bn USD or 28% of Government expenditures<sup>17</sup>. Each year on average since 2000, the Government of Bangladesh and external donors have spent over US\$300 million for natural disasters (See Figure 3.1). Over the same period international donor post-disaster assistance has averaged US\$ 46 million per year rising to US\$ 306 million in the aftermath of Cyclone Sidr in 2007(See Figure 3.2). Tropical Cyclones and floods are the major cause of donor post-disaster expenditures, accounting for 40% and 38% of donor expenditure.

<sup>15</sup> "Bangladesh: Poverty Reduction Strategy Paper", Planning Commission, Ministry of Planning, Government of the People's Republic of Bangladesh, March 2013

<sup>16</sup> "Standing Orders on Disaster", Ministry of Food and Disaster Management Disaster Management & Relief Division, Disaster Management Bureau, April 2010.

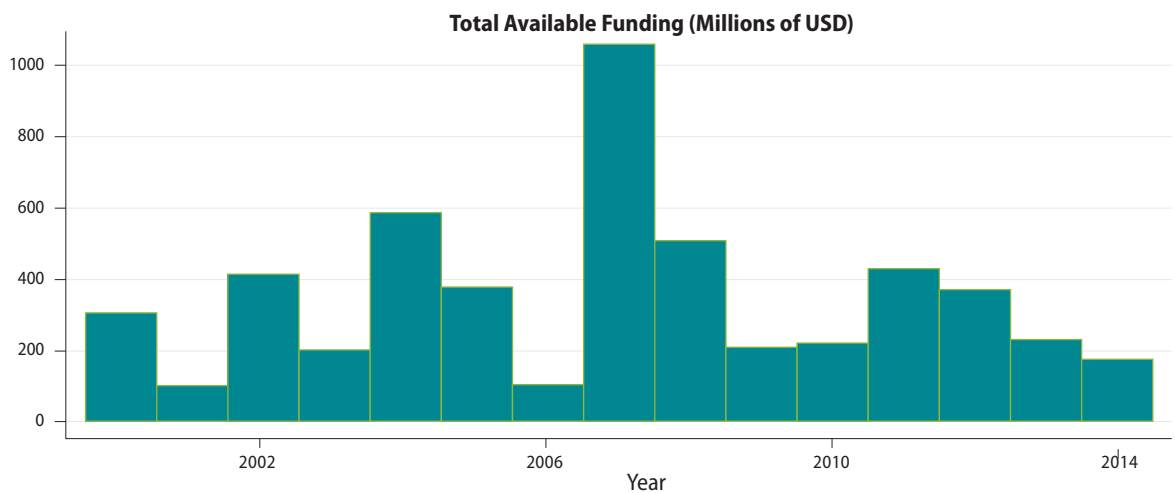
<sup>17</sup> General government final consumption expenditure in 2008 amounted to 4.7 bn USD according to World Bank. It includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.

**Box 3.2. Disaster Management Institutions in Bangladesh**



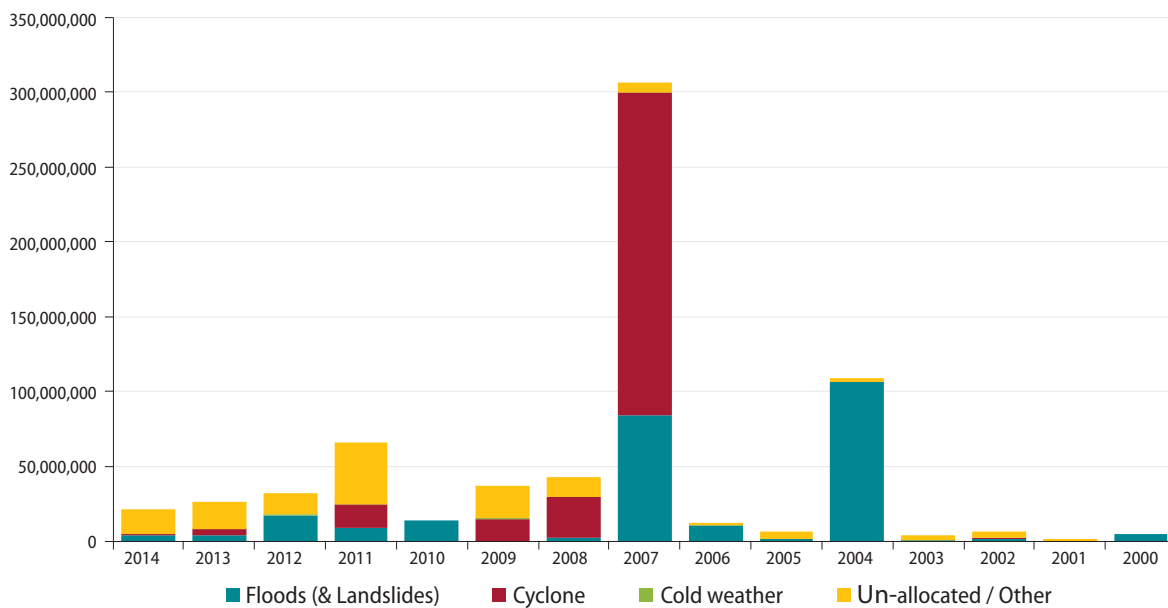
Source: National Plan for Disaster Management (2010-2015), Disaster Management Bureau - Disaster Management & Relief Division

**Figure 3.1. TOTAL Available Funding for natural disasters 2000-2014 (millions of USD)**



Source: Air World Wide and ADPC. Years 2000, 2001, 2013 and 2014 do not include disaster-related foreign aid.

**Figure 3.2. Costs of International Donor Assistance by Type of Disaster 2000 - 2014 (US\$)**



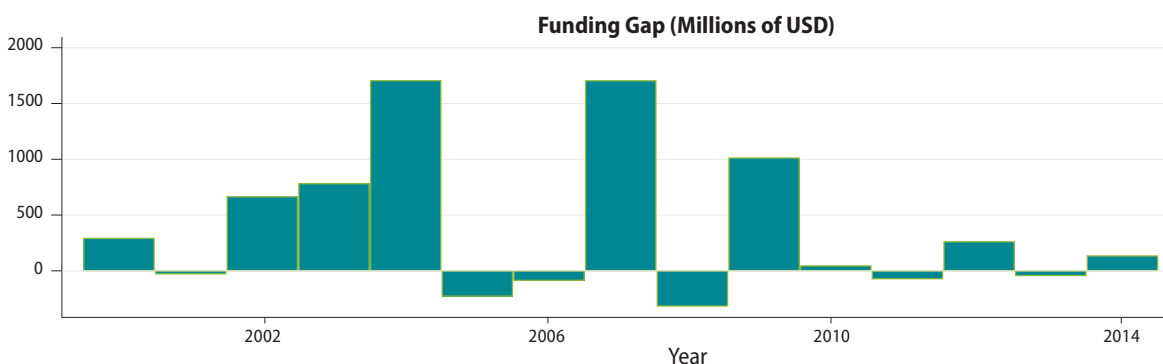
Source: <http://fts.unocha.org>

**Post-disaster Government expenses also include support to PKSF, the microfinance apex institution created and funded by GoB18, which provides soft loans to vulnerable families after disasters.** PKSF has provided soft term loans for reconstruction and rehabilitation through various programs such as the Disaster Management Fund since 1998, the Southwest Flood Damage Rehabilitation Project (SFDRP) after the 2000 flood, the ‘Special Assistance for Housing’ (SAHOS) and the Rehabilitation of SIDA affected Coastal Fishery, Small Business & Livestock Enterprises (RESCUE) in 2007. A summary of these programs is provided in Table 3.2. Under the Disaster Management Fund only, PKSF has disbursed an amount of Tk. 97.95 crore (12 million USD) to its POs for 203,946 flood-affected members. These funds have been used for house repairing purposes, reconstruction/repairing of latrines and purchase of productive assets, emergency food and medicine.

**Post-disaster Government expenses also include waivers of principal and interest after natural disasters.** Detailed data on the amount of these expenses has been requested to Bangladesh Bank and will be presented in the technical report.

**While the Government and external donors spend large amounts of money in the aftermath of disasters, the funding gap is still high and can reach more than USD 1.5 billion in bad years.** Indeed, an analysis conducted by AIR Worldwide in 2014 estimated that the funding gap for Bangladesh in 2004 and 2007 was above USD 1.5 billion (See Figure 3.3).

**Figure 3.3. Natural Disasters and Funding Gap in Bangladesh 2000-2014 (in millions of USD)**



Source: Asian Development Bank, Air WorldWide, ADPC– Capacity Building for Disaster Risk Finance, 2014

18 PKSF receives grants and loans provided by the Government of Bangladesh and PKSF’s Development Partners through the Government of Bangladesh.

**Table 3.2. Government support to microfinance sector (PKSF) after disasters**

Program/Project	Project/Programs Objective	Project implementation		Budget (up to) October 2009		Service charge		Size of loan (Tk)
		Start	End	Allocation	Expenditure	PO	Beneficiaries	
Disaster Management fund (DMF)	Operating vulnerable areas to support disaster beneficiaries	1998	Continued	8 Core		0.5%	4%	5000
Socio-economic Rehabilitation Loan Program (SRLP)	Rehabilitation of Flood 2007 Affected members	June 2000	June 2004			1.5%	4.5%	3000
Livelihood Restoration Program (LRP)	Rehabilitation of Monga/ flood/man made disaster affected members	1 Year		10 ml US\$ (Tk 70cr)		0.5%	4%	3000
Rehabilitation of SIDR Affected Coastal Fisheries Small Business and Live-stock Enterprise RRESCUE)	Providing credit to restart income generating activities and self-employment opportunities of the cyclone affected members	Nov 2007	Continued	130 Crore Taka	108 Core	1%	4%	Up to 1,50,000
Special Assistance for Housing of SIDR affected Borrowers	Providing financial support for repairing of construction house	Nov 2007	Sep 2008	50 Cr	34 Crore	0%	0%	Highest 15,000/=
Emergency 2007, Flood Restoration and Recovery Assistance (EFRRAP)	Rehabilitation of Monga/ flood/man made disaster affected members	Nov 2008	Dec 2010	15 ml US\$	67.75 Crore	0.5%	4%	5,000/=

Source: National Academy for Planning and Development, Initiatives and Achievements in Managing Disaster for Micro Finance Sector: Public Sector Stewardship of Palli Karma Shahayak Foundation in Bangladesh







# 4. Agriculture credit landscape

## 4.1. Structure of credit market in Bangladesh

**Bangladesh is a long-time pioneer in providing financial services to the poor.** Financial inclusion activities started before the independence of the country in 1971 with the development of rural co-operatives under the Bangladesh Academy for Rural Development (BARD). After independence, the Bangladesh Rural Advancement Committee (BRAC) started providing microcredit to the poor together with a range of social services, making it today the largest NGO in the world reaching more than 126 million people<sup>19</sup>. In 1983, Grameen Bank pioneered a microfinance model based on group lending, which has been replicated globally and today reaches millions of people with a particular focus on women.

**Along with the formal banking sector, a variety of non-banking financial institutions, cooperatives, microfinance institutions and other government and non-government financial institutions provide financial services to the poor.** As can be seen in Table 4.1, banks are the main providers of credit to lower income people covering 85% of total loan outstanding, however microfinance institutions, MFIs have the largest networks and covered nearly 24 million clients in 2012. Mobile financial services are rapidly growing in Bangladesh, with main provider bKash reaching currently 14 million customers through a network of 100,000 agents, after 3 years of operations.

**Table 4.1. Contribution to Financial Inclusion by types of financial institutions in 2012**

Institution/Programme	Loan Outstanding (Million USD)	Percent of GDP	No. of Clients (Millions)
Financial Banks	54,960.68	478.54	9.67
Non-banking Financial Institutions	3,308.54	2.86	
Microfinance Institutions	2,598.68	2.25	23.82
Grameen Bank	1,038.99	0.89	8.40
Government Programmes	222.0	0.19	0.80
Cooperatives	376.43	0.32	8.50
Mobile Banking	670.01	0.60	2.83
Total	63,175.33	54.64	54.02

Source: MRA-2012, Bangladesh Bank, Grameen Bank, Ministry of Finance

<sup>19</sup> BRAC website

**Financial services are regulated by five financial bodies in Bangladesh: Bangladesh Bank (BB); the Microcredit Regulatory Authority (MRA); the Department of Cooperatives; the Insurance Development Regulatory Authority (IDRA); and the Securities and Exchange Commission (SEC).** Bangladesh Bank regulates banks and financial institutions and is the lead agency on financial inclusion. The Microcredit Regulatory Authority regulates licensed microfinance institutions (MFIs), as established under an Act of Parliament in 2006.

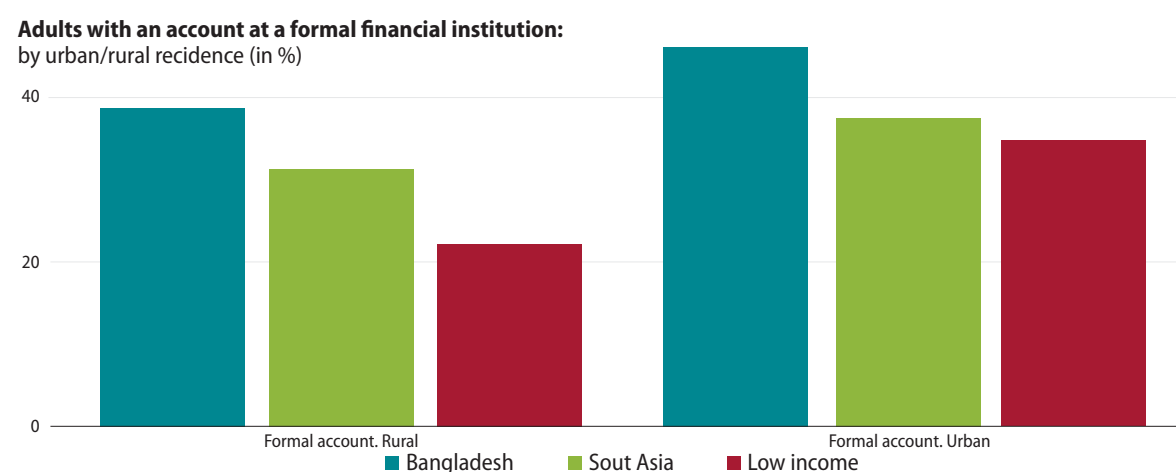
**Constraints to the development of agricultural insurance Five key players dominate the micro-finance market, which altogether reaches 25 million clients.** Although 649 licensed MFIs are registered, the top ten MFIs account for 87% of total loans by value and just 3 companies, Grameen Bank, BRAC and ASA account for 72% of total loans by value (Table 4.2). The gross loan portfolio amounts to US\$ 4 billion, while savings amount to US\$ 3 billion. In 2013, microfinance institutions reached 24.6 million clients, including 93 percent of women, through more than 14,000 branches.

**Table 4.2. Top ten Bangladesh MFIs outreach indicators**

MFI name	Gross Loan Portfolio (USD)	Number of active borrowers	Deposits (USD)	Number of depositors
Grameen Bank	1,117,452,369		1,909,329,042	
BRAC	992,533,141	4,361,591	384,808,714	6,331,374
ASA	763,555,799	4,444,461	365,462,022	
BURO Bangladesh	176,748,360	841,475	57,785,120	1,323,113
TMSS	125,842,031	745,401	42,942,000	907,216
JCF	88,248,949	297,753	32,296,143	406,334
SSS	84,533,954	365,667	44,065,345	474,920
UDDIPAN	59,929,865	280,451	22,032,196	408,371
PMUK	42,442,738	199,419	19,323,307	244,787
Shakti	41,811,668	410,870	12,495,340	651,089
Top Ten	3,493,098,874	11,947,088	2,890,539,229	10,747,204
Total MFIs	4,000,000,000	16,400,000	3,000,000,000	13,800,000

Source: Mix Market, 2014

**Figure 4.1. Financial inclusion in Bangladesh in rural and urban areas compared to selected peers**



Source: Demircig-Kunt and Klapper, 2012.

**While financial inclusion in Bangladesh is high compared to selected peers in South Asia and Low Income Countries, 60% of adults are still financially excluded (See Figure 4.1.).** According to the World Bank's Global Financial Inclusion (Global Findex) Database, 40% of the adult population had a formal account with a bank in 2011 and about one-fifth had taken out a loan in the last 12 months. Most of the financially excluded live in rural areas, and are dependent on agriculture for their livelihoods.

## 4.2. Access to rural and agriculture credit

**The Government and Bangladesh Bank have introduced several successful initiatives aimed at facilitating rural and agriculture credit.** These initiatives range from direct provision of financial services to enabling regulation, target-setting and monitoring and indirect financing (see Box 4.1).

**In order to serve rural areas, the Government has created two specialized banks: Bangladesh Krishi Bank (BKB) in 1973 and Rajshahi Krishi Unnayan Bank (RAKUB) in 1987.** These banks are the main providers of agriculture credit and together account for 40% of agriculture lending<sup>20</sup>.

**In addition, non-specialized banks are required to open branches in rural areas, to develop agriculture and rural lending and to open bank accounts to farmers with minimal requirements.**

Private and foreign banks are obliged to disburse at least 2 percent of their total loan portfolio as agricultural loans- including 60% to be targeted to crops/harvest sector - and often meet this requirement through onlending to microfinance institutions. The maximum interest rate for loans disbursed under this agriculture and rural credit program is 13%, although there is a concessional rate of 4% for specific crops and activities (pulses/lentils, oil seeds, spice, salt farmers in coastal areas). In 2013, Private and foreign banks accounted for 43% of agriculture lending<sup>21</sup>. In issuing new branch licenses to banks, BB has been following a policy of requiring at least one in every five new branches to be in rural locations with a view to making banking services physically closer to the rural population. Moreover, in order to cover un-served farmers by the commercial banks, BB has requested state owned commercial banks to open bank accounts for farmers free of charge with minimal requirements (initial deposit of 10 Taka). These accounts are being used to disburse government input subsidies to farmers and also facilitate small savings, revolving loans and remittances. In particular, a refinance scheme of 2 billion taka (25 million dollars) for 10-taka account holders harmed by natural disasters has been set-up. In 2013, about 10 million bank accounts for farmers have been opened<sup>22</sup>. In addition, BB, has also introduced several customer protection measures such as the simplification of loan application forms, a 10 day maximum period for crop loan applications and the requirement to inform customers on reasons for not granting the loans.

**Disbursement targets for financial institutions are set on a yearly basis by BB which has allowed 3.31 million farmers to receive agricultural and rural credit amounting to Taka 145 Billion (about US\$ 2 billion) in FY2013.** This is quite significant compared to a total of 15 million farm households. Among these farmers, 2.44 million were small and marginal farmers, 0.44 million were women and about 6,000 were sharecroppers from less developed and neglected areas (i.e. char, haor, coastal belt etc.). Bank Bangladesh carefully monitors credit disbursement and recovery process, with the mobile phone number of each borrower being collected for direct monitoring.

**The GoB and BB also support rural and agricultural credit through refinance facilities and budget support to microfinance<sup>23</sup>.** In 2009, Bangladesh Bank launched a re-financing scheme of Tk. 5 billion (US\$ 64 million) revolving fund for the neglected sharecroppers in partnership with Bangladesh Rural Advancement Committee (BRAC). This refinancing facility is mainly used for short term crop cultivation loans (Tk. 4.5 billion) but also allows medium term loans for purchasing agricultural equipment (Tk. 0.5 billion). Under this program, Tk. 7.38 billion has been disbursed to 578,210 sharecroppers up to February 2013 at a flat rate of 10 percent per annum, with no collateral requirement. BRAC has been operating this program in 250 upazillas of 48 districts across the country. In addition, two other refinance facilities have been set-up to promote the adoption of high margin crops. The NorthWest Crop Diversification project, financed by the Asian Development Bank, ADB, and disbursed by large MFIs (BRAC, Proshika, RDRS and GKF) aims at alleviating poverty of rice farmers in North West division by promoting credit for high margin crops, vegetables and fruits. As of 2014, 186,000 farmers had received credit through this facility. Similarly, the second crop diversification program is a 26 million USD credit facility aimed at promoting the adoption of high margin crops in Khulna, Barisal and Dhaka. Loan disbursement is

<sup>20</sup> Bank Bangladesh Annual report 2013

<sup>21</sup> Bangladesh Bank Annual report 2013

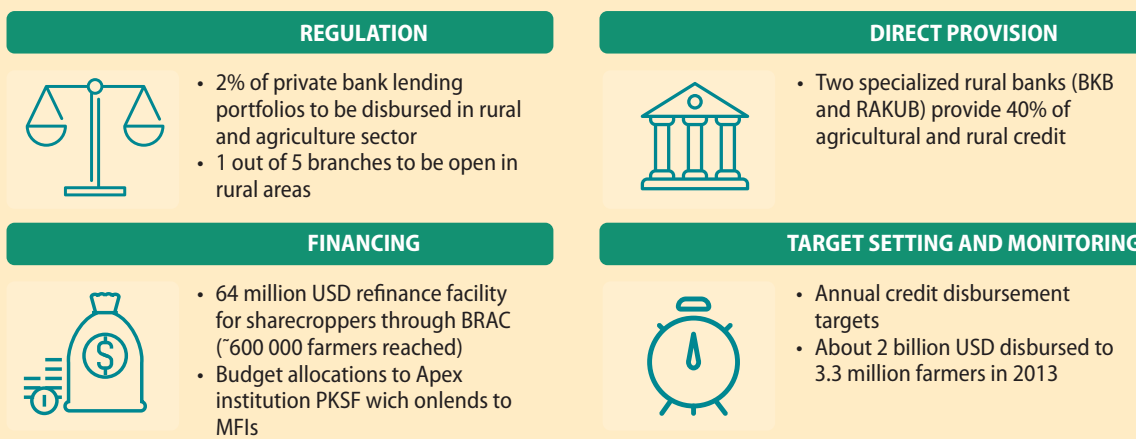
<sup>22</sup> Transactions of approximately Taka 2.94, 1.06, 0.48 and 0.19 billion have taken place as credit disbursement, savings, inward and outward remittances respectively through these accounts in FY13.

<sup>23</sup> Bangladesh Bank, Agriculture and Rural Credit program, 2014-2015

implemented by Eastern Bank, Basic Bank and BRAC MFI. The GoB has also been providing from annual national budgets lending resources to MFIs through PKSF, the apex financing agency for MFIs for rural on- and off-farm self-employment micro and SME credit. See Box 4.2 for further details on PKSF.

### Box 4.1. The role of Government and Bank Bangladesh in supporting agriculture and rural credit

The Government and Bangladesh Bank support agriculture and rural credit through a range of instruments



Source: Based on information from Bangladesh Bank, Agriculture and Rural Credit program, 2014-2015

### Box 4.2.: The role of PFSK in supporting microfinance and agricultural and rural credit

Palli Karma-Sahayak Foundation (PKSF) was established in 1990 by the GoB as a "not for profit company" with the objective of providing funds at subsidized rates to microfinance institutions. It is the leading apex microcredit and capacity development institution in Bangladesh.

- **Microfinance:** It has lent about US\$ 1.5 billion to its 268 Partner Organizations (POs) covering more than 8 million borrowers of which 91% are women
- **Agricultural and Rural Finance:** PKSF started its first Micro Finance for Marginal and Small Farmer Project in 2005. The success of this project led PKSF to design and introduce its Agriculture Sector Microcredit Program in 2008. Under this program PKSF disbursed US\$ 46 million (BDT 3.62 billion) to concerned POs during FY 2012-13. In addition to lending, technical capacity is provided to farmers and staff of the MFIs. In particular, attention is given to research, innovation of high-yielding seed, management of irrigation, optimum use of pesticide, mechanized and technology-based farming and vocational education to produce skilled human resources and increased productivity.
- **Disaster Management Fund:** PKSF also provides funds to POs operating in designated vulnerable areas for supporting to disaster beneficiaries (see more details in section 2). PKSF provides loans to POs at the interest rate of 0.5% per annum and a repayment period of 24 months in two yearly installments. The POs assess the needs of the affected or vulnerable families and provide loans for disaster preparedness and post-disaster rehabilitation at an interest rate of maximum 4 percent and with the typical loan term between 12 to 24 months. The recovery rate of these loans is 100%, and funds recovered are remitted back to PKSF for revolving in subsequent years. Source: National Academy for Planning and Development, Initiatives and Achievements in Managing Disaster for Micro Finance Sector: Public Sector Stewardship of Palli Karma Shahayak Foundation in Bangladesh

### 4.3. Barriers to rural and agriculture credit and potential roles for agriculture insurance

**In spite of Government's efforts, credit to agriculture is still constrained and represented only 3% of total lending in Bangladesh in 2013<sup>24</sup>.** Increasing access to agriculture finance is often the last frontier for financial sector development in developing countries. Financial institutions aiming to develop their agriculture portfolio have to develop expertise in agriculture; address challenges associated with small-scale lending in remote areas; adapt products to agriculture cycles and more importantly deal with related agriculture production shocks and price risks. The exposure of agriculture to a variety of natural disasters—including floods, droughts, and cyclones—is a key constraint to the expansion of agricultural credit. While GoB policy has allowed the development of bank branches in rural areas, rural credit remains limited, as banks transfer 0.5 taka to urban areas for each 1 taka in deposits collected in rural areas<sup>25</sup>. In addition, the expansion of agricultural credit by the largest providers of agricultural loans, BKB and RAKUB, is constrained by the high levels of non-performing loans faced by these institutions. Repeated waivers of interest after natural disasters and before elections have jeopardized the banks' profitability and undermined the repayment culture. While the agriculture and rural credit program of Bangladesh Bank aims at promoting credit to vulnerable areas such as char, alluvial land, haor and coastal areas, exposure to disasters is still an obstacle to the achievement of agriculture and rural credit disbursement targets. In January 2015, 12 banks had disbursed below 25 per cent of their agriculture loan targets as 21 districts in the country had faced flood between July and October of 2014.<sup>26</sup> Finally, while the microfinance sector is a key provider of small loans in rural areas, rural microcredit has remained focused on weekly repayment group loans to the landless poor, which is not adapted to the agriculture crop cycle.

**International experience shows that agriculture insurance can help unlock access to credit for farmers.** In India, financial institutions are required to bundle rural loans with agriculture insurance as a way to secure repayments in case of agriculture shock. Today, agriculture insurance in India covers 34 million farmers or 20% of total farm households. Similarly, in Mexico, credit institutions that receive public support are required to bundle agriculture insurance with their rural loans. Today, this subsidized insurance program covers 300 000 farmers on an area of 2 million ha, with agriculture insurance premiums amounting to US\$ 200 million. However agricultural insurance cannot deliver its benefits when basic agricultural services are not in place. Such services include timely availability of seeds and fertilizers, extension services, and efficient marketing channels so that farmers can sell their products. Agriculture insurance can therefore play a role in unlocking access to credit when integrated in a broader farmer development framework.

**In Bangladesh, initial discussions between the World Bank Group team and lending institutions such as BKB and BRAC have shown that financial institutions are interested in agriculture insurance as a way to better protect their borrowers and their lending portfolios against agriculture shocks.** As a first step, the WBG will conduct a credit risk analysis of the two agriculture development banks' crop loan portfolio against weather risks.

<sup>24</sup> Bangladesh Bank Annual Report 2013 indicates that rural and agriculture lending amounts to Taka 146.67 billion compared to total lending amounts to Taka 4482.15 billion

<sup>25</sup> Between 1996 and 2005 the proportion of loans to deposits in rural branches deteriorated sharply as banks increasingly drained deposits from rural areas to finance urban loans. Source: A. Ferrari.2007."Increasing Access to Rural Finance in Bangladesh: The Forgotten Missing Middle". World Bank.

<sup>26</sup> Source: New Age, January 24th 2015



# 5. Agriculture insurance landscape

## 5.1. Insurance legal and regulatory framework

**The Bangladesh insurance industry is supervised and regulated by the Insurance Development and Regulatory Authority, IDRA, which was recently established under the *Insurance Development and Regulatory Authority Act 2010*.** IDRA replaced the former Department of Insurance under the Ministry of Finance. IDRA's mission is to protect the interests of policyholders and other stakeholders, supervise and regulate the insurance industry effectively and ensure orderly and systematic growth of the insurance industry. The IDRA is funded by all the life and non-life companies through a levy of 0.35% of the amount of gross premium written. IDRA's budget has to be approved by MOF and as such it is not free to act as a truly independent regulator (Axco 2014).

**In Bangladesh, public and private insurance companies are legally bound to operate within the terms and conditions of the Insurance Act 2010 which replaces the former Insurance Act 1938 and subsequent amendments to the Act, most notably, in 1973 and 1990.** The Insurance Act 2010 represents a major attempt by GOB-MOF to strengthen the legislation regarding insurance provision in Bangladesh. The Act does not, however, specifically address agricultural insurance as a class of non-life insurance nor does it address the specific issues relating to index insurance in agriculture.

**The IDRA has identified 50 rules and regulations which need to be passed by parliament in order to enforce the provisions of the Insurance Act 2010<sup>27</sup>.** According to a recent Axco report only 11 of these new rules have been implemented up to now. Enactment of rules requires approval from IDRA, MoF, and parliament (Axco 2014).

**Bangladesh is a tariff market and Insurers are obliged to follow the rates set by the Central Rating Committee, which apply to the principal classes of business: fire, motor, workers' compensation, marine hull and marine cargo.** Other classes, including agricultural insurance, are not subject of tariff rating. The committee operates under the auspices of the IDRA and is headed by its chairman (AXCO 2014).

**In Bangladesh insurance legislation requires that private non-life insurers must place 50% of their reinsurance with the SBC and they are free to place the remaining 50% with international reinsurers.**

**In accordance with Section 6 of the Insurance Act 2010, every insurer will be obliged to provide a minimum percentage of business in the rural or social sector.** Section 6.26 of the "IDRA (Obligations of Insurers to the Rural and Social Sectors) Regulations 2011" obliges life insurers to underwrite

<sup>27</sup> For further details of the new Insurance Rules and Regulations which have been drawn up for Bangladesh see Maxwell Stamp 2011

between 2% (year 1) and 10% (by year 5) of all their policies with rural people involved in crop, livestock, poultry, fisheries and in the social sector (self-employed persons) In the case of non-life insurance companies must insure 5% (by year 5) of all their policies with rural and social sectors (Maxwell Stamp 2011). In the last quarter of 2013, the IDRA issued a circular which required non-life insurers to write policies in this sector for a minimum of 0.1% of their gross written premium. This is likely to have a significant impact in forcing insurers to develop products and services for the rural population and to consider their distributional strategies (Axco 2014).

**Bangladesh also has a growing microinsurance sector, but in this case the products and schemes are not subject to supervision by the IDRA.** Under the terms of the Micro-Credit Regulatory Authority Act 2006, microfinance institutions, MFIs, have been permitted to offer credit linked micro-insurance products to their members including life, health and livestock mortality insurance. GOB is keen to promote microinsurance products for the rural community and for example since 2012, has provided counterpart funding to the Japan Fund for Poverty Reduction, JFPR, funded Developing Inclusive Insurance Sector Project, DIISP which is being implemented by the government backed Palli Karma-Sahayak Foundations (PKSF). The major drawback of these microinsurance programs is that because they are not supervised by or approved by the IDRA they are not eligible for formal reinsurance and instead PSFK has established a catastrophe insurance fund to protect the microinsurance programs against catastrophe losses<sup>28</sup> (Axco 2014).

**PKSF is currently working with the Micro Credit Regulatory Authority, MCRA to draft new micro-insurance legislation which is designed to strengthen the rules and regulations governing microinsurance provision in Bangladesh.** WBG has not had access to the draft microinsurance legislation and we are not able to advise whether there is an attempt to bring microinsurance more into line with mainstream commercial insurance activities.

**The Bangladesh Insurance Association (BIA) represents the interests of all the private insurance companies in the market and it works closely with IDRA on all matters relating to the Bangladesh insurance industry.** The BIA does not, however, represent the two state-owned companies, the non-life insurer, Sadharan Bima Corporation, SBC, and the life insurer, Jiban Bima Corporation, JBC.

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## 5.2. Insurance market Structure

**In 2014 there were 77 insurance companies in Bangladesh divided into 46 general or non-life insurance companies and 31 life only insurance companies (GOB 2014).** Most of the companies are private limited companies, but there are two state owned companies, one life (Jiban Bima Corporation, JBC) and one non-life (Sadharan Bima Corporation, SBC) In 2012 the total market insurance premium volume was BDT 88.68 billion (US\$ 1,058.77 million). Non-life gross premiums amounted to BDT 21.48bn (USD 262.33mn), which was an increase of 11.57% compared to 2011. This compares with life premiums of BDT 65.20 billion (US\$ 796.44 million). Given today's very small insurance market in Bangladesh, the total number of 77 insurance companies is considered far too high by many local practitioners (AXCO 2014).

**Insurance penetration is very low in Bangladesh in comparison with other South Asian countries.** In 2007, the insurance premium in Bangladesh was slightly less than US\$3.0 per capita (0.51% of GDP) and although this had risen by 2012 to US\$ 6.84 per capita, this still represents only 0.94% of GDP. This compares with 1.15% of GDP in Sri Lanka, 3.46% of GDP in India and a high of 4.51% of GDP in Malaysia (Table 5.1) As the urban middle-class in Bangladesh continues to grow, there is the possibility for greater insurance penetration, but with most of the population living on minimal incomes, or outside of the cash economy, the best chance for development may lie with microinsurance products (Axco 2014).

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<sup>28</sup> The PKSF fund is BDT 50mn (USD 641,025).



**Table 5.1. Insurance Penetration in Bangladesh and other selected Asian countries**

	Life including riders		Non-life (P&C)		Personal Accident & Healthcare		Total	
	% of GDP	US\$ / Capita	% of GDP	US\$/Capita	% of GDP	US\$/Capita	% of GDP	US\$/Capita
Bangladesh	0.71%	5.15	0.23%	1.7	n/a	n/a	0.94%	6.84
India	2.86%	43.44	0.45%	6.81	0.15%	2.24	3.46%	52.49
Malaysia	2.89%	299.66	1.40%	145.1	0.22%	22.64	4.51%	467.39
Sri Lanka	0.49%	13.92	0.66%	18.45	n/a	n/a	1/15%	32.37

Source: AXCO 2014

**The top 5 non-life companies by premium volume in 2012 included Green Delta, SBC, Pioneer, Reliance and Pragati.** Green Delta overtook SBC as the largest non-life insurance company in 2010 and in 2012 it had a leading 12.1% of the non-life insurance market. In 2013 the International Finance Corporation, part of WBG, purchased a small shareholding in Green Delta. SBC is in second place with 10.3% of market non-life premium. These five companies were the only companies to generate more than BDT 1 billion (US\$ 12.2 million) non-life premiums and they accounted for 43% of total non-life premium in 2012 (Axco 2014).

## 5.3. History of agricultural insurance in Bangladesh

### Formal Insurance Sector Programs

**Agricultural crop insurance was first introduced into Bangladesh on a pilot basis in 1977 by the state-owned insurance company, Sadharan Bima Corporation (SBC).** SBC offered an individual-grower multiple peril crop insurance, MPCl, product. SBC subsequently introduced livestock mortality insurance in 1981 and then aquaculture insurance (in the mid-1990s). However, on account of poor underwriting results and lack of demand, SBC had terminated these programs by the turn of the century.

**There has been no history of private sector commercial agricultural insurance prior to 2014.**

#### SBC crop insurance:

**Starting in 1977, SBC introduced a conventional individual-grower multiple-peril crop insurance (MPCI) yield-shortfall policy that provided coverage against a wide range of climatic perils, including the potentially catastrophic climatic perils of floods, droughts, and winds and biological perils of pests and diseases.** The program was launched on a pilot basis to individual farmers who were members of cooperatives with linkage to public sector crop credit albeit on a voluntary basis

**Insured crops included rice (Aman, Boro, and Aus), wheat, sugar cane, and jute.** The sum insured was set at 80 percent of the past three-year average yield for each crop on each farm (as declared by the farmer) and valued at the government intervention price for the crop, or in other words a revenue-based valuation. Premium rates were calculated on an actuarial basis, but as these were deemed to be unaffordable for poor farmers, actual premium rates were capped at between 3 percent for wheat and jute and Boro paddy, 4% for Aus paddy and a maximum of 5 percent for Aman paddy and sugar cane<sup>29</sup>. These single premium rates for each crop operated throughout all districts and regions of the country. Loss adjustment was based primarily on “eye estimation” techniques<sup>30</sup>. The amount of indemnity payable was adjusted according to the stage of growth of the crop and amount invested in the crop at the time of loss ranging from 20% for early season sowing losses up to 100% of the sum insured for losses immediately pre harvest.

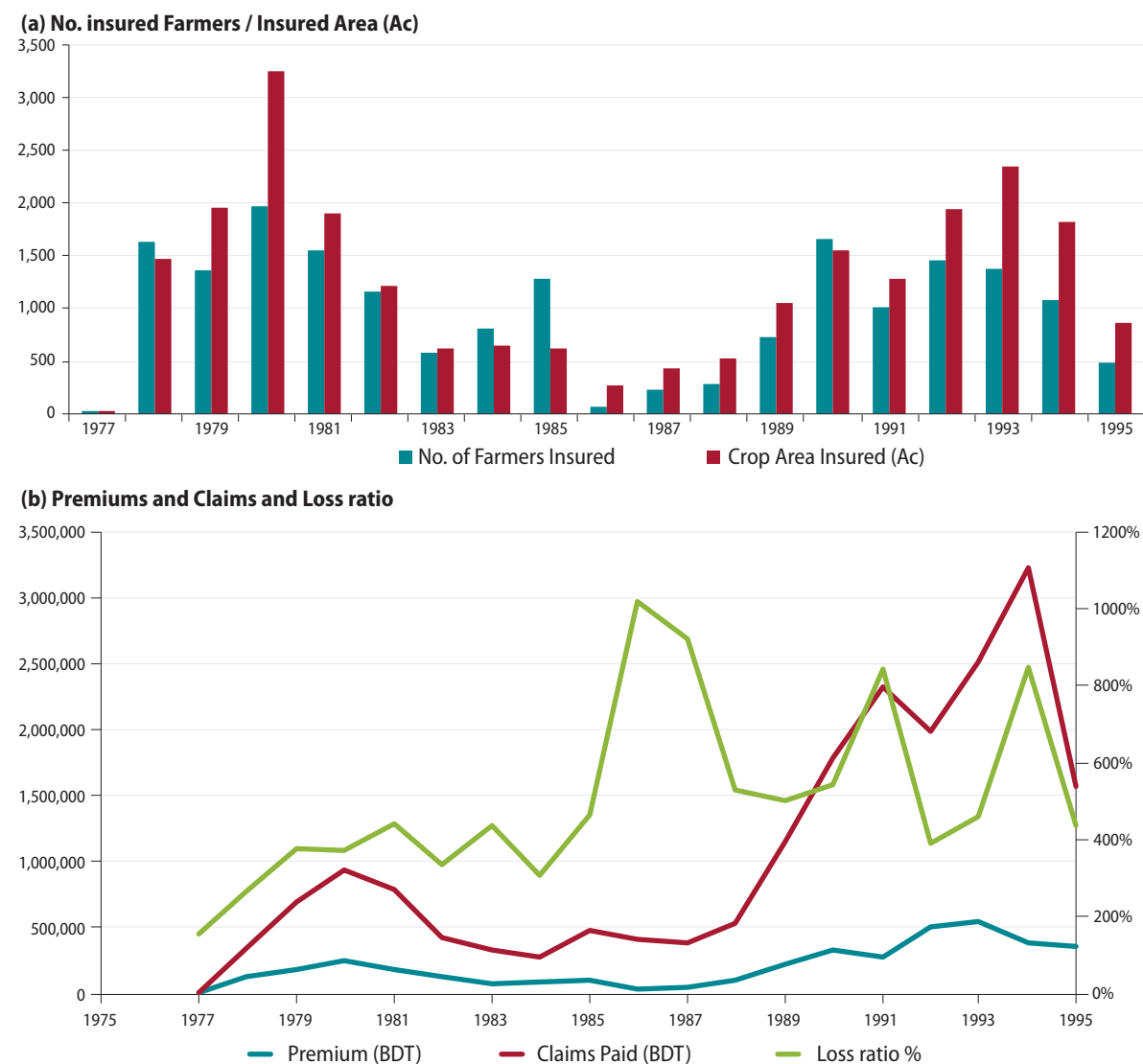
**From 1977 to 1995, the individual grower MPCl programme was insured exclusively by SBC, which retained 100 percent of the losses without any external reinsurance protection, and there was no premium subsidy or other financial support from the government.**

<sup>29</sup> The actuarially determined rates for paddy were: 6% Boro, 9% Aus and 15% Aman

<sup>30</sup> Loss adjustment was conducted by a team consisting of three officials one each from SBC, the agricultural credit agency concerned and the thana extension officer (TEO)

**SBC's budget for the crop insurance program was very limited and it never achieved scale or sustainability.** The annual average MPCl policy sales were only 989 insured farmers with insured area of 1,252 Acres, and the maximum sales in 1980 were again only 1,969 policies and 3,246 ha insured area (Figure 5.1.a). Over the 19 years (1977 to 1995) the crop insurance program experienced very poor underwriting results with a long term average loss ratio of 499 percent: in no year were paid premiums adequate to cover the value of incurred crop losses (Figure 5.1.b.)

**Figure 5.1. SBC Crop Insurance Program Results 1977 to 1995**



Source: SBC results reported in World Bank 2010

**On account of the very poor financial performance the SBC Crop Insurance Program was terminated by government in 1995.** Some of the key reasons which led to the failure of the SBC MPCl program appear to have been (i) low demand for the voluntary program and problems of adverse selection and moral hazard, (ii) technical drawbacks of the policy design including the setting of insured yield coverage levels too high and the capping of premium rates at well below the actuarially required levels, (iii) operational issues including poor control over loss assessment and loss assessment procedures and high administrative costs, and (iv) lack of financial and other support to the program from the Government to effectively market and promote the program, to conduct farmer education and awareness programs and to implement effective control over loss assessment (World Bank 2010).

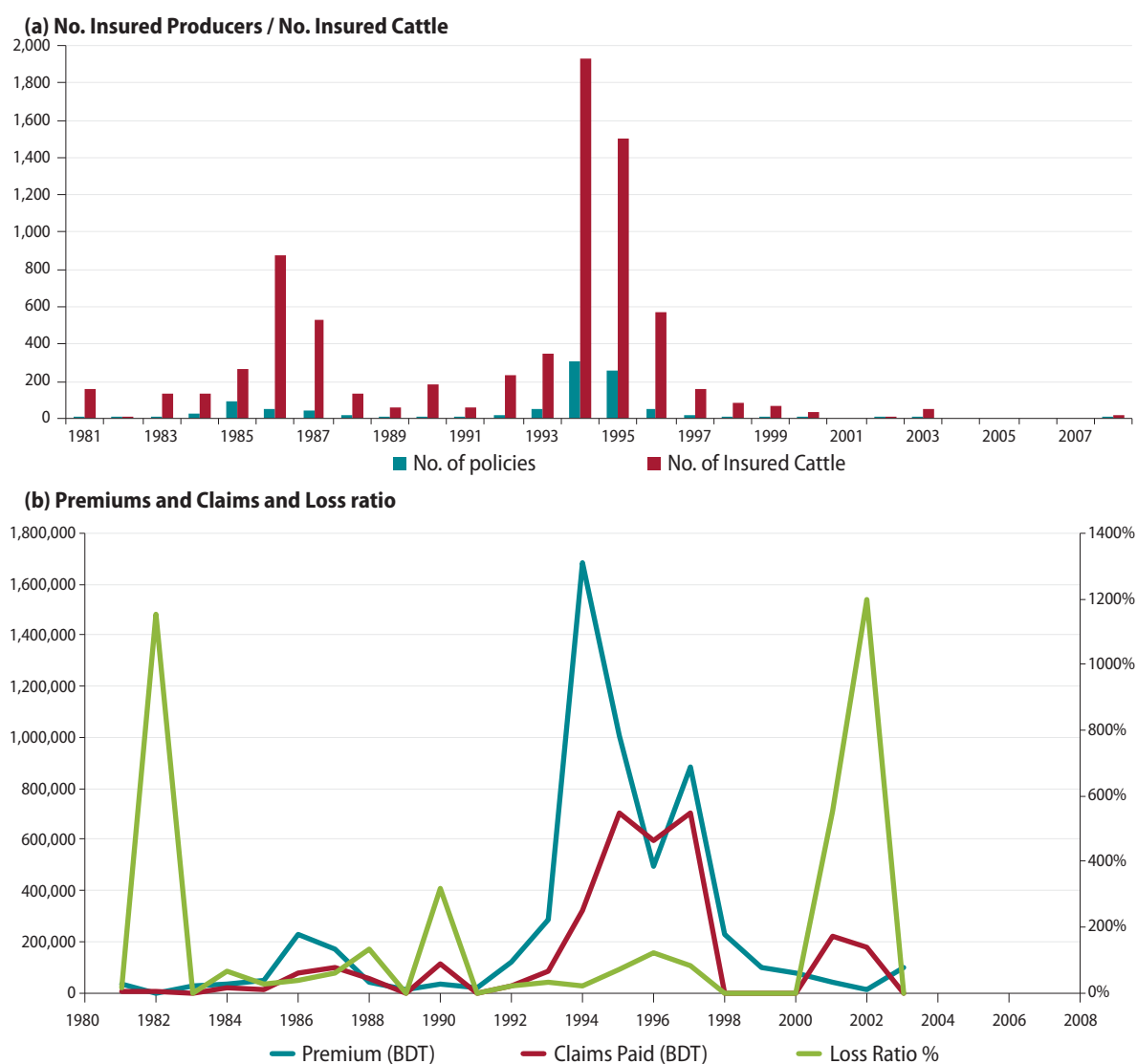
### SBC livestock (Cattle) insurance:

**In 1980 SBC launched a livestock insurance pilot project for cattle, using a traditional individual animal indemnity-based cover.** The policy was linked to cattle loans financed by BKB and other State Commercial Banks.

The policy insured against accidental mortality and diseases in cattle, but excluded epizootic or Class A epidemic diseases, catastrophes, poisoning and starvation of animals and theft. The sum insured was based on the value of the loan and the policy carried a flat premium rate for all insured's that varied over time from a low of 3.0 percent to a high of 5.0 percent. In common with the crop insurance program, SBC did not receive any form of financial support from GOB and the livestock insurance program was not reinsured.

Over the 24 years of operation of the livestock insurance programme (1981 to 2008) the SBC livestock insurance program also failed to achieve commercial scale. SBC issued a total of 1,026 livestock insurance policies with a total of 7,591 head of cattle insured, representing an average of only 45 livestock policies and 330 insured cattle per year (Figure 5.2.a), and generated an average annual premium of slightly below BDT 239,000 (about US\$3,500). Over the same period the program generated underwriting profitability with an annual average loss ratio of 56%. However, in 2002, the worst year the loss ratio was as high as 1200 which demonstrates the catastrophe loss potential on a small livestock insurance program. (Figure 5.2.b). By the early-2000s SBC had effectively ceased underwriting the livestock insurance program.

**Figure 5.2. SBC Livestock Insurance Program Results 1981 to 2008**



Source: SBC results reported in World Bank 2010

### SBC Shrimp Insurance

Shrimp production in Bangladesh is concentrated in the southern coastal region and is highly exposed to floods, tropical cyclones and tidal surges, and diseases of shrimp. The SBC shrimp policy was introduced in the 1990s as a named-peril cover restricted to floods, cyclones and tidal

surges, and diseases were specifically excluded. The policy covered both loss of fish stock (shrimp and prawns) and loss or damage to the shrimp farm installations, buildings, ponds, and feedstock on site. The policy was marketed on a voluntary basis with a fixed premium rate of 0.99 percent of the sum insured, which was based on the input costs (stock, feed, etc.) for each 120-day shrimp production cycle. The programme never achieved the required sales levels, the fixed premium rate was far below the correct technical rate(s), and in the absence of a conventional deductible the product was exposed to first loss. On account of the very poor underwriting results, SBC withdrew this cover in 2004.

### Informal Insurance Sector Initiatives

**Starting in the early 1990s several of the large MFIs began offering livestock-credit insurance to their members, including Grameen and Proshika<sup>31</sup>.** To date, however, neither BRAC nor ASA which are the largest MFIs have offered livestock insurance to their members. Furthermore, up to now, none of the MFIs have provided any form of crop insurance to their borrowing members as they deem agriculture (crop) insurance too risky.

#### Proshika Livestock-credit insurance

**Proshika was the first MFI to introduce a livestock mortality loan protection scheme in 1990 under its Participatory Livestock Compensation Fund (PLCF).** The PLCF was linked on a compulsory basis to Proshika's revolving credit fund for cattle, sheep/goats, and poultry-rearing projects. The PLCF policy compensates against the "sudden death" of insured livestock and poultry during the loan repayment period (usually 12 to 24 months), and it is in effect an all-risk livestock accident and disease policy. The policy did not, however, compensate poor management practices or negligence on the part of the insured. The rates charged by the PLCF were between 3 percent and 5 percent of the purchase price (or loan amount) for cattle and sheep/goats and 10 percent for poultry.

**Between 1990 and 2009 Proshika achieved significant coverage under its livestock-credit insurance program and positive underwriting results.** A total of 11,739 livestock producer groups participated in the program with 140,439 insured cattle and goats (figures exclude poultry). On account of the MFIs ability to exert tight control over risk acceptance and livestock husbandry and sanitation, claims and loss assessment the program experienced sound underwriting results with overall loss ratio of 68% from 1990 to 2006. (Table 5.2). It is therefore surprising to learn in 2015 that Proshika's microcredit and microinsurance operations have been suspended due to severe financial losses<sup>32</sup>

**Table 5.2. Proshika Livestock Credit Underwriting Results 1990-2009**

Item	Results from inception in 1990 up to 21/03/2009
Number of Livestock Producer Groups participating in Livestock Compensation Fund	11,739
Total Sum Insured (Amount of credit disbursed for purchase of livestock) (BDT)	597,735,561
Number of Insured Livestock	140,439
Average Sum Insured per Animal (BDT)	4,256
Subscription (Premium income) (BDT)	31,392,787
Average Premium Rate (%)	5.25%
Number of Dead Animals compensated	4,855
Mortality rate (%)	3.46%
Claims Paid (BDT)	21,300,186
Loss cost (%)	3.56%
Loss Ratio (%)	68%

Source: World Bank 2010 reporting PROSHIKA 2007

<sup>31</sup> In 2009, three other MFIs also offered livestock credit insurance to their members including Pallid Bikes Kendra (PBK) Dust Sashay Kendra (DSK) Gina Unnayan Kendra (GUK)

<sup>32</sup> Personal communication by Micro Credit Regulatory Authority, MCRA

## Grameen Livestock-Credit Insurance

Starting in 1999, the Grameen Fisheries and Livestock Foundation (Grameen Moshto Pashusampad Foundation, GMPF) introduced a livestock-credit compensation scheme for members of its Community Livestock and Dairy Development Project (CLDDP). Livestock producers who accessed dairy cattle investment loans were protected under a livestock mortality compensation scheme provided by the Livestock Insurance Fund (LIF). The LIF programme insured against death of the dairy cow where this was “outside the control of the owner”, and was an all-risks livestock mortality policy. The sum insured was equivalent to the amount of loan taken out to purchase the cow and premium was charged at a rate of 3 percent of the value of the loan. Coverage terminated once the loan had been repaid (usually over a maximum of two years). In addition, a fee of 2.5 percent of the value of the loan was levied to cover the cost of veterinary services, vaccinations, and technical assistance.

**Between 1999 and 2006 the Grameen Bank livestock insurance program insured a total of slightly more than 7,000 dairy cows with an average mortality rate of 2.8 percent and insurance loss ratio of 75%.** The LIF liability was totally retained within GMPF, and the programme did not carry any form of catastrophe reinsurance protection.

**A key operational feature of both the Proshika and Grameen micro-level livestock mortality insurance programs was the presence of village-level para-veterinarians who received training in basic animal health, in providing vaccinations and in artificial insemination.** The para-veterinarians performed a central and low cost role in facilitating livestock insurance provision because they were contracted to ensure animals were properly registered and ear-tagged, they conducted pre-inspections to verify each animal was in sound health and its vaccinations were up to date before insurance cover was granted and in the event of a claim against the policy (accidental injury or death of the insured animal) they were employed to inspect the loss and confirm the cause of death. As such these MFIs faced much lower costs of implementing traditional individual animal livestock mortality insurance schemes for small holder producers, than the formal private commercial insurance companies.

**The main drawback of these early MFI implemented micro-livestock insurance programs is that they did not carry any form of reinsurance protection and they were therefore very exposed to catastrophe events resulting in the death of the livestock (epidemic disease, cyclone and flood).**

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## 5.4. Current initiatives in agricultural insurance

**Following the termination of the SBC agricultural crop insurance program in 1995 on account of very poor underwriting results no public or private insurance company in Bangladesh was willing to underwrite this class of business for nearly two decades.** Several agricultural (mainly crop) insurance initiatives were carried out between 2005 and 2013 in Bangladesh including (i) a national commission led by SBC into alternatives to the former indemnity-based MPCl crop insurance program including the option with ADB of developing weather index-based crop insurance, WIBCI; (ii) two crop insurance studies conducted by the North South University, NSU, (iii) Oxfam UK's research starting in 2009 into flood index insurance for poor households living in flood prone *chat* areas of Bangladesh; (iv) a major 2008-09 World Bank technical study which identified potential opportunities for crop hail insurance in hail prone areas, area yield index insurance, AYII for paddy and major cereals, rainfall deficit WII cover in drought prone areas and possible opening for livestock and aquaculture insurance (World Bank 2010); (v) starting in 2011 IFPRI has conducted research, in collaboration with PKSF, in Bogra district to introduce index based insurance, IBI, against rainfall deficit (drought) in *aman* rice and as a starting point to this work IFPRI conducted an experimental insurance demand-elicitation exercise with more than 300 farmers in Bogra and Maninkganj which found that because farmers are subject to a variety of risks they do not focus on one type of insurance product only, but evenly split their endowment between life insurance, disability insurance and crop insurance (Ahmed 2013; Clarke et al. 2014) and finally (vi) since 2013 the IFC has been working closely with Green Delta Insurance Company to introduce weather index-based crop insurance, WIBI, for selected perils starting with rainfall for selected crops (IFC 2014). Of these initiatives only the Oxfam flood index insurance program is currently operational and in its second full year of implementation as a Meso-level *aman* season river

flood index insurance program - this program is currently offered as a consequential loss or business interruption cover, but in future might be adapted to cover direct losses in specific crops such as *aman* paddy (Oxfam 2013).

**The MFI or informal insurance sector has also been active in promoting microinsurance in recent years.** Research has been led by PKSF which has assisted its MFI Partner Organizations, POs to develop micro life, health and livestock insurance products and programs.

**Key features of these current formal and informal insurance sector initiatives are reviewed further below.**

### **Formal Insurance Sector**

#### **IFC-Green Delta weather index based crop insurance**

**Since 2013 IFC has been working closely with Green Delta Insurance Company to design the first commercial insurance company WIBCI product for Bangladesh.** The focus of IFC's work is on partnering with interested insurance companies and in developing their internal capabilities to design, rate and underwrite crop insurance products and programs. As a starting point, in 2014, IFC has contracted Skymet weather services, India's first private sector meteorological and weather forecasting entity and also a specialist in the design and rating of WIBCI products to develop a historical gridded rainfall database in order to address the constraints with the current rainfall and temperature data available from the Bangladesh Meteorological Department. The gridded data will be used subsequently for weather index insurance product design and pricing as well as loss estimation. As part of this work, Skymet is working closely with BMD to design a rainfall gridded index for all of Bangladesh.

**WBG will provide technical support across the entire value chain including designing and developing the product, training underwriters within Green Delta who will be responsible for pricing and contract design, facilitating access to reinsurance, developing a retail/distribution strategy, providing support to partner financial institutions primarily Banks (incl. development banks) and MFIs in agriculture credit risk tools to help mitigate the risk of lending to agriculture/farm sector among others.**

#### **SBC-ADB-Basix weather index based crop insurance**

**ADB in 2014 has entered into a three year agreement with GoB and SCB the state insurance company to develop a pilot weather index based crop insurance, WIBCI, project initially to cover excess rainfall or rainfall deficit for selected crops and districts in Bangladesh.** Key components of this project include: (i) assistance to the Insurance Development and Regulatory Authority, IDRA, to draft a regulatory framework for implementing index insurance-WIBCI, (ii) financial assistance to Bangladesh Meteorological Department, BMD to finance the purchase and installation of at least 20 Automatic Weather Stations, AWS, to provide timely and reliable data for insurance purposes. (iii) collaboration with agricultural research institutions, BMD and BWDB to provide training and capacity building in the design of WIBCI products, (iii) training for SBC (which will assume responsibility as the lead implementing agency) in the design and implementation of WIBCI products and programs and (iv) provision of WIBCI training for sales and administration staff and staff from the commercial insurance companies and also farmer training programs (Ahmed 2013; ADB 201433). ADB note that the project is designed to reach at least 12,000 farming households during its lifetime. In 2014 ADB has contracted BASIX, an Indian MFI, and specialist in the design and implementation of WIBCI programs to assist SBC in the design and implementation of the Bangladesh WIBCI pilot projects.

**ADB is in discussion with GoB to provide 50% premium subsidies on this WIBCI project in order to make crop insurance more readily accessible and affordable to small and marginal farmers in Bangladesh.** If approved, this will be the first time that GoB has provided agricultural insurance premium subsidies.

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33 ADB personal communication November 2013

## Oxfam-Pragati insurance company Flood Index Insurance

As noted in Chapter 2, flooding is a recurrent problem in Bangladesh and 30% of the country experiences annual flooding while extreme floods affect up to two thirds of the country and can cause severe losses to the agricultural crop, livestock and fisheries sectors. Over the past 35 years Bangladesh has experienced eight major flood events including the floods of 1988, 1988, 2004 and most recently 2007 with estimated losses to these sectors of US\$ 648.39 million (World Bank and ADB 2007).

Although agricultural insurance is widely available in more than 50% of countries, public and private insurers have traditionally shied away from offering flood insurance protection to the crop, livestock and fisheries sectors. Agricultural flood insurance is very difficult to design and implement for a number of reasons including: challenges over defining and measuring direct flood damage (each crop has a different tolerance to flood according to the stage of crop growth, depth of flooding and duration) and indirect damage/loss arising from business interruption; flood risk mapping and modelling place very high requirements on time series local river flow and flood data which are often not available in developing countries; flood insurance is difficult to operate and traditional voluntary farmer schemes suffer from problems of moral hazard and adverse selection and prohibitively high costs of accurate in-field flood loss assessment and finally flood insurance is difficult to manage financially (Lotsch, Dick and Manuamorn 2010).

Many of the challenges to traditional indemnity based agricultural flood insurance could be overcome by an index-based insurance approach. Key advantages of index-based insurance include the minimising of moral hazard, elimination of the need for costly and time consuming in-field loss assessment and replacement by timely and objective index-based triggers and payouts (CIRM undated; Lotsch, Dick and Manuamorn 2010). Applications of flood index insurance have, however, until recently lagged behind weather index pilots with the notable exceptions of: (i) Vietnam: a Ford Foundation funded, GlobalAgRisk designed meso-level river-level gauge flood index providing business interruption insurance for banks lending to paddy producers located in the Mekong Delta, which has not yet been commercially launched (GlobalAgRisk 2010); (ii) Indonesia: a river-level gauge flood index for individual urban households, designed by GIZ and MunichRe and underwritten by Wahana Tata insurance company in 2010 (GIZ 2010) and (iii) Peru: Meso level ENSO index designed to capture catastrophe flooding related to the El Nino phenomenon and marketed as a bank assurance business interruption cover to banks lending to farmers located in flood prone coastal regions of Peru and which was launched in 2012-13 (Skees & Murphy 2009).

The Oxfam-GB, flood index insurance initiative for Bangladesh represents a major breakthrough in catastrophe flood risk insurance for very poor rural households (including landless households) located in river flood prone areas. Starting in 2009, OXFAM, GB and the Centre for Insurance and Risk Management (CIRM) have collaborated in a pilot project to design and distribute a CAT Flood meso-insurance product in Bangladesh. The Bangladesh Institute of Water Modeling (IWM), was contracted to conduct the flood hazard modelling and flood risk mapping for the selected pilot project area, Sirajganj District through which the Jamuna river drains southwards. The main exposure to riverine flooding is in the monsoon season (mana) from July to September and the index was designed to cover this period. The biggest challenge faced by IWM was to develop a flood model that could relate historical (35 year daily) river-level gauge data from the Jamuna River to predict flooding (water depth and duration) in the selected villages / flood plain areas bordering the river. The predictive flood hazard model was tested on the ground and refined by IWM in 2011 and 2012. SwissRe, a leading reinsurer and specialist in agricultural index insurance was appointed to design the flood index contract design parameters. Pragati Insurance company, a leading non-life commercial insurance company agreed to underwrite the flood index insurance program.

From the outset, the Oxfam flood index insurance policy was planned as a meso-level cover with the Insured being a local microfinance institution Manab Mukti Sangathi, MMS and the beneficiaries being poor vulnerable households in selected villages as defined by Oxfam-MMS. MMS works very closely in Sirajganj District with poor and extreme poor mainly female landless households living in *char* areas of the River Jamuna and whose main source of income and livelihoods is working as agricultural labourers. Pragati Insurance Company does not have either the local infrastructure or local knowledge to promote, market and administer flood micro-insurance to individual households in remote rural areas of Sirajganj District hence the early decision to implement a meso-level program.

**The Oxfam meso-level flood index cover is a business interruption policy that makes payouts according to the duration of flooding in each defined flood risk zone.** In the event of prolonged monsoon season river flooding in the zone/district the vulnerable households cannot obtain daily wage labour from agriculture, or in other words they face a major business interruption exposure. The sum insured was therefore based on the value of hired labour with a maximum sum insured of BDT 8,000 per household (about US\$ 120). The policy was designed so that progressive payouts started to be triggered if continuous flooding exceeded 10 days with the maximum payout of BDT 8,000 being paid out if continuous flooding exceeded 26 days. Pragati Insurance Company is responsible for making payouts to MMM in each risk zone/village and MMM then distributes the payouts to the affected beneficiaries according to their needs (Desai 2013; Oxfam 2013)<sup>34</sup>.

**The Meso-level Flood Index Insurance program was launched in 2013 with 1,661 poor households identified as the beneficiaries in 14 villages in Sirajganj District with Pragati Insurance Limited acting as the local insurer and with reinsurance protection from Swiss Re.** In 2013 total sum insured amounted to BDT 13.3 million with total premium of BDT 1.73 million (approximately US\$20,000) with implied premium rate of 10.3%. Oxfam financed 100% of the premium costs. Pragati Insurance purchased quota share reinsurance protection (80% cession) with SwissRe, one of the world's largest reinsurers and a specialist in index insurance for the agricultural sector. The policy cover period was from 15/08/2013 to 30/09/2013 to coincide with the main monsoon season rains and peak period of river flood exposure in Sirajganj. In 2013 the program was free of any flood payouts (Desai 2013; Oxfam 2013).

**The policy was renewed in 2014.** Severe floods in August and September led to significant damage in Sirajganj District and the Pragati insured flood index program triggered payouts in 4 villages (Boro Chouhali, Choto Chouhali, Fulhara East and Muradpur): more than 700 families benefited from the payouts of BDT 1,982,400 (US\$ 2,500) (SwissRe 2014)<sup>35</sup>.

**Going forward, Oxfam and its partners, Pragati Insurance Company and SwissRe are examining the feasibility of scaling up the flood index insurance program for vulnerable rural households in other flood prone areas of Bangladesh.** The partners are currently reviewing options significantly to scale up the program in other riverine flood prone areas of Bangladesh. One key challenge to scalability will be to obtain detailed flood data and to conduct the necessary risk modelling for these new areas. In the development of the Sirajganj pilot Oxfam, CIRM and the Institute of Water Modelling spent two years calibrating their flood model for the 10 villages. A further key challenge to be addressed is whether the product can be adapted to provide flood coverage for *aman* paddy crops: the issue of basis risk is, however, likely to be a major potential problem for any crop insurance application of the product. Finally careful consideration will need to be given going forward as to who pays for the premiums: in the pilot phase Oxfam agreed to finance premiums in recognition that these poor and very poor landless households could not afford to pay for their flood premiums: however, if the program is to scale up in future alternative premium financing arrangements may need to be secured.

### **Informal Insurance Sector**

**The MFIs have continued to offer and expand livestock microinsurance provision to their members, but to date no MFI is implementing any form of crop insurance.** This section describes the recent innovations in livestock microinsurance.

#### **PKSF-DIISP Livestock microinsurance.**

**Since 2010 the Palli Karma-Sahayak Foundation (PKSF) has been assisting a group of 40 MFIs distributed throughout Bangladesh to design, rate and pilot test a range of microinsurance products including life, health and livestock insurance.** PKSF's assistance is being provided through the Developing Inclusive Insurance Sector Project, DIISP, (2010-14) which is funded by a grant of US\$ 2 million from the Japan Fund for Poverty Reduction (JFPR) and administered by the Asian Development Bank (ADB). The project aims to reduce the vulnerability and improve welfare of the poor through

<sup>34</sup> available at: <http://oxfamblogs.org/bangladesh/wp-content/uploads/2013/08/Product-Brochure1.pdf>

<sup>35</sup> [http://www.swissre.com/global\\_partnerships/Bangladesh\\_flood\\_victims\\_benefit\\_from\\_first\\_index\\_insurance\\_payout.html](http://www.swissre.com/global_partnerships/Bangladesh_flood_victims_benefit_from_first_index_insurance_payout.html)



improved access to reliable and affordable risk mitigation services (microinsurance), building on the existing microinsurance services offered by MFIs.

**The DIISP livestock insurance policy is a livestock-credit insurance policy specifically designed for MFIs to protect their loans to members under a beef fattening program.** Livestock insurance is mandatory for any borrower. The insurance policy protects against death of the animal due to conventional mortality or natural catastrophes and epidemic diseases and the sum insured is based on the value of the loan and in the event of the death of the animal 100% of the loan amount of the borrower with the MFI is waived. The DIISP designed policy carries a flat premium rate of 0.7% for a six month cover period and given the high level of insurance protection provided this premium rate is very competitive when compared with the earlier annual policies for mainly dairy cattle offered by SBC, Proshika and Grameen. The borrower can also purchase life insurance on the livestock loan for a further 0.3% premium payment (PKSF 2014).

**28 out of the 40 selected MFIs are currently offering livestock (cattle) insurance to their members and in 2014 343,508 cattle were insured up to October 2014.** The program has generated premium of BDT 52.4 million (about US\$ 0.70 million) against paid claims of BDT 19.4 million with implied loss ratio of only 37.1%. The livestock mortality rate of 0.28% is much lower than the mortality rates experienced on the earlier Proshika (3.5%) and Grameen (2.8%) programs. With an average premium of BDT 153 per insured animal (about US\$ 2.00 per animal) there is a major challenge for the MFIs to keep down their administration and operating costs.

**Table 5.3. DIISP Livestock (Cattle) Insurance interim results 2014 (January 2014 to October 2014)**

Number of Insured Cattle (2014)	Total Premium (BDT)	Total Number of Cattle Claims	Total Paid Claims (BDT)	Loss Ratio (%)
434,508	52,393,410	953	19,445,282	37.1%

Source: PKSF December 2014

**One of the major issues facing the MFIs in Bangladesh is that their life, health and livestock microinsurance portfolios are not reinsured against covariant or catastrophe risk.** As the MFIs are not registered with Insurance Regulator and are not regulated under the Insurance Act, they do not qualify for access to reinsurance. The livestock insurance program is very exposed to epidemic disease outbreak which might result in widespread death of insured cattle: the WB estimate the total 2014 liability (total sum insured) to be in the order of BDT 7.5 billion (US\$ 100 million) and un-reinsured financial losses could therefore be very high. PKSF, in recognition of this problem, has established a Covariant Risk Fund (CRF), initially with its own funds and this fund is available to compensate any MFI under DIISP which incurs catastrophic insured losses. The MFI has to pay the required fees and charges to obtain access to CRF services. (PKSF 2014).

### Sajida Foundation Livestock Insurance Program

**Under the DIISP program individual MFIs insuring small numbers of cattle are very exposed to first loss.** In 2014 the Sajida Foundation insured a small portfolio of 566 beef cattle linked to its 6-month beef cattle fattening loans. With the fixed 0.7% premium rate the collected premium amounted to BDT 107,880. Seven animals died equivalent to a mortality rate of 1.2% resulting in total claims payouts of 173,842 (an average claim payout of BDT 24,835 per animal or US\$ 331 per animal) and a loss ratio of 161%<sup>36</sup>. As such Sajida lost money in 2014 on this very small livestock insurance portfolio.

**Table 5.4. 2014 Sajida Foundation 2014 Livestock Insurance Results (at Dec 2014)**

Number of Insured Cattle (2014)	Total Premium (BDT)	Total Number of Cattle Claims	Total Paid Claims (BDT)	Loss Ratio (%)
566	107,880	7	173,842	161.1%

Source: Sajida Foundation 2015

<sup>36</sup> The loss ratio is the ratio of claims paid to premium earned: a loss ratio greater than 100% implies that the insurer has paid out more in claims than it has collected in premiums, or in other words it has incurred a net financial loss on its underwriting business.

## 5.5. Constraints to the development of agricultural insurance

**In spite of the initiatives highlighted in the preceding Section, agricultural insurance provision in Bangladesh is still extremely low and very few farmers have any knowledge or understanding of, or access to, crop, livestock or fisheries insurance.** A national microinsurance demand assessment survey implemented by PKSF in 2010 with 3,500 poor and low income households under the DIISP Project showed that only 1% of respondents had access to livestock insurance and that very few had any form of coping mechanism to deal with major floods or other shocks which cause the death of their animals; no respondents had access to crop or aquaculture insurance and the majority of them whether ultra-poor, poor or non-poor were unable to cope with large production shocks (PKSF undated).

**The formal and informal agricultural insurance market in Bangladesh has shown modest development in recent years, but less than 1% of agricultural producers currently benefit from agricultural insurance.** Beyond these pilot programs insurers identify a series of key constraints to their entry into agricultural insurance provision including lack of access at affordable cost to data and statistics (climate, hydrological, crop and livestock production data etc.) with which to conduct risk assessment and rating, lack of technical knowledge and expertise to design and rate crop and livestock insurance products, and lack of rural distribution channels through which to market and administer such programs cost effectively.

**International experience suggests that there are core reasons for the failure of agricultural insurance markets and for the failure of pilots to scale up.** Most of these are equally applicable to Bangladesh:

- **Lack of time-series data to design and rate crop, livestock and fisheries insurance products.** In Bangladesh it appears that for major crops such as paddy and wheat, crop area, production and yield data have been systematically recorded for many years by the Bangladesh Bureau of Statistics and the Department of Agricultural Extension, DAE and that this data could be used for the design on crop insurance policies. Such data is not, however, available for cash crops, horticulture and minor crops. The density of weather stations which can provide time-series daily rainfall and other meteorological data is however, relatively low and investment is required in new AWS if weather index insurance is to be developed in future. The development of livestock and fisheries insurance products and programs is severely constrained by the lack of time-series production and mortality statistics at the individual house-hold level.
- **Lack of technical know-how on the part of the insurance companies in the design and rating and implementation of crop and livestock and aquaculture insurance.** Although the Insurance Act 2010 obliges non-life insurance companies to underwrite a significant portion of their portfolios with the rural and social sectors, to date only 3 (Pragati, SBC and Green Delta) of the 46 non-life insurers have started to develop suitable non-life insurance products to meet the needs of the rural and social sectors. In these exceptional cases, the local insurers have lacked technical know-how and expertise to design and rate index-based programs for excess or deficit rainfall and or flood and have had to rely on development partners and NGOs to bring in international design specialists. There is an important need to build local technical capacity in the design and rating of crop, livestock, poultry and aquaculture insurance in Bangladesh.
- **Lack of insurance capacity especially for catastrophe risk.** Insurers do not have the financial capacity to cover catastrophe risk associated with drought, flood and other typical agricultural risks, and similarly SBC the national non-life insurer and reinsurer also has a relatively low ability to retain catastrophe risk. Access to international reinsurance capacity is apparently very low for agricultural insurance and it is expensive, particularly where there is a lack of data. In this context it is important to note that IDRA in conjunction with the insurance sector is currently conducting a feasibility study into the formation of a national reinsurance company for all classes of life and non-life business.
- **High distribution costs.** Given that farms tend to be small and spread over wide areas, agricultural insurance typically carries very high distribution costs. These are exacerbated by the lack of established insurance branch or agent networks in the rural areas: in Bangladesh few of the private insurance companies have well established branch networks and sales agents in rural areas. Conversely in Bangladesh the rural MFIs and NGOs and cooperatives have very well established organisational and administrative systems for their members and these institutions could provide low-cost, effective distribution channels for the private commercial insurance companies if an enabling system could be created that provides incentives to the MFIs to act as agents to the insurance companies (under some form of partner-agent agreement).

- **High loss assessment costs.** In relation to traditional indemnity insurance, the costs of assessing crop and livestock and fisheries losses are usually extremely high, particularly in relation to small insured farm units, where the premium volume generated is usually very low and insufficient to cover the costs of the loss assessment. This is one of the main reasons that private insurance companies in Bangladesh have been reluctant to provide indemnity-based crop and livestock and aquaculture insurance.
- **High development costs.** Index insurance, although lowering the transaction cost, carries extremely high development and other start-up costs. These start-up costs cannot usually be justified by commercial insurers, especially on an individual basis. In Bangladesh, it is notable that all the pilot index insurance initiatives in recent years have relied heavily on funding by international donors or NGOs in the development phase. Issues also need to be addressed of who will fund the implementation costs of these programs after the pilot projects have been completed and while the programs have yet to reach scale and financial sustainability and here there may be important roles for GOB to play.
- **Low affordability of premiums.** Small farmers are unwilling, and may be unable, to pay for commercially priced agricultural crop and livestock insurance. The problem of affordability was one of the main reasons why premiums were capped at well below actuarially determined rates under the former SBC crop and livestock insurance programs. Under most of the large-scale agricultural insurance programs in South Asian countries such as India, Vietnam, China, South Korea and Japan, governments provide major premium subsidy and or reinsurance support to agriculture insurance.
- **Poor understanding of insurance by farmers.** This reduces the demand for agricultural insurance and may lead to farmers buying, or being sold, inappropriate products.
- **Lack of an enabling legal and regulatory framework.** As noted in the introduction to this Chapter, in Bangladesh the Insurance Act does not support crop or livestock index insurance and a regulatory framework for microinsurance is still being developed.

**Furthermore, the design of post-disaster relief often results in the crowding out of insurance.** If farmers expect post disaster relief from government, development agencies or NGOs, they have little incentive to purchase insurance.

## 5.6.GOB Proposals to Introduce a National Insurance Policy for Bangladesh

**GOB identifies the lack of a national policy for insurance as a major reason for the lack of development of insurance in Bangladesh.** GOB recognises that one of the major reasons for the fragmented insurance market and lack of insurance development and penetration of all classes of life and non-life insurance has been due to the lack of a national policy for insurance. For this reason, BFID-MOF-GOB have in 2014 produced a document titled National Insurance Policy- 2014. This document highlights the great many problems facing the insurance industry both in terms of demand and supply constraints, the measures government has already taken since 2010 to strengthen the legal and regulatory and supervisory framework through the passing of the IDRA Act 2010 and Insurance Act 2010 and then presents GOB's vision for transforming the insurance sector and details 50 specific measures which would be implemented under this National Insurance Policy (GOB 2014).

**In the case of the agricultural sector the same report proposes to introduce crop, livestock and fisheries insurance on a massive scale.** The report states:

**“Massive development occurred in agricultural sector of Bangladesh due to use of scientific technology, fertilisers, high yielding seeds, insecticides etc.** But still how huge harvest get damaged due to natural disaster. So we can introduce massively corn insurance, fisheries insurance, cattle insurance etc. to ensure continuation of development in the field of agriculture, fisheries and animal resources.. In the past, such non-traditional insurances were introduced through pilot program in small scale. But due to unwillingness about insurance, small number of policy, non-existence of area based weather forecasting centre, the agricultural insurance did not get success. Agricultural insurance is widely seen in developed countries. There is scope to extend insurance service through creating separate insurance company for agriculture. If the agriculture, fisheries and animal resources are brought under insurance, the farmers would have no fear to be ruined” (GOE 2014).



# 6. Opportunities for agriculture insurance and potential role of government

The final section of this Situation Analysis Report presents a series of opportunities for agricultural insurance market development identified by the WBG Team in consultation with the Bank and Financial Institutions Division (BFID) of the Ministry of Finance, and which will be investigated further through a diagnostic report. The WBG team has also consulted with the Ministry of Livestock and Fisheries, and other key public and private sector stakeholders during our two mission visits in November 2014 and again in January 2015.

The diagnostic report will also present options for government support roles and the fiscal costs for GOB to consider. During the preparation of the Diagnostic Report, the WBG will closely appraise the institutional framework options for possible public-private partnership options for agricultural insurance in Bangladesh as well as the potential support functions and roles of GOB and to also present the fiscal cost implications of such support and the potential economic benefits from such interventions.

This Section also briefly addresses the potential important roles that GOB could perform in order to promote the development of agricultural insurance in Bangladesh in future.

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## 6.1. Potential opportunities for agricultural insurance

### *Dairy cattle insurance*

At the Request of the Secretary, Ministry of Fisheries and Livestock the WBG is exploring opportunities to develop suitable insurance cover for the dairy cattle sector. This work is being conducted in conjunction with the Department of Livestock Services, DLS.

Dairy cattle insurance is seen by DLS as part of a package of measures designed to increase investment in improved cattle breeds and in increasing milk production and incomes for small dairy producers. In Bangladesh, there are about 11 million dairy cattle. About 10% of the national dairy business is managed by commercial dairy producers owning between 10 and 50 head of cattle and in rare cases, even larger herds. The bulk of production is, however, in the hands of small scale emerging dairy cattle producers typically owning about five dairy cows and then resource poor households with 1 or 2 animals and whom own very little or no land and whom are often women headed

households. From a national economic perspective the demand for fresh milk and milk based products is increasing by about 5% per annum and although major investment is being made in developing the livestock sector, supply is currently lagging behind demand. Dairy cattle insurance provided as part of a package of value added services could unlock credit to enable small-scale producers to invest in high milk yielding cross-bred cows as well as to protect the owner against catastrophe natural events and disease outbreaks leading to the death of their animals.

**Index-based livestock insurance will not fit the needs of the dairy cattle sector in Bangladesh and therefore the WBG is exploring opportunities to develop traditional indemnity-based livestock accident and mortality cover which can either be marketed on an individual animal basis, or for larger dairy enterprises on a herd basis.** Insurers usually set a series of pre-conditions that must be in place before implementation of a dairy cattle insurance program, including: 1. all insured cattle must be registered and individually identified by ear tagging (and in future, possibly by micro-chip); and 2. before being insured each animal must undergo a pre-inspection to certify that the animal is in sound health and that its vaccination record is fully up to date. The very high costs for an insurer of conducting these pre-inspections means that discussions are necessary to seek the collaboration of DLS and the cooperatives/social enterprises and other delivery channels to carry out these procedures / pre-conditions. Equally under this initiative options for developing community-based dairy livestock insurance building on success stories from other Asian countries is being explored.

**The development of a sustainable dairy cattle insurance program in Bangladesh will require the active collaboration of not only the MFIs, but also the formal commercial insurance sector.** The Situation Analysis presented in Chapter 5 shows that although the MFI's have considerable experience with individual dairy and beef cattle credit guarantee insurance, to date the private commercial insurers have not provided any livestock insurance. The dairy cattle insurance initiative is built on the recognition that livestock insurance faces catastrophe exposures (e.g. in the form of epidemic disease and/or cyclone and storm surge/flood) and that the formal insurance sector will need play a leading role in any program in Bangladesh, or the cooperatives/social enterprises will be exposed to the risk of catastrophic insurance losses.

**Any dairy cattle insurance program is probably most cost-effectively promoted and implemented through the leading milk cooperatives and social enterprises in Bangladesh, several of whom have indicated that they have considerable potential demand from their milk producing members for such a cover.** These dairy cooperatives could potentially enter into partner-agent, PA, relationships with the formal commercial insurance companies to market dairy cattle insurance to their members, to assist in the pre-registration animal health inspection and certification process; in the collection of premiums on behalf of the insurers and then in claims notification. Such a PA model would reduce the administration and operating overhead costs for the insurance company to manageable levels.

**A series of data and information requests were prepared by WBG in the January 2015 Mission for the DLS and Cooperatives to collect and collate by end February 2015.** On the basis of the information provided a set of options for a dairy livestock insurance program will be analysed and presented in the Diagnostic Technical Report which will be presented to BFID-MOLF in May/June 2015.

### **Fisheries / aquaculture insurance**

**The Ministry of Livestock and Fisheries and Department of Fisheries has identified a need to develop suitable aquaculture insurance products for the sector.** DOF is keen to introduce aquaculture insurance both for the 4 million or more smallholder fresh water fin-fish producers of carp, tilapia etc. and for the shrimp and prawn producers. On the basis of the discussions between DOF and WBG it has been agreed that shrimp insurance potentially offers an easier entry point to developing aquaculture insurance in Bangladesh in a first phase. Another option which might be considered is cover for the 60,000 artisanal fishermen who are registered with DOF.

**Initial work is being focused on the shrimp (& prawn) sector given its importance to farmers located in the southern coastal regions of Bangladesh and the high risk exposure to tropical**

**cyclone damage and tidal surge and fact that shrimp exports are a very important source of foreign exchange for Bangladesh.** SBC tried unsuccessfully to introduce shrimp insurance into Bangladesh in the 1990s. Shrimp insurance is a recognised class of aquaculture insurance internationally: countries which have developed commercial shrimp insurance include Mexico, China and Thailand. This WBG-DOF initiative will aim to draw on this international experience.

**Diseases in shrimps (including white spot virus disease) are a major challenge not only for the industry, but also for insurers and their reinsurers.** Research is at an initial stage into the cover design options for a dedicated shrimp insurance cover for Bangladesh. WBG is working closely with DOF and aquaculture research institutes including World Fish Bangladesh to understand the terms and conditions under which diseases in shrimps might be considered under any insurance program for the shrimp sector.

### **Crop insurance**

**This Situation Analysis has shown that crop production in Bangladesh is very exposed to catastrophe drought, flood and tropical cyclones and which cannot be managed by farmers and governments alike but that currently in 2015 there is no commercial crop insurance program operating in Bangladesh.** Chapter 5 showed that in the late 1970s SBC, a state insurance company, attempted to introduce an individual farmer multiple peril crop insurance, MPCI, program but that this program incurred heavy underwriting losses and was withdrawn by the 1990s. Since then no insurance company has offered crop insurance products or programs. There are, however, currently two important crop weather index insurance, WII, initiatives under development: (a) an IFC funded collaboration with Green Delta Insurance company which as an entry point is designing a gridded-rainfall index program for Bangladesh; and (b) an ADB-financed rainfall index program which is being developed by SBC with an Indian WII specialist and which will use individual ground-based weather stations to trigger payouts.

**WBG identify potential to develop Area Yield Index Insurance, AYII, in Bangladesh for important cereal crops such as paddy/rice, wheat and maize, and which would lend itself to specific linkage to crop-credit provision.** Any AYII program would be designed to complement the current weather based crop index insurance initiatives being developed by Sadharan Bima Corporation supported by ADB and Green Delta supported by IFC. Area yield index insurance could be developed as a retail product relatively quickly and at low start-up cost which could be linked to crop-credit provision through the state banks and commercial banks, thereby leveraging farmer's access to credit and contributing towards stabilising of farm production and incomes in times of major catastrophe losses in the crop sector.

**Area-Yield Index Insurance, AYII, has a lengthy history in West Bengal and other Indian states and merits further investigation as a potential option for Bangladesh.** Seasonal crop cutting is at the heart of an AYII system, and Bangladesh benefits from a highly developed system of seasonal crop production and yield reporting based on sample crop-cutting jointly led by the BBS and the Department of Agriculture, DAE.

### **Fully Subsidized Insurance for the poorest**

**Given the current level of government post-disaster expenditures, Government of Bangladesh might consider to offer fully-subsidized insurance to particularly vulnerable farmers who might face severe stress in times of a disaster, but who may not be able to purchase insurance themselves.** Potential benefits of such an option are enhanced timeliness, discipline and better targeting. In the technical report, the costs and benefits of this option will be compared to the existing mechanisms of ex-post disaster expenditures.

**Fully-subsidized insurance built potentially on the existing flood index could be explored.** Some 5.4 million Bangladeshi families live in the low lying flood and erosion prone areas in or adjacent to major rivers known as Char lands and they are subject to major floods every three to five years which can threaten their livelihoods. Chapter 5 showed that over the past five years Oxfam UK in conjunction

with Pragati Insurance Company has developed a unique fully subsidised flood index insurance program that is designed to protect the livelihoods of vulnerable families living in the Char areas against extreme monsoon season river flooding. The program was launched two years ago in selected villages in Sirajganj District, with technical and financial support from an international reinsurer Swiss Re and in 2014 flood payouts were triggered and promptly settled.

**The flood index insurance partners are seeking to scale up the fully subsidised index insurance program to cover 500,000 flood prone households over the next five years.** They are therefore interested to seek technical and financial assistance from interested parties (government, development partners etc.) to scale-up this program.

**Options appear to exist to develop fully subsidised index insurance in Bangladesh as part of Government's disaster risk financing strategy cum social protection strategy for the poorest segments of the population and whom often live in the flood prone Char areas.** While such a cover would not fall strictly under agricultural insurance, the WBG has a great deal of experience in supporting governments in making informed decisions about such products and if requested by BFID we would be pleased to assist them to investigate this option further.



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# Annexes

# Annex 1. Form D Assessment of Loss and damage

## Form for Assessment of Damage and loss

### Form-D

Chairman, Upazila Disaster Management Committee will collect detailed information from Union Parishads and various departmental officers and fill up this form and send to the EOC at the Ministry of Food and Disaster Management through the Deputy Commissioner.

1	2	3	4	5			6	7	8	9	10		
Name of Upazila	Total Union (nos)	Total areas (Sq. km)	Char Areas (if) (sq km)	Total population (No)				Total families/ households	Cost of house Tk/Unit	Repairing Cost of house Tk/Unit	Other information (housing materials used)	Total disaster shelter (under LGED, DRR and other institutes)	Information source
													Baseline data/ Basic statistics
Name of Upazila	Affected Union (No)	Affected Area (Sq. km)	Affected char areas (sq km)	Affected population (No)	No. of dead buried/ burnt	No. of injured	Number of affected families	No. of house Fully damaged	No. of houses partially damaged	No of pacca house damaged	Shelter used during disaster (if)		

11		12		13		14		15		16		17			
Sheep and goat Population (No)		Cattle and buffalo Population (No)		Poultry Population (Chicken and Duck) (No)		Total crop land		Other farms (Pond fisheries, shrimp and other farms)		Total Power lines and accessories (unit)		Other infrastructure (if any) telecom Towers			
Death/washed out sheep and goats		Death and washed out cattle and buffalo including farms		Death and washed out poultry including farms		Fully damaged		Partially damaged		Other farm (Pond fisheries, shrimp, Gher, fish fingerlings)		Damaged other infrastructure (if any)			
Number	Taka/unit	Number	Taka/unit	No.	Taka/unit	ha	Taka/ha	ha	Taka/ha	ha	Taka/ha	Fully (cost tk)	Partially (cost tk)	Fully (cost tk)	Partially (cost tk)

### Form for Assessment of damage and loss

18		19		20		21		22		23		24										
Total Mosques/Temples No		Carpeted roads (KM)		Other roads (Km)		Embankments (KM) River, Coastal, Haor		Total forest and nursery areas (ha)		Total Educational Institutes (College, primary and high schools, madrasa and other)		Total Telecom-communication means (tk)										
Number of damaged mosques/temple		Destroyed carpeted roads (KM)		Damaged other roads (Km)		Destroyed embankments (KM)		Damaged forests and nursery (ha)		Damaged educational institutes (College, primary and high school, madrasa and other)		Damaged Telecom-communication means (tk)										
Fully	Partially	Fully	Partially	Fully	Partially	Fully	Partially	Fully	Partially	Fully	Partially	Fully	Partially									
no	tk/unit	no	tk/unit	km	tk/km	km	tk/km	km	tk/km	ha	tk/ha	ha	tk/ha	no	tk/unit	no	tk/unit	no	tk/unit	no	tk/unit	

25		26		27		28		29		30			
Other Industry (garments, agro-processing, dry fish, salt etc)		Tube-wells (Shallow and deep)		Pond/Water reservoir (Nos)		Hospital/clinic/health centre and accessories		Fishing nets boats/ Trawlers		Looms/ hand looms (No)			
Damaged others industry (garments, agro-processing)		Damaged tube-wells		Pond/Water reservoir (Nos)		Damaged Hospital/clinic/health centre and related accessories		Lost /damaged boat/trawlers/fishing nets		Damaged Looms/handlooms			
Fully	Partially	Deep	Shallow	Hand driven	Fully	Partially	Fully	Partially	Fully	Partially	Fully	Partially	
no	tk/unit	no	tk/unit	no	tk/unit	no	tk/unit	no	tk/unit	no	tk/unit	no	tk/unit

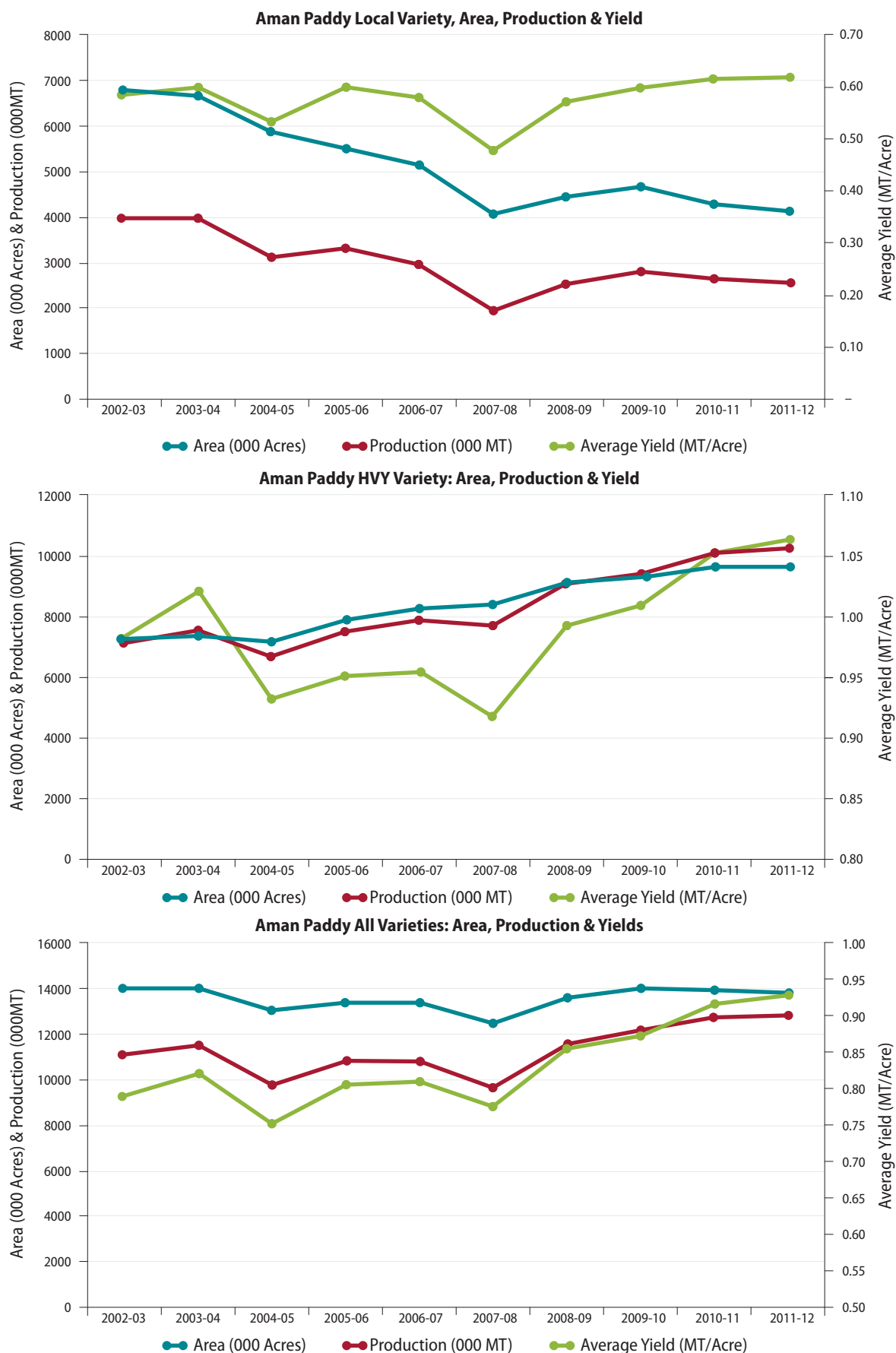
## Annex 2. Chronology of Major Drought Events and its impact in Bangladesh

Year	Details
1791	Drought affected Jessore district, prices doubled or tripled.
1865	Drought preceded Dhaka famine.
1866	Severe drought in Bogra, rice production of the district was hit hard and prices tripled.
1872	Drought in Sundarbans, crops suffered greatly from deficient rainfall.
1874	Extremely low rainfall affected Bogra, great crop failure.
1951	Severe drought in Northwest Bangladesh substantially reduced rice production.
1973	Drought responsible for the 1974 famine in northern Bangladesh, one of the most severe of the century.
1975	Drought affected 47 percent of the country and more than half of the total population.
1978-79	One of the most severe droughts in recent times with widespread damage to crops reducing rice production by about 2 million tonnes, directly affecting about 42 percent of the cultivated land and 44 percent of the population.
1981	Severe drought adversely affected crop production.
1982	Drought caused a loss of rice production of about 53 000 tonnes while, in the same year, flood damaged about 36 000 tonnes./
1989	Drought dried up most of the rivers in Northwest Bangladesh with dust storms in several districts, including Naogaon, Nawabganj, Nilpahamari and Thakurgaon.
1994-95 and 1995-96	The most persistent drought in recent times, it caused immense crop damage, especially to rice and jute, the main crops of Northwest Bangladesh and to bamboo clumps, a main cash crop in the region

Source: ADPC & FAO 2007

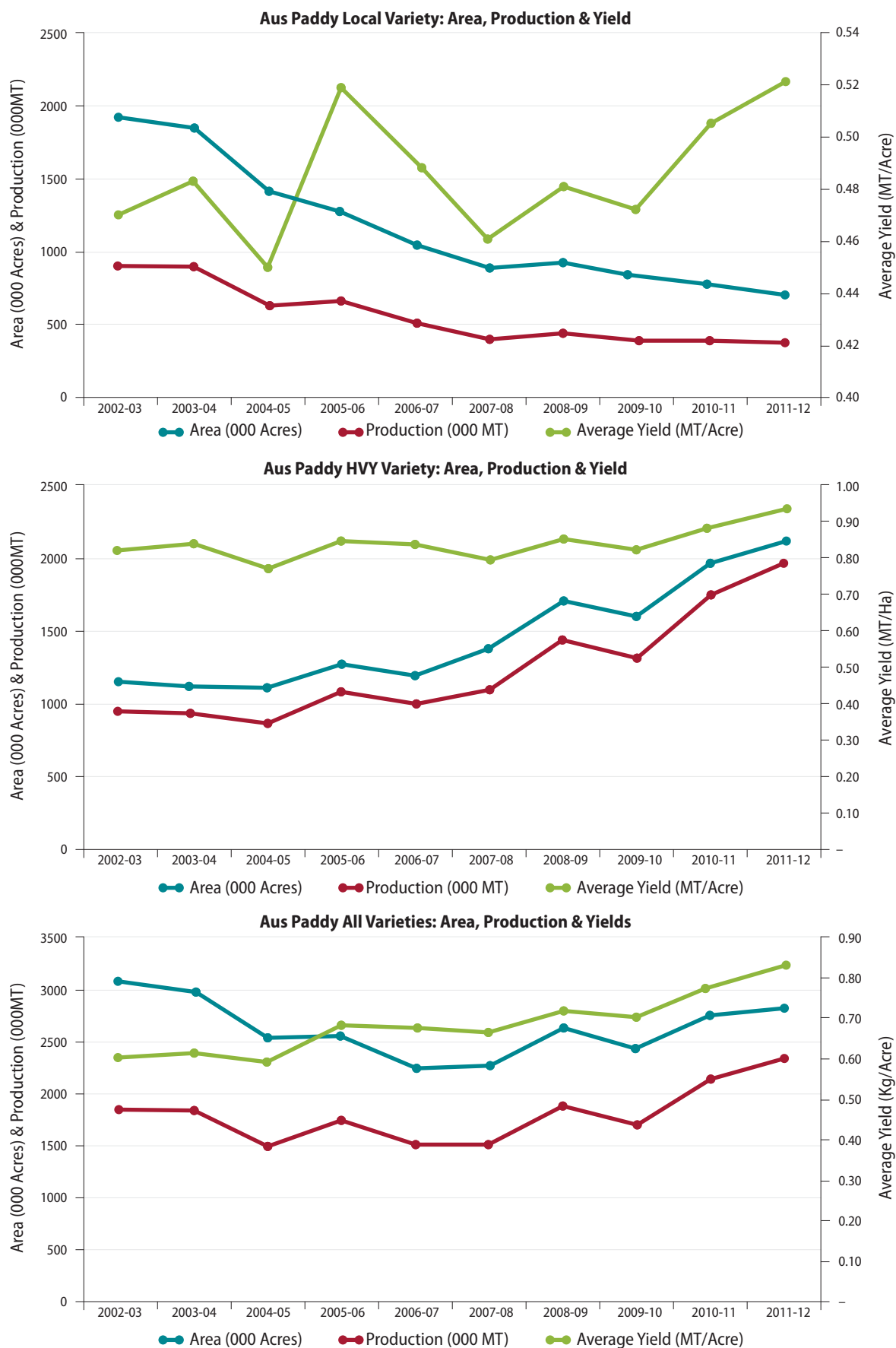
## Annex 3. Crop production and Yields

### Annex 3.1. Aman Paddy Area, Production and Yields 2002/03 to 2011/12



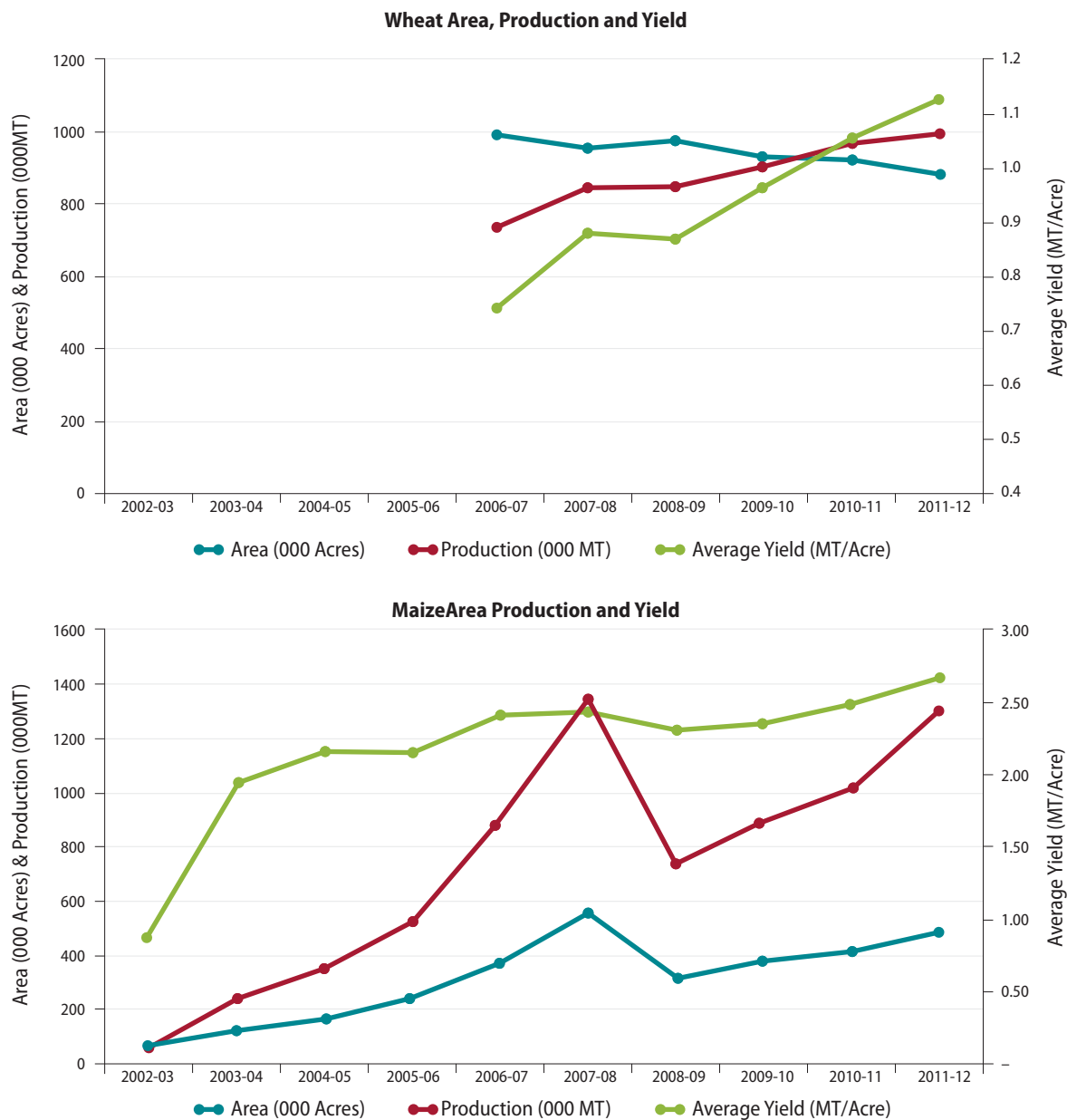
Source: BBS 2013

### Annex 3.2. Aus Paddy Area, Production and Yields 2002/03 to 2011/12



Source: BBS 2013

### Annex 3.3. Wheat and Maize Area, Production and Yields (2002/03 to 2011/12)

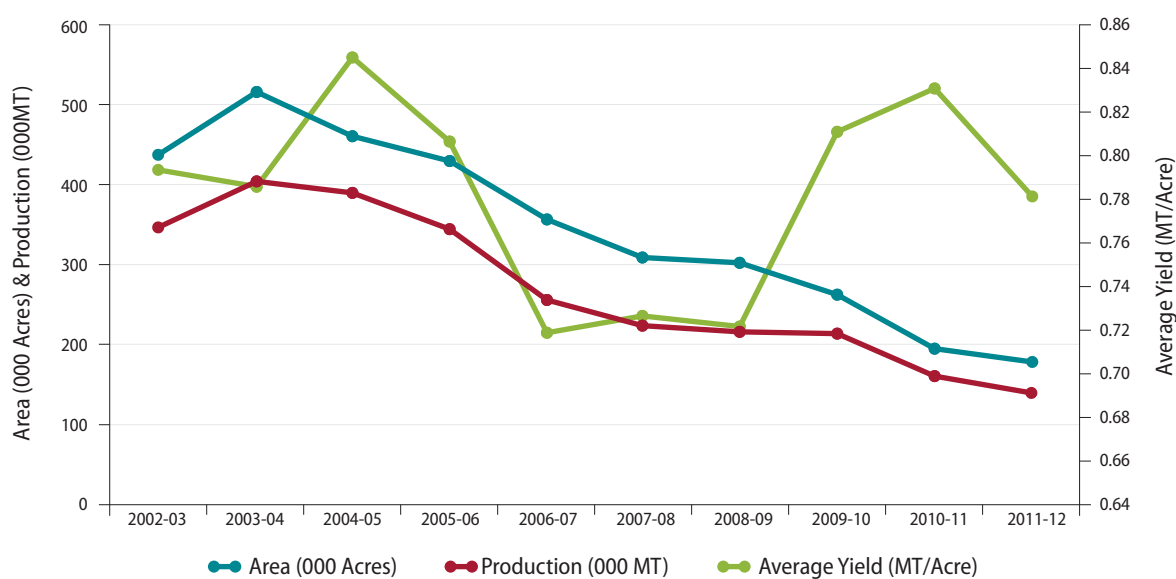


Source: BBS 2013

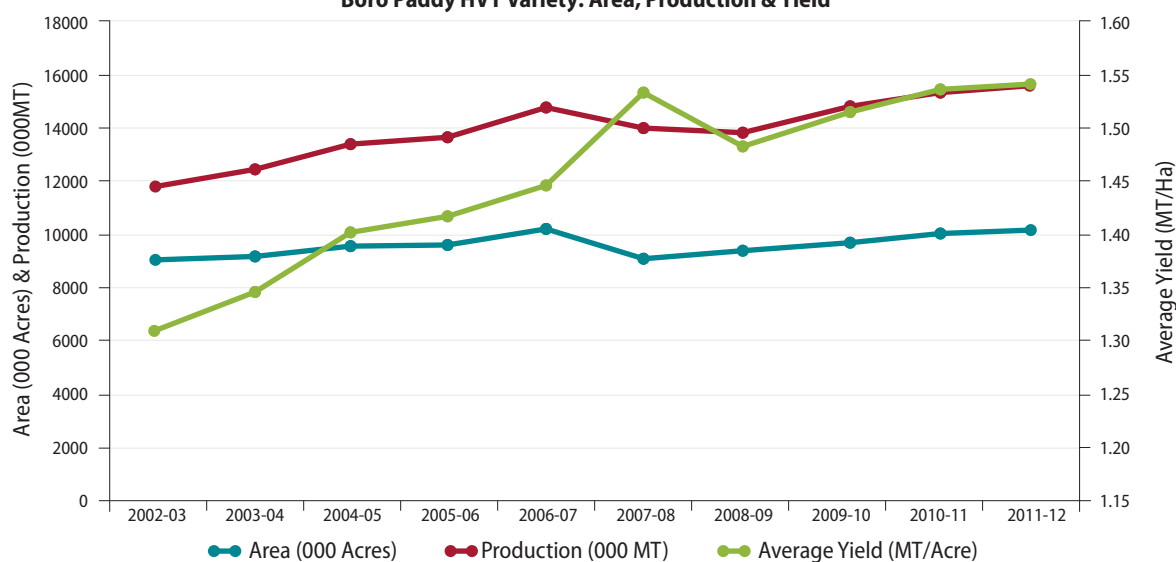


### Annex 3.4. Boro Paddy Area, Production and Yields 2002/03 to 2011/12

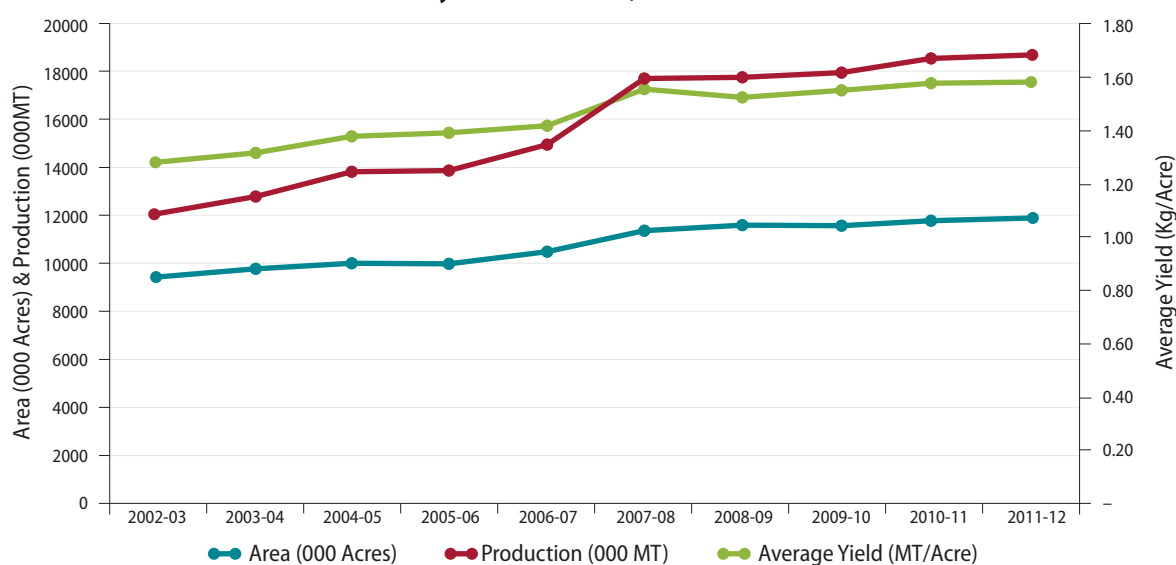
**Boro Paddy Local Variety: Area, Production & Yield**



**Boro Paddy HVY Variety: Area, Production & Yield**



**Boro Paddy All Varieties: Area, Production & Yields**



Source: BBS 2013

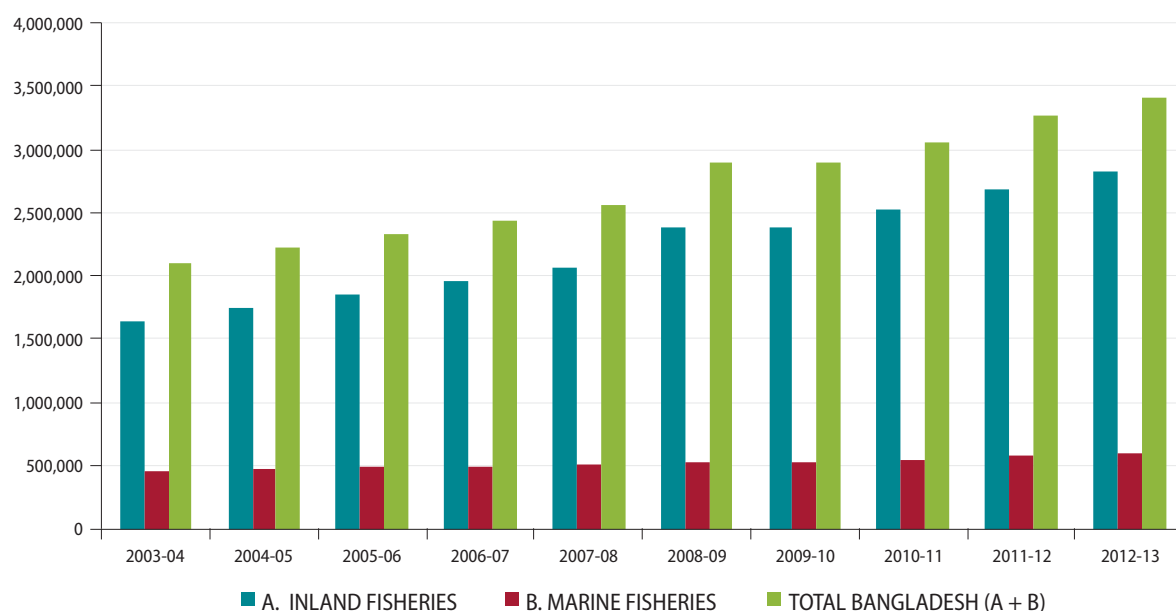
## Annex 4. Fisheries and Aquaculture Production in Bangladesh

**Table A4.1.** Annual Fish Production in Bangladesh (Metric Tons)

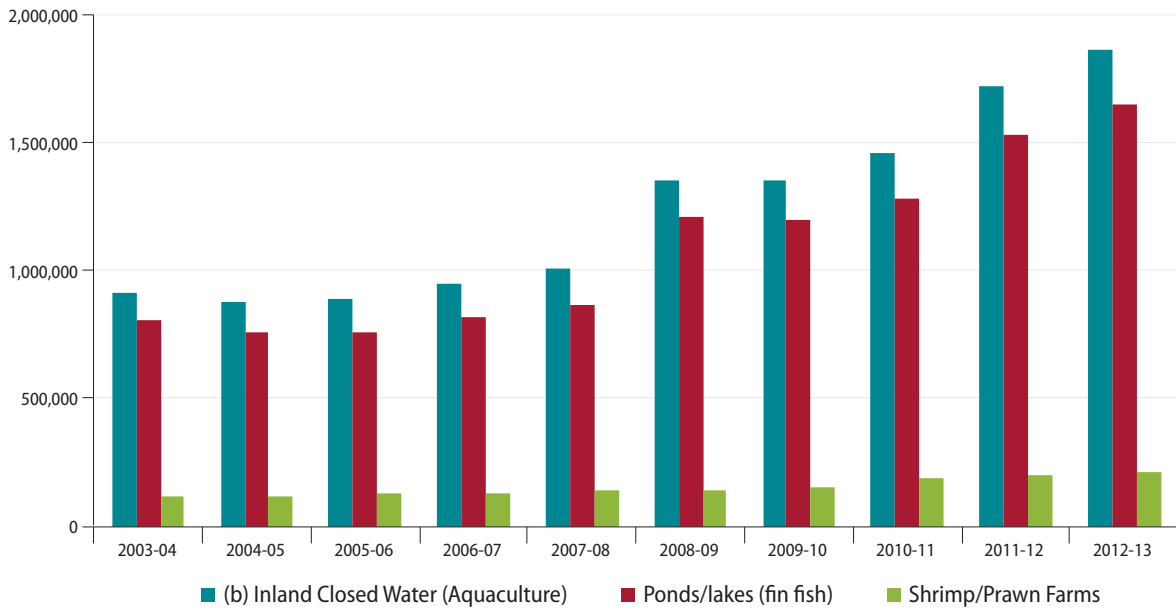
Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
A. Inland Fisheries	1,646,819	1,741,360	1,848,735	1,952,573	2,065,723	2,381,917	2,381,916	2,515,354	2,683,162	2,821,266
(A) Inland Open Water (Capture)	732,067	859,269	956,686	1,006,761	1,060,181	1,029,937	1,029,937	1,054,585	957,095	961,458
(B) Inland Closed Water (Aquaculture)	914,752	882,091	892,049	945,812	1,005,542	1,351,980	1,351,979	1,460,769	1,726,067	1,859,808
Ponds/Lakes (Fin Fish)	800,092	761,381	764,126	816,652	870,827	1,206,395	1,196,113	1,275,830	1,529,761	1,653,573
Shrimp/Prawn Farms	114,660	120,710	127,923	129,160	134,715	145,585	155,866	184,939	196,306	206,235
B. Marine Fisheries	455,207	474,597	479,810	487,438	497,573	517,282	517,282	546,333	578,620	588,988
Industrial	32,606	34,114	34,084	35,391	34,159	34,182	34,182	41,665	73,386	73,030
Artisanal	422,601	440,483	445,726	452,047	463,414	483,100	483,100	504,668	505,234	515,958
Total Bangladesh (A + B)	2,102,026	2,215,957	2,328,545	2,440,011	2,563,296	2,899,199	2,899,198	3,061,687	3,261,782	3,410,254
Annual growth rate %		5.42%	5.08%	4.79%	5.05%	7.3%	7.32%	5.60%	6.54%	6.13%

Source: DOF 2013. Annual Report

**Figure A4.1.** Inland and Marine Fish Production (Metric Tons)



**Figure A4.2.** Breakdown of Inland Aquaculture Production (Metric Tons)



## Annex 5. Donor Expenditure on Humanitarian assistance by event 2000-2014 US\$

**Table A5.1.** Bangladesh: Donor expenditure on humanitarian assistance 2000 to 2014

Year	Floods (& Landslides)	Cyclone	Cold weather	Un-allocated / Other	Total	Comment
2014	3,817,756	1,272,169	0	16,017,735	21,107,660	
2013	4,388,493	3,736,572	30,211	18,184,259	26,339,535	
2012	17494232	0	265252	14025225	31,784,709	
2011	9,242,607	15,028,713	296,697	41,735,349	66,303,366	
2010	14,024,577				14,024,577	
2009	0	14,647,744	1,255,095	21,345,872	37,248,711	TC AI LA 2009
2008	1,979,015	27,368,272	0	13,607,152	42,954,439	
2007	84,504,963	215,695,722	39,388	6,278,188	306,518,261	TC SI DR 2007; Floods
2006	10417624	0	0	1800000	12,217,624	
2005	1,281,577	0	0	5,066,950	6,348,527	
2004	106,343,540	0	0	2,565,863	108,909,403	Major floods
2003	308,148	0	191,598	3,102,135	3,601,881	
2002	1,468,536	610,851	0	4,179,536	6,258,923	
2001				1,906,163	1,906,163	
2000	4,836,236	0	0	0	4,836,236	
<b>Total</b>	<b>260,107,304</b>	<b>278,360,043</b>	<b>2,078,241</b>	<b>149,814,427</b>	<b>690,360,015</b>	
	37.7%	40.3%	0.3%	21.7%	100.0%	
<b>Ann Average</b>	<b>18,579,093</b>	<b>21,412,311</b>	<b>159,865</b>	<b>10,701,031</b>	<b>46,024,001</b>	

Source: UNOCHA. Financial Tracking Service, FTC, <http://fts.unocha.org>

**Cost of Humanitarian Assistance following natural disasters (Tropical Cyclone, Floods, Cold Weather, Other) US\$**

