Chapter 18
Financing for Disaster Risk Reduction in Pakistan

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Abstract Disaster records in Pakistan during the last few years show severe impact both on the citizens as well as the Government. The losses incurred during the floods of 2010 and 2011 resulted in damages amounting to US$10 billion and US$3.7 billion respectively. Likewise, the earthquake of 2005 caused a loss of US$5.2 billion, which is enormous when compared to the national budget of US$25 billion for the year following the quake. The losses due to the drought of 1998–2001 were also staggering. In 2000–2001 financial year alone, the drought reduced the average economic growth rate from 5 to 2.5 %. The financial pressure generated by these and other disaster events had short-term severe fiscal impact as well as long-term developmental implications, and therefore, need effective remedial measures. These, in turn, demand critical insight into investments in disaster risk reduction and recovery to identify weaknesses therein, so that appropriate fiscal instruments may be put in place. This is particularly important in the wake of expanding population and economy that are exacerbating the disaster risk. This paper analyses the past and present mechanisms to finance disaster management in Pakistan. With the scanty data available in Pakistan, quantifying overall Disaster Risk Reduction (DRR) and recovery investments is a challenging task. Nevertheless, a review of data shows that investments in DRR have been scarce and spending on disaster preparedness has not been given priority in the national development plans. Moreover, for every dollar spent on disaster management, only a tiny fraction was spent on preventing or preparing for them; most of the funds went into relief and rehabilitation. This applies to all kinds of funding including those of the Government, private sector, charities as well as international donors. However, the growing losses from natural hazards demand much greater investment in enhancing resilience, which includes risk assessment, risk reduction, and efficient management of residual risk. A wind of change has started in the country with the creation of institutional

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mechanisms and establishment of a Disaster Management Fund. The study found that there is still a big vacuum, which can be filled only by the development of a comprehensive risk financing strategy with a range of instruments. It further recommends financing through public-private partnerships for the promotion of cost-effective solutions to counter enhanced threats from climate change.

Keywords Disaster risk • Risk financing • Cost of damages • Disaster management fund • Public-private partnership

18.1 Introduction

Disaster records in Pakistan during the last few years show severe impact both on the citizens as well as the Government. This paper after discussing vulnerability to disasters examines the past and present mechanisms to finance disaster management in Pakistan. It is followed by analyzing the shortcomings in the present mechanism in the wake of emerging realities. Finally a range of tools and mechanisms available are discussed for adoption by government and other stakeholders as a part of a comprehensive risk financing strategy. The findings of the chapter are summed up in concluding section of the paper.

18.2 Hazard Vulnerability

Pakistan is vulnerable to disaster risks from a range of hazards including avalanches, cyclones/storms, droughts, earthquakes, floods, fogs, glacial lake outburst floods, heat waves, landslides, and tsunami. High priority hazards in terms of their frequency and scale of impact have been earthquakes, droughts, floods, windstorms and landslides (Table 18.1) that have caused widespread damages and losses in the past.

Occurrence of natural hazards/disasters have threatened sustained economic growth by causing shocks such as the 1998–2001 drought, October 2005 earthquake, and August 2010 floods did (Table 18.1). The losses incurred during the 1998–2001 droughts were staggering. In 2000–2001 financial year alone, the drought reduced economic growth rate to 2.5 % as compared to expected growth rate of over 5 % (Ahmad et al. 2004). The quake caused a loss of about 5 billion US$ (ADB-WB 2005), which is enormous when compared to national budget for 2006–2007, which was about US$25 billion. Cyclone Yemyin in 2007 caused damage amounting to US$674 millions (ADB-WB 2007). The economic damage from 14 flood events between 1947 and 2007 was estimated at US$6 billion. The floods of 2010 wiped off 5.8 % of the national GDP causing a loss of some 10 billion dollars (ADB-WB 2010). The economic damages suffered from the flood of 2011 were estimated at US$3.7 billion (ADB-WB 2011).

Table 18.1 Impacts of natural disasters in Pakistan 1987–2010

S.No	Disaster type	People homeless	People killed	People injured	People affected	Total affected	Total damage $ 000	Rank
1	Flood	8,927,685	11,722	12,62	38,669,447	47,589,394	2,746,030	1
2	Earthquake	2,853,585	142,812	88,096	1,294,429	2,336,110	5,019,255	2
3	Drought	–	223	–	2,269,300	2,269,300	247,000	3
4	Famine	–	–	–	300,000	300,000	–	4
5	Epidemic	–	283	211	16,275	16,486	–	5
6	Windstorm	22,579	11,654	1,183	1,057,000	1,080,780	4,100	6
7	Landslides	3,100	384	114	200	3,414	–	7
8	Extreme temperature	–	1.406	324	250	574	–	8
9	Total	11,806,967	161,464	90190	43,606,901	55,505,058	8,016,385	–
10	Flood 2010	1,744,471	1,984	2,946	20,484,550	20,184,550	10,000,000	–

Source: NDMA (2011)

Table 18.2 Top ten countries of the world affected by disasters 2000–2010

Top countries affected by disasters	Number affected (million people)	Number of disasters	Number of deaths	Ratio disasters to death	Economic costs (US$bln)
China	1,321.6	311	105,849	340	205,654,128
India	602.9	204	60,879	298	25,888,285
Bangladesh	73.2	90	9,696	108	5,884,000
Philippines	52.9	160	10,531	66	2,543,118
Thailand	43.6	57	9,750	171	2,433,613
Pakistan	32.8	74	789,325	1,072	17,134,648
Ethiopia	29.2	48	2,926	61	9,400
Vietnam	21.8	89	3,754	42	5,759,905
United States	20.7	257	4,357	17	353,414,290
South Africa	15.3	42	708	17	866,305
% of total	90	27	25	–	61

Source: OECD DAC

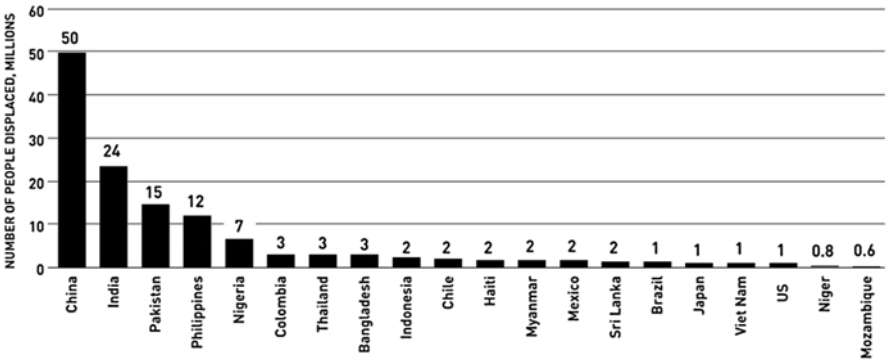

Fig. 18.1 Top 20 countries of the world with the highest disaster induced displacements 2008–2012 (Source: Development initiatives based on Internal Displacement Monitoring Centre (IDMC) data)

When compared with rest of the world, Pakistan was among top ten countries ranking sixth in terms of disasters faced between 2000 and 2010 (Table 18.2) and ranked third in displacement of people due to disasters (Fig. 18.1).

The financial pressure generated by these and other disaster events had short-term severe fiscal impact as well as long-term developmental implications, and therefore, need effective remedial measures. These, in turn, demand critical insight into investments in disaster risk reduction and recovery to identify weaknesses therein, so that appropriate fiscal instruments may be put in place. This is particularly important in the wake of expanding population and economy that are exacerbating the disaster risk.

18.3 Disaster Management Investments: Past Scenario

18.3.1 Past Mechanisms

Historically disaster management in Pakistan followed a reactive post disaster or Post ante rather than a proactive or Ex ante approach. Hence the investments focused on post disaster relief, rescue rehabilitation and reconstruction and gave little importance to disaster risk reduction.

18.3.1.1 Domestic Sources

The Government responded to disaster relief on case-by-case basis through reallocation of funds from other budgetary heads or provided adhoc assistance by creating special funds for a particular disaster. Examples of such funds included Prime Minister Fund for Flood Relief (to which public and organizations could also contribute) as the primary fiscal response to disaster relief at national and provincial levels. Individual government organizations also created relief funds for example Army announced setting-up of its relief fund. Government also used other means to gather funds, which were mandatory rather than voluntary – where sponsors were left little option to deny funding. For instance deductions from salaries for relief fund and flood surcharge on the sale of petroleum. Such ex-post instruments were too small to cover recovery and reconstruction needs and contributed to liquidity shortfalls in the immediate aftermath of disasters. The government's ultimate responsibility to provide post-disaster assistance to not only the poor and vulnerable for reconstruction but also to restore lifeline infrastructure was a huge challenge.

The reactive approach was also apparent in the legal and institutional framework prior to 2005. For example, the West Pakistan National Calamities Act 1958 was the legislation that provided the mechanism for the maintenance and restoration of order and relief in areas affected by disasters. In terms of institutions, an Emergency Relief Cell was created in 1971 in the Cabinet Division for providing an institutional disaster relief support at the federal level. At the provincial level the institution of Relief Commissioners was created to look after the matters at that level. The Federal Emergency Relief Cell in 1974 prepared the first plan proposing organizational structures, responding agencies and procedures for monitoring relief operations; the plan however, did not materialize.

Further, disaster management in the country focused mainly on flood disasters. After each episode of flood, the government investment remained concentrated mainly on rescue, relief and rehabilitation. Nevertheless an important aspect in this regard was that it led to preparation of annual flood fighting plans at all levels of the government – district, provincial as well as federal with a bottom up approach. It also promoted early warnings through various means of communication both indigenous and modern.

18.3.1.2 Humanitarian Assistance

Humanitarian assistance for disasters in the country has come from some domestic but largely international sources. Regarding domestic sources, Development Assistance Committee of the Organization for Economic Co-operation and Development ranked Pakistan the fourth most charitable nation in the world after Sweden, Norway and Luxembourg. Their 2010 report stated that people in Pakistan give 1 % of their Gross National Income (GNI) as charity. This is however, only a small component of the Humanitarian Assistance that the country received from international sources.

The amount of International Humanitarian Assistance received between 1995 and 2008 in response to specific disasters such as flash floods, floods, drought and earthquakes is shown in Fig. 18.2. This assistance reached its peak in 2005, when the country received US$576 million following the flooding and Kashmir earthquake in 2005, and a further US$465 million in 2006 as humanitarian needs in Kashmir continued. In 2008 Pakistan was the 16th largest global recipient of humanitarian aid.

18.3.1.3 Coordination of International Assistance

Office of the Coordinated Humanitarian Assistance (OCHA) coordinates the humanitarian aid from international community to the Government of Pakistan for emergency relief. Such assistance was provided for flood-affected areas in 2010 and 2011 and more recently earthquake affected area in Balochistan. OCHA provide support for emergency preparedness, coordinated assessments, disaster risk reduction as well as capacity building of government functionaries. It also assists in enhancing disaster management and response skills of local humanitarian partner organizations in districts prone to disasters.

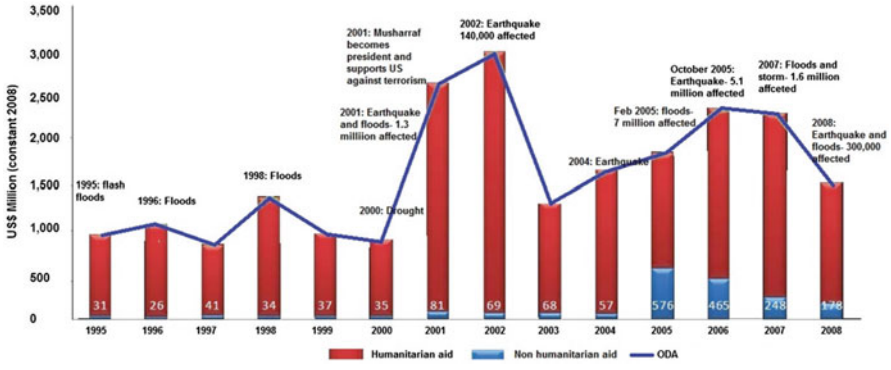

Fig. 18.2 Humanitarian assistance to Pakistan as compared to Non-Humanitarian Aid and ODA 1995–2008 (Source: ORCD DAC (all donors))

Over US$6 billion has been mobilized for humanitarian assistance in Pakistan since 2005. OCHA manages two pooled-funds mechanisms, the Central Emergency Response Fund (CERF) and Pakistan Emergency Response Fund (ERF), which provide assistance for food, water, shelter, health care, nutrition and protection support to people affected by natural disasters and complex emergencies (Table 18.3). Since 2007, Pakistan has received more than U$168 million from the CERF to address urgent humanitarian needs, while the Pakistan ERF has disbursed over $42 million since its inception in 2010.

18.3.2 Weakness and Shortcomings

The weakness of the existing emergency and disaster-response apparatus became too apparent during the devastating earthquake of 2005. It was after the devastation during this earthquake that led to a transformation of national perspective on the disaster issue. The main drawback in the investment mechanisms was that it focused on reactive or ex-post strategies. The data analysis on investments show that there has been very little outlay on disaster risk reduction (DRR) and spending on disaster preparedness has been minimal in the wake of low priority given to it in the country. In June, 2011, the Federal Finance Minister announced that the cost of reconstruction, after the July 2010 floods, would be in the region of US$43 billion. The 2011 floods, 2013 earthquake in Balochistan and 2014 drought in *Thar* have put further strain on national budgets. A major reason for the occurrence of these series of disaster is that most development in the country has taken place with little or no regard to natural hazards, not only exacerbating existing disaster risk but also creating new disaster risks. This amply demonstrates the need for the government and donors to increase investments in disaster risk reduction and enhancing resilience by effective early warning systems, flood control, resilient buildings and infrastructure and better planning particularly through implementation of building codes.

According to agreed international targets, under the Hugo Framework of Action, a minimum of 10 % of all humanitarian funding including allocation for post-disaster reconstruction, and recovery projects should be allocated to disaster risk reduction (DRR). Likewise 1 % of broader development budgets should also be given to DRR. Moreover, the Framework of Action demands that all public development policies should integrate DRR and climate adaptation principles systematically to face the emerging challenges of the changing climate.

Improved DRR measures not only help avoid loss of lives, damage, and distress but also have great value in economic terms. For example it has been estimated that between 2005 and 2011, disasters cost to Pakistan was about US$20 billion. Reconstruction cost after the 2010 floods alone was assessed at $10.9bn, almost one-quarter of the national budget. The Asian Development Bank and the World Bank, which estimated this cost stated that an initial investment of just US$27 million by the Government of Pakistan would cut substantially losses from future disasters. The Government of Pakistan had allocated more than this sum to pay for National

Table 18.3 Top 10 recipient countries of central emergency response funding 2008–2012

	2008	US$m	2009	US$m	2010	US$m	2011	US$m	2012	US$m
1	DRC	41	Somalia	61	Pakistan	52	Somalia	53	South Sudan	40
2	Ethiopia	32	DRC	30	Haiti	37	Ethiopia	46	Pakistan	37
3	Myanmar	28	Zimbabwe	27	Niger	35	Pakistan	32	Syria	36
4	Kenya	26	Kenya	26	DRC	29	South Sudan	23	DRC	31
5	Pakistan	19	Sudan	26	Sudan	24	Kenya	23	Niger	25
6	Afghanistan	18	Sri Lanka	24	Chad	23	Chad	23	Yemen	23
7	Haiti	16	DPRK	19	Kenya	20	Sudan	18	Sudan	20
8	Sudan	16	Ethiopia	16	Ethiopia	17	Cote d'iviore	16	Myanmar	17
9	Nepal	13	Philippines	12	Sri Lanka	16	Sri Lanka	16	Burkina Faso	15
10	Sri Lanka	12	Niger	12	Yemen	15	Niger	16	Chad	15
% of total		**52**		**63**		**64**		**62**		**54**
Total top 10 recipients		**221**		**252**		**266**		**266**		**259**
Total all recipients		**429**		**397**		**415**		**426**		**477**

Note: DRC - Democratic Republic of Congo; DPRK - Democratic Peoples Republic of Korea
Source: Development Initiatives based on Central Emergency Response Fund (CERF) data

Assembly expenses in budget of financial years 2009/2010 and 2010/2011. This initial investment, followed by sustained allocation of resources, could help reorganize the existing parallel disaster management bodies, providing them assistance and hardware support in the 30 most vulnerable districts and longer-term flood risk mapping (Oxfam 2011).

Donor Support is also imperative to ensure strengthening DRR and climate change adaptation measures. Sustained DRR funding along with continued development assistance is indispensible in developing disaster preparedness mechanisms. In the past even outside donors support had low priority for DRR. According to OECD Development Committee, for example, only 1 % of total reported official humanitarian assistance to Pakistan between 2005 and 2009 was allocated to disaster prevention and preparedness (Fig. 18.3).

The OECD Development Assistance Committee data for top ten recipients (including Pakistan) of bilateral humanitarian assistance for 2007–2011 period (Fig. 18.4) reveals that all these countries received very little proportion of this funding for DRR. Pakistan particularly was at the lower end of the scale whereas Haiti and Somalia did much better.

One other important thing to note is that overall financing for disasters is not a priority for the international community. As an example, over 20-year period between 1990 and 2010 the commitment for international aid was just over 3 trillion US dollars (Fig. 18.5). Compared to this the total commitment to natural disaster related aid was 106.7 billion US dollars. A balance sheet of spending, within this reveals that US$13.5 billion or only about 12.7 % was actually spent on disaster prevention and preparedness, compared to US$23.3 billion on reconstruction and a

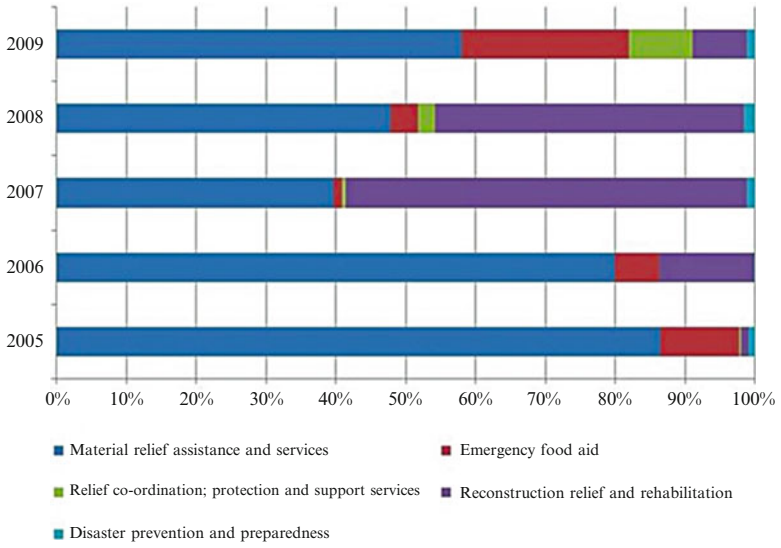

Fig. 18.3 Pakistan: humanitarian assistance by type 2005–2009 (Source: Development initiatives based on OECD DAC data)

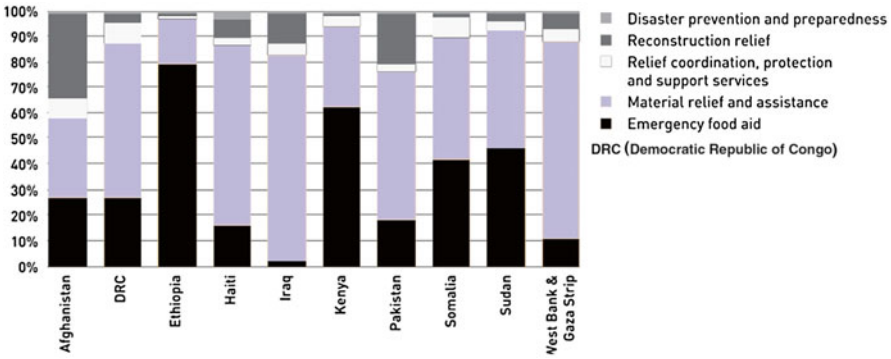

Fig. 18.4 Bilateral humanitarian assistance to top ten recipients by type 2007–2011 (Source: Development initiatives based on OECD DAC CRS data)

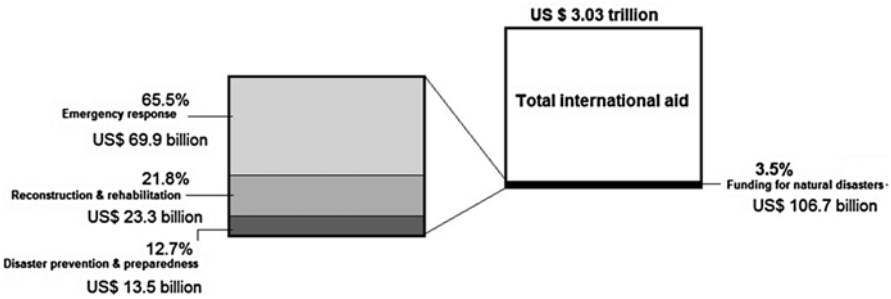

Fig. 18.5 Proportion of disaster prevention and preparedness assistance in international AID

staggering US$69.9 billion on disaster-related emergency response (Fig. 18.5). Thus for every US$100 spent on disasters, only US$12 was spent on either preventing them in the first place, or preparing for them.

It is encouraging however that in recent years, DRR has gained great prominence and international recognition through global initiatives like the Global Facility for Disaster Reduction and Recovery (GFDRR) and the UN International Strategy for Disaster Reduction (ISDRR). DRR, as a result, is now being used as a crucial means to check the impact of natural disasters, avert humanitarian crisis and to promote sustainable development. Most multilateral donors such as the World Bank and Asian Development Bank and bilateral donors such as governments now recognize its importance and are adopting strategic approaches to incorporate DRR within their aid programmes. Further in response to continuing trend of rising disaster losses, even governments of the affected countries are not only acknowledging and appreciating DRR but also investing in it. The Government of Pakistan, for example, through this investment is assessing risk to reduce and ensure that residual risk is managed as efficiently as possible for hazard-resilient recovery and reconstruction.

18.4 Disaster Management Investments: Present Scenario

There was a paradigm shift in Pakistan in recent years from reactive to proactive approach, a large share of investment since the earthquake of 2005 has gone into development of legal framework, institution building, formulation of a National Disaster Reduction Policy and development of a National Disaster Reduction Plan (NDRP). Moreover, a Disaster Management Framework was launched in 2007 to guide entire system of disaster management. The life of the framework was for 5 years. Subsequently, 10 years 'National Disaster Management Plan' (NDMP-2012–2022) was formulated with Japanese assistance. The approved plan identifies short, medium and long-term interventions for public sector investment in the whole spectrum of disaster management. The emphasis though remains on vulnerability and risk assessment, early warning system and human resource development.

The NDMP 2012–2022 has been developed to implement National Disaster Risk Reduction Policy, which provides coverage to both natural and man-made hazards and has been developed in consultations with all stakeholders to mainstream disaster management in development planning. It outlines the country's objectives, priorities and directions for reducing risks from upcoming challenges of disaster management, while providing a guiding framework for DRR friendly development planning focusing on climate change adaptation measures, disaster risk insurance, and community based disaster risk management approaches. DRR mainstreaming strategies for six federal ministries have already been formulated for implementation. The Provinces of Punjab and Khyber Pakhtunkhwa have also initiated replication of similar arrangements by establishing Provincial Working Groups on Mainstreaming DRR within their planning and Development Departments.

18.4.1 Present Mechanisms

In terms of financial mechanisms, besides establishment of national and provincial national disaster management funds, a social safety net has been created, and an ambitious insurance programme is being initiated for the whole country.

18.4.1.1 New Funding Mechanisms

Provision has been made for the following new funding mechanisms for disaster management at both national and provincial levels in the National Disaster Management Act of 2010 as follows:

18.4.1.2 The National Disaster Management Fund

This Federal Fund is the main source of funding to meet any threatening disaster situation or disaster. It will absorb all other existing funds for managing disasters such as Prime Minister Disaster Relief Fund and any other related funds at the

discretion of the Federal Government. The National Authority shall administer the fund, which is to be financed from

(a) Federal Government grants
(b) National and international agencies loans, aid or donations
(c) Donations from other sources

18.4.1.3 Provincial Disaster Management Funds

The respective Provincial Governments will establish this fund. The Provincial Authority shall administer the fund, which will be financed from:

(a) Federal and Provincial Government grants
(b) National and international agencies loans, aid or donations
(c) Donations from other sources

18.4.1.4 Budgetary Provisions

The Act also calls upon Federal and Provincial Governments to provide funds from their budget to carry out the activities and programmes included in the Disaster Management Plan.

18.4.1.5 Social Safety Net

In order to cope with the severe floods of 2010, the Government of Pakistan (GoP) initiated a program of temporary nationwide social safety net (SSN), which enabled it reach an estimated eight million flood-affected people. This rapid response cash grant program known as, "The Pakistan's Citizen's Damage Compensation Program" (CDCP) was built upon experiences that were gained from two previous cash grant relief efforts first of these was for 2005 Pakistan earthquake victims and the second was for people internally displaced during the 2009 civil conflict. The CDCP did not use Pakistan's existing SSN mechanism – The Benazir Income Support Program that was not developed enough for effective delivery of support at that time. Hence, the federal government initiated this separate program in close cooperation with provincial governments, the National Database Registration Authority (NADRA) and commercial banks. The selected program beneficiaries were issued Visa direct debit cards by these banks, called Watan cards, which could be used to collect their grants from ATM machines or designated Points of sale.

A major advantage of this program that can be of great use in future is that it has led to the development of a SSN disaster preparedness action plan for future disasters and crises.

18.4.1.6 Insurance Provision

Pakistan has developed a plan for its entire population to be covered under a proposed National Disaster Risk Insurance (NDRI) programme which will compensate communities against any natural calamity. It will initiate a pilot phase of the programme first, which is to be implemented through a funding support of the World Bank. The Programme is to provide free or subsidized insurance from Zakat fund. Private Sector fund may also be tapped as part of their corporate social responsibility.

According to the envisaged scheme various insurance companies will provide coverage to communities living in different areas of the country. In the case of occurrence of a disaster, the insurers will have to give a prompt response as per their mandate to the respective area or district (s) affected, by providing shelter, food, and medicines. The burden of rehabilitation and rebuilding of the affected communities will also be the responsibility of the insurer. According to the agreement, the government will only pay the premium.

The Poverty Index Database will facilitate the underwriters and the actuaries along with demographic data collected under Benazir Income Support Programme in ascertaining the financial impact of disasters on the people of a particular area/town or a district. The vulnerability of every area will be assessed to the probability of disasters together with their financial implications in order to meet the challenge. The respective insurance company of the area in this way will be ready to handle the emergency.

18.4.2 Emerging Challenge

The Government of Pakistan in recent years has also taken positive steps in creating a disaster management framework and institutions. However, a major emerging challenge is to translate the Disaster Management Policy and Plan into effective disaster management systems; particularly at the community level not only to minimize risks but also to support people help themselves when faced with crisis. It would also require fiscal resilience through sustained investment from domestic resources as well as development of innovative financial instruments and mechanisms. The fiscal measures such as the establishment of a Disaster Management Fund and development of Social Safety Net are encouraging steps in that direction. However, there is still a big vacuum, which can be filled only by advocacy through cost benefit analysis of mitigation measures as well as development of a comprehensive risk financing strategy.

18.5 Fiscal Resilience to Disasters

18.5.1 Cost Benefit Analysis of Investment in Mitigation Measures

It is important to demonstrate through robust cost benefit analysis the critical need to invest in mitigation measures to control disasters. This would involve probabilistic risk assessment as well as the information on expenditures needed to reduce the risk. In addition it may also require examination of fiscal impact of medium and large size disaster events that occurred in past two decades. A combination of these could be used for cost benefit analysis to demonstrate the economic and social benefits of investment in mitigation measures at all levels from local and provincial to national. The mitigation measures in this regard could be both structural and non-structural. The example of the former are those which involve flood control structures like river levees and earthquake resistant buildings while that of the later are building codes, land use policies, awareness creation and early warning system. This is extremely important for advocacy to local/municipal, provincial and Federal officials for investments on the implementation of mitigation measures to reduce expected losses.

18.5.2 Risk Financing Strategy

Development and implementation of a viable risk financing strategy, with a range of instruments, is the most logical future option not only for generating and sustaining investments in disaster management but for enhancing fiscal resilience to disasters. Such a strategy would require the commitment of adequate funds, know-how, and human resources on the part of the government along with logistical cum financial support of the private sector, civil society, and the international community. It will also be important to reflect and integrate the strategy appropriately into national development plans and investment policies to make it effective.

The range of instruments both post ante and Ex ante from which the Government of Pakistan can choose to muster funding after a disaster along with the time needed to mobilize funds by these instruments have been shown in Fig. 18.6. Cost, size and timeliness should be the guiding principles for the selection of instruments. Ex ante instruments may cost more, however, they have an edge over the post ante instruments since they are secured before a disaster and therefore enable speedy disbursement after disasters. The two approaches may be combined for an optimal mix as done in the case of Colombia. However, in Australia financial commitments to natural disasters management relies on ex post approaches, while in Mexico, the reliance is mainly on ex ante financing approach (OECD 2012).

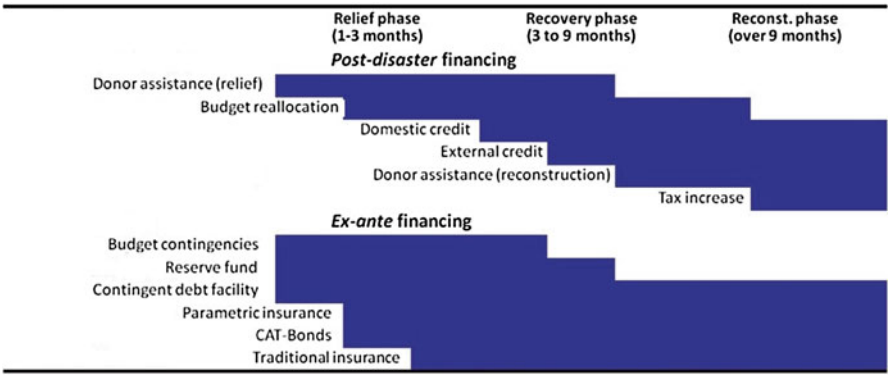

Fig. 18.6 Financial instruments for disaster amelioration (Source: Ghesquiere and Mahul 2010)

18.6 Mechanisms and Instruments of Risk Financing Strategy

The risk financing strategy should have a multi-layered Ex- ante system of instruments including: (i) Reserve or Disaster Management Funds; (ii) Contingency for Emergency Loans; and (iii) Risk Transfer Mechanisms such as Insurance, Parametric Insurance (based on hazard parameters intensity such as earthquake magnitude, sea level rise or wave height, windspeed and rainfall etc.) and/or Catastrophe Bonds etc. Further, the funding base of the strategy needs strengthening with a range of other innovative financial risk transfer mechanisms involving varied stakeholders from private non-life catastrophe insurance for homeowners to agricultural insurance for farmers and micro insurance for the poor. Financing through public-private partnerships would also be extremely useful for the promotion of cost-effective solutions to counter enhanced threats from climate change.

18.6.1 Disaster Management Funds

These constitute dedicated savings or reserves, a source of risk financing obtained mainly through internally generated funds in Pakistan but also include other sources. The Government has already established National Disaster Management Fund at national level. In addition, Provincial Disaster Management Funds have also been established in the Punjab Sindh and Khyber Pakhtunkhwa. Punjab has allocated two billion rupees for the Fund and Khyber Pakhtunkhwa one billion rupees. However, the current domestic resources available for the funds are too little

in comparison to the gravity of the problem. It has been suggested to mobilize further resources through urgent widening of the tax base (currently only 2 % of Pakistan's population pay income tax) without disproportionately impacting on the poorest (Oxfam 2011).

18.6.2 Contingent Financing

Immediately in the aftermath of a disaster, the country is confronted with the urgent need to provide emergency assistance to victims and reinstate damaged infrastructure including roads, bridges, irrigation system, hospitals, schools and utilities such as water supply, gas, electricity, gas. This requires immediate financing to reset the infrastructure and utilities in the affected area. Since in the past, it has been demonstrated that the disaster impacts are very high relative to domestic financial bearing capacity, therefore accessing external sources of risk financing such as contingent credit facilities, where loans are provided in the event of a disaster event is therefore important. It would help to arrange for credit to this effect from a source preferably in advance, contingent upon the calamity. It ensures that if a calamity occurs, the lending source will provide a certain amount of credit to the affected country/party at a pre-determined or negotiated rate.

Recently the World Bank has initiated Disaster Risk Management Development Policy Loan, which has a Catastrophe Deferred Drawdown Option (CAT-DDO). CAT-DDO offers finances for immediate relief, recovery and reconstruction. It is a lending mechanism that allows quick government response to emergency needs following a natural disaster. A major advantage of the mechanism is that it gives flexibility to the Government for not diverting resources from development projects or programs. A limit of up to US$500 million or 0.25 % of GDP (whichever is less) has been set for disbursement of Funds when a country suffers from a natural disaster and declares a state of emergency. International Monetary Fund (IMF) also has an Emergency Natural Disaster Assistance (ENDA) Policy, under which Pakistan received US$450 million after the 2010 floods (Laframboise and Loko 2012).

18.6.3 Risk Transfer Mechanisms

Risk transfer instruments such as insurance allow risks to be transferred to an entity or entities whose business is to pool and diversify risks. This could be a traditional insurance or reinsurance or parametric insurance where insurance payments are triggered by prescribed parameters such as intensity of wind speed in a cyclone. It could also include an alternative risk transfer instrument like Catastrophe bonds. There is a substantial literature available on these (Caballero 2003; Freeman et al. 2003; Gurenko and Lester 2004; Hofman and Brukoff 2006; Cummins and Mahul 2009; Ghesquiere and Mahul 2010; World Bank 2010).

18.6.3.1 Insurance

Markets are well developed and well known for households and other economic insurance, which may also include corporate and public assets providing simple and cost-effective financial protection. The insurance, as risk transfer mechanisms, can be helpful in building resilience of communities' to disasters and is particularly relevant to developing countries like Pakistan. The United Nations Climate Change Conference in its Cancun Adaptation Framework 2010 recommended taking enhanced action on risk transfer and insurance. Nevertheless, in order to promote these, it is essential to create awareness and provide financial help to poor and down trodden, who cannot afford to pay the premium. Whether the insurance scheme to be launched by the Government of Pakistan, which envisages payment of premium of poor's from Zakat Fund, would be successful to this end is yet to be seen.

Turkish Catastrophe Insurance Pool (TCIP) provides an example of insurance for disaster risks. It was established in 2000 especially because by tradition Turkey's private insurance market neither provided nor had adequate capacity for catastrophe property insurance. A World Bank contingent loan supplemented the company's capital from domestic resources. Further international reinsurers have reinsured the program. TCIP had covered about three million dwellings by 2010. The insurance under TCIP was designed as a stand-alone property earthquake policy. The maximum sum insured is US$65,000 per policy and the average premium is US$46 with a 2 % deductible. The rates of premium are determined by two factors construction material (two types were identified) and location of the dwelling (five earthquake risk zones were identified). For example the rates vary from a high of 0.60 % for a weak material house located in the highest risk zone to a low of less than 0.05 % for a concrete reinforced house in a low risk zone. Thus by making purchase of insurance compulsory for middle and high income homeowners, the Government of Turkey has reduced considerably the number of households likely to need assistance from the Government in case of an earthquake disaster (Ghesquiere and Mahul 2010).

It is rather important to note that innovation in disaster risk financing and insurance, in recent years, has considerably diversified its scope to bring in a wide variety of stake holder in the ambit of risk transfer ranging from government to private non-life catastrophe insurance markets for homeowners, agricultural insurance for farmers and livestock owners, and disaster micro insurance for low-income population. Innovation is also taking place in disaster risk financing and insurance product development, disaster risk assessment and sharing, and delivery channels, which need to be carefully explored in the context of Pakistan.

18.6.3.2 Catastrophe Risk Pooling

Catastrophe risk pooling is a mechanism whereby a number of stakeholder or parties such as governments, insurers and reinsurers, donors and people pool their resources to split the heavy economic burden of a calamity. The stakeholders may

also involve a group of countries, which may share their disaster risk through regional cooperative insurance. The example of former case is risk pooling for livestock mortality primarily due to extreme weather whereby the Government of Mongolia initiated an index linked insurance in order to build resilience of nomadic herders to large livestock losses, with the assistance of the World Bank. A livestock insurance indemnity pool was created, which had a reserve fund and a risk pooling arrangement. The partners supporting the risk included the Ministry of Finance, Mongolia, international reinsurance community and the World Bank (which provided contingent credit). The losses up to 8 % were to be borne by the herders while the remaining was covered by the Government of Mongolia through a safety net programme, and insurance indemnity pool.

The example of second case is the Caribbean Catastrophe Risk Insurance Facility (CCRIF 8), the first regional insurance pool of the world, which was established in 2007, involving a group of 16 countries exposed to earthquake and hurricanes. The facility had its own reserved pool of over US$90 million contributed by the countries and reinsurance to the amount of US$110 million from international financial market thus providing US$200 million to the risk facility. When a disaster event occurs the loss at first is met through pooled reserve while the excess risk is transferred to the international capital market (reinsurance and catastrophe bond markets). The reserved pool gets contribution from countries in proportion to their exposed risk that was initially determined through a detailed study of exposure to catastrophes. Since the insurance is parametric, therefore the disbursements are also on the parameters such as wind speed rather than on actual losses. The CCRIF has provided a higher level of resilience than international standards because its reinsurance strategy has been designed to withstand a series of major natural disaster events, each with a probability of occurrence lower than 0.1 %.

18.6.3.3 Direct Access to Capital Markets

With further increase in the severity of the risks and increase in the size or number of the risk bearers, additional risk transfer instruments or tools are used for direct access to capital markets such as catastrophe-linked securities. In a limited number of cases, countries have used catastrophe-linked securities or bonds to cover higher layers of risk in the context of structured disaster risk financing (e.g., a disaster fund) or risk transfer (e.g., an insurance scheme) mechanisms. Global capital markets have much larger amount of funds available and ideally they can be tapped to deal with major and destructive catastrophes. Some of the instruments that have been used to channel funds from the capital markets such as disaster insurance and reinsurance have already been discussed above. Other channels may include Catastrophe bonds and public private partnerships. The first catastrophe bond or a cat-bond was issued in 1994 and since then risk-linked securities have become well known (Anderson 2002). Aon Benfield Securities, which offers cat bonds, sidecars and collateralized reinsurance reported in January 2014 that as of December 31, 2013, the total limit of cat bonds outstanding was US$20.3 billion (Canadian Underwriter 2014).

18.6.3.4 Catastrophe Bonds

The catastrophe bond or cat bond are different from normal bonds, because firstly they are insulated from variations in the stock market and secondly their revenues/returns are comparatively higher than those from normal securities. In addition they allow investors to diversify their portfolio. A reinsurance company or even a government can take the sponsorship of the bond. It appeals to them because it not only serves their purpose of reducing the basic risk by bringing previously uninsurable risks under the umbrella of insurability but also by attracting investors, thereby increasing the capital inflow. According to Wall Street Journal companies had floated upto US$20 billion in Cat Bonds upto March 2012. The Journal also reported cat bond issuance had climbed to US$1.2 billion, over 100 % in the first quarter of 2014 compared to the same period last year and the issuance is expected to increase to more than US$3.5 billion in the second quarter. "Catastrophe bondholders have rarely suffered losses historically. But investors can lose both interest payments and their principal if the costs of disasters top a preset level, which allows insurers to spend the money" (Well 2014). The bonds usually mature in 3–4 years and have floating interest rates.

Among governments, in 2006, the Mexican Government floated a cat bond (Mexi Cat ILS) to insure FONDEN (its national disaster fund against earthquake risk). The principal for the bond amounted to US$160 million. Swiss Re was the reinsurer, which renewed the contract in 2009 for USD 290 million. Earlier than this, Taiwan Province of China had issued a cat bond, in 2003, to insure its residential earthquake insurance pool with underwriter Formosa Re (Clemence et al. n.d).

18.6.3.5 Public-Private Partnership in Risk Financing

This is another instrument that helps mobilize private market funds when complexity and costs rise due to natural disasters. In such cases public or private institutions alone may not be able to meet the challenge alone yet their joint response could be effective. This is particularly true for Pakistan, which lacks funds in both public and private sector but has to deal with the increasing frequency and severity of natural disasters. "Public-private partnerships, especially those involving reinsurance and capital market solutions, can improve disaster planning and prepare stakeholders for the consequences of climate change. They can also facilitate risk awareness and joint solutions using various risk transfer mechanisms" (Wong 2009). It may also allow the government to provide relief at lower costs on the one hand and improve budgetary certainty with lower debt levels after a disaster, on the other.

18.6.4 Combining Fiscal Instruments: Risk Layering

The instruments available for designing a Risk financing strategy in Pakistan have their own costs and characteristics, as discussed above. These are not either/or alternatives but provide complementary solutions. An effective national financial

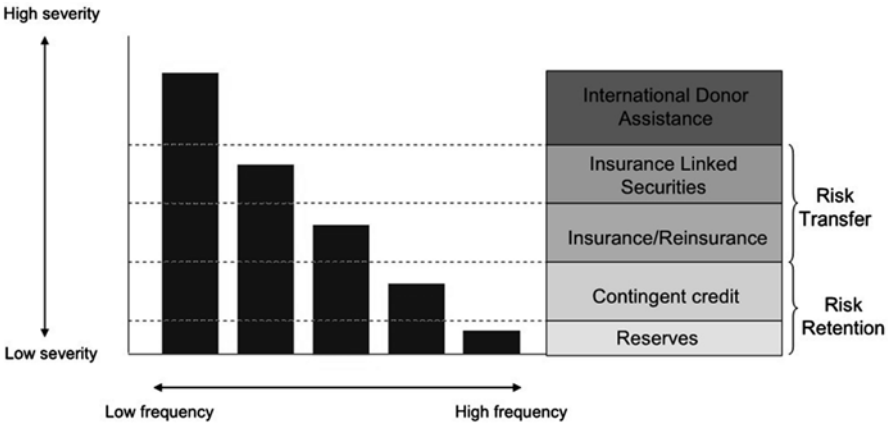

Fig. 18.7 Catastrophe risk layering (Source: Ghesquiere and Mahul 2010)

strategy against natural disasters for Pakistan should therefore rely on a combination of these instruments, taking into consideration indigenous situation such as the country's fiscal risk profile, as well as the cost of available instruments, technicalities involved and the likely disbursement profile after a disaster. Catastrophe risk layering method can be used to design such a strategy (Fig. 18.7). Firstly, the budget contingencies including the reserves in the disaster management funds need to be greatly strengthened and replenished annually. They provide the most important source for ex-ante risk financing that can be utilized in small as well as large disaster events to cover the recurrent losses. Contingent funds or credit including emergency loans could be utilized in medium layer disasters and perhaps insurance could be used if the budgetary contingencies and reserves cannot be accessed or get exhausted. Parametric insurance or catastrophe bonds or other linked securities could be used to finance rare and most severe events. The first preference should be given to secure funds for recurrent disasters events following which the Government should enhance its capacity to finance less frequent but high impact events. There is nevertheless the need to design an optimal risk financial strategy to develop fiscal resilience to natural disasters based on the Governments economic political and social considerations.

18.7 Conclusions

Natural disasters, in past had broad range of economic and social impacts in Pakistan, including loss of human life and injuries, damage to buildings and infrastructure; displacements and unsustainable losses to national economy. The damages in 2005 earthquake and floods of 2010 and 2011 in particular have been

colossal and they could have been cut significantly, if the disaster risk reduction measures would have been in place and integrated into physical, economic and social planning and development. The 2005 earthquake was like a wake-up call, which led the Government of Pakistan to change its emergency response paradigm based on ex post risk financing or funding after the risk event, through budget reallocation, creation of adhoc emergency funds, raising taxes and reliance on international assistance, and pay attention to prevention, mitigation and preparedness.

Major positive steps taken in that direction are creation of a disaster management framework, institutions and DRR Policy. The Government is currently facing two major challenges in this endeavor. The first is to translate the Disaster Management Policy and Plan into effective disaster management systems and secondly but equally if not more important is the creation of fiscal resilience through sustained investment from domestic resources as well as development of innovative financial instruments and mechanisms. The fiscal measures such as the establishment of a Disaster Management Fund and development of Social Safety Net are encouraging steps in that direction. However, the fiscal imbalances created by 2010 floods that threatened the national economy revealed that much more efforts are needed to deal with the increasing frequency and intensity of disasters. It has demonstrated firstly the importance of ensuring that in future the economy has the resources necessary for relief, recovery, rebuilding and resuming economic growth in the aftermath of disaster and secondly that it is critical to invest in disaster risk reduction through preparedness, prevention and mitigation. Both these call for the development and implementation of a robust risk financing strategy.

The strategy needs to be based upon advance planning and geared to increase Pakistan's financial response capacity in the aftermath of disasters. It should have a multi-layered Ex- ante system of instruments including reserve or disaster management funds; contingency for emergency loans; risk transfer mechanisms such as insurance, parametric insurance and/or catastrophe bonds as well as innovative risk transfer means for tapping funds from international capital market. Presently insurance markets in Pakistan have comparatively low level of development and need government support and push for its boosting and enhancement. Tapping other innovative risk transfer mechanisms from international capital markets can also be of immense value as they supplement traditional insurance, which is still largely under-developed in the country. They can ensure availability of funds during recovery and rebuilding efforts, on the one hand and protect budgetary resources and enhance financial stability on the other. Further, pre-determined premiums promote budgetary certainty (particularly in a multi-year contract). Likewise, no payback obligation, in contrast to loans, reduces the pressure to divert funds from existing important projects to manage the after effects of disaster.

It goes without saying that a well-designed risk financial strategy for Pakistan is the need of the day as it has several advantages. Firstly, it will reduce the economic and fiscal burden of natural disasters by transferring excess losses to private capital and insurance markets. Secondly, it would create financial incentives for public and private agencies and/or households to take responsibility for risk reduction and mitigation. Thus for accessing disaster risk financing and insurance instruments, it

would be mandatory to comply with disaster e.g. earthquake- resistance building codes. Additionally, it would be extremely useful in the promotion of cost-effective solutions to counter enhanced threats faced by the country in the wake of climate change. Finally, it is important to mention that a major step in the development of a Risk Financing Strategy in Pakistan would be the comprehension of risk landscape. Risk assessments and risk modeling techniques provide the basic tools for this purpose as they allow appraisal of the likely economic and fiscal impact of natural hazards upon which such a cost-effective risk strategy needs to be based.

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