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Disaster Risk Reduction Strategies and Climate Change Policy Punjab: Linking DRR to CCP

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Disaster Risk Reduction Strategies and Climate Change Policy Punjab: Linking DRR to CCP

Acknowledgement

LEAD Pakistan developed this research brief as part of its efforts to draft a provincial climate change policy for Punjab, aligned with the National Climate Change Policy of 2012. This study was carried out through the support of Oxfam Novib . The paper is part of a series of studies on key sectors that are ancillary documents to the Climate Change Policy Punjab. Planning and Development Department (P&D) and Environment Protection Department (EPD) of the provincial government provided support in systematically executing this project, through a participatory approach, ensuring consensus among all key stakeholders.

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List of Abbreviations and Acronyms

CCA	Climate Change Adaptation
CCP	Climate Change Policy
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
ESCAP	The United Nations Economic and Social Commission for Asia and the Pacific
EWS	Early Warning Systems
GDP	Gross Domestic Product
IPCC	Intergovernmental Panel on Climate Change
MDGs	Millennium Development Goals
NDMA	National Disaster Management Authority
PDMA	Provincial Disaster Management Authority
UN	United Nations
UNISDR	United Nations International Strategy for Disaster Reduction
UNDP	United Nations Development Program

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Foreword

This research brief is among series of research studies conducted by LEAD Pakistan, through support of Oxfam, to help better understand climate response related sector specific needs, with a special focus on the province of Punjab, Pakistan. The research aims to produce add-on information to complement the process of climate change policy development in the sectors most relevant to and critical for effective climate change response in the Punjab province. It aims contributing to development of Provincial Climate Change Policy, aligned with the National Climate Change Policy of 2012.

The series includes the studies titled Food insecurity under self-sufficiency: The Climate-Food-Tenure Nexus; Resilient and sustainable urbanization in Punjab; Future climatic impacts on water: Policy options for ensuring food security in Punjab; Gender and climate change: A provincial context; Role of government in making a transition to climate compatible development; and Impacts of climate change on the energy sector of Pakistan: With focus on Punjab.

This paper titled 'Disaster risk reduction strategies and the climate change policy Punjab' discuses that the debate of Disaster Risk Reduction (DRR), is essentially a proactive approach to disaster management, whereby the probability of loss and damage caused by hazards and natural disasters is reduced significantly.

The study emphasizes that it is essential for the province of Punjab to understand how climatic changes and associated disasters and hazards are having an impact on the lives of the people. The extreme events in the province are posing a challenge to the existing institutional arrangements and structures. This calls for the development of policies and action plans at the provincial level to cope with the impacts of climate change. Furthermore, it is necessary to highlight DRR as a cornerstone in planning for extreme events and their disastrous impacts. Hence, it especially recommends integrating and harmonizing Disaster risk reduction strategies and the climate change policy Punjab, by adopting a holistic approach on these.

It also highlights the potential relationship between poverty and vulnerability to disasters by informing that most people affected in the province belong from the 'poor' to 'extremely poor' districts. It narrates impacts of hazards on the most affected agriculture sector and livelihoods. It guides that the concept of disaster risk reduction can be materialized by integrating a proactive disaster management approach with the provincial and district development plans.

Ali T. Sheikh

CEO, LEAD Pakistan

Abstract

Disaster Risk Reduction (DRR) is essentially a proactive approach to disaster management, whereby the probability of loss and damage caused by hazards is reduced significantly. This paper explores DRR in the face of climate-induced natural hazards in the province of Punjab and sets out policy recommendations.

The National Disaster Management Authority (NDMA), Pakistan, is responsible for analyzing the risks of disasters and the National Disaster Risk Reduction Policy (2013) is the central guiding document for the country that provides an overarching framework for risk reduction. Hydrological-based disasters have been the leading cause of destruction in the province of Punjab, between 1980 to 2015. Riverine floods have the greatest spread across the province. These have historically affected the greatest number of people and destroyed property, arable land and crops. Rains have been the second greatest disaster and threat in the province.

The incidence and spread of poverty in the region must be analyzed, in order to instill DRR in the development initiatives. The paper argues that there is a potential relationship between the vulnerability of people to natural hazards and prevalence of poverty across Punjab. Natural hazards, predominantly floods dominantly affect the agrarian economy of Punjab. Policy recommendations on DRR, include improving institutional arrangements and early-warning systems, promoting research, creating awareness among key stakeholders, prioritizing the needs of hazard prone areas, and recognizing adaptation needs of the agriculture sector.

Background

Problem Statement

There has been evidence of climate change, since beginning of the 20th century in Pakistan. The mean annual temperatures have increased by 0.35 degrees, since 1960, at an average rate of 0.08 degrees per decade (McSweeney et al. 2010; Salik et al. 2015). In Pakistan, the Meteorology Department has observed that the frequency of 'hot days' and 'hot nights' has increased significantly,[1] annually, since 1960 – by 20 and 23, respectively. In terms of projections for the country, the mean temperature is likely to increase by 3.8 degrees by year 2100 (Haensler 2013).

The occurrence of extreme natural events has increased globally, particularly in the South Asian region. The Disaster Risk Management (DRM) Plan published in November 2008 by the Punjab Provincial Disaster Management Authority (PDMA) states that the most commonly occurring natural disasters and hazards in Punjab are floods, heatwaves, storms, earthquakes, and droughts. There is growing literature and evidence available globally and regionally that increase in the frequency of extreme events is attributable to climate change (IPCC 2014). Overall, attribution is an academic debate. However, realities of the impact of these events on the lives of people are determinate and certain. It is important to mention climate change as an ongoing phenomenon, because it is compounding the impact of natural hazards and extreme events. The frequency of these events is increasing, hence making it difficult for the communities to cope with and recover from their impacts in the immediate short term and long term. On the other end, regions are experiencing hazards and climate phenomena due to climate change, to which they are not accustomed to cope with.

Definition

Disasters are considered as situations that involve 'major and widespread disruption of life in a community or society, from which most people are not able to recover without assistance from others, from outside the community or society' . Therefore, disaster risks are considered as potential losses in terms of life, health, assets, services and livelihoods that a community may face over a specified period of time.

Disaster Risk Reduction is defined as 'The concept and practice of reducing disaster risks, through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment and improved preparedness for adverse events' . (UUISDR 2009)

This has given rise to the debate of Disaster Risk Reduction (DRR), essentially a proactive approach to disaster management, whereby the probability of loss and damage caused by hazards is reduced significantly.

For the province of Punjab, it is essential to understand how these climatic changes are going to have an impact on the lives of the people. The extreme events in the province are posing a challenge to the existing institutional arrangements and structures. This calls for the development of policies and action plans at a provincial level to cope with the impacts of climate change. Furthermore, it is necessary in the context of this paper to highlight DRR as a cornerstone in planning for extreme events and their disastrous impacts.

Disaster Risk Reduction Approach

The DRR approach comprises disaster management that focuses on reducing the risks or probability of loss of life, health,

1- Hot' day or 'hot' night is defined by the temperature exceeded on 10% of days or nights in current climate of that region and season

assets and livelihoods in the face of hazards. Hence, reduction of vulnerabilities by enacting a proactive approach and integrating DRR strategies on various levels of development is crucial (DRR Policy, Pakistan, 2013).

Climate Change Adaptation (CCA) is similar in some aspects to DRR. However, DRR and CCA have marked differences. Climate change adaptation deals with adjustments carried out in the natural or human settlements in response to actual or expected climate effects, which moderates harm or exploits benefits [(IPCC definition as cited by (Venton and Trobe 2008)].

DRR, on the other hand does not limit itself to climatic events. Instead, it constitutes all forms of hazards, including man-made ones (for instance war, oil spills, nuclear, and chemical accidents). Moreover, DRR does not include other climate change phenomena, such as loss of biodiversity, changes in ecosystem and spread of climate-sensitive diseases.

CCA and DRR aim to reduce the vulnerability and risk of people to sudden and slow-onset[2] extreme events, and enable them to better anticipate, respond to and cope with hazards to resume normal life. Therefore, there is a strong relationship between DRR and CCA strategies. There is a need to integrate these and improve coordination within state departments that are looking after climate change and disaster reduction.

Institutional Arrangements[2]

The Ministry of Climate Change (MoCC), Pakistan, has the overall responsibility of identifying the changes in climate and associated climate threats. The climate change policy comprises adaptation strategies, mitigation strategies, and legislative and institutional frameworks. The adaptation strategies aim to cope with the changing climate, and define IPCC as 'the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities'. Mitigation involves formulating strategies to prevent those human actions that result in climate change in the long-run. The 'Framework for Implementation of Climate Change Policy' is a follow up to the National Climate Change Policy (NCCP), which has been formulated to provide a broader framework on how to adapt to the changing impacts of climate, and how to play a role in its mitigation. It will help mainstream the concerns of climate change into decision making and development processes for integrated climate compatible development (Climate Change Division (CCD) 2013).

The National Disaster Management Authority (NDMA), Pakistan, is responsible for analyzing the risks of disasters, and proposing strategies to curb the risks and cope with the hazards. The National Disaster Risk Reduction Policy (2013), is the guiding document on DRR. It provides an overarching framework for risk reduction. However, the principal responsibility lies with the provinces and districts to come up with the means and ways to ensure that the framework laid out under the national DRR policy is implemented and integrated in their development and risk management approaches.

2- Slow onset' is the term used by development and humanitarian practitioners to refer to a disaster that does not result from a single, distinct hazard, but one that emerges gradually (over weeks to months and even years), based on a combination of complex and interrelated circumstances." (Turnbull et al. 2013, p.111). 3- The relevant documents are: National Climate Change Policy 2012, National Disaster Risk Reduction Policy 2013, Provincial Disaster Response Plan 2014, Framework for Implementation of National Climate Change Policy 2014-2030.

Situation Analysis

The agriculture sector significantly contributes to the economy, by employing about half the labour force and constituting 24% of the national GDP (Pakistan Bureau of Statistics (PBS) 2015). The province of Punjab has the largest share in the agriculture sector, with 57.1% of the cultivated land belonging to the province. It produces the majority share of cotton, wheat, rice, and sugarcane crops and milk.

Agriculture, predominantly contributes to income generation for the people of the province. It is imperative to protect the agriculture sector from extreme events and natural hazards. The change in climatic conditions has a profound effect on the agriculture sector, innately connected with the environment. Successful adaptation to and risk reduction from climate change and natural hazards, result in a resilient economy. Livelihoods can be protected and impacts of hazards moderated by improving coping-capacities of the people.

Socio-economic Overview with Linkages to Disaster Risks

Punjab, much like the entire country, suffers from various socio-economic problems. The provincial issues include political uncertainty, poverty, malnutrition, unemployment, crime, terrorism, climate change and natural disasters.

The cumulative incidence of poverty, estimated through the head-count ratio in Punjab is 19% (falling below the poverty line), predominantly in the rural areas. However, the incidence of poverty is 28% in the rural areas of the province (Naveed and Ali 2012). In terms of the national average, Punjab is better than the other provinces, in general. In terms of the incidence of poverty in the rural areas, it again falls short of the overwhelming national 46% figure. Annex-III shows a district-wise comparison of the incidence of poverty across Pakistan (Naveed and Ali 2012). The provincial unemployment rate of Punjab is 6.1%, which is close to the national average of 6.2% (PBS, 2013).

Risks in the Punjab Province

Hydrological-based disasters have been the leading cause of destruction in the province of Punjab, between 1980-2015. As shown in figure 1 below, the catastrophic floods of 2010 (annex) have shifted the focus of DRR strategies in Punjab to primarily risk reduction from the impacts of floods. Riverine floods have the largest spread across the province and have historically affected the greatest number of people and destroyed property, arable land and crops. Rains have been the second biggest disaster and threat in the province, affecting 18% of the total affected due to hazards.

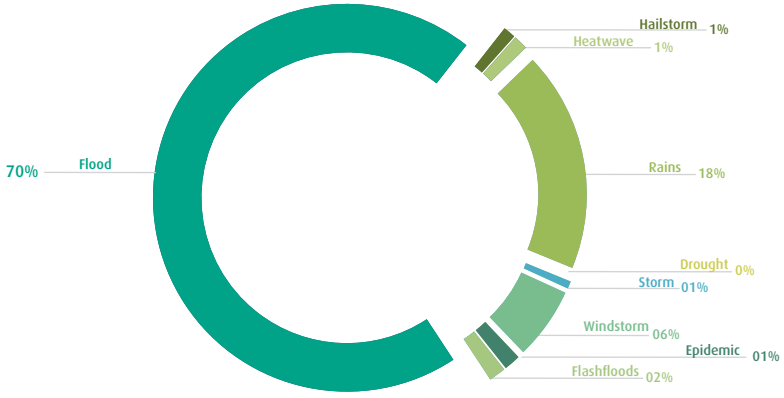


Figure1 People Affected from Disasters in Punjab (1980-2015) (Data source: Desinventar, 2015)

Floods

Considering the historical data, this study presents an overview on floods as primary source of devastation across the province. The scale of this risk will help us ascertain importance of DRR for the province. For this purpose, table 1 enumerates the impact of floods on districts, houses, and the number of people.

A study titled 'Promoting Adaptation through the provision of Evidence and Support to the Duty Bearers in Pakistan' by LEAD Pakistan identifies the vulnerabilities of Rajanpur and Mirpur Khas Districts to extreme climatic events. In line with the framework used in this study, DRR strategies should aim to reduce the social, physical, financial, capital and natural vulnerabilities in Punjab. The threats of floods need to be understood and analyzed closely. The flood prone areas must be identified, where riverine floods have affected large number of population in the province. This is the initial step forward in the DRR response. By doing so, the importance role of DRR for Punjab can be gauged and its urgency can be recognized.

Table 1 : History of Floods and Damages (2010-2013) (PDMA 2014, p.13)

Flood Type		
Riverine	Indus	Mianwali, Layyah, Muzaafargarh, Dera Ghazi Khan and Rajanpur
	Jhelum, Chenab	Jhelum, Sargodha , Khushab , Gujrat, Chiniot, Jhang, Khanewal, Lodhran and Multan
	Ravi	Lahore / Shahdara, Gujranwala, Okara and Sialkot
	Sutlej	Pakpattan, Vehari and Bahawalpur
Flash		Dera Ghazi Khan, Rajanpur, Mianwali, Sialkot, Sheikhupura and Lahore
Urban		Rawalpindi, Lahore, Gujranwala and Faisalabad

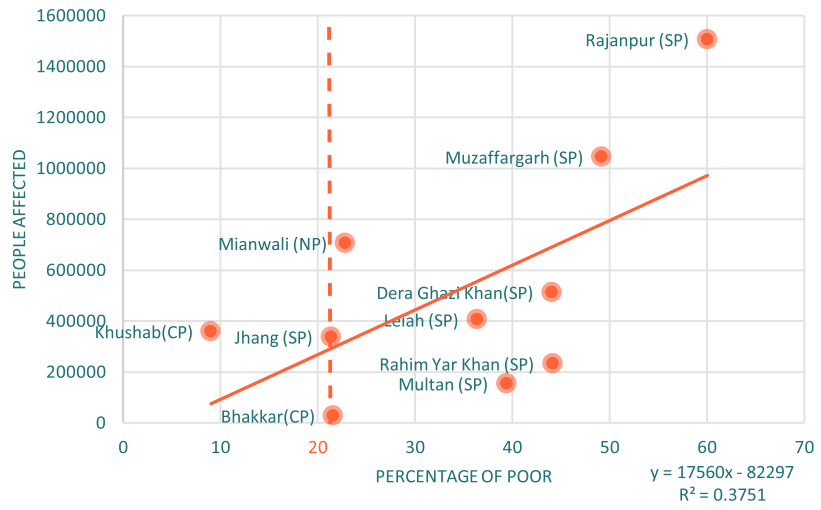
Table 2 : List of Districts Vulnerable to Flooding in Punjab (NDMA 2012, p.11)

Floods 2010-Livelihood Approach

This brief analysis reinforces the association of livelihoods, poverty and natural hazards. It analyses the case of 2010 floods in association with the incidence of poverty in Punjab. The areas most affected by the 2010 floods have been selected for the analysis presented in figure 2 below. Predominantly, most of these districts are located in Southern Punjab, and a couple in Central Punjab. The dotted line in the figure below represents the provincial average of poverty (at 21.1%). The first noteworthy feature is that six of the 10 selected districts (with an average of 45%) are well beyond the provincial average of poverty. Three out of 10 are near the provincial average of poverty and one district Khushab is at less than 10%.

It can be deduced that floods are more likely to affect those districts, which have an 'above average' and 'high incidence' of poverty. Alternatively, the districts with high levels of poverty are vulnerable to the impacts of natural hazards, such as floods. Hence, their likelihood of getting affected is higher.

Figure 2 Correlation of Flood Affected Districts and Incidence of Poverty -2010



[Computed in Excel using data sources: Poverty: 2010 BISP-PSS micro dataset cited in and People Affected: UNOCHA, 2011]

Identification of Key Departments/Agencies

Reducing the risks of disasters cannot be achieved solely by a department/ agency/ ministry. Instead, for it to be effective, DRR approaches need to be part of the interventions of several departments and agencies, provincially and nationally. The DRR approaches outlined in the National DRR policy (see Annex-V) need to be treated as guiding principles, on which to build upon and align the provincial and district development plans. For this purpose, there needs to be apt coordination between the state and provincial departments, and the first step in this is to identify them:

- Ministry of Climate Change
- Ministry of Planning, Development and Reforms
- National Disaster Management Authority
- Provincial Disaster Management Authority
- District Disaster Management Authority
- Environment Protection Agency
- Ministry of Agriculture
- Ministry of Water and Power

Conclusion

- The most distinct threat in the province is that of floods followed by rainfall, which have caused an overwhelming bulk of destruction in the recent decades from 1980 to 2015.
- The district poverty rankings and the number of people affected in the districts have a potential relationship, where the most people affected in the province belong from the 'poor' to 'extremely poor' districts. At the same time, it must be noted that the 'poorest' of the districts (generally areas of South Punjab) are also situated in the most hazard prone areas adjacent to the River Indus.
- Agriculture sector is backbone of the economy (in terms of share in GDP and employment it provides), is also most vulnerable to climate change and natural disasters. Moreover, the impact of hazards on this sector has far-reaching consequences, as livelihood of a vast majority of the population depends on it.
- The concept of DRR can be materialized by integrating a proactive disaster management approach with the provincial and district development plans.

Recommendations for Policy and Research

- Setting up immediate inter-department/agency dialogues at the national and provincial levels and highlight, understand and take forward the linkages, which exist with regard to implementing DRR strategies.
- Strengthening efforts to establish an effective early warning system and improve coordination at the District/Tehsil, Union Council and Village levels.
- Information gathering and mapping of disaster risks need to be carried out on a regular basis to ensure proactive approach.
- The dissemination of warnings at the local or village levels must be in the form of easily understood information, and clearly defined actions.
- Understanding the concept of reducing disaster risk by initiating and promoting research in the civil society, academia and private sector.
- Understanding the local conditions of different districts of the province and developing localized approaches to DRR.
- Participatory approaches to carrying out and implementing DRR are important. It will lead to inclusion of marginalized and most vulnerable groups, including women.
- The most hazard prone areas/districts must be identified and prioritized in DRR planning and implementation.
- The agriculture sector should be acknowledged as the most important sector of the economy.
- Steps need to be taken to prioritize adaptation and disaster risk reduction in the most vulnerable areas, as identified in this paper.
- The link between livelihoods and DRR needs to be explored further.
- Research into how a vast majority of people can be brought out of the vicious circle of poverty and impacts from recurring disasters, such as floods in Punjab.

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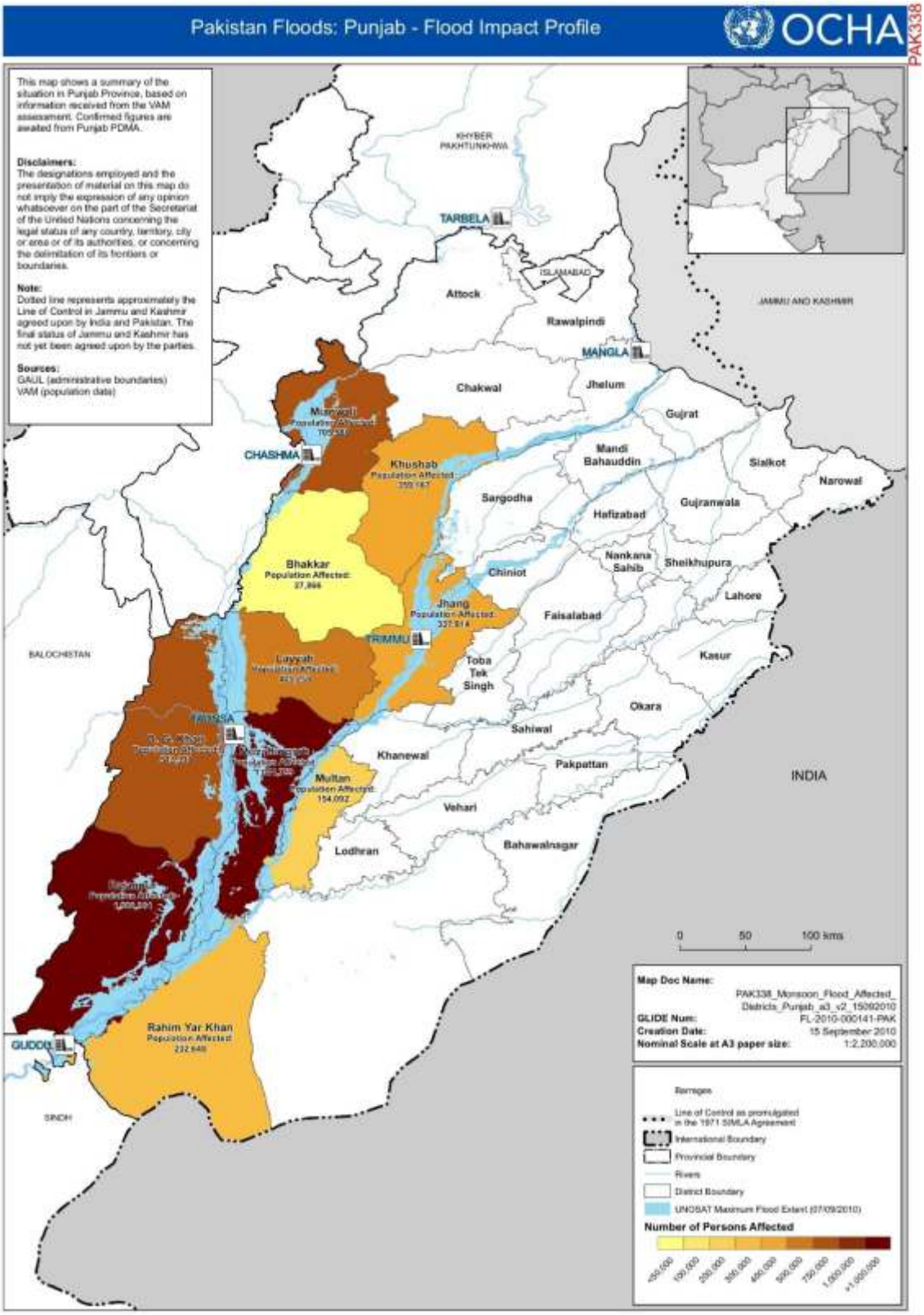
Annex - I Impact of 2010 Floods



Annex- II: Hazard Profile of Punjab

Event	Deaths	Affected
DROUGHT	16	4,123
EPIDEMIC	985	53,407
FLASH FLOOD	43	54,766
FLOOD	4,612	2,700,704
FOG	5	0
HAILSTORM	0	39,820
HEAT WAVE	358	46,208
LIGHTNING	3	0
OTHER	180	33,687
PEST	0	0
RAINS	3,705	711,133
SANDSTORM	20	1487
STORM	86	24,140
THUNDERSTORM	19	526
WINDSTORM	114	232,678
TOTAL	10,146	3,902,679

Source: Desinventar, 2015

Annex - III: Poverty Ranking of Districts of Punjab

No.	District	% poor	Location in Punjab	Status
1	Rajanpur (P)	60.05	South Punjab	Extremely Poor
2	Muzaffargarh (P)	49.18	South Punjab	Very Poor
3	Rahim Yar Khan (P)	44.15	South Punjab	
4	Dera Ghazi Khan(P)	44.04	South Punjab	
5	Multan (P	39.41	South Punjab	Poor
6	Layyah (P)	36.37	South Punjab	
7	Kasur	30.35	Central Punjab	
8	Bahawalpur	29.52	South Punjab	
9	Lodhran (P)	29.24	South Punjab	
10	Pakpattan (P)	28.81	South Punjab	
11	Mianwali (P)	22.83	Northern Punjab	Vulnerable
12	Jhang (P)	21.37	South Punjab	
13	Nankana Sahib (P)	21.13	Central Punjab	
14	Bhakkar	21.56	Central Punjab	
15	Okara (P)	21.03	South Punjab	
16	Khanewal (P)	20.20	South Punjab	
17	Vehari	20.17	South Punjab	
18	Chiniot	20.07	Central Punjab	
19	Sahiwal	18.24	Central Punjab	
20	Hafizabad	15.60	Central Punjab	
21	Sheikhupura	15.48	Central Punjab	
22	Bahawalnagar	15.30	South Punjab	
23	Sargodha	14.07	Central Punjab	
24	Gujranwala	13.28	Central Punjab	Least Poor
25	Faisalabad	12.86	Central Punjab	
26	Toba Tek Singh	12.19	Central Punjab	
27	Narowal	11.49	Northern Punjab	
28	Lahore	10.19	Central Punjab	
29	Chakwal	9.87	Northern Punjab	
30	Mandi Bahauddin	9.85	Northern Punjab	
31	Khushab	9.00	Central Punjab	
32	Gujrat	8.83	Northern Punjab	
33	Rawalpindi	7.34	Northern Punjab	
34	Attock	6.77	Northern Punjab	
35	Jhelum	6.34	Northern Punjab	
36	Sialkot	5.63	Northern Punjab	

Source: 2010 BISP-PSS micro-dataset

Annex - IV: Salient Policy Measures Of National DRR Policy 2013

1. Risk Knowledge

a. Risk or vulnerability atlas and index at national level

b. Local/district level risk assessments

c. Damage and loss database and climate change-focused research

2. Prevention and Mitigation

a. Developing more resilient communities

b. Promoting 'risk conscious' and resilient development

i. Integrate DRR into development planning (macro-level: national-level plans and strategies; mega projects)

ii. Establishing adequate regulatory regimes to promote DRR

iii. Integrate DRR into development planning (micro-level project)

iv. Integrate DRR into the whole spectrum of post-disaster interventions

c. Resilient key-infrastructure and lifelines

d. Promoting risk awareness and knowledge through DRR education, through:

i. Public awareness campaigns

ii. DRR education in schools and colleges

iii. Professional and technical education

iv. Strengthening DRR capacity amongst key stakeholders and decision-makers

3. Preparedness

a. Multi-hazard early warning system

b. Integrated disaster preparedness and response capacity

i. Disaster preparedness and response plans

ii. Hazard and sector-specific plans

iii. Defining levels and geography of disaster situations

iv. Disaster response forces / volunteers

v. Assessments and information management

vi. Civil-military relations

c. Financial protection and disaster risk financing mechanisms

i. Public catastrophe risk financing

ii. Property catastrophe insurance system

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