



**Report on Wilton Park Conference WP940
RESPONDING TO FLOODING –
IMPROVING THE PREPARATION AND RESPONSE**

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in co-operation with the UN Office for Co-ordination of Humanitarian Affairs (OCHA) and with support from: Norwegian Ministry of Foreign Affairs and the Department for International Development (DFID)

Policy conclusions and recommendations

- Changing climatic conditions and increased vulnerabilities are increasing the incidence of flooding worldwide.
- Flood preparedness does save lives through water management, prevention measures, early warning systems, shelters and on occasion, evacuations.
- Rescuing the victims of a flood will remain a critical part of any flood response and more needs to be done at national and international level to develop rescue capacities often involving the deployment of military assets.
- There has been a shift from controlling flood waters towards 'living' with floods and managing the risk.
- Greater emphasis is now required to increase the resilience of those communities likely to be affected by floods. Much of the flood preparedness work should therefore be concentrated on building the resilience of vulnerable, often impoverished, communities.
- The maintenance of existing flood control measures, such as embankments, however remains critical and needs sustained investment.

- The international humanitarian community needs to treat flooding as a problem in its own right and consequently should develop relevant expertise, and make necessary preparations and financial provision should a national government request international support. International donors should support the strengthening of the response capacities of national governments.
- Potential victims need know-how and experience to be shared before a flood occurs, rather than just the provision of rescue or recovery equipment and support after a flood.
- As urban flooding is likely to become more common-place, action is needed to prepare for the probability of a large-scale flood disaster of low-lying 'megacities',
- Whilst International Non-governmental Organisations (INGOs) have successfully worked with rural communities to develop and support flood prevention measures, more focus is needed on urban areas, including working with local and municipal governments.
- Existing flood response literature needs to be better organised and more widely shared internationally. More systematic research is needed, with improved links between humanitarian responders and academia.
- The response to Cyclone Nargis in Myanmar in June 2008 may prove a turning point for humanitarian assistance because the proliferation of new actors, regional bodies, corporate and non-traditional donors challenged the coordination capacities and 'humanitarian-standards' developed by traditional humanitarian actors.

Introduction

1. The story of Noah's Ark is a useful reminder that flooding is nothing new. Indeed many cultures living in the Nile basin or alongside the rivers flowing from the Himalayas or in the Mekong Delta depend on annual floods for food production. However, the impact of floods and windstorms has intensified in recent decades. Climate change is expected to increase the number of extreme weather events (such as high intensity windstorms and rainfall, and sea surges, resulting in flooding on an unprecedented scale and the loss of life, livelihoods and assets). Areas not traditionally prone to flooding will be affected, including low-lying cities with poor drainage as well as more traditional rural areas in river basins.

2. Globally there has been a general shift from controlling flood waters, by taking defensive action against a flood, for example, using large scale infrastructure projects to hold water in retained areas, towards 'living' with floods and managing the risk. This change of approach needs to be long-term and sustained. An effective flood control strategy should therefore include not only natural retention measures but also prevention measures, including awareness raising, contingency planning and emergency response.

3. Learning from previous floods and the response to them is critical in preparing to improve response in the future. Interventions need to focus on the most vulnerable people in developing countries who are affected most by floods. Communities need to be at the centre of improved preparedness, disaster risk reduction, mitigation work and strengthened emergency response (through mass casualty management and medical preparedness).

Trends in floods and the response

4. There is no one description for 'floods'. Rather there are different situations such as flash floods, monsoon flooding and wind storms such as hurricanes. The scale of floods is increasing, as is the number of floods. Of the 2136 floods recorded globally in the last decade, about 40% occurred in Asia; 23% in Africa and 20% in the Americas.¹ China expects a major flood every two years; Bangladesh, as a deltaic country with two-thirds of the country less than 5 metres above sea level, experiences a major cyclone every 3-4 years and anticipates a major river flood, often due to monsoon storms, every 4-5 years.

5. Climate change experts anticipate more extreme weather events; but their severity and location are difficult to predict. Increases are expected in:

- flash flooding; (39 inches of rain fell in 24 hours in Mumbai in 2005);
- landslides, as a result of intense rainfall or flood water;
- storm surges;
- man-made floods, such as breaches of embankments (as in the case of the Kosi embankment in August 2008 which caused widescale flooding in Bihar, India);
- areas not previously prone to flooding, such as urban areas.

6. Large-scale floods can kill significant numbers of people. For example, 138,000 people were killed by Cyclone Nargis in Myanmar in June 2008; most by the surge of a 12 foot high wall of sea water (similar to the 2004 Tsunami). Proportionately there are higher

¹ Source Centre for Research on the Epidemiology of Disasters (CRED): for a flood to be 'recorded' by CRED at least 10 or more people are reported killed; 100 or more people are reported as affected; and a state of emergency declared or call for international assistance (www.cred.be).

levels of fatalities amongst women and children. Sea surges generally either kill or leave survivors uninjured. Apart from large-scale disasters, fewer people overall are being killed as a direct result of floods, thanks to improvements in warning systems and better preparedness. China, for example, has seen the average death toll from a flood disaster halve from 3,900 to 1,700. Bangladesh has made major strides to reduce casualties from recurrent floods through increased flood control and other structural mechanisms, early warning and shelter construction. 4,234 people died from Cyclone Sidr in 2007 compared to previous similar cyclones (500,000 in 1970 or 138,000 in 1991). This is despite a doubling of the coastal population in the affected area.

7. Whilst floods resulted in fewer fatalities overall, the number of people whose lives and livelihoods were affected by the flood waters has increased: an estimated 2.6 billion over the last 30 years. In 2007, 105 million were affected in China; 18 million in India, and 8.9 million as a result of Cyclone Sidr in Bangladesh. Flood-prone areas in China contain 50% of the population and 30% of agricultural land. Large-scale flooding is a new phenomenon in some countries given climatic and other changes. For example, in Colombia there were 65 deaths from flooding in 2008 and 1.2 million people affected.²

8. The economic and social impact of floods is significant: the annual cost of the damage caused by disasters can constitute a significant percentage of developing country GDP. In the 1990s the direct economic losses from flooding averaged between \$98-134 billion per annum or 2.24% of Chinese GDP over the decade. This has now decreased to less than 1% per annum. Floods also disproportionately affect the poor who tend to live in high density flood-prone areas, often in poorly constructed houses.

9. Floods also cause longer term problems. There is concern about flood-related diseases; caused by contaminated water or rodent-borne diseases such as leptospirosis, or vector-borne diseases such as malaria and dengue fever. Longer-term psychological problems persist for those affected. Other problems include the destruction of infrastructure and housing; nutritional loss through initial crop losses, or increased levels of salt in the soil after a sea surge or cyclone, reducing crop productivity and increasing malnutrition; and longer-term economic deterioration. Major floods could also lead to increased numbers of refugees crossing borders. More research is needed into these broader impacts of floods.

² with 98 injured, 18 missing, 2489 houses destroyed and 90390 damaged.

Lessons from Recent Flood Responses:

10. There is now a wealth of literature about flooding with many evaluations being carried out. The 2008 Learning, Accountability, Performance in Humanitarian Action (ALNAP)³ report assessed over 70 evaluation reports of responses floods in the period 1970-2007, most of which had resulted in international support or funding. Evaluations need to be written and read in the spirit of “what could have gone better” and lead to a change of behaviour if the outcome of one response is not to be ‘washed away’ by the next flood. Increased sharing of evaluations would be valuable, as would improved procedures for monitoring new personnel.

11. Many evaluations, however, look at outcomes rather than impact. The proposed 10 year review of the response to Hurricane Mitch to be undertaken by the regional Central American organisation Centro de Coordinacion para la Prevencion de los Desastres Naturales en America Central (CEPRENAC) will be a useful exercise assessing the longer term impact of the response made.

National Response

12. National governments have ultimate responsibility for responding to disasters. Many countries have made significant improvements in national response mechanisms, often spurred by lessons from previous major floods.

Indonesia after the Tsunami

13. Following the Tsunami in 2004, Indonesia has made some fundamental changes to its approach to disaster management. Lessons have also been learned from large-scale flooding in the Jakarta area in 2007 and 2009 including:

- strengthening the legal framework (law 24/1007) which acts as an ‘umbrella’ for a national system of disaster management, setting out the government’s role and responsibilities;
- shifting from a government focus on ‘response’ to one of ‘prevention’ and ‘preparedness’, and recognising the role communities need to play in their own risk reduction, preparedness and management of floods (including developing contingency plans);
- integrating disaster management into national and local development planning (disaster management is now funded by the government’s development budget);
- strengthening the responsible institutions at national, provincial and district levels;

³ see www.alnap.org

- improving early warning systems for floods and landslides;
- balancing structural flood mitigation measures (levees and floodwalls, water storage areas, drainage improvements, floodway clearance etc) with the non-structural flood mitigation measures, such as land use management, flood forecasting, public information and evacuation planning; and
- using damage and loss assessments developed by the Economic Commission for Latin America and the Caribbean (which demonstrates the value in sharing lessons between regions).

Bihar

14. Extensive flooding in Bihar, India in August 2008 was caused by the breach of the 2 kilometre embankment of the Kosi river in Nepal, forcing the river to change course and flood an area not traditionally flood-prone.⁴ More than 200 people died and 4.6 million people were affected in 2,528 villages.⁵ A large-scale national response was needed including 1.02 million people being evacuated using 3,654 boats; 700 response personnel in 100 inflatable boats rescued 100,000 people over 18 days and 407 camps were set up to house 423,178 people.

15. Key lessons from the Bihar response included:

- the lack of information-sharing between governments about the state of the river embankments;
- lack of early warning systems.
- although not a flood prone area, the role of the affected communities in their own response was critical;
- the national response, whilst large-scale, was hampered by different political parties governing Bihar state and the Union;
- given its capacity and experience, the Indian government did not ask for international support (nevertheless, some INGOs and the corporate sector provided significant support);
- mobile banks enabled people to access cash quickly to restore some level of normalcy and re-start livelihoods;
- temporary schools were quickly established in camps to keep traumatised children active;

⁴ the Kosi is a trans-boundary river running through Nepal and India, whose river course has shifted significantly over the last 250 years.

⁵ the flooding destroyed almost 320,000 houses and affected 337,000 hectares of cropland.

- reconstruction after the flood waters receded was used as an opportunity to “build back better” with rebuilding and retrofitting buildings.

16. Flood-affected countries continue to learn from responses which in turn enhances their preparedness. Response preparedness needs to emphasise rescuing and supporting victims after a flood as well as prevention and mitigation programmes. The extensive use of military assets in flood response, particularly in developing countries, suggests the military should be involved in planning. Key questions that need to be addressed include: how can a country assess how well prepared it is? Would a monitoring and evaluation mechanism of a country’s level of preparedness be feasible, for example involving a third party? Is each country able to reach the poorest or most vulnerable?

Strengthening the role of communities

17. There is growing recognition that improving the resilience of communities at risk of flooding is critical to reducing the risk and impact of a flood. Communities have the knowledge and capacity to identify their risks and vulnerabilities, and are the first to provide an immediate response to their own plight and that of their neighbours. However, the most vulnerable are often the poorest, with no surplus income to invest in long-term protective preparedness measures. Hence, they become more dependent on national or international institutions and formal assistance mechanisms.

18. Converting preparedness measures into practical action in ‘communities’ is important. Work by Plan, an INGO in Bangladesh, for example, has helped raise awareness and improve preparedness in this regard. The term ‘communities’ also needs to be more broadly defined as not just based on a location, but by occupation, such as fishermen, or age.

19. Introducing more Disaster Risk Reduction (DRR) measures at a local level would help support the communities. DRR support also needs to be broader than just planning and training exercises for a response (both rescue and longer-term survival) and should include the empowerment of communities and the provision of longer-term investment. This needs political trust and financial support. Where this has been given Oxfam, for example, has witnessed rapid impacts on community preparedness and response capacities in Bangladesh and Mozambique. Mechanisms are needed to scale-up such community-based initiatives.

20. External actors, such as INGOs, working with flood-risk communities, can play an important role, but care is needed to avoid over-dependency. Humanitarian and development actors need to work together. The humanitarian actors can learn from their development colleagues, for example, how to build capacities at local level. Innovative measures, such as providing direct cash transfers after a flood to get money into the local economy quickly, can be valuable.

21. Communities can be encouraged to work with upstream river communities, including across borders, to improve early warning and share information about coping mechanisms as well as learn lessons from recovery.

Improving risk assessments and early warnings

22. The key to saving more lives and reducing the impact of flooding is through improved early warning systems for alerting both those likely to be affected and the emergency response organisations. Early warning can also protect agriculture and livelihoods. Forecasts need to create a picture of a developing flood risk, through the gestation from initial weather predictions through to active flood, and to provide at least 5 days lead time where possible. Steady improvements in weather forecasts are having a significant impact and Global Information System meteorological data is now being shared much more widely. However, weather forecasts also need to be more closely integrated with flood risk mapping. Meteorological organisations need to co-ordinate closely with hydrological organisations. Lessons from the UK floods in 2007 recommended co-location of the Met Office (weather forecasting) and Environment Agency (responsible for monitoring river levels and providing flood alerts). In many Eastern European countries, meteorology and hydrology are located in one organisation.

23. Good mapping of hazardous areas prone to flooding is also critical; the increased use of satellites to assist mapping is an important step forward. However, risk assessments based on hazard maps need to be interpreted alongside local community-based vulnerabilities. They need regular updating and past assumptions of risk should be adapted after a flood and shared with countries sharing river basins etc.

24. Dissemination of risks and warnings to the local level are also critical. They need to be provided in a language local communities can understand. Science needs to be distilled in a simple fashion and tailored to the differing needs of individuals at risk, such as farmers or first responders. A 'layered' warning system such as the alert stages 'Ready; get set; go' developed in the Philippines can be valuable. Dissemination can be achieved through the

use of television weather channels and FM and community-based radios. Wind-up radios should be available in case of power failure. Although public awareness may be high where floods are frequent, people do not always react as expected. For example, after the 2007 UK floods, it is recommended that police should in future actively knock on doors in high-risk areas to warn people directly.

Moving from flood control to flood management – the Chinese experience

25. Following the catastrophic flood of the Yangtze in 1998, China recognised it can no longer depend on large-scale controls to prevent floods. Instead it should concentrate on 'managing' the flood and reducing its impact. Flood control engineering projects are still important; the large-scale Three Gorges project is now nearing completion. In order to 'store' flood waters in the upper reaches and discharge floods in the lower reaches of its seven major rivers China has 85,000 reservoirs and 278,000 kilometres of dykes. However, efforts to manage floods now include such measures as returning man-made polders to natural lakes, dredging rivers and lakes, planting trees and re-forestation, soil and water conservation, restricting human access to mountains, and using flood water as an important resource in a 'water scarce' country.

26. China has resettled about 2.4 million people in high risk flood areas, sometimes sacrificing smaller settlements for the sake of protecting cities, and has restricted human activities in natural flood plains. A complete flood control engineering system is being established with all levels of government responsible for flood control. A comprehensive legislation 'package' has been introduced, with laws on water, regulations on flood control, rules on compensation for the use of flood storage and retention areas, and regulation of flood management tools.

Spreading the Risk - the Role of Insurance?

27. Insurance could serve as a risk management tool in providing support to households near or just above the poverty line in flood-risk areas. Traditional coping mechanisms of those affected by a flood include selling assets (land, animals or equipment) or reducing consumption, both of which have significant consequences for longer-term economic prospects. Insurance can provide assistance after a flood and limit post-flood credit constraints and other market failures that might hamper subsequent recovery. Insurance could also 'incentivise' people to take measurements to reduce their risk to a flood.

28. Experiments to develop micro-insurance for those vulnerable to floods are limited. China is developing a form of social insurance that allows those living in the flood storage

and retention areas to receive compensation for recovery and evacuation; pilot schemes are being conducted for a national social insurance compensation scheme. The scheme uses a hi-tech approach to compensation using hazard assessments and remote sensing. Such a scheme may be applicable elsewhere. The challenge is to find ways of scaling up such schemes. Insurance in itself is an inefficient way to transfer money; but creating national, government-subsidised schemes might be beneficial. To work they need a significant target group size in order to correlate insurable flood events to target group losses, affordability and an enabling institutional environment. A proposed Climate Change Multi-Donor Trust Fund for Bangladesh is another example of insurance.

29. A cost benefit analysis (CBA) approach has been developed to demonstrate the benefits of disaster risk reduction projects. This is currently being used in certain situations in South Asia as a tool to provide analysis of the projected outcomes with, or without, a particular project.⁶ For example, setting up an early warning system may be good at saving lives, but not at saving assets and livelihoods. Whilst such an approach should not be used in isolation, it can challenge processes and assess whether things could have been done better, or whether particular projects should go ahead. Results of detailed CBAs indicate investment in risk reduction can generate high rates of return; however, not all approaches to risk reduction are resilient under changing climatic conditions. Such an approach questions certain DRR programmes, particularly those which are dependent on specific events, have long lead times, a high initial investment and long-term institutional dependence. Additional evaluation prior to investment is recommended.

Urban challenges

30. Whilst most floods still occur in rural areas, flooding in urban areas is increasing. Demographic trends towards urbanisation and increased vulnerability of those living in slums in many low lying 'megacities' are increasing the risk of flooding. Of 25 'megacities' with populations over 10 million, 19 are in developing countries, and 14 are on the coast. All are vulnerable to storm surges or rises in sea level. There has been significant flooding in Mumbai in 2005 and Jakarta in 2007 and 2009. 'Megacities' need to be a key focus of both DRR and future response planning at national and international levels. Potential economic losses from urban floods are huge. Although Africa is likely to become the most heavily urbanised continent, flooding is not yet recognised as a problem in, for example, Nairobi or Freetown. Much could be learned from the experience of Maputo and Lagos.

⁶ see Institute for Social and Environmental Transition www.i-s-e-t.org

31. Urban flooding may be 'artificial' in the sense that it is often caused by high rain intensity combined with inappropriate sewer systems, rather than flooding of large river basins. Urban drainage infrastructure, such as pipeline networks and culvers, are rarely large enough to cope with a large scale flood. Prevention of floods in cities is expensive but critical and a programme of improvements in urban water management and drainage is therefore needed. In Jakarta, a flood canal started in 2003 is expected to be completed in 2010 to minimise flooding to the east and south. Urban land use planning is also critical and needs to include hydrological planning. Drainage systems of the future should be based on increasing infiltration into the ground and the use of ponds or dams to reduce flood peaks. Urban planners, water companies and municipal governments all need to integrate their activities. Improved legislation in this area could help, and national political will is also needed. Urban areas have added complexities of tenancy rights and land ownership (or lack of); municipal governments are less prepared and livelihood recovery is more complex and intertwined. The collection of rubbish should be ensured so water courses are not blocked.

32. Urbanised people generally have fewer coping mechanisms and higher expectations of someone looking after them in the event of a flood. The sheer numbers involved in an urban flood mean that however good plans and procedures are, resources will never be enough. Clean water and sanitation are vital as are shelters and the provision of food at local level. Equipment, such as pumps and generators, needs to be more sophisticated and include search and rescue capacity for landslides as well as flood water.

33. The evacuation of a flooded city may not be appropriate or feasible and there are questions of how to evacuate and where to go. The potential for looting also needs to be factored in and therefore needs careful policing. The emphasis for international donors in cities should be to increase support of preventative measures and contingency planning of national and municipal authorities. Such work is, however, often outside the traditional 'comfort zone' of many INGOs.

International Support – How Much and When?

What national governments want from donors

34. With scarce resources the challenge for donors is whether to support investments such as analysis of vulnerabilities and flood prevention and mitigation work before a flood, or strengthen response capabilities during and after a flood. Flood-prone countries may seek support for capacity building for the response and the longer-term interventions, before, during and after a flood. At the time of a flood, the affected national government may seek

international assistance in the form of equipment, technical or financial assistance. The mix of their requirements will vary depending on the situation, and evolve over the course of a disaster response. It will also depend heavily on the governments own capacity to respond and the availability of hardware such as boats and helicopters. Whilst helicopters are in short supply, and expensive to operate, they are a highly visible form of international assistance. A national government, may however, prefer generators which support lead ministries and response organisations to enable them to continue to function and to manage the crisis and provide relief to those affected, rather than allow direct requests to support victims. Such international support is less 'visible' or 'media-friendly', but could be critical in strengthening the national government assistance.

35. In providing support the governments of countries affected by floods expect donors to respect their sovereignty, culture and traditions; share knowledge, with local level organisations and national governments and develop agreed procedures to help governments save face when requesting financial support.

36. Different international interventions may be needed where there are militia groups in control of flood affected territories rather than official or functioning government. Such support might need more diplomatic intervention or additional security.

Cyclone Nargis

37. The international response to Cyclone Nargis in Myanmar in June 2008 was unique in many ways. The response became highly political with the international community keen to create a 'humanitarian space' within a politically closed environment, but with little trust between the Myanmar government and the international community at the outset. Diplomacy was a critical element and was shown to work. The role of regional governments also became critical; Myanmar preferred initially to invite its neighbours to provide support including China, Bangladesh and India but then accepted a solution where the regional Association of South East Asian Nations (ASEAN) took the lead.

38. For the international humanitarian community a number of key issues arose:

- the need to deal with the national government in whatever shape this takes, recognising the cultural and historical contexts and how a government perceives international support (for Myanmar this included memories of warships off its coast).
- care is needed in defining those 'affected'; including those who need life saving assistance (food, water, sanitation); assistance in restoring livelihoods; and those in the affected areas who can continue to function reasonably normally. Care is also

needed when agencies quantify the numbers 'reached', for instance at a food distribution point or treatment centre;

- a second wave of deaths did not occur as many outsiders predicted, either from starvation or cholera;
- local populations in such flood-prone areas have a significant coping mechanism;⁷
- the 'traditional international humanitarian community', however defined, needs to deal with a growing range of new 'humanitarian' actors, including neighbours, INGOs (in this case from India and other Asian countries), regional organisations and countries not traditionally associated with a traditional humanitarian response, as well as the corporate sector and the military;
- In a closed environment such as Myanmar, some UN organisation in-country staff can develop strong prejudices about the situation in which they are working.

39. The response in Myanmar may well be a turning point for the 'traditional international humanitarian community' of western donors and INGOs who have set up humanitarian standards and a degree of accountability amongst themselves. Now they are challenged to co-operate with the many newer and non-traditional players, and are encouraging them to take on the principles of good humanitarian donorship and accountability.

40. Cyclone Nargis involved a degree of irresponsible media reporting. Burmese diaspora were an important factor in mobilising international public opinion through blogs and feeding an international media machine starved of access and pictures;

The Growing Role of Neighbours and Regional Co-operation

41. Regional organisations are playing an important role in supporting how national governments respond to disasters. As demonstrated by the role of ASEAN after Cyclone Nargis, regional organisations can provide a critical link between the national affected government and the international community, and advising the national government on how the international community could help. Countries in the region can also learn from one another. Some regions such as the Caribbean and Central America have developed strong co-operation. CEPREDENAC for example, has for the past 20 years, built up common political will, inter-governmental co-operation and the development of much shared training and education in relation to disaster preparedness and response. CEPREDENAC and the Red Cross in Central America have developed closely interlinked specific groupings for flooding and hurricanes. In South East Asia, ASEAN's role in disaster response within the

⁷ Cyclone Nargis affected less than 1.5% of Myanmar's land mass and about 2.4 million people, about 5% of its population

region is growing, particularly since the Indian Ocean Tsunami and Cyclone Nargis. However, the South Asian Association for Regional Cooperation (SAARC) could do a lot more at the political level to develop regional co-operation and build informal academic and technical networks. Africa and the Middle East/North Africa would also benefit from greater cross-border co-operation. UN (through the Office of Co-ordination of Humanitarian Affairs (OCHA)) representation is valuable, and needs to be extended to countries of newer actors such as the Organisation of the Islamic Conference.

42. Building up cross-border networks between neighbours and countries sharing a river basin takes time and needs to be institutionalised. In many regions good co-operation exists at a technical or community level; for example African communities are using mobile phones to communicate water levels. The challenge is how to replicate such co-operation at the political level. Inter-governmental connections are harder where responsible agencies in each country lie in different political, humanitarian or military agencies. For instance in East Africa the lead for disaster response lies with a variety of Ministries, the Red Cross in Kenya, and the military in Zimbabwe.

43. More effective regional co-operation should include:

- establishing effective channels of communication between countries;
- greater exchange of information, such as scientific inputs in weather, water or mapping of vulnerable areas;
- sharing plans of action of each country within a regional context; involving a range of Ministries, and de-classification of some plans;
- supporting formal collaboration at a regional level on research (for example weather patterns);
- if the military and NGOs are active players in the national disaster management plan, they need to be closely involved in national and cross-border committees;
- supporting national legislation that covers any potential cross-border request, thus easing border customs, air clearance and visas at the time of a disaster;
- expanding bilateral agreements to a basin-wide or regional remit.

44. The international community can help improve national and regional disaster preparedness and response at the request of the national government. Donors can support regional co-ordination. This is particularly important when they provide development assistance or work with the range of different governments in any regional grouping.

45. Donors are also urged to:
- ensure that short and long-term lessons from research feed back into developing policy response;
 - act as advocates for communities with national governments;
 - support the deployment of early warning systems within vulnerable communities, connecting the meteorological and hydrological expertise with communities;
 - include more specialist experience within humanitarian teams;
 - train in swift-water rescue (to date the US and Singapore are believed to be the only countries doing this in a humanitarian context), an activity that is increasingly likely to involve working with militaries;
 - listen to what countries want and better understand the individual context (for example, if a government priority is food security through external procurement, but the international community should not procure food locally as this drives local prices up;
 - avoid a response being driven by the 'politics of visibility' (helicopters make good media in donor countries but may be a less suitable response);
 - minimise donor fatigue at recurring and smaller-scale floods.
46. Donor co-ordination in response work is critical. The UN through OCHA plays a key role in co-ordination. Re-engineering of co-ordination mechanisms is needed to take account of the proliferation of new humanitarian actors and groups who provide assistance during and after a flood. Throughout a response donors need to pay greater recognition of the sovereignty of the national disaster management structure of the affected country and have a greater awareness of their national capacities.

Post Flood - Building Back Better

47. Any reconstruction after a flood should not sow the seeds for another disaster. Experience shows a habit of reconstructing vulnerabilities, for example using poor construction standards and the use of 'cowboy' builders.

48. The aftermath of a flood provides an opportunity to address historical vulnerabilities such as opening drainage ditches, voluntary resettlement away from flood plains, and protecting existing structures. The location of houses, water points, schools, medical facilities can also be improved. Such infrastructural improvements should be budgeted during a response phase. Those affected should also seek to improve or change their livelihoods.

49. Humanitarian actors need to understand the implications of their actions in the immediate response phase for the long-term recovery, and factor this into their plans to 'build back better'. Accordingly, discussions between humanitarian actors with urban planners, architects and development experts would be beneficial.

50. Bangladesh's approach to floods offers an example to others. A proposed 15 year investment following Cyclone Sidr aims to prevent economic losses of 1% of GDP every 3-4 years. A comprehensive plan, developed from a World Bank co-ordinated 'damage loss and needs assessment', proposes a \$1.3 billion investment. The aim is to reduce flood casualties, and ensure faster recovery, for instance improving agricultural production post flood, when increased salinity usually leads to a lost crop.⁸ Included in the plan is a long-term disaster risk reduction programme focused on assessing and identifying risk, strengthening emergency preparedness, building institutional capacity, investments in risk mitigation and development of a catastrophic risk finance and transfer scheme to provide funding for early recovery.

51. Additional lessons from the recovery phase of floods include the need for: political commitment to improve (international donors can act as advocates for improvements); pre-planning for reconstruction; recognition of the importance of the local economy and those not directly affected physically; enabling quicker asset recovery which reduces future flood vulnerability (for example protecting livestock, or restoring livelihoods quickly), and recognition that the capacity of traumatised communities to recover can be weakened.

Conclusion

52. Much has been achieved to reduce deaths from flooding. However, given the increased risk of flooding, including in areas not-traditionally prone to floods, more action will be needed to reduce the risk and impact of a flood and prepare to respond.

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⁸ The Food and Agriculture Organisation are introducing a winter crop to reduce crop loss.