



XL Reinsurance

Disaster Recovery Case Studies India-Pakistan Floods 2014

In cooperation with

Centre for
Risk Studies



UNIVERSITY OF
CAMBRIDGE
Judge Business School



2014: The India-Pakistan Floods

Report Citation:

Cambridge Centre for Risk Studies and AXA XL, 2020. *Disaster Recovery Case Studies: India-Pakistan Floods 2014*. Cambridge Centre for Risk Studies at the University of Cambridge Judge Business School.
or
Platt, S., Carpenter, O., Mahalingham, A. 2020; *Disaster Recovery Case Studies: India-Pakistan Floods 2014*. Cambridge Centre for Risk Studies at the University of Cambridge Judge Business School.

Introductory Commentary

Andrew MacFarlane, Head of Pricing & Analytics, Bermuda & London, Reinsurance, AXA XL

The important role of (re)insurance in the speed of physical and economic recovery after a major disaster, especially when there is little to no coverage due to unavailability, insufficient capacity or lack of take up (predominantly because of economic reasons), has not really been studied in detail. The (re)insurance industry tends to focus on the potential for future events and events in the immediate past. However, there is a need for a deeper understanding of the aftermath of disasters over a longer time frame, as well as an understanding of the impact that insurance penetration has on the pace of economic recovery.

Working with Cambridge Centre for Risk Studies at the University of Cambridge Judge Business School (CCRS) we have been examining more than 100 catastrophes across the world over a three-year timeline to compare and contrast outcomes and establish conclusions and recommendations. A consolidated report will be released later in 2020 but the case studies (this one covers 2014 India-Pakistan Floods) produced by CCRS were so interesting and of such quality we thought it would be beneficial to share these as they became available. In the future we intend to make available publicly all of the detailed work from all of the case studies in an open source database whilst also establishing a template to study and collect data from future catastrophes in a more structured way.

Our aim is for this work to be used as a tool by policymakers and governments worldwide when evaluating disaster preparedness and seeking to fully understand, from the lessons learned by others, the impact of displacement of populations; increasing personal debt levels; change in economic mix of industry; political upheaval and overall time to recover, among other things. Intuitively, we know the speed and scale of protection the (re)insurance industry provides dramatically reduces the recovery time for communities which have suffered through extreme catastrophes. However, we believe that it is imperative that this be demonstrated in more detail with evidence and placed in front of the right people to effect change – particularly governments.

Using these studies, we also want to explain the marginal increased cost in relation to the value of rebuilding with resilience – what we call “building back better” – over and above the cost of replacement. The (re)insurance industry needs to provide extra limit and contractual stipulations for “building back better” to minimize the impact of future disasters. In addition to this, we want to demonstrate the importance of “building better before”, that is encouraging our partners, including governments, through funding with NGOs, banks and other bodies to retrofit properties and strengthen vulnerabilities to avoid losses in the first place. This should result in savings on future insurance costs which would more than finance the initial upfront investment.

We are starting to see good progress in terms of the increased role of governments in closing the gap between economic loss and insured loss – since we started these papers we have seen the FEMA program in the US placed in the market for the first time; Flood Re in the UK become fully operational and the California Wildfire Fund established by the State of California and managed by the California Earthquake Authority (CEA), at least initially. The current pandemic is another unfortunate example of the difference between economic risk and insurance coverage with many businesses not prepared and not covered for what is a foreseeable peril. The enormous exposure made clear in the COVID-19 pandemic is far greater than the (re)insurance industry’s capital base and future coverage can only be provided with governmental assistance. AXA XL Reinsurance are formulating ideas for possible future structures based on our work understanding Government Pools in 2018 and will be sharing this work in due course.

There are discussions happening in numerous countries within the industry about working with government to provide some form of pandemic coverage. This work together with the more recent schemes where governments are de-risking are encouraging and signs of the partnerships being built up between governments and the industry. We will continue to support these initiatives with reinsurance and by sharing our findings from studies such as these.

The views, findings and opinions in this case study are those of the researchers at CCRS and not necessarily those of AXA XL.* Notwithstanding this, we are proud to be associated with this project and are sure that by gaining a greater level of understanding, we will ultimately develop more catastrophe reinsurance solutions and, more importantly, show the world the true value and social benefit of (re)insurance.

* AXA XL is the Property & Casualty and Specialty division of AXA Group: providing products and services through three business groups: AXA XL Insurance, AXA XL Reinsurance, and AXA XL Risk Consulting.

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Abstract

In September 2014, the Kashmir region on the northern borders of India and Pakistan experienced disastrous riverine flooding across many of its districts, caused by sustained torrential rainfall over a three-week period. Often dubbed the most severe flood to hit the Kashmir valley in over 100 years, the havoc wreaked by the floods and resultant landslides directly affected about half a million people. The regional economy relies on agriculture and tourism, which were both severely impacted. Economic losses totalled approximately US\$7 billion. This case study examines the impacts of flooding during this event and the subsequent socioeconomic recovery in the Kashmir valley, a contested region comprising the Indian state of Jammu and Kashmir, as well as the Pakistani territories of Azaz Kashmir, Gilgit-Baltistan and Punjab. Both nations are lower-middle income developing economies with low non-life insurance penetration

Kashmir has been in a state of political conflict since Pakistani independence in 1947. These floods exposed political fragilities in the region, where cross-border cooperation over response and relief is fractured, exacerbating the state of disaster. The narrative of this event was biased by Indian involvement, with media coverage exaggerating Indian state involvement, eroding what little trust existed in the Indian government. The state ultimately failed to provide timely and equitable relief to those affected.

Disaster risk management in both India and Pakistan tends to focus on post-disaster rescue and relief operations and not on ex-ante measures like early warning, flood prevention and insurance. Lack of flood prevention measures, early-warning systems and weak recovery planning processes were cited as chief reasons for extreme disaster impacts. The regional economy is reliant on agriculture, and to a lesser extent tourism, which are both extremely vulnerable industries to flooding – these were the worst affected sectors, and this had a significant impact on the regional economy. The low crop and property insurance rates also impeded the recovery process; less than 2% of the economic losses were insured indicating a large protection gap. Reliance on external aid, restrictive bureaucracy, and religious beliefs were found to contribute to low insurance uptake.

Section 1: Event Context



Figure 1: Extent of flooding India and Pakistan 2014²

Event Overview

In September 2014, the Kashmir region suffered disastrous floods across many of its districts. The floods were caused by torrential rainfalls in the Kashmir valley, which lasted for over three weeks and led to floods and landslides. The Indian state of Jammu and Kashmir, as well as the Pakistani territories of Azad Kashmir, Gilgit-Baltistan and Punjab were affected. In all, 280 people died due to the floods in India and 367 people in Pakistan. Figure 1 shows the extent of the 2014 flooding in India and Pakistan. Often dubbed as the most severe flood to hit the area in over 100 years, the havoc wreaked by these floods directly affected about half a million people. The Indian state and the international community were quick to respond to the crisis that followed this disaster, devoting financial and human resources, and a number of recovery initiatives have been started in the state¹.

India and Pakistan are among the countries most affected by climate-related events and Munich Re places India the third most affected by natural disasters. The Kashmir valley in India is very prone to floods mostly due to its location and geology. The frequency of occurrence of floods has been on the rise and the damages incurred have also been increasing mainly due to changing hydrographic features and the drainage characteristics of the Jhelum river system. In Pakistan, floods pose a serious threat to life and property both in terms of intensity and severity³. Over three-quarters of the country are affected by floods with the Punjab and Sindh provinces being the most affected. The major causes of flooding in this region are:

- Heavy, prolonged monsoon season with melting of snow caps and glaciers
- Deforestation in some of the upper reaches of drainage basins
- Rapid water accumulation in river basins that overflows riverbanks and inundates floodplains.

Research Approach

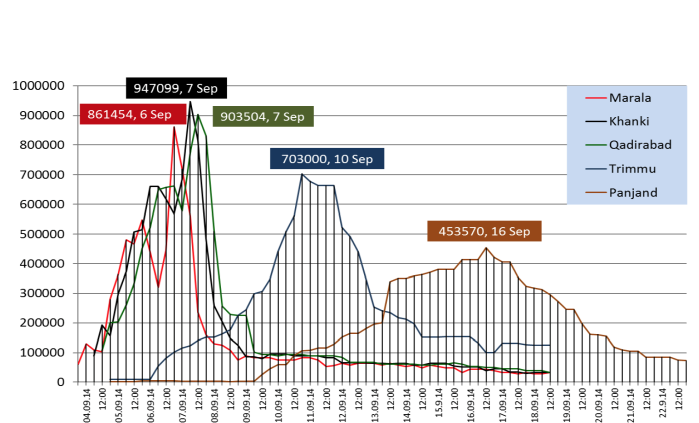
The Cambridge Centre for Risk Studies conducted extensive research into the impacts of tropical storms and the characteristics of storm recovery. This case study is informed by secondary literature sources.

1 ReliefWeb 2017
2 European Union 2014
3 Rahman et al. 2017

Figure 2 shows the patters of rainfall in the first week of September in these regions. It shows heavy rainfall on 4th-7th September.

The intensity of the floods meant that several records on rainfall measurements were broken; rainfall was several times the normal for this season and rivers, such as Jhelum and Chenab, recorded water discharges higher than the usual and above than the danger mark in several points. The heavy downpour in the region (combined with a few other factors) resulted in large discharge of floodwater from the rivers. Figures 3 and 4 show that the water discharges in the Chenab and Jhelum were higher than those corresponding to a 25-year flood during some days in the month.

Figure 3: Hydrographs for River Chenab⁵



4 Kar and Tiwari 2016
5 GoP 2014
6 GoP 2014

Figure 2: Rainfall intensity plots of the Jammu & Kashmir Region in September 2014⁴

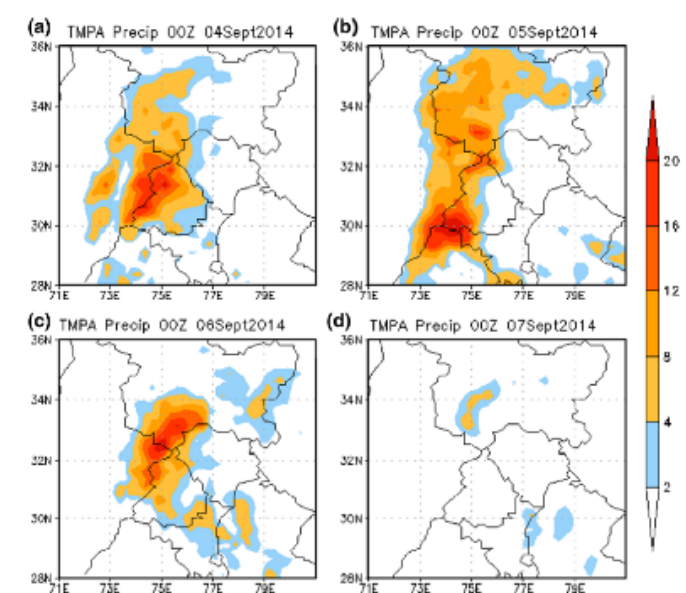
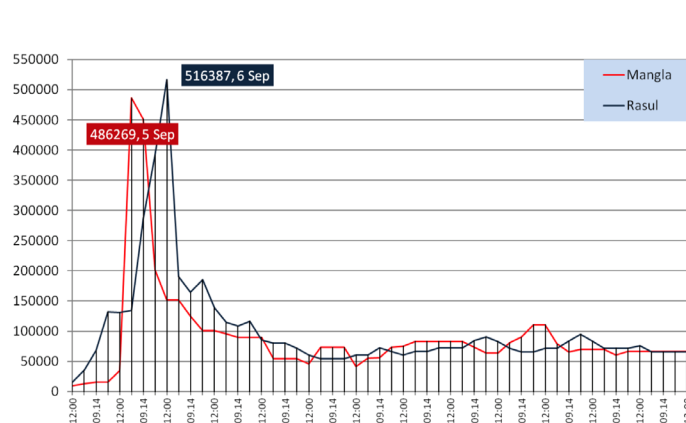


Figure 4: Hydrographs for River Jhelum⁶



Socioeconomic Context

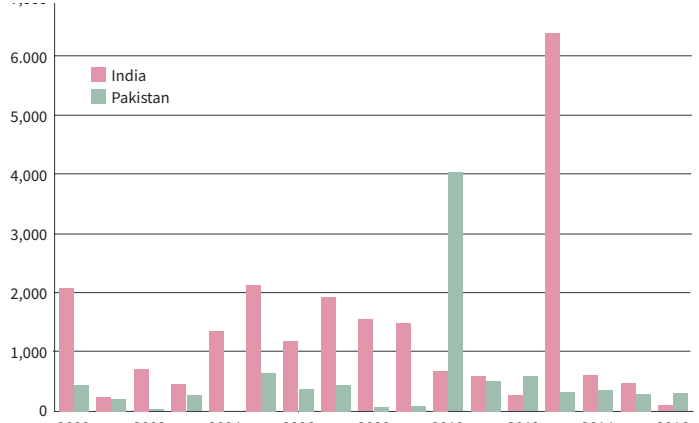
The main economic activity in area affected is agriculture because of the availability of fertile soil deposited by the river and water for irrigation. The main cultivated crops are rice, sugarcane, maize, cotton, fodder, and beans. The majority of local residents earn their livelihood from agriculture. In most of the region, houses are made of bricks and mud, which are vulnerable to floodwaters. On average monthly income of the surveyed household is less than US\$200. This means that people living near rivers are more vulnerable and have a limited capacity to cope with disasters⁷.

Risk Landscape

The upper Indus plain is a fertile area that supports millions of people and a diverse economy. Every year in summer, the combined action of monsoon rain and meltwater augment river volumes leading to damaging floods in the flood-prone region. The upstream areas of Chenab basin are mountainous and experiences flash floods, whereas riverine floods dominate the lower reaches. Extensive deforestation of natural forests in the upland catchment area for timber and fuel wood reduces the water retention capacity of the forest ecosystems. This can increase surface water runoff and soil erosion, increasing the quantity, velocity and sediment load of the headwaters entering the river system. In turn, this causes repeated landslides, damages riverine infrastructure and results in additional siltation of the downstream water channels⁸.

Kashmir has a recorded history of flooding that dates back nearly 5,000 years and the first reference to a flood level measurement in the Kashmir Valley appears in 2041 BC. There are records of 50 major historic floods prior to 1900. India has suffered 62 and Pakistan 47 major flood events since 1900. Figure 5 shows the pattern of floods since 2000. It is clear that, although the 2014 floods where the worst Kashmir had suffered in sixty years, both countries regularly suffer worse floods in other areas in terms of deaths, population displaced and economic loss.

Figure 5: Deaths from floods India and Pakistan 2000-2016¹¹



India and Pakistan are prone to a variety of natural hazards, including floods, earthquakes, cyclones and droughts. At the global level, India has the greatest number of people exposed to natural hazards (one billion).⁹ In Pakistan, on average, approximately three million people (1.6% of the population) are affected by natural catastrophes each year, with damages and losses estimated to have exceeded US\$18 billion over the past decade¹⁰. In the last 40 years or so, over three quarters of all people affected by natural disasters in Pakistan have been impacted by floods. In India, 113 million people, or 9% of the population, are acutely exposed to flood hazard, 76 million in Bangladesh and 10 million in Pakistan.

The economy of Indian and Pakistani Kashmir is dependent on agriculture and vulnerable to weather shocks, and its people have poor access to formal methods of coping with those shocks, such as assets, savings, and formal insurance. Governments and international organisations thus face pressure to provide emergency response and social protection. Both India and Pakistan have extremely young populations; in India 50% of the population are under 25 and in Pakistan 63%¹². Kashmir has a fragile security situation frequently rocked by acts of terrorism and the increasing frequency of floods evidences the effects of climate change on extreme weather in the region¹³.

Overview

7 Mahmood et al. 2014
8 Oxley 2011
9 Bahree 2016
10 Watson et al 2017
11 Guha-Sapir et al. 2016
12 CIA 2019; FES 2018
13 Kosec and Mo 2017

Section 2: Disaster Impacts

The 2014 floods across the Kashmir region resulted in huge devastation in India-held Kashmir (IHK), Azad Kashmir, as well as downstream areas of Pakistan¹⁴. Some districts were more severely affected than others. Districts in the Punjab province of Pakistan and districts such as Sialkot and Narowal in India, closer to the Kashmir valley, were amongst the most severely affected. Most of the city of Srinigar was under water. In India, over one million people were displaced from their homes and over 3,000 villages were inundated. In Pakistan the figure was even higher, and more than two million people were displaced from over 2,500 villages. Many of these people went to nearby cities. Over 95% of the people affected by the floods in Pakistan were located in Punjab province. Multan, near the confluence of the two major rivers that flow through Pakistan, the Sutlej and Chenab, was severely flooded, as were Muzaffargarh and Jhang districts due to the breaches at two places in Athari Hazari dyke, leaving behind a trail of destruction.

Table 1: Impacts of the 2014 floods in India and Pakistan

	India ¹⁵	Pakistan ¹⁶	Total
Deaths	280	367	647
People directly affected	1,949,790	2,600,555	4,550,345
Villages flooded	3,275	2,519	5,794
Displaced	1,300,000	2,300,000	3,600,000
Homes damaged or destroyed	121,124	101,515	222,639
Economic loss US\$m	6,560	440	7,000
Crop area affected km2	444	9,768	10,212

14 Saeed 2014
15 Caritas India 2014; Bhatt et al. 2017
16 NDMA 2014; Rahman et al. 2017
17 Mahmood 2018
18 Romshoo 2015

The maximum extent of the flood either side of the river in the upper Indus plain was 20 km, and the minimum 10 km. The maximum depth (5m) was in district Jhang located in the lower reaches of the flooded area. The extent and depth of flood caused severe damage to standing crops, livestock, houses, and infrastructure¹⁷.

- The chief causes of the floods were partly natural and partly anthropogenic¹⁸:
1. Inadequate carrying capacity of the River Jhelum in a few places
 2. Flat topography of the Jhelum river basin
 3. Worsening flood vulnerabilities in the region due to changing geography
 4. Large areas of uncontrolled encroachments along the floodplains of Jhelum,
 5. Urbanisation leading to hard, impermeable landscapes replacing the flood plains
 6. Destruction of valley wetlands.



Socioeconomic impacts

The floods severely impacted social and economic life of people in both countries. In Pakistan, the 2014 flood affected most social and economic sectors including community physical infrastructure, housing, agriculture, and flood defences. Community physical infrastructure was the most affected sector with estimated economic damage of US\$0.17 billion, followed by housing sector with estimated rehabilitation cost of US\$0.13 billion. Lack of advanced flood forecasting and absence of community-level early warnings were, in part, responsible for inadequate preparedness.

Agriculture

The Indus floodplain is a fertile agricultural area and agriculture is one of the main sources of income and livelihood in the areas affected by the floods in India and Pakistan. More than 10 million acres of agricultural land and 250,000 farmers in Pakistan alone were affected by the floods. Crop damage accounted for a quarter of all losses and standing crops were severely affected by floodwater (Table 2). Damages to standing crops not only affected the farmers' livelihood but also impacted overall agricultural production, particularly of rice, sugarcane, cotton and fodder. Seed stocks were lost, agricultural tools and equipment were damaged, irrigation channels were breached or blocked and land erosion caused further damage to the agricultural sector¹⁹. The floods also caused significant losses of livestock. Livestock is an important part of the agricultural sector, considered as a secondary source of earning livelihood and food of households. Insurance for flood events is almost non-existent, which has consequences for the recovery of important sectors of the economy such as agriculture²⁰. Although flood exposure lowers savings, adjustments in income strategies help farmers to overcome immediate losses and initiate recovery: flood-affected households allocate a significantly higher portion of their post-flood income than unaffected households to replenishing livestock and seeds²¹.

Table 2: Estimated costs of resilient recovery after the 2014 floods in Pakistan (US\$ M) (NDMA 2014b)

Province/ Region	Punjab	Azad Jammu & Kashmir	Total
Housing	111.6	14.3	125.9
Crops	108.5	0.6	109.1
Livestock	2.2	0.2	2.3
Livelihoods	27.2	0.2	27.4
Community Physical Infrastructure	159.5	12.2	171.6
Disaster Risk Reduction	2.5	1.0	3.5
Total (US\$)	411.5	29.3	440.0

19 GoP 2015
20 Rahman et al. 2017
21 Eskander et al. 2018

Housing

The floods also damaged housing, the education and health sectors, transport and communications and other infrastructure, including flood defences of dykes and sluices. The total number of completely damaged houses was higher than the partially damaged houses. According to the estimate of PDMA, approximately 9,872 houses were completely damaged and 2,894 houses were partially damaged in Pakistan. The initial flood surge damaged houses and contents, while the duration of floodwater compounded this damage. Most of the houses in the flood zone were made of mud. The destruction of houses in the flood plain of districts Jhang and Muzaffargarh, however, was irrespective of type of houses due to the fact that construction techniques were inappropriate on one hand, and, on the other, communities did not have enough financial resources to hire technical manpower to reconstruct properly²².

Infrastructure

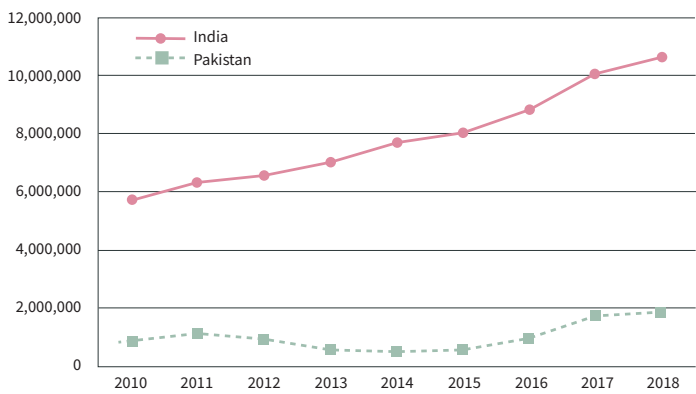
Landslides, triggered by heavy rainfall, damaged roads, destroyed dozens of bridges and washed away flood defences. National Highways, for example the Jammu-Srinagar Road, were cleared and repaired within a fortnight. Many parts of Srinagar were flooded and vital roads were submerged. Communication broke down and power supply was disrupted. Many families lived on boats for days till the water receded²³. Four of the five main hospitals in Kashmir were out of action for over a month²⁴. Expensive, life-saving and necessary equipment like X-ray machines and oxygen plants, CT scanners and MRI machines suffered major damage or were completely destroyed. Laboratories were badly damaged and power supplies were disrupted²⁵. It took 3-4 weeks to restore telecommunications.

22 Jamshed 2015
23 Shankar 2017
24 Tabish and Nabil 2015
25 Parvaiz 2014
26 Rawat 2014
27 World Asia 2019
28 Gol 2019; Government of Jammu & Kashmir 2014; Saeed 2014

Tourism

Tourism is an important part of the economy of both Jammu-Kashmir in India and Azad Kashmir in Pakistan. Kashmir is an area of outstanding beauty with fertile, green, mountainous valleys, crystalline blue lakes and high snow covered peaks of the Himalaya. In India, international tourism to Jammu & Kashmir (Jammu and Kashmir) contributed 10% of the gross GDP and 30% of services exports. The effect of the floods on tourist numbers was, therefore, of great concern. In Pakistan, however, tourism had long been severely limited; since 1999, social unrest, terrorism, and shelling from the Indian side of the border, for example in the Neelum Valley, had been a blight on tourist numbers. The floods therefore had little additional impact in Pakistan, but in India there was a loss of tourist confidence and a decline in tourist numbers in the 2014 September-November tourist season²⁶. A report by the Pakistan Tourism Development Corporation (PTDC) showed that the inflow of foreign visitors declined drastically in 2014, by over 47%, compared to 2013²⁷. In Pakistan, after 2014, tourism increased as a result of the gradual improvement in security, following operations to eliminate terrorism. Nationally however, the floods had little or no impact on overall tourist numbers. International arrivals to India have shown a steady 7% annual increase on average since 2010. In contrast in Pakistan tourist numbers declined in the period 2011-2015 and have only began to pick up since 2016 (Figure 6).

Figure 6: International tourist arrivals 2010-2018²⁸



Section 3: Disaster Management and Resourcing



Disaster Management

Since its independence in 1947, India has experienced 48 major floods and Pakistan, 37, that have caused severe human and economic loss²⁹. While damages and losses have been massive, they could have been significantly reduced if disaster risk reduction measures had been incorporated into physical, social and economic development to address both the proximate and root causes of vulnerability³⁰. Both the Indian and Pakistani authorities had to face a lot of criticism by the stakeholders; their inability to predict rains on the one hand, and in showing negligence in coping with the urgency³¹.

In India, initial rescue was by the India Army with airlifts supported by boats. The army also constructed temporary floating bridges, repaired roads and supplied water in Jammu region. The Indian Government built 87 camps in Jammu and 147 (excluding Srinagar, Banidipora and Kupwara) in Kashmir division. The state government requested from the central government 25,000 tents and 40,000,000 blankets for the affected population. Tents, tarpaulin, blankets, cooking utensils, food and milk, and books and pencils for children were distributed. Nearly 21,000 people were evacuated and 23,900 were rehabilitated in the Jammu region alone. Similarly, in Pakistan, the Pakistani Army and Air Force carried out most of the rescue operations, in some instances winching stranded people from their roof tops using helicopters, and dropping food packets and drinking water. However, in Jammu, the Indian Army’s contribution to disaster relief was seen as modest at best and this exacerbated political tensions. Volunteers played a major role in the absence of effective state action. It highlighted the unfairness in the rescue, relief provision and prioritisation of the government during the disaster. Coordination between government and NGOs, and within NGOs, was a challenge during the first week of response partly due to telecommunication failure and partly because most of the international NGOs (almost 30-40) were unaware of the state context³².

Floods in hilly areas are normally accompanied by landslides, which severely interrupt transportation and mobility. It is difficult to mobilise local response immediately, as most of the first responders, including police, fire and health personnel, themselves are affected. In Kashmir, the response, rehabilitation and recovery agencies faced delays not only in moving the requisite skilled manpower in a timely phase but also in procuring the materials to rebuild the life of the affected area³³.

29 Guha-Sapir et al. 2016
30 Nawab and Nyborg 2017
31 Saeed 2014
32 Hejazi 2017
33 Mishra 2017

Flood management measures in Pakistan mainly comprise of flood protection embankments, spurs, studs, and advanced flood-forecasting techniques. Various flood protection structures were built by the provincial governments to solve local flood problems³⁴. Numerous efforts have been made in the past to entrain rivers and protect the adjoining areas from river erosion and flood damages, but large-scale variations in river discharge and sediment concentrations have led to eroding river plains. Traditionally, flood management has relied heavily on the provision of structural measures for flood containment³⁵. Structural measures have been employed on a large-scale and include construction of embankments, spurs, dikes, gabion walls, floodwalls, dispersions, diversion structures, delay action dams, bypass-structures, and channelisation of floodwaters. About 6,719 km of embankments have been constructed along major rivers and their tributaries. In addition, more than 1,375 spurs have been constructed to protect these embankments³⁶.

Authority

In India, flood responsibility for disaster management lies entirely with the state government and the state is therefore responsible for mobilising financial resources for recovery and reconstruction. Jammu and Kashmir, therefore, has a institutional mechanism to deal with disasters at the state level. Since the state shifts the capital, between Srinagar and Jammu, every six months there are two Divisional Disaster Management Authorities for Kashmir and Jammu Divisions respectively. Interim Emergency Operation Centres have been established at all 22 District Headquarters. The State Disaster Management Plan, the State Disaster Management Policy and District Disaster Management Plans have been prepared and are regularly updated. The state has established two dedicated Battalions of State Disaster Response Force (SDRF)³⁷.

The local community is generally the first responder in disaster situations and 300 volunteers per district have been identified by the respective Deputy Commissioners and are being trained in basic life skills. It has been ensured that women are adequately represented. Mock drills are being held on a regular basis in various educational institutions. After the training, they are involved in preparation of Community Level Disaster Management Plans, including Village Disaster Management Plans.

34 Baig 2008
35 Tariq 2012
36 FCC 2009
37 Mir 2017
38 Venugopal and Yasir 2017

Political issues

Kashmir has been in state of political conflict, the subject of a border dispute between India and Pakistan, since Indian-Pakistan independence in 1947. It has been locked in a state of wounded abnormality for so long that the extraordinary has become routinised as part of the ordinary³⁸. People factor the likelihood of sudden disruptions into their coping strategies of normal life. This makes cross border cooperation over response and relief doubly difficult and impedes long-term recovery.

The people of Kashmir reject Indian rule and see the Indian army as alien to their land. Several key issues came to the fore with the 2014 floods. Despite the vulnerability of location and previous climate-related threats, they revealed poor disaster planning and underscored the Jammu and Kashmir state’s incompetence in responding to disaster. Finally, the Indian media was overly focused on the Jammu and Kashmir capital, Srinagar. Moreover, there were concerns that the Indian press was portraying the army in good light, despite their perceived lack of efforts by the public. These issues led to numerous protests against the state government, which subsequently resulted in the ruling party being voted out in the elections in December 2014. Fortunately, there were several instances of humanitarianism, compassion and cooperation between India and Pakistan during the floods of 2010 and 2014.

Financing

The central government supplements the state’s efforts by providing financial aid for relief and rehabilitation through the State Disaster Response Fund (SDRF), which provides 75% of funding needed for general category states and 90% for special category states. In extreme disasters when the SDRF is insufficient, the central government provides supplementary funding through the following main sources:

- National Disaster Response Fund (NDRF)
- Centrally sponsored schemes
- External agencies such as World Bank (WB) and Asian Development Bank (ADB)
- Special Plan Assistance (SPA) and Additional Plan Assistance (APA)

Ex-post instruments are sources that do not require any planning in advance. In this case, they include budget reallocation, domestic credit, external credit, tax increase, and donor assistance. On the other hand, ex-ante risk financing instruments require proactive planning. They include reserves or calamity funds, budget contingencies, contingent debt facility, and risk transfer mechanisms. Parametric insurance are those insurance products where insurance pay-outs are triggered by predefined parameters such as wind speed.

In India, the Prime Minister refused foreign aid to Kashmir and instead offered government assistance of US\$100m to the state government, in addition to US\$150m already earmarked for the disaster³⁹. Jammu and Kashmir Chief Minister announced a relief package for those affected by the floods. It included US\$28m assistance for Jammu region and the valley and US\$4,900 for the kin of those who lost their lives in the disaster. He also announced financial assistance of US\$1,000 as initial instalment for those who lost their homes. Free food supply was supplied to the affected for six months⁴⁰. The National Disaster Management Authority (NDMA) was involved with managing the distribution of aid. This was first time in India that the allocated money was transferred to disaster victims through the Direct Benefit Transfer (DBT) mechanism. The priority was given to those families whose homes were completely destroyed. The NDMA directly coordinated with State Relief Commissioner's Office and concerned District Collectors for verification and distribution⁴¹. There were some issues in the distribution of relief aid in the aftermath of the disaster, with some people making multiple claims and media reports that several victims had to wait up to 3 years to receive government compensation.

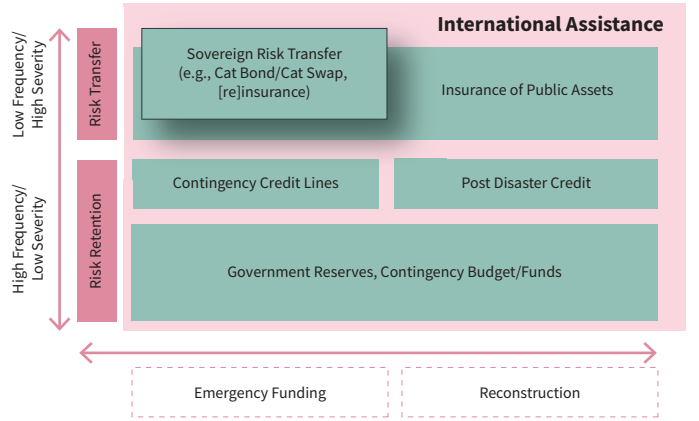
Pakistan learned lessons in the provision of cash transfers for emergency relief and recovery after the Kashmir earthquake 2005 which provided a ‘wake-up call’ on the need for effective disaster-response systems. Most experiences to date, including after the 2010 and 2014 floods, have not, however, been run through the social protection system, but rather as standalone emergency interventions or through DRM structures. Public sector budget allocations for social protection are low overall, with spending on the national safety net in Pakistan estimated to be less than 1% of GDP over the past five years⁴².

39 Rashid 2014
40 Press Trust of India 2014
41 Mishra A 2017
42 Watson et al. 2017
43 Ghesquiere and Mahul 2010
44 Mahul & Signer 2014; Forni et al. 2015
45 Gupta 2017

The efficacy and speed of aid administration was also critical. A World Bank study analysed the availability of aid following natural disasters. It argued that some financial instruments are available quicker than others. Budget contingencies and reallocation, for example, are available quickly in the short-term with 1-3 months, while credit, both internal and external, is available in the medium term 3-9 months after the disaster. Importantly, catastrophe funds and insurance, requiring advance planning, are available throughout the recovery and reconstruction cycle⁴³. It recommended that governments in developing countries adopt a layering approach to managing disaster and should secure funds for frequent disaster events and only increase its post-disaster financial capacity to finance less frequent and/or more severe events⁴⁴ (Figure 7).

The World Bank has approved US\$250m under the Jhelum and Tawi Flood Recovery Project, which will restore and improve the connectivity disrupted by damaged roads and bridges, and reinforce existing weak and vulnerable flood control infrastructure⁴⁵.

Figure 7: Risk laying of catastrophe funding



Section 4: Recovery and Resilience

Overview

Recovery is defined as a return to normality and an attempt to bring the post-disaster situation to some level of acceptable performance. However, a post-disaster ‘normal’ may not be a return to the same status as before the event, especially if safety and amenity can be improved to enhance resilience and achieve a new normal. Recovery from disaster can therefore be viewed as a process of resilience building, whereby the capacity of a community to spring back after the initial shock of a disaster is increased. Although there is a strong imperative to recover quickly and get people back home and business back in operation, a balance must be achieved between speed and enhanced resilience.

Disaster risk management in both India and Pakistan tends to focus on post-disaster rescue and relief operations and not on ex-ante measures like early warning, flood prevention and insurance⁴⁶.

Speed of recovery

Floods are not short-term events. Recovery of the agriculture sector was fairly slow, particularly due to lack of a functioning crop insurance market. In fact, several small and medium farm enterprises did not survive the floods. Crop insurance was found to be a better risk mitigation strategy for weather-related disasters than structural measures such as dams and dikes⁴⁷. However, there is strong resistance to purchase crop insurance in Pakistan, and to an extent in India, because of the prevailing idea that the government should provide ex-post financial support rather than poor farmers pay for insurance.

Community physical infrastructure such as village roads, drainage system, and some electricity poles was not restored after either the 2010 and 2014 flood disasters. Major reasons were ignorance and corruption in the funds allocated for recovery of rural areas by local politicians with the involvement of government officials. Most development programs were focused on urban areas and the lack of restoration of infrastructure facilities increased vulnerability of people by causing health problems and hampering the shifting of belongings before the flooding occurred⁴⁸.

46 Arshad et al. 2016
47 Arshad et al. 2016
48 Jamshed 2015

Quality of recovery

Soon after the floods in Pakistan, a recovery needs assessment (RNA) was carried out to estimate the costs of recovery (National Disaster Management Authority of Pakistan 2014). The RNA identifies the steps to bridge the gap between relief and rehabilitation by concentrating on immediate actions that would enable the affected population to restore their livelihoods. The sectors that were studied were housing, agriculture, livelihoods and community infrastructure. Two different approaches were used to estimate costs: (i) replacement and (ii) Build-Back-Better, including risk reduction. Table 4 provides detailed estimates of intervention budget for various sectors: agriculture, physical infrastructure, livelihoods and housing and disaster risk reduction. It was estimated that the total additional cost of building back better and increasing resilience was about US\$56m. Of note was US\$100m ear-marked for micro-insurance to small farmers. The total estimated cost of recovery in Pakistan was about US\$440m. How much of this budget was actually spent is not known. Disaster risk reduction efforts depend on people's perception of risk, which is affected by factors such as actual flood risk threat, house ownership, education levels, past experience with the floods and location, in terms of distance from the nearest water body^{49,50}. However, whether households and communities are willing and able to take preventative action to address flood risk is a complex question that many authors have attempted to answer with only limited success^{51, 52, 53}. Few households incorporated flood resilient measures in reconstruction. Measures were only incorporated by large farms and high-income families. Nevertheless, lack of knowledge and inadequate perception of risk is a hurdle in building back better. Similarly, the usefulness of some resources is questionable and loans together with deficient restoration of village infrastructure are found to have increased community vulnerability against floods⁵⁴.

49 Qasim et al. 2015
50 Lechowska 2018
51 Birkholz et al. 2014
52 Slovic 1987
53 Grothman and Reusswig 2006
54 Jamshed 2015

This overview of the literature on post-flood recovery patterns in India and Pakistan facilitates an estimate of the speed of recovery shown in Table 3 and Figure 8. Housing and agriculture recovered fairly quickly and we imagine that over 90% of homes were rebuilt within 12 months. We imagine that farming mirrored this pattern of recovery and that 90% of agricultural production had also recovered within 12 months. Floods bring benefits in terms of higher crop yields in the season following a major flood. Micro-enterprises also show fairly quick recovery and that about 50% of them recovered within a week after floods.

Table 3: Speed of recovery (months to recover ≥90%)

Sector	Months to recover ≥90%
Housing	12
Agriculture	12
Tourism	30
Infrastructure	36

Figure 8: Speed of recovery

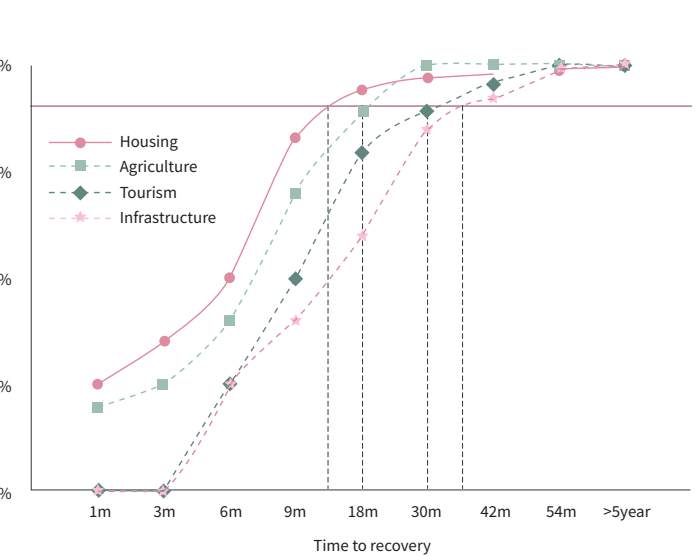


Table 4: Recovery Needs Assessment (RNA) - Indicative intervention budgets (US\$m)

Sector	Replacement	Build Back Better	Total (US\$m)
Housing	112.4	13.5	125.9
Crops	101.1	8.1	109.1
Livestock	2.2	0.2	2.3
Livelihoods	9.1	18.3	27.4
Infrastructure	158.9	12.7	171.6
Disaster risk reduction	0	3.5	3.5
Total	383.7	56.2	440.0

Key gaps and challenges in flood management were also identified in the needs assessment exercise, some technical and others political in nature. The main shortcomings were:

- Inadequate flood control infrastructure
- Lack of adoption of prevention and mitigation measures
- Lack of flood management data, planning and coordination
- Lack of community-based disaster preparedness plans
- Late weather warnings due to lack of early-warning systems and technology
- Improper implementation of the land use policy resulting in building in flood hazard zones
- Government ineptitude in dealing with emergencies
- Weak recovery planning



Qasim et al. (2016) measured socioeconomic resilience in Pakistan using multiple indicators with a survey of 280 households and data from the director of Centre for Disaster Preparedness and Management (CDPM) as inputs. They find that resilience in Pakistan in all four areas studied is uniformly low. Social resilience scored due to low educational status and lack of insurance. It is also widely thought that religion was also a factor, as people believe Allah will protect them from floods and therefore take few precautions. However, other studies have shown that contrary to popular belief, religious views of insurance are not a major reason for not holding insurance⁵⁵. Low economic resilience suggests many households below the poverty line, many of whom are dependent on agriculture. Poor institutional resilience reflects inadequate forecasting, such as the fact that people did not receive flood warnings. Low physical resilience was because people built mud houses in flood-prone areas, which were easily destroyed.

55 Turner 2014
56 Fahada et al. 2017

A survey of 600 farmers in NW Pakistan found that the majority of farmers were risk-averse, and floods, high input prices, crop diseases, and excessive precipitation were the main risks they perceived. Results of a probit regression model indicate that age, education level, farm location, off-farm income, and access to market information were the main factors that affect the farmers’ risk perception⁵⁶.

Section 5: Discussion

Considerations for the Insurance Sector

The floods were ranked among the costliest weather event in Asia for 2014 because of their collective severity, in terms of number of deaths and number of insurance claims⁵⁷. Such estimates were based on the assessment that the floods destroyed 375,000 homes and other structures in both countries, and killed 648 people. Of the total US\$18 billion losses due to the floods, US\$16 billion were in India and the rest in Pakistan. Although the losses in Pakistan are significantly lower in comparison to India, this was the fifth successive billion-dollar flood event in Pakistan.

The majority of insurance premiums in the region cover shops and factories, and despite the importance of agriculture to the regional economy, insurance penetration and per capita spending on crop insurance and home insurance were very low⁵⁸. Only about 1.5% of the total damaged property was insured in the affected Jammu and Kashmir (J&K) region during these floods. Total pay-outs in the region were around US\$236m, but the total losses were approximately US\$15.8 billion, leading to a significant protection gap in India alone of roughly US\$15.5 billion. It has been recommended that government subsidised crop insurance schemes are needed to encourage farmers to buy insurance policies and tilt the balance⁵⁹.

There have been several reasons for the low insurance uptake in these regions. The lack of credible insurance firms operating in the region reinforces people’s low trust in insurance and red tape is seen as a major inhibitor, particularly the paperwork involved. Finally, one of the key issues is that Islam does not permit the purchase of property insurance and it is noteworthy that Kashmir is a Muslim-majority state. While Islamic finance proposes a “Takaful system”, which is a form of mutual fund insurance, as an alternative to the traditional insurance policies, it does not find a place under the secular Indian banking laws.

Despite these barriers, there are positives and while growth rate of insurance policies was only 10% in India, the growth rates in Kashmir was 30% immediately after the disaster. There was more interest in purchasing insurance after the floods, after pay-outs were made to insurance holders following the disaster. For example, Bajaj Allianz in Srinagar reported a 50% increase in home insurance soon after the event and they expected the number to rise further. Similarly, United India Insurance saw a 30% increase in its new policies purchase. This suggested that

the affected areas were more proactive with insurance purchases. There were judicial interventions in the public provision of insurance because of the severity of the damages and four public sector insurance companies had to pay out US\$615m as the Jammu and Kashmir high court ordered them to pay 95% of the claim if the cover was US\$38,500 without any verification.

Drivers of Insurance Demand

Because insurance penetration in India and Pakistan is so low, it is important to understand what factors determine the demand for insurance policies in the affected regions and the steps needed to close the protection gap. A household survey asked farmers about their willingness-to-pay (WTP) for “hypothetical” crop insurance using a double-bounded logit model⁶⁰. Each respondent was asked if they were willing to pay an initial amount of premium (start-up bid) and if they answered “yes” then a higher follow-up bid was presented, and if “no”, then a lower follow-up bid was presented. Therefore, there were four possible responses, which provide the classification levels for the logit model. The findings indicate that only 28% of respondents were willing to purchase crop insurance against floods. The mean WTP insurance premium was about PNR55 (US\$0.5) per month per acre. Interestingly, these farmers did not differentiate between private and public insurance schemes. Higher bid premium resulted in lower WTP for crop insurance and therefore confirms the negative relationship. Households whose main source of income is farming had higher WTP and access to credit also positively affected the WTP for crop insurance. Importantly, those who had experienced a flood were more willing to purchase crop insurance against floods. A survey of 384 individuals in the Punjab province, where an equal number of respondents were sampled from the flood-affected and non-affected villages, found that those who experienced the 2010 floods were more willing to purchase insurance against floods⁶¹. The study also found that the availability of external aid significantly affected the demand for flood insurance and, having received external assistance in the past for reconstruction, reduced demand for insurance.

57 Aon Benfield 2014
58 Swiss Re 2019
59 Arshad et al. 2016
60 Arshad et al. 2016
61 Turner et al. 2014

Section 6: Key Findings

Disaster management is still relatively undeveloped in India and Pakistan. Pakistan still lacks proper disaster mitigation strategies, preparedness and institutionalised coping strategies. It is imperative that disaster risk management be a national priority and an essential component of long-term development goals⁶². Flood hazard mapping and risk zonation is needed to highlight areas of high risk. It is time for disaster management authorities to devise plans to better protect human life and property.

India and Pakistan are characteristic of Indian sub-continent nations with flood-prone geography and increasing vulnerability to natural disasters. While the origin of the 2014 floods was in the Kashmir valley of India, Pakistan was severely affected because of overflowing of the Jhelum River. Low water carrying capacity of rivers, flat topography of the landscape and human factors such as encroachments were some of the key factors that resulted in widespread flooding in India and Pakistan. Agriculture and tourism were the worst hit sectors in the affected region of these countries, which is consistent with them contributing the largest to the state’s economy. These floods resulted in loss of lives and displacement of residents in the region around Kashmir valley and North-Eastern Pakistan provinces such as Punjab. These floods exposed political fragilities in Jammu and Kashmir, such as failure of the state to provide timely relief. Furthermore, it also exposed the bias of media towards the contribution of the Indian army in addition to disproportionate coverage of the Jammu and Kashmir capital city Srinagar. These factors further reduced the trust of people in the state government.

A very large insurance protection gap exists in the flood-affected region. Consequently, less than 2% of the economic losses arising from these floods were insured. The lower emphasis on ex-ante measures has also led to slower recovery and rehabilitation process following the floods. Low crop and property insurance rates were also key impediments to the recovery process and symbolised low resilience. The slow recovery was exacerbated by technical factors such as lack of flood prevention measures, early-warning systems and weak recovery planning processes. On the positive side, those with better access to credit and prior exposure to floods and those with positive insurance experience were more willing to purchase insurance against floods.

US\$15.8b

total losses

US\$236m

total payouts for losses

<2%

of the economic losses arising from these floods were insured

Only about 1.5% of the total damaged property was insured in the affected Jammu and Kashmir region during these floods. Most insurance is related to shops and factories and despite the importance of agriculture to the regional economy, crop insurance and home insurance rates were very low.

62 Deen 2015

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Acknowledgements

Cambridge Centre for Risk Studies gratefully acknowledges AXA XL for supporting the research efforts summarised in this report. The Centre is grateful for the expertise provided by our research team, collaborators, and subject matter specialists.

Cambridge Centre for Risk Studies Research Team

- James Bourdeau, Geopolitical Risk Research
- Oliver Carpenter, Lead Environmental Risk Research
- Dr Andrew Coburn, Chief Scientist
- Jennifer Copic, Lead Liability Risk Research
- Dr Jennifer Daffron, Lead Technology Risk Research
- Ken Deng, Lead Financial Risk Research
- Timothy Douglas, Risk Modelling
- Tamara Evan, Lead Geopolitical Risk Research
- Taryn Hubbard, Risk Modelling
- Farnaz Mahdavian, Risk Researcher
- Dr Stephen Platt, Senior Risk Researcher
- Professor Daniel Ralph, Academic Director
- Simon Ruffle, Director of Research and Innovation
- Dr Andy Skelton, Lead Risk Modelling
- Timothy Summers, Senior Data Science
- Jayne Tooke, Communications Assistant
- William Turner, Data Science
- Dr Michelle Tuveson, Chairman & Executive Director

Cambridge Centre for Risk Studies

University of Cambridge Judge Business School
Trumpington Street
Cambridge, CB2 1AG
United Kingdom

enquiries.risk@jbs.cam.ac.uk

Website and Research Platform

www.jbs.cam.ac.uk/risk



