

Living With Disasters

Disaster profiling of districts of Pakistan



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AN OVERVIEW OF THE DISASTER SITUATION IN PAKISTAN

Geographically, Pakistan is situated in hazard-prone region. . It is exposed to erratic seasonal monsoons that bring rain and fertility. They also cause violent flash floods inflicting heavy damages to property and land. Floods are the most recurrent natural calamity in Pakistan, followed by earthquakes, cyclones and drought. However, drought is more damaging than floods in terms of food insecurity.

In the northern region of Pakistan the Hindukush and Himalayan ranges are situated. The Himalayas is the common place of natural hazards especially earthquakes, floods, severe winter storms, retreating glaciers, landslides, soil degradation etc.

The known record for last one hundred years tells us that four major earthquakes exceeding 8 on the Richter scale have occurred in the Himalayan region.

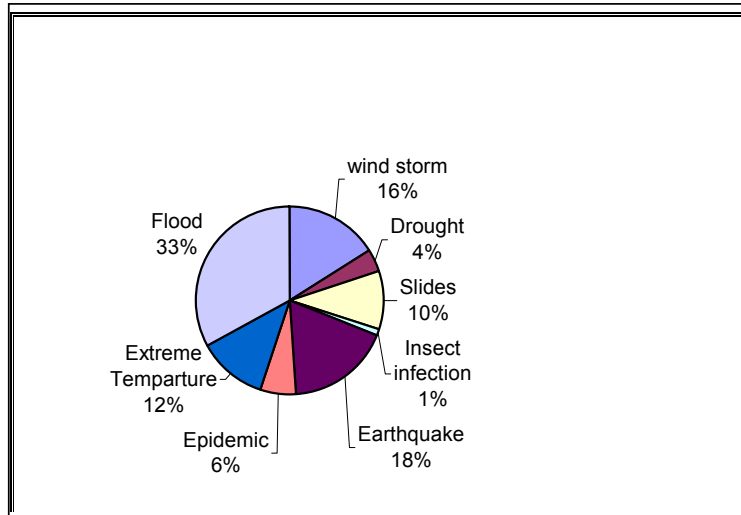
Other than these natural hazards, biological risks like epidemics, outbreaks of diseases like cholera, typhoid, and enteric can cause disaster situations.

This geographical area experiences adverse impacts of climate change like extreme temperatures and severe heat and cold waves also.

This region is also prone to cyclones, which hit coastal areas of Pakistan. The region is known as having winds between 62 and 116 km per hour resulting in windstorms, thunders, and lightening and torrential rains.

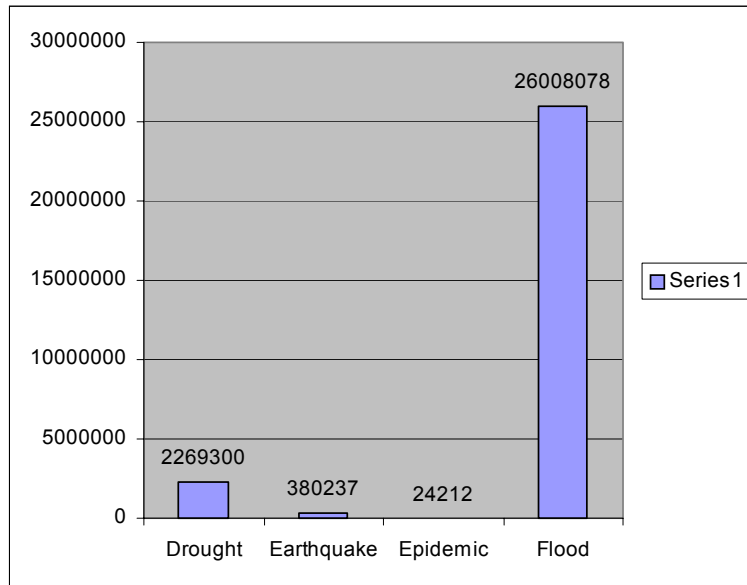
In May 1999,a cyclone (TC02A) stuck Badin and Thatta coast causing destruction to agricultural land, orchards, fruits and vegetable fields.

Fig: 1 Frequency of Disasters in Pakistan 1954 to 2004¹



¹ Suparco

Fig: 2 Disaster and affected population in Pakistan²



² Data from Suparco

Kinds of Disasters

Disasters could be of various kinds but most important are:

I Water and climate related disasters

1. Floods
2. Cyclone
3. Tornadoes and Hurricane
4. Hailstorms
5. Cloud bursts
6. Droughts
7. Sea Erosion
8. Heat and cold wave

II Geology related

1. Land slides
2. Earthquakes
3. Dam Failure
4. Mine fires

III Chemical, Industrial, nuclear

1. Chemical
2. Nuclear

IV Accident Related

1. Forest fires
2. Urban fires
3. Bomb blasts
4. boats capsizing
5. Air, road, railway accidents.

V Epidemics

1. Epidemics
2. Food poisoning/water poisoning

II

NATURAL HAZARDS AND DISASTERS

2.1 FLOODS

When rivers overflow their banks they cause damage to property and crops. Floods are common and costly natural disasters.

Floods usually are local, short-lived events that can happen suddenly, sometimes with little or no warning. They usually are caused by intense storms that produce more runoff than an area can store or a stream can carry within its normal channel. Rivers can also flood when dams fail, when ice jams or landslides temporarily block a channel, or when snow melts rapidly. In a broader sense, normally dry lands can be flooded by high lake levels, by high tides, or by waves driven ashore by strong winds.

Small streams are subject to floods (very rapid increases in runoff), which may last from a few minutes to a few hours. On larger streams, floods usually last from several hours to a few days. A series of storms might keep a river above flood stage (the water level at which a river overflows its banks) for several weeks.

Floods can occur at any time, but weather patterns have a strong influence on when and where floods happen. Cyclones, or storms that bring moisture inland from the ocean, can cause floods. Thunderstorms are relatively small but intense storms that can cause floods in smaller streams. Frontal storms form at the front of large, moist air masses moving across the country and can cause floods. Hurricanes are intense tropical storms that can cause floods.

The size, or magnitude, of a flood is described by a term called recurrence interval. By studying a long period of flow records for a stream, it is possible to estimate the size of a flood that would, for example, have a 5-year recurrence interval (called a 5-year flood). A 5-year flood is one that would occur, on the average, once every 5 years. Although a 100-year flood is expected to happen only once in a century, there is a 1 percent chance that a flood of that size could happen during any year.

Flood plains are lands bordering rivers and streams that normally are dry but are covered with water during floods. Floods can damage buildings or other structures placed in flood plains. They also can change the pattern of water flow and increase flooding and flood damage on adjacent property by bloc

The confluence of river basins, the canal irrigation network and interrupted drainage system are some of the major reasons of flooding in Pakistan. .

Floods can be divided in three major categories:

1. **Monsoon Floods:** Flooding along rivers is a natural and inevitable. Some floods occur seasonally when monsoon rains, coupled with melting snows, fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

It has been argued that El-Nino and La Nina factors have upset the system of rains in India, Pakistan, Iran and Afghanistan. Incidentally El-Nino events are a local manifestation of a global phenomenon, which begins with the relaxation of the wind stress that drives warm water towards the west. In the case of the monsoons, which are also part of a global phenomenon, the atmospheric pressure at sea level at the south-west of the Indian Peninsula, the ocean temperature in the Bay of Bengal and the rainfall fluctuation across South Asia are inter-related critical factors.³

2. **Flash Floods:** An arroyo is a water-carved gully or a normally dry creek found in arid or desert regions. When storms appear in these areas, the rain water cuts into the dry, dusty soil creating a small, fast-moving river. Flash flooding in an arroyo can occur in less than a minute, with enough power to wash away sections of pavement.

Because of its rapid nature flash floods are difficult to forecast and give people little time to escape or to take food and other essentials with them.

3. **Floods due to Breaches:** Floods due to the breaches of river embankments and canal breaches are a frequent occurrence in all the districts of Pakistan.
4. **Urban Flood:** As undeveloped land is paved for construction, it loses its ability to absorb rainfall. Rainwater cannot be absorbed into the ground and becomes runoff, filling parking lots, making roads into rivers, and flooding basements and businesses. An urban area can be flooded by an amount of rainfall that would have had no impact in a rural area. But in crowded towns and cities, rainwater flows into storm sewers and drainage thus flooding them.
5. **Coastal Flood** - Hurricanes and tropical storms can produce heavy rains, or drive ocean water onto land. Beaches and coastal houses can be swept away by the water. Coastal flooding can also be produced by sea waves called tsunamis, giant tidal waves that are created by volcanoes or earthquakes in the ocean.

³ The Dawn, By Dr. Mirza Arshad Ali Beg, 9/9/2002

CAUSES OF FLOODS IN PAKISTAN

Flooding in rivers is generally caused by heavy concentrated rainfall in the catchments during the monsoon season, which is sometimes augmented by snowmelt flows. Monsoon currents originating in the Bay of Bengal and resultant depressions often cause heavy downpour in the Himalayan foothills. These are additionally affected by weather systems from the Arabian Sea (by seasonal lows) and from the Mediterranean Sea (through westerly waves) which occasionally produce destructive floods in one or more of the main rivers of the Indus system. However, exceptionally high floods have occasionally been caused by the formation of temporary natural dams by landslides or glacier movement and their subsequent collapse. These are large seasonal variations in almost all the river discharges, which further aggravates the river course and morphology.

The major rivers cause losses by inundating areas along their banks, by damaging irrigation and communication facilities across or adjacent to their banks, and by erosion of land along the riverbanks. In the upper part of the Indus Basin System, flood water spilling over the riverbanks generally returns to the river. However, in the lower Indus Basin, where the Indus primarily flows at a higher elevation than adjoining lands, spills do not return to the river. This phenomenon extends the period of inundation, resulting in even greater damages. Although embankments built along almost the entire length of the river in Sindh and at many locations in the upper Indus Basin have provided some protection against floods, poor maintenance of the bunds causes breaches. Such breaches often cause great damage because of their unexpected nature and intensification of land use following the provision of flood protection.

Floods are a potential threat to land, property, lives, and the ecosystem. Floods cause revenue loss and damage irrigation and drainage channels.

In **Pakistan**, the snowmelt, combined with the annual monsoon rains, has caused heavy flooding of the northern Kabul and Swat rivers, tributaries of the Indus River and led to emergency situations in parts of North West Frontier Province, Punjab province, and Sindh province during the last several weeks. Floods have affected more than 460 000 people and killed over 30 persons. Some 950 000 hectares of crop land have also been reportedly damaged. Based on meteorologists in Islamabad, this year's flooding has been worse than usual due to above average summer temperatures across northern Pakistan and Afghanistan in the past four weeks, which have led to the largest snowmelt in the last 100 years.

FAO/GIEWS Global Watch

25 July 2005

In a recent article published in The News on Sunday, by Mr Badar Alam has pointed out further factors causing monsoon floods.

He writes, quoting Mr Muslehuddin, ex director of Karachi Met Department that, there are large seasonal variations in almost all river discharge, which further affect adversely the river course. The most important local factors, to Muslehuddin's eye, is temperature obtaining in central Pakistan -- southern Punjab, upper Sindh and northeastern Balochistan -- during the monsoon months. "If these areas are having temperatures below 40 degree centigrade, the

country will have a weak monsoon." If the current heat wave sweeping across the central parts of the country persists, expect monsoon to bring more showers than it normally does."

According to the experts, global temperature has increased by 1.5 degree centigrade, making weather patterns unpredictable. Also, rains have become inconsistent. They are now usually a sudden and heavy downpour than a steady shower.

Pakistan faced severe flood situation in 2003 when unprecedented rains caused havoc in Sindh

Heavy rains in July and August caused severe flooding across the coastal region of Sindh. The worst monsoon for a decade resulted in over 230 deaths and widespread devastation.



An estimated one million people were left homeless as tens of thousands of homes were destroyed. Agriculture was also severely hit with over 45,000 acres of crops destroyed and nearly 20,000 head of cattle killed.

In urban areas drainage systems collapsed, and a mixture of sewage and water flooded the streets. The disaster followed a five-year drought, which had already impoverished the rural Sindhi population. Hundreds of families faced destitution.

DEVELOPMENT CAUSING DEVASTATION

Although embankments built along almost the entire length of the river, in Sindh and at many locations in the upper Indus basin have provided some protection against the floods, poor maintenance of the banks causes breaches. Such breaches often cause great damage because of their unexpected nature and intensification of land use following the provision of flood protection.

During the monsoons in 2003 devastating damage was caused by the LBOD canal inundation in various districts of Sindh. The worst affected areas included the districts of Badin, Thatta, Larkana, Dadu, Tharparkar and Shikarpur. According to reports from the Relief Department, Government of Sindh, the number of affected villages was 1,407 while the number of affected persons was 390,469. The rains destroyed 11,889 houses while more than 25,000 houses were partially damaged. A total of 88 persons died as a result of the floods and 321 were injured. According to the latest reports, 9,110 heads of cattle perished and 229,931 acres of cropped area was affected. The Government of Sindh established 100 relief camps in the affected areas and 23,650 persons took refuge in those camps.⁴

Along with breaches and spills heavy rains can also cause floods especially in the mountainous areas like in 2003 Baluchistan Province received unprecedented rains for two weeks. The wide spread torrential rains played havoc on the province destroying Crops, Orchards, Houses, Dams, Flood Protection Bund, Water Supply Schemes while killing more than 15 persons and injuring more than 80 throughout Baluchistan. Overall, more than 10,000 persons were affected throughout Baluchistan. Worst affected areas were Jafarabad, Naseerabad, Bolan, Jhal Magsi, Harnai (Sibi). 113 m.m. rains was recorded in the Province from July 20 to July 28 2003.

Large number of livestock perished particularly in Awaran, Jafarabad, Naseerabad, Jhal Magsi, Noshki and Kalat, Dahdar, Sibi (Harnai), Bolan, Loralai, Zhob, Pishin, Killa Saifullah and Quetta.

National Highway between Nawabshah and Khuzdar was damaged because of flood causing an accident in which two persons received serious injuries. Road near Pat Kaker post in Jafar Abad district has been washed away by flood.

Another reason for the devastating floods is that Pakistan being on the downstream receives multiple effects of the heavy floods from India at the time of monsoons.

But it must be remembered that floods also have benefits as they replenish agricultural soils. The communities living around the flood prone area are used to the floods and the “rhythm of nature” and they sometimes look forward to the natural floods. According to experts sometimes flood prevention becomes an even greater disaster than the flood itself. Some feel that large dams like Mangla and Tabela have contributed to disturbances on a large scale. This also supports the view that dams do not prevent floods, they merely create flood threat transfer mechanisms.⁵

⁴ Flood update report July 29 2003

⁵ Pakistan Water Gateway.

Historical Flood Damages In Pakistan (1950-1995)

Table: 1⁶

Year	Value of Property damaged(Rs in Million)		Lives Lost	Villages Affected
	Unadjusted	Adjusted		
1950	199.80	11,282.00	2,190	10,000
1956	155.50	7,356.00	160	11,609
1957	152.50	6,958.00	83	4,498
1973	5,137.00	118,684.00	474	9,719
1976	5,880.00	80,504.00	425	18,390
1978	4,478.00	51,489.00	393	9,199
1988	6,879.00	25,630.00	508	1,000
1992	34,751.00	69,580.00	1,008	13,208
1995	6,125.00	8,698.00	591	6,852
2001	450.00	450.00	219	50
2003	5,175.00	5,175.00	484	4,376
2004	15.00	15.00	85	47
2005	Not Reported		59*	1,931

(Note: For the year from 1950 to 2001, the damage are adjusted to 2002 price level)

*Punjab 42, Sindh 3, NWFP 14.

Although there are records and data available showing the recurrence of flood in various districts of Pakistan there seems to be inconsistency in the data from various departments directly dealing with flood, disaster management and relief.

A. According to the Metrological Department of Pakistan, the most flood prone Districts of Pakistan have been listed as:

Badin	Khairpur	Sargodha
Bhakkar	Larkana	Sheikhupura
Dadu	Leiah	Shikarpur
Dera Gazi Khan	Multan	Sialkot
Dera Ismail Khan	Muzafa Garh	Sukkur
Faisalabad	Nawabshah	Jaffarabad
Gujaranwala	Okara	Jhelum
Gujrat	Rahim Yar Khan	Kasur
Hafizadad	Rajan Pur	killa`abdulla
Hyderabad	Sahiwal	Thatta
Jhang	Sanghar	Tobatek Singh

⁶ Federal Flood Commission

A more detailed data provided by the Federal Flood Commission indicated the following districts as most likely to be affected by Floods:

District	Sargodha	Gujrat
D I Khan	Khushab	Wazirabad
Mianwali	Sialkot	Hifizabad
Bhakkar	Dadu	Sargodha
Layyah	Naushahro Firoz	Jhang
DG Khan	Nawabshah	Multan
Muzaffargarh	Hyderabad	Muzaffargarh
Rajanpur	Thatta	Narowal
Rahim Yar Khan	Thatta R.T Bank	Lahore
Jacobabad	Jehlum	Sheikhupura
Ghotki	Gujarat	okara
Sukkur	Mandi Bahauddin	Sahiwal
Shikarpur	Bahawalnagar	Multan
Larkana	Vehari	Kasur
	Bahawalpur	Okara

Flash Floods

Other than the floods brought on by the major rives , in the Northern areas of Pakistan there are also recurrent flash floods in the summers which cause a great deal of damage to life and property.

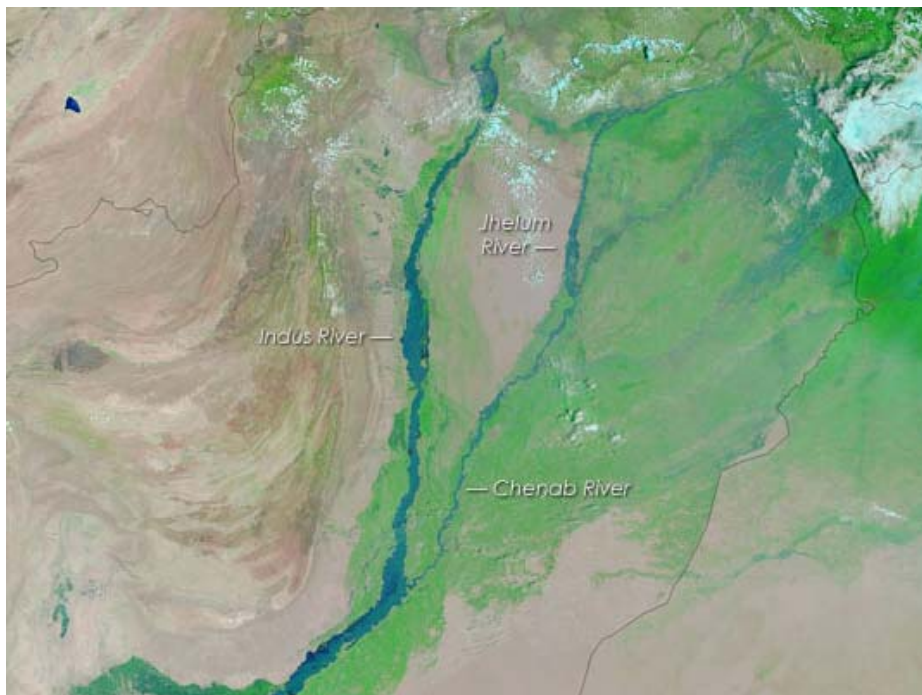
The districts most likely to be affected by Flash Floods in the Northern areas of Pakistan are:

Table :2⁷

District
Buner
Swat
Shangla
Malakand
Kohistan
Batagram
Mansehra
Abbotabad
Haripur
Mardan
Charsadda
Peshawar
D.I.Khan

⁷ District Census Report

Flood Prone Areas of Pakistan along the major rivers





IMPROVING FLOOD PROTECTION

Monsoon Floods, Flash floods and canal breeches have always been a cause of disaster in our country. In this regard the government has spent billions of rupees in Flood protection schemes over the years to train the rivers, protect the adjoining area from soil erosion and reduce vulnerability of the people living along the flood prone areas and major flash points.

These schemes include Flood protection Bunds, Stone pitching and construction of stone aprons along canals, and construction of spurs along banks. To safeguard the areas from inundation 5,600 km of embankments have been constructed along major rivers.

Punjab		
District	No.of scheme	Total Cost in million Rs
Sheikhupura	8	170.93
Okara	3	81.04
Gujrat	15	297.06
Gujranwala	4	48.1
Jhang	2	72.34
Multan	5	102.62
Muzaffargarh	10	302.88
Lodhran	1	6.58
DG khan	10	209.21
Bhakkar	1	95.7
Bahawalpur	4	136.86
Khanewal	1	4
R.Y Khan	4	24.14
Rajanpur	13	213.28
Narowal	5	59.02
15	86	1823.76
NWFP		
District	No. of scheme	Total Cost in Million Rs
Swat	15	150.04
Peshawar	16	129.66
Charsadda	7	23.14
D I Khan	11	137.01
4	49	439.85

Baluchistan		
District	No.of schemes	Total Cost
Quetta	1	59
Ziarat	10	22.48
Harnai	9	15.89

Sibi	2	9
Pishin	4	60.93
Dadhar		3.65
Killa Saifullah	6	
Loralai	9	47.47
Zhob	2	13.43
Flood mangement of Ziarat Harnai	1	40.52
Flood mangement of Hill Torrents	1	108.52
Additional schemes	1	46.3
9	46	427.19

Sindh		
District	No.of schemes	Total Cost
Jacobabad	12	297.38
Thatha	7	187.15
Larkana	3	77.02
Khairpur	2	61.09
Skikarpur	2	63.91
Hyderabad		10.05
Khairpur	1	22
Nawab Shah	6	223.66
Connecting approach of Guddu Barrage	1	325.29
Guddu Sukhar Reach	1	306.72
Sukkur Kotri Reach	1	441.53
Kotri Sea reach	1	189.45
8	37	2205.25

FLOOD FORECASTING SYSTEMS

In order to reduce the vulnerability and for better preparedness in the event of floods Pakistan Meteorological Department and Flood Forecasting division has a comprehensive system in place.

The system includes close observation and monitoring of the Dams and Rivers, watching the level of water in the rivers and abnormal amount of rainfall in twenty four hours.

The Flood forecasting Division has a large network of Observation stations country wide which closely monitor any changes in the weather, river water levels and rainfall.

The Flood Forecasting Division also has a very elaborate HR Radio Communication network in order to broadcast the flood warnings all around the country.

In addition arrangements have also been made with India to communicate hourly, three hourly and 6 hourly (depending upon the flood stages) advance information about flood flows in the Rivers on telephone the following rivers sites.

- i) **SUTLEJ** (Below Rupar, below Harike and below Ferozpur)
- ii) **RAVI** (Below Madhopur)
- iii) Releases from Bhakra Dam Reservoir on Sutlej and Beas (Pong) Dam Reservoir on Beas River, are also to be communicated to Pakistan on SUTLEJ telephone daily at 10:30 hours (pst) along with base flow data of and Ravi.

There are three categories of floods with respect to their intensity and accordingly a Blue, Yellow and red alert is issued by the Flood forecasting division in that sequence.

Blue Alert: A blue alert is issued when a monsoon low/depression reaches the adjoining states of Haryana/Rajasthan and there is a possibility of its moving towards the upper catchment areas of Indus basin.

Blue Alert means that the situation is being watched and further information would be given.

Yellow Alert: A yellow alert is issued when Monsoon low/depression starts moving towards the N/NW of the country. Risk of heavy ,flood generating rains over the upper catchment areas of rivers increases.

Red Alert: Red alert is issued when an abnormbally heavy amount of rain had fallen into the catchment areas of Indus/Jhelum/Chenab/Ravi /Sutlej and there is prediction of high/very high/exceptionally high and critical flood in the next 12/24/36/48 hours.

2.2 Landslide

Downhill sliding or falling movement of cry soil and rock. Landslides are difficult to estimate as an independent phenomenon. It seems appropriate, therefore, to associate landslides with other hazards such as tropical cyclones, severe local storms and river floods. The term landslide is used in its broad sense to include downward and outward movement of slope forming materials (natural rock and soil). It is caused by heavy rain, soil erosion and earth tremors and may also happen in areas under heavy snow.

2.3 DROUGHT

Of all the natural disasters, drought whether Meteorological, Hydrological or Agricultural has the greatest potential impact as compared to other disasters like floods, tropical storms etc. as the latter are mostly of short duration and geographically limited and droughts, by contrast, affect large geographic areas often covering the whole of the countries or even parts of continents. Droughts may last for months and in some cases several years.

DEFINITION OF DROUGHT⁸

Drought is commonly associated with periods of reduced precipitation of sufficient duration to cause insufficient water resources. The loss of these water resources, in turn, disrupts natural ecosystem and human activities. However conditions that initiate drought in one region of the globe may go unnoticed in another. For example a few consecutive months without precipitation over Cholistan, Thar and Nokkundi deserts constitute a drought whereas over other regions like the plains of Punjab where surface water making part of the perennial flows and ground water are available may not suffer from drought under similar conditions. There is as such no precise definition of the word "Drought" that can be universally applied to all the regions.

Meteorological drought involves a reduction in rainfall over a region for a specified period (day, month, season, and year) below a specified amount, usually defined as some proportion (percentage) of the long term average for the specified time period. Its definition involves only the precipitation statistics.

Hydrological Drought: -

This involves a reduction in water resources (stream flows, reservoir levels, ground water, underground aquifers etc) below a specified level for a given period of time. Hydrological drought occurs when a lengthy meteorological drought causes a sharp decline in the levels of ground water, rivers and lakes. For example, lack of winter snowfall over the mountains of northern areas and failure of monsoon rains during the monsoon period has a serious impact on water availability for the country in the subsequent months.

Agricultural Drought:

This emerges due to the impact of Meteorological and Hydrological droughts on a particular area of human activity. In order to achieve the optimum growth, crops have particular temperature, moisture and nutrient requirements during their growth cycle. If the moisture availability in particular falls below the optimum amount during the growth cycle, the crop growth will be impaired and yields reduced.

⁸ Dr. Q.Z. Chaudhry, M. Munir Sheikh, Anjum Bari, Azmat Hayat

CAUSES OF DROUGHT

Drought conditions appear over any of the vulnerable zone when the rain producing systems fail in succession. Winter rainfall generally fails when the tracks of western Disturbances which move on to our area from the west, remain at a latitude of 35° N or higher. Under such a situation, no secondary western disturbances form below 30°N and consequently Sindh province and parts of Baluchistan can completely go dry. This situation has been found to occur quite often. The situation get aggravated if the subsequent months of April and May also go completely dry and temperatures become very high which is a normal feature of these months. Evapotranspiration tremendously increases and results in perpetual drought. During the summer months June to September, if a monsoon low or monsoon depression which forms over Arabian Sea or over Bay of Bengal fails to reach our areas, the monsoon rains are very scanty and that too in the northern parts of the country which include northern divisions of Punjab, parts of NWFP & northern areas

The drought has become a frequent phenomenon in our country. Already, the two droughts in 1999-2000 and 2000-2001 have stretched the coping abilities of the existing systems to the limit and it has barely been able to check the situation from becoming a catastrophe.

From its formation in 1947 to the recent past, Pakistan has been blessed with a fully operational irrigation system and plenty of water from the rivers that flow through it. Up till quite recently, the supply of the water was greater than or enough to meet the demand of all the end users but the rapid growth in population started putting unprecedented pressure on the irrigation system. The passage of time has degraded it to a large degree and there is a need for its massive restoration and improvement to meet the increased demands.

According to the Economic Survey of Pakistan, the drought was one of the most significant factors responsible for the less than anticipated growth performance. The survey terms it as the worst drought in the history of the country. According to the government, 40 percent of the country's water needs went unmet.

"The drought has wreaked havoc in 58 of the total 106 districts of the country, especially impacting rainfed and rangeland areas. Causing devastation and loss of human lives in semi-arid regions, the drought eliminated of US \$ 247 million worth of livestock in the first five months of this year alone. Given that 70 percent of the entire population of Pakistan is rural based and dependent on agriculture for its livelihood, negative agricultural growth of 2.5 percent (estimated) has not only impacted agro-based industry, but displaced a large number of the rural poor. Massive migratory trends have been witnessed, therefore, to irrigated and urban areas. The losses of the agricultural sector will also trickle down to the banking and financial sectors, in view of farmers' outstanding loan obligations and financing needs of agro-based industries.

Massive decline in floodwater in Sindh has led to rapid sea intrusion in the delta, raising salinity levels in underground water and spurring cattle migration to irrigated areas as well. In NWFP and Balochistan, the permanent damage includes dwindling vegetation cover, almost to the point of disappearing altogether in the latter province. Finally, excessive depletion of underground water resources has occurred and will not be compensated without strong efforts at conservation, as well as immediate change in water use practices.

Almost all the semi-arid and arid areas of Pakistan experience drought with varied intensity. The severity of drought reached its climax in low rainfall zones including most of Balochistan, southern parts of Sindh and southeastern parts of Punjab

The districts affected by severe droughts in Pakistan are:⁹

1 B Ketch	9 B Ziarat	16 B Mastung
2 B Barkhan	10 B kohlu	17 B Kalat
3 B Chagai	11 B Awaran	18 F Mohmand
4 B Sibi	12 B Gwadar	19 N L.Marwat
5 B Zhob	13 B Pishin	20 N Karak
6 B Khuzdar	14 B Bolan	21. N Tank
7 B LoraLai	15 B Quetta	22 S Tharparkar
8 B Musa khel		

A prolonged drought seriously affects crops and livestock production . As happened in 1998 when a prolonged drought spell started and continued till 2001-02.In 2000 Baluchistan and parts offing Sindh and Cholistan in Punjab were particularly affected with serious consequences on a large segment of population.

Based on NDVI analysis, districts have been ranked and grouped on the basis of decline in vegetation in 2001-2002.

The above given 22 districts were severely effected by depleting more than 50% of their vegetation.

Majority of districts fall in Baluchistan (77%). Above 30% decrease in vegetation was observed in 42 districts (35%). Half of the districts 60 were affected upto 20% in vegetation cover.

The most affected province was Baluchistan 92%,Sindh 65%,NWFP 42% and Punjab 21%.Baluchistan was most severely affected due to its heavy dependency on rains and a sharp decline in rainfall in several years.

The state of food security in this area has been assessed by FAO/WFP in joint food assessment mission conducted in 2001 as “very serious”.

⁹ Pakistan Metrological Department

2.4 EARTHQUAKES

The known record for last one hundred years tells us that four major earthquakes exceeding 8 on the Richter scale have occurred in the region. According to the recent seismic assessments, the region is likely to face a major earthquake in future as a critical seismic gap is widening particularly 'between Kangra in Himachal Pradesh to Kathmandu in Nepal which has not seen a major earthquake for the last 350 years.

As the overall population of the Indian subcontinent has doubled since the last big earthquake in 1950, and the urban population in the Indo-Gangetic plains has considerably increased almost by a factor of ten since the 1905 earthquake, a recent conservative estimate is that 'more than 50 million people are at the risk from the great Himalayan earthquake, majority of them living in towns and villages'. The capital cities of Bangladesh, Bhutan, India, Nepal and Pakistan and several other cities are vulnerable to potential damages from some of these future earthquakes.

The districts of Pakistan most likely to be earthquake prone are:¹⁰

Earthquake prone districts	
Abbotabad	Mansehra
Attock	Muzaffarabad
Chitral	Nushki
Dadhar	Pashin
Dir	Pasni
Gawadar	Quetta
Gilgit	Rawalpindi
Islamabad	Sawat
Kalat	Sibi
Kharan	Skardu
Khuzdar	Ziarat
Kohistan	Zhob
Loralai	Malakand

¹⁰ Pakistan Metrological Department

RECENT EARTHQUAKE IN PAKISTAN

On October 8, 2005 at 08:52 hours a powerful earthquake struck the northern part of Pakistan causing major destruction and playing havoc with millions of lives. The affected areas were the five districts of North West Frontier Province and four districts of Azad Jammu & Kashmir. More than 70,000 people lost their lives out of those 35,000 were children who were attending schools at that time. Most of the civil society infrastructure such as schools, colleges and hospitals were destroyed and require immediate attention.

Kashmir lies in the area where the Eurasian and Indian tectonic plates are colliding. Out of this collision, the Himalayas began uplifting 50 million years ago, and continue to rise by about 5 mm/year This geological activity is the cause of the earthquakes in the area.

The United States Geological Survey (USGS) measured its magnitude as 7.6 on the Richter scale, with its epicenter at 34° 29' 35" N, 73° 37' 44" E, about 19 km (11.8 miles) northeast of Muzaffarabad, Pakistan, and 100 km (65 miles) north-northeast of Islamabad (Pakistan).

The hypocenter was located at a depth of 26 km (16.2 miles) below the surface (USGS).



Earthquake in Pakistan	History of Earthquakes
<p>The earthquake caused widespread destruction in northern Pakistan, and did some damage in Afghanistan and northern India.</p>	<p>There have been many secondary earthquakes in the region, mainly to the northwest of the original epicenter.</p>
<p>The worst hit areas were Pakistan-administered Kashmir, Pakistan's North-West Frontier Province (NWFP), and western and southern parts of the Kashmir valley in the Indian-administered Kashmir.</p>	<p>147 aftershocks were registered in the first day after the initial massive quake that hit at 8:52 am, one of which had a magnitude of 6.2 (a tremor of magnitude six is rated as a "strong" earthquake).</p>
<p>It also affected some parts of the Pakistani province of Punjab and the city of Karachi experienced a minor aftershock of magnitude 4.6.</p>	<p>Twenty-eight after-shocks occurred with a magnitude greater than five during four days after the principal quake and even eleven days after the big one, there were still major quakes.¹¹</p>

2.5 TROPICAL CYCLONE

Tropical cyclone is a storm system with a closed circulation around a center of low pressure, fueled by the heat released when moist air rises and condenses. The name underscores their origin in the tropics and their cyclonic nature. Depending on their strength and location, there are various terms by which tropical cyclones can be described, such as tropical depression, tropical storm, hurricane and typhoon.

Tropical cyclones can produce extremely high winds, tornadoes, torrential rain (leading to mudslides and flash floods), and drive storm surge onto coastal areas. Though the effects on populations and ships can be catastrophic, tropical cyclones have been known to relieve drought conditions. They carry heat away from the tropics, an important mechanism of the global atmospheric circulation that maintains equilibrium in the environment.

Pakistan has a history of being hit by severe cyclones and tropical storms which has caused catastrophic damages. For example on 12 Nov 1970 a devastating Cyclone hit East Pakistan now Bangla Desh. That night, 800 mi. south of the Ganges delta, winds whipped along at 150 mph, dragging in their vacuum wake a 20' wave of water that would devastate East Pakistan. The death toll was around one million.

The primary reason was lack of preparedness from cyclone in that area. According to reports in international press, "Four years before the disaster, elaborate storm-warning systems were developed. Hundreds of miles of dikes were built. But they were too few and too weak. By the tomorrow after tomorrow, more precautionary measures will be in effect, but the major hope of Bengalis is that future storms will be less powerful"¹²

The historical record of the windstorms that has hit Pakistan is given in the following table: -

Dates: Start date End date	Country:	Location:	Disaster: Type SubType Name	Numbers:
Jan/2005	Pakistan	Lwargi	Wind Storm Winter	58 killed
16/Feb/2003 22/Feb/2003	Pakistan	Baluchistan, Sindh, North Western Frontier province, Punjab, Northern areas, Azad Kashmir	Wind Storm Storm	51 killed 57 injured 2,500 homeless

¹² "The People's Almanac" series of books.

27/May/2002	Pakistan	Punjab province	Wind Storm Storm	14 Killed 12 injured
28/Mar/2001	Pakistan	Chak Miran (Punjab province)	Wind Storm Tornado	4 Killed 500 homeless
13/Aug/1999	Pakistan	Kasur (Near Lahore); Level 1 = Punjab	Wind Storm Storm	27 killed 66 injured 345 homeless
20/May/1999	Pakistan	Thatta, Umer Kot, Mirpu, Badin, Hyderabad, Tharparker (cities) - Level 1 = Baluchistan, Jammu and Kasmir, Sind	Wind Storm Cyclone 2-A	231 killed 155 injured 9,252 homeless 657,000 affected
10/Jun/1998	Pakistan	Karachi=level 2 Sing = Level 1	Wind Storm Storm	12 killed
27/Jun/1997	Pakistan	Jabar Kund (Mansehra Province)	Wind Storm Storm	22 killed
21/Oct/1997	Pakistan	Thatta district (Sindh province)	Wind Storm Storm	19 killed
4/Jul/1994	Pakistan	Karachi	Wind Storm Storm	26 killed

12/May/1994	Pakistan	Multan	Wind Storm Storm	10 killed 20 injured
14/Nov/1993	Pakistan	Keti Bandar, Hyderabad	Wind Storm Cyclone	609 killed
23/Jul/1988	Pakistan	Jagat	Wind Storm Storm	36 killed
31/May/1986	Pakistan	Karachi	Wind Storm Storm	11 killed 250 injured
10/Mar/1981	Pakistan	Gujranwala, Sheikhupura districts	Wind Storm Tornado	56 killed 600 injured
13/Jun/1980	Pakistan	Northern	Wind Storm Storm	18 killed 23 injured
15/Dec/1965	Pakistan	Karachi	Wind Storm Cyclone	10,000 Killed

12/Jun/1964	Pakistan	Coast, Low Indus valley	Wind Storm Cyclone	450 Killed 400,000 Affected 4,100,000 US\$ Damage
27/Jul/1944	Pakistan	Karachi	Wind Storm Cyclone	10,000 Homeless
10/Mar/1939	Pakistan	Hyderabad	Wind Storm Storm	
1/Sep/1926	Pakistan	Karachi	Wind Storm Storm	

III

VULNERABILITY RANKING

In this study we are primarily going to focus on natural disasters that occur in Pakistan and the districts that are prone to them

Methodology:

Prepare an information database of all the districts:

1. Land use, demographic data, socio economic data, infrastructure (rail, road, hospitals etc), geography.
2. Resource inventories of government equipment.
3. Information on climate, weather and man made structures.
4. Historical documentation of previous disasters, which includes location of disasters and damages incurred.

Developing a vulnerability criterion

Vulnerability is defined as “the extent to which a community, structure, service, or geographical area is likely to be damaged or disrupted by the impact of particular hazard, on account of their nature, construction and proximity to hazard terrain or disaster prone area.”

Concept of vulnerability implies a measure of risk combined with level of social and economic ability to cope with to cope with resulting event or to resist major disruptions or loss. The first step is to identify the hazard that could impact an area, to consider and access the various conditions of physical social, economic and environmental vulnerability that characterise the most threatened districts.

The vulnerability criterion selected for this study is the ranking of a particular district according to the degree to which an area is prone to a natural disaster, its literacy rate, percentage of the poor population, food insecurity and its HDI ranking.

The degree to which a population is affected is contextual to the prevailing social and economic conditions and affect on human activity.

By analysing these factors we can come up with the disaster vulnerability ranking of the districts and can do the scoring of the most vulnerable districts accordingly.

RANKING OF DISTRICTS

**ALL PAKISTAN RANKING OF DISTRICTS BY LITERACY RATES
AND ILLITERATES
(BY 10+ AND 15+ AGE GROUPS)**

Sr. No.	District	Literacy Rate 10+ (%)	Illiterates 10+ Pop	Sr. No.	District	Literacy Rate 15+ (%)	Illiterates 15+ Pop
1	Islamabad	72.38	166,708	1	Islamabad	70.2	149,027
2	Rawalpindi	70.45	740,625	2	Rawalpindi	67.5	670,956
3	Karachi	65.26	2,405,915	3	Karachi	63.58	2,093,633
4	Lahore	64.66	1,650,853	4	Lahore	62.98	1,421,602
5	Jhelum	63.92	247,880	5	Jhelum	60	225,975
6	Gujrat	62.18	562,450	6	Gujrat	57.87	513,255
7	Sialkot	58.92	799,630	7	Sialkot	55.72	703,653
8	Quetta	57.07	231,116	8	Quetta	54.56	200,362
9	Chakwal	56.72	346,276	9	Gujranwala	53.67	906,008
10	Abbottabad	56.61	273,570	10	Chakwal	51.57	319,963
11	Gujranwala	56.55	1,049,510	11	Abbottabad	51.41	245,001
12	Haripur	53.72	230,737	12	Faisalabad	49.15	1,634,920
13	Narowal	52.65	416,642	13	Haripur	48.07	209,065
14	Faisalabad	51.94	1,880,742	14	Narowal	47.26	371,339
15	Toba Tek Singh	50.5	575,767	15	Toba Tek Singh	46.95	504,959
16	Attock	49.27	474,779	16	Attock	44.65	426,784
17	Mandi Bahauddin	47.44	438,461	17	Sukkur	44.54	281,933
18	Sukkur	46.62	330,593	18	Mandi Bahauddin	42.93	391,738
19	Sargodha	46.3	1,023,488	19	Sargodha	42.81	893,353
20	Hyderabad	44.25	1,134,367	20	Hyderabad	42.15	967,317
21	Kohat	44.06	214,258	21	Multan	41.66	1,024,972
22	Sahiwal	43.9	740,641	22	Sahiwal	41.18	639,863
23	Shekhupura	43.78	1,309,213	23	Shekhupura	40.72	1,122,309
24	Multan	43.38	1,229,392	24	Kohat	40.1	180,929
25	Mian wali	42.76	421,329	25	Peshawar	39.43	662,160
26	Noshera	42.5	347,518	26	Noshera	39.32	293,339
27	Karak	41.92	159,831	27	Mianwali	38.69	365,175
28	Peshawar	41.75	801,665	28	Karak	37.51	133,682

29	Hafizabad	40.74	351,799	29	Khanewal	37.21	739,689
30	Khushab	40.5	386,715	30	Hafizabad	37.2	307,560
31	Chitral	40.3	13,031	31	Khushab	36.51	340,707
32	Khanewal	39.94	868,572	32	Naushahro Feroze	36.16	377,487
33	Malakand P.A	39.14	440,045	33	Layyah	35.83	387,632
34	Naushahro Feroze	39.14	440,045	34	Okara	35.12	836,240
35	Layyah	38.68	440,045	35	Malakand P.A	34.67	150,349
36	Okara	37.79	975,309	36	Jhang	34.28	1,085,460
37	Jhang	37.12	1,261,071	37	Vehari	34.1	781,575
38	Vehari	36.79	922,771	38	Chitral	33.8	109,955
39	Mardan	36.45	621,769	39	Kasur	33.57	875,298
40	Mansehra	36.32	506,766	40	Dadu	33.53	631,741
41	Kasur	36.21	1,044,193	41	Bahawalpur	33.35	901,908
42	Swabi	36.03	442,268	42	Bahawalnagar	32.68	794,054
43	Dadu	35.56	739,667	43	Khairpur	32.42	559,167
44	Khairpur	35.5	653,975	44	Mardan	32.29	523,256
45	Bahawalnagar	35.07	936,819	45	Larkana	32.03	698,785
46	Bahawalpur	35.03	1,084,887	46	Pakpattan	31.8	502,471
47	Larkana	34.95	814,889	47	Nawabshah	31.79	401,651
48	Pakpattan	34.7	588,309	48	Mansehra	31.76	428,816
49	Ziarat	34.34	14,293	49	Ziarat	31.71	11,965
50	Bhakkar	34.17	477,011	50	Swabi	31.27	378,604
51	Nawabshah	34.13	474,088	51	Bhakkar	31.03	401,935
52	Rahim Yar Khan	33.09	1,398,416	52	Rahim Yar Khan	30.93	1,170,401
53	Bannu	32.11	294,486	53	Shikarpur	29.85	334,356
54	Shikarpur	31.94	393,354	54	Pishin	29.62	123,272
55	Panjour	31.35	95,140	55	Bannu	29.29	248,697
56	D.I. Khan	31.28	389,067	56	D.I. Khan	29.27	321,442
57	Pishin	31.14	157,231	57	Sanghar	28.93	564,260
58	Charsada	31.11	469,586	58	Panjour	28.93	75,883

59	Sanghar	30.87	675,226	59	D.G Khan	28.71	596,503
60	D.G Khan	30.61	733,913	60	Mirpurkhas	28.57	599,216
61	Hangu	30.5	141,462	61	Lodhran	27.8	456,958
62	Mirpurkhas	30.4	722,547	62	Hangu	27.7	113,982
63	Lodhran	29.9	552,644	63	Charsada	27.34	394,596
64	Lower-Dir	29.9	313,515	64	Ghotki	27.26	376,149
65	Lakki Marwat	29.71	217,398	65	Muzaffargarh	26.92	994,168
66	Ghotki	29.01	450,081	66	Swat	26.58	472,079
67	Swat	28.75	588,304	67	Lower-Dir	26.4	254,530
68	Muzaffargarh	28.45	1,226,326	68	Lakki Marwat	25.86	183,644
69	Mastung	27.58	79,840	69	Mastung	25.26	67,761
70	Kech	27.51	194,428	70	Changhi	24.38	79,440
71	Chiaghi	26.99	96,575	71	Kech	24.36	165,303
72	Tank	26.25	113,459	72	Tank	23.95	93,182
73	Sibi	25.47	93,838	73	Sibi	23.82	79,172
74	Gawadar	25.47	92,828	74	Badin	23.09	480,463
75	Badin	24.63	572,742	75	Gawadar	22.4	78,118
76	Jacobabad	23.66	705,112	76	Jacobabad	22.03	597,147
77	Buner	22.62	252,534	77	Thatta	21.52	490,587
78	Lasbela	22.3	167,775	78	Loralai	19.99	133,680
79	Thatta	22.14	586,524	79	Lasbela	19.98	141,102
80	Upper Dir	22.21	285,151	80	Buner	19.55	207,032
81	Rajanpur	20.73	559,510	81	Rajanpur	19.35	460,327
82	Loralai	20.47	162,114	82	Upper Dir	19.03	223,786
83	Kalat	19.86	123,145	83	Tharparkar	17.57	374,684
84	Jafarabad	18.51	232,626	84	Kalat	17.53	101,245
85	Tharparkar	18.32	474,908	85	Batagram	17.34	132,329
86	Batagram	18.31	166,203	86	Jafarabad	16.53	199,687
87	Killa Saifullah	17.55	100,032	87	Killa Saifullah	16.45	78,909
88	Khuzdar	17.46	226,817	88	Zhob	16.27	110,402
89	Zhob	16.78	143,187	89	Khuzdar	15.93	187,275
90	Killa Abdullah	16.1	198,708	90	Killa Abdullah	15.53	157,385

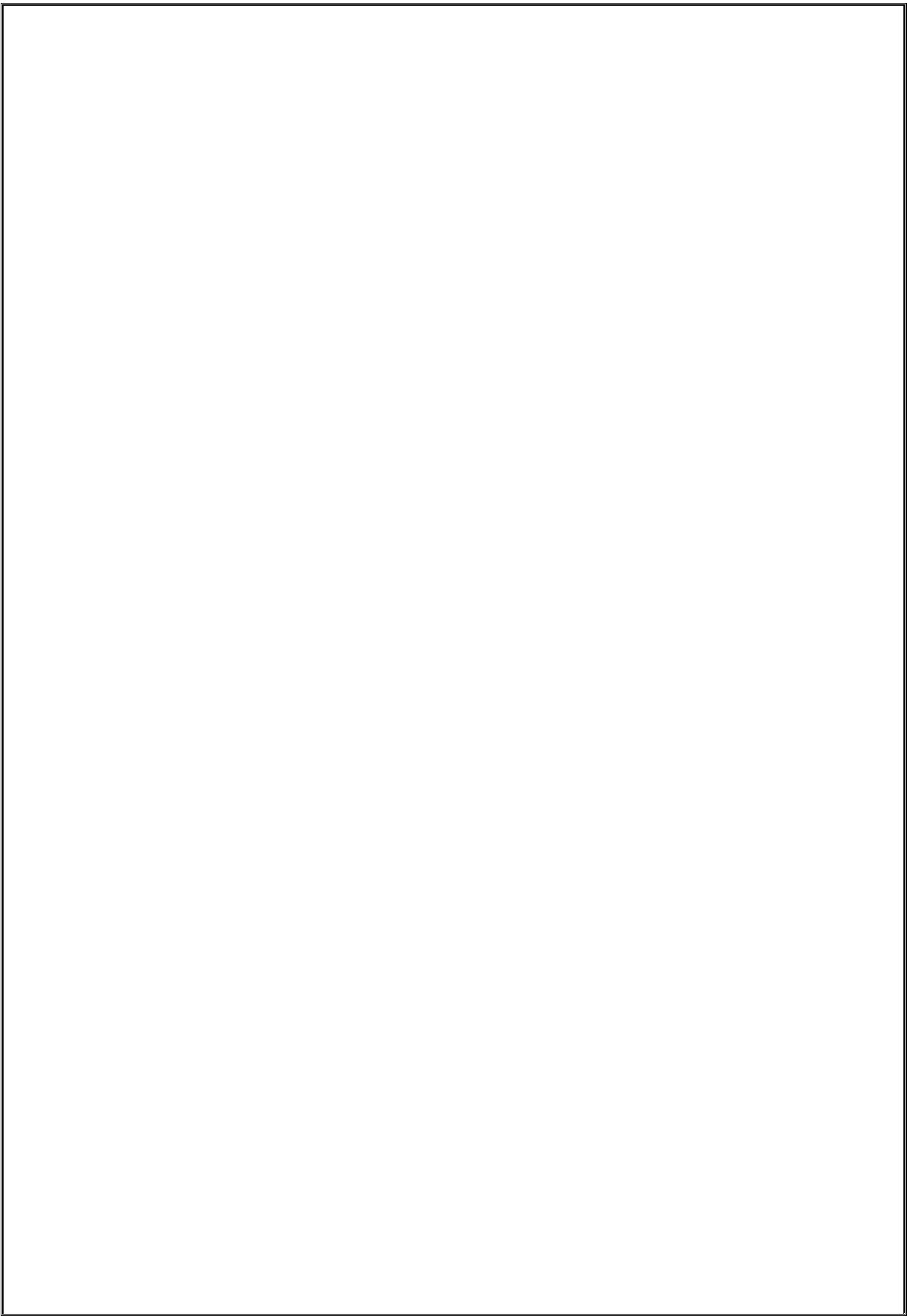
91	Bolan	15.78	163,587	91	Bolan	14.55	135,863
92	Barkhan	15.67	58,290	92	Barkhan	14.07	49,060
93	Kharan	15.05	114,855	93	Kharan	13.98	93,238
94	Awaran	14.79	66,148	94	Shangle	13.87	192,427
95	Shangle	14.73	241,701	95	Awaran	12.57	55,101
96	Naseerabad	12.69	141,469	96	Jhal Magsi	11.57	52,350
97	Jhal Magsi	12.28	63,556	97	Kohlu	11.47	51,753
98	Kohlu	12.15	60,858	98	Naseerabad	11.45	120,665
99	Dera Bughti	11.73	101,919	99	Dera Bughti	11.36	84,232
100	Kohistan	11.08	274,919	100	Kohistan	10.5	213,399
101	Musa Khel	10.37	76,265	101	Musa Khel	10.24	58,482

Source: Ministry of Education, Islamabad.

RANKING OF DISTRICTS OF BY THE HUMAN DEVELOPMENT INDEX

DISTRICT	HDI	HDI Rank	DISTRICT	HDI	HDI Rank	DISTRICT	HDI	HDI Rank
	0.703	1	Mardan	0.519	32	Khairpur	0.449	63
Ziarat	0.697	2	Lasbela	0.514	33	Thatta	0.447	64
Haripur	0.629	3	Khanewal	0.513	34	Lakki Marwat	0.444	65
Sheikhupura	0.621	4	Kech	0.512	35	Swat	0.442	66
	0.618	5	Vehari	0.508	36	Larkana	0.435	67
Abbotabadd	0.598	6	Attock	0.507	37	Zhob	0.432	68
Bhakkar	0.581	7	Naushahro Feroze	0.506	38	Dera Ismail Khan	0.425	69
Kasur	0.577	8	Charsadda	0.506	39	Buner	0.423	70
	0.576	9		0.501	40	Barkhan	0.420	71
Khusab	0.575	10	Pakpattan	0.498	41	Shikarpur	0.417	72
Mandi Bahauddin	0.568	11	Ghotki	0.496	42		0.413	73
	0.558	12	Panjgur	0.496	43	Kalat	0.412	74
Loralai	0.556	13		0.494	44	Sibi	0.411	75
	0.555	14	Nasirabad	0.492	45	Hangu	0.400	76
Chakwal	0.545	15	Hafizabad	0.486	46	Jacobabad	0.393	77
Gujrat	0.543	16	Sukkur	0.486	47	Gwadar	0.392	78
Sahiwal	0.541	17	Karak	0.484	48	Killa Abdullah	0.387	79
Rahim Yar Khan	0.541	18	Nawab Shah	0.481	49	Tank	0.384	80
Kohat	0.537	19	Chitral	0.479	50	Awaran	0.381	81
Mianwali	0.537	20	Lodhran	0.475	51		0.369	82
Dadu	0.535	21	Narowal	0.472	52	Batgram	0.363	83
	0.535	22	Dera Ghazi Khan	0.471	53	Bolan	0.360	84
	0.532	23	Chagai	0.468	54	Kohlu	0.348	85
	0.531	24	Bannu	0.465	55	Kharan	0.346	86
	0.529	25	Sanghar	0.461	56	Jhalmagsi	0.345	87
Nowshera	0.529	26	Malakand	0.461	57	Tharparkar	0.343	88
Jhang	0.529	27	Mansehra	0.459	58	Kohistan	0.332	89
Mastung	0.528	28	Muzaffargarh	0.459	59	Shangla	0.332	90
Okara	0.528	29	Badin	0.459	60	Dera Bugti	0.285	91
Swabi	0.523	30	Killa Saifullah	0.455	61			
Mirpur Khas	0.522	31	Jaffarabad	0.454	62			

Source: UNDP Human Development Report 2003



Ranking of the districts according to food Insecurity in Rural Pakistan 2003

S	Tharparkar	1	1	F	Kurram	14	4	B	Jhal Magsi	27	10
B	Dera Bugti	2	1	NA	Skardu	15	2	B	Barkhan	28	11
F	N.Waziristan	3	1	F	Mohmand	16	5	N	Bannu	29	7
B	Musa Khel	4	2	NA	Ghanche	17	3	NA	Ghizer	30	4
B	Kharan	5	3	N	Battagram	18	5	P	Rajanpur	31	1
N	Shangla	6	1	B	Kohlu	19	5	N	Tank	32	8
N	Kohistan	7	2	F	Orakzai	20	6	N	Chitral	33	9
F	S.Waziristan	8	2	B	Zhob	21	6	N	Buner	34	10
NA	Diamer	9	1	B	Khuzdar	22	7	B	Killa Saifullah	35	12
N	Hangu	10	3	F	Bajour	23	7	N	Lower Dir	36	11
B	Bolan	11	4	B	Awaran	24	8	P	Muzaffargarh	37	2
N	Upper Dir	12	4	N	Swat	25	6	B	Kalat	38	13
F	Khyber	13	3	B	Killa Abdullah	26	9				
V E R Y I N S E C U R E											
S	Umerkot	39	2	B	Chagai	45	15	S	Sukkar	50	4
A	Muzaffarabad	40	1	S	Jacobabad	46	3	N	Lakki	51	15
B	Sibi	41	14	N	Mansehra	47	13	B	Panjour	52	16
P	D.G Khan	42	3	NA	Gilgit	48	5	B	Turbat	53	17
P	Multan	43	4	N	Nowshera	49	14	B	Lasbela	54	18
H	N Karak	44	12								
L E S S I N S E C U R E											
P	Bahawalpur	55	5	S	Ghotki	64	6	P	Rahim Yar Khan	73	7
S	Khairpur	56	5	S	Thatta	65	7	P	Attock	74	8
N	Mardan	57	16	B	Mastung	66	20	S	Sanghar	75	8
B	Gawader	58	19	B	Pishin	67	21	P	Lahore	76	9
N	Kohat	59	17	N	Malakand	68	21	S	Dadu	77	9
N	D.I.Khan	60	18	P	Layyah	69	6	S	Mirpurkhas	78	10
N	Swabi	61	19	B	Loralai	70	22	P	Lodhran	79	10
A	Bhimber	62	2	A	Bagh	71	3	S	Larkana	80	11
N	Charsadda	63	20	A	Kotli	72	4				
M O D E R A T E L Y S E C U R E											
P	Rawalpindi	81	11	P	Jhang	88	15	N	Haripur	95	23
A	Sudhnoti	82	5	A	Rawalakot	89	6	S	Hyderabad	96	13
N	Peshawar	83	22	P	Chakwal	90	16	S	Badin	97	14
P	Khanewal	84	12	P	Narowal	91	17	B	Quetta	98	24
P	Mianwali	85	13	P	Khushab	92	18	P	Bhakkar	99	20
P	Gujrat	86	14	B	Jafarabad	93	23				
S	Shikarpur	87	12	P	Vehari	94	19				
R E A S O N A B L Y S E C U R E											
A	Mirpur	100	7	S	Naushero Feroze	107	16	P	Sargoda	114	31
P	Kasur	101	21	P	Okara	108	26	P	T.T.Singh	115	32
P	Bahawalnagar	102	22	S	Nawabshah	109	17	N	Abbottabad	116	24
P	Sahiwal	103	23	P	Sialkot	110	27	P	Jhelum	117	33
P	Gujranwala	104	24	P	Faisalabad	111	28	P	Mandi Bahaud Din	118	34
S	Karachi	105	15	P	Hafizabad	112	29	B	Nasirabad	119	25
P	Pakpattan	106	25	P	Sheikhupura	113	30	B	Ziarat	120	26

P = Punjab, S = Sindh, N = NWFP, B = Balochistan, F = FATA, NA = Northern Area, A = AJK

National Rankings are from 1 to 120, 1 being the worst and 120 the best. Provincial Rankings depend on the number of districts per province.

Food Insecurity in Rural Pakistan 2003

FSA 2003

TABLE 6.5

INTENSITY OF POVERTY WITHIN THE DISTRICTS (RURAL) OF PAKISTAN

S. No	PUNJAB		NWFP		SINDH		BALOCHISTAN		Other Regions	
	District	%age of Poor	District	%age of Poor	District	%age of Poor	District	%age of Poor	District	%age of Poor
CALORIC POVERTY IN RURAL PAKISTAN										
1	Rajanpur	48.1	Shangla	37.4	Tharparkar	72.4	Dera Bugti	73.0	NORTHEREN AREA	
2	Muzaffargarh	47.1	Kohistan	37.3	Umerkot	46.2	Musa Khel	68.9	Diamer	46.2
3	D.G Khan	46.4	Hangu	36.2	Jacobabad	45.0	Kharan	68.6	Skardu	40.9
4	Multan	46.2	Upper Dir	33.8	Sukkar	44.4	Bolan	62.2	Ghanche	40.4
5	Bahawalpur	43.3	Battagram	31.4	Khairpur	42.9	Kohlu	57.1	Ghizer	35.1
6	Layyah	39.7	Swat	29.1	Ghotki	41.1	Zhob	56.8	Gilgit	32.5
7	Rahim Yar Khan	39.4	Bannu	28.0	Thatta	40.7	Khuzdar	56.6	AJK	
8	Attock	39.1	Tank	27.6	Sanghar	38.6	Awaran Killa	53.9	Muzaffarabad	33.7
9	Lahore	38.6	Chitral	27.4	Dadu	37.8	Abdullah	52.7	Bhimber	30.0
10	Lodhran	37.5	Buner	27.3	Mirpurkhas	37.6	Jhal Magsi	51.5	Bagh	28.7
11	Rawalpindi	37.1	Lower Dir	27.1	Larkana	37.2	Barkhan Killa	51.5	Kotli	28.6
12	Khanewal	37.0	Karak	26.4	Shikarpur	36.2	Saifullah	49.7	Sudhnoti	26.9
13	Mianwali	36.7	Mansehra	25.9	Hyderabad	34.0	Kalat	49.6	Rawalakot	26.2
14	Gujrat	36.5	Nowshera	25.8	Badin	33.9	Sibi	48.9	Mirpur	24.6
15	Jhang	36.1	Lakki	25.7	Karachi Noushero Feroze	32.6	Chagai	47.8	FATA	
16	Chakwal	35.7	Mardan	24.7	Nawabshah	32.0	Panjour	46.7	N. Waziristan	48.8
17	Narowal	35.5	Kohat	24.5			Turbat	46.6	S. Waziristan	46.3
18	Khushab	35.3	D.I.Khan	24.4			Lasbela	46.2	Khyber	41.3
19	Vehari	34.7	Swabi	24.3			Gawader	45.0	Kurram	41.0
20	Bhakkar	34.0	Charsadda	23.8			Mastung	43.1	Mohmand	40.9
21	Kasur	33.8	Malakand	23.0			Pishin	42.7	Orakzai	39.3
22	Bahawalnagar	33.8	Peshawar	21.3			Loralai	41.8	Bajour	38.5
23	Sahiwal	33.6	Haripur	19.9			Jafarabad	36.8		
24	Gujranwala	33.5	Abbottabad	17.8			Quetta	35.9		
25	Pakpattan	33.2					Nasirabad	30.3		
26	Okara	32.4					Ziarat	27.7		
27	Sialkot	32.2								
28	Faisalabad	32.1								
29	Hafizabad	31.9								
30	Sheikhupura	31.8								
31	Sargoda	31.4								
32	T.T.Singh	31.1								
33	Jhelum	30.8								
34	Mandi Bahaud Din	30.6								

SCORING THE DISTRICTS

Literacy ranking	
Below 30%	5
Between 30%-40%	4
between 40%-50%	3
Between 50% -60%	2
Above 60%	1

HDI ranking	
Below .3	5
Between .3-.4	4
Between .4-.5	3
Between .5-.6	2
Above .6	1

%age of the poor	
10-20%	1
20-30%	2
30-40%	3
40-50%	4
Above 50%	5

Disaster	1
Flood	1
Drought	1
Earthquake	1
Cyclone	1

	District	Literacy Rate 10+ (%)	HDI	%age of the poor	Flood	Drought	Earthquake	Cyclone	scoring
	Islamabad	72.38							
	Islamabad	1					1		
P	Rawalpindi	70.45	0.576	37.1					
P	Rawalpindi	1	2	3	1	0	1		8
S	Karachi	65.26	0.618	33.2					
S	Karachi	1	1	3		0	1	1	7
P	Lahore	64.66	0.558	38.6					
P	Lahore	1	2	3		0			6
P	Jhelum	63.92	0.703	30.8					
P	Jhelum	1	1	3	1	0			6
P	Gujrat	62.18	0.543	36.5					
P	Gujrat	1	2	3	1	0			7
P	Sialkot	58.92	0.555	32.2					
P	Sialkot	2	2	3	1	0			8
B	Quetta	57.07		35.9					
B	Quetta	2	2	3		0	1		8
P	Chakwal	56.72	0.545	35.7					
P	Chakwal	2	2	3		1			8
N	Abbottabad	56.61	0.598	17.8					
N	Abbottabad	2	2	2	1	0	1		8
P	Gujranwala	56.55	0.529	33.5					
P	Gujranwala	2	2	3		0			7
N	Haripur	53.72	0.629	19.9					
N	Haripur	2	1	2	1	0	1		7
P	Narowal	52.65	0.472	35.5					
P	Narowal	2	3	3		0			8
P	Faisalabad	51.94		32.1					
P	Faisalabad	2		3		0			5
P	Toba Tek Singh	50.5		31.1					
P	Toba Tek Singh	2		3		0			5
P	Attock	49.27	0.507	39.1					
P	Attock	3	2	3		0	1		9
P	Mandi Bahauddin	47.44	0.568	30.6					
P	Mandi Bahauddin	3	2	3	1	0			9
S	Sukkur	46.62	0.486	44.4					
S	Sukkur	3	3	4		1			11

P	Sargodha	46.3	0.534	31.4				
P	Sargodha	3	2	3		0		8
S	Hyderabad	44.25	0.532	34				
S	Hyderabad	3	2	3	1	0		9
N	Kohat	44.06	0.537	24.5				
N	Kohat	3		2		1	1	7
P	Sahiwal	43.9	0.541	33.6				
P	Sahiwal	3	2	3		0		8
P	Sheikhupura	43.78	0.618	31.8				
P	Sheikhupura	3	1	3		0		7
P	Multan	43.38	0.494	46.2				
P	Multan	3	3	4	1	0		11
P	Mian wali	42.76	0.537	36.7				
P	Mian wali	3		3		0		6
N	Noshera	42.5	0.529	25.8				
N	Noshera	3	2	2		1		8
N	Karak	41.92	0.484	26.4				
N	Karak	3	3	2		0		8
N	Peshawar	41.75	0.532	21.3				
N	Peshawar	3	2	2	1	0	1	9
P	Hafizabad	40.74	0.486	31.9				
P	Hafizabad	3	3	3	1	0		10
P	Khushab	40.5	0.575	35.3				
P	Khushab	3	2	3	1	0		9
N	Chitral	40.3	0.479	27.4				
N	Chitral	3	3	2		0	1	9
P	Khanewal	39.94	0.513	37				
P	Khanewal	3	2	3		0		8
N	Malakand P.A	39.14	0.461	23				
N	Malakand P.A	3	3	2	1	0	1	10
S	Naushahro Feroze	39.14	0.506	32.6				
S	Naushahro Feroze	3	2	3	1	0		9
P	Layyah	38.68		39.7				
P	Layyah	3		3	1	0		7
P	Okara	37.79	0.528	32.4				
P	Okara	3	2	3	1	0		9
P	Jhang	37.12	0.529					
P	Jhang	3	2		1	0		6
P	Vehari	36.79	0.508	34.7				

P	Vehari	3	2	3	1	0			9
N	Mardan	36.45	0.519	24.7					
N	Mardan	3	2	2		0			7
N	Mansehra	36.32	0.459	25.9					
N	Mansehra	3	3	2	1	0	1		10
P	Kasur	36.21	0.577	33.8					
P	Kasur	3		3		0			6
N	Swabi	36.03	0.523	24.3					
N	Swabi	3	2	2		0			7
S	Dadu	35.56	0.535	37.8					
S	Dadu	3	2	3	1	0			9
S	Khairpur	35.5	0.449	42.9					
S	Khairpur	3	3	4		0			10
P	Bahawalnagar	35.07		33.8					
P	Bahawalnagar	3		3	1	0			7
P	Bahawalpur	35.03	0.501	43.3					
P	Bahawalpur	3	2	4	1	0			10
S	Larkana	34.95	0.435	37.2					
S	Larkana	3	3	3	1	1			11
P	Pakpattan	34.7	0.498	33.2					
P	Pakpattan	3	3	3		0			9
B	Ziarat	34.34	0.697	27.7					
B	Ziarat	3	1	2		0	1		7
P	Bhakkar	34.17	0.581	34					
P	Bhakkar	3	2	3	1	0			9
S	Nawabshah	34.13	0.481	32					
S	Nawabshah		3	3		0			6
P	Rahim Yar Khan	33.09	0.541	39.4					
P	Rahim Yar Khan	3	2	3	1	0			9
N	Bannu	32.11	0.465	28					
N	Bannu	3	3	2		1			9
S	Shikarpur	31.94	0.417	36.2					
S	Shikarpur	3	3	3		1			10
N	Panjgur	31.35	0.496	46.7					
N	Panjgur	3	3	4		1			11
P	D.I. Khan	31.28	0.425	24.4					
P	D.I. Khan	3	3	2	1	1			10
B	Pishin	31.14		42.7	1				
B	Pishin	3		4	1	1	1		10
N	Charsada	31.11	0.506	23.8					
N	Charsada	3	2	2	1	0			8

S	Sanghar	30.87	0.461	38.6				
S	Sanghar	3	3	3		0		9
P	D.G Khan	30.61	0.471	46.4				
P	D.G Khan	3	3	4		0	1	11
N	Hangu	30.5	0.4	36.2				
N	Hangu	3	3	3		1		10
S	Mirpurkhas	30.4	0.522	37.6				
S	Mirpurkhas	3	2	3		0		8
P	Lodhran	29.9	0.475	37.5				
P	Lodhran	4	3	3		0		10
N	Lower-Dir	29.9	0.413	27.1				
N	Lower-Dir	4	3	2		0		9
N	Lakki Marwat	29.71	0.444	25.7				
N	Lakki Marwat	4	3	2		1		10
S	Ghotki	29.01	0.496	41.1				
S	Ghotki	4	3	4	1	0		12
N	Swat	28.75	0.442	29.1				
N	Swat	4	3	2	1	0	1	11
N	Muzaffargarh	28.45	0.459	47.1				
N	Muzaffargarh	4	3	4	1	0	1	13
B	Mastung	27.58	0.528	43.1				
B	Mastung	4	2	4		1		11
B	Kech	27.51	0.512					
B	Kech	4	2			1		7
B	Chiaghi	26.99	0.468	47.8				
B	Chiaghi	4	3	4	1	1	1	14
N	Tank	26.25	0.384	27.6				
N	Tank	4	4	2		1		11
B	Sibi	25.47	0.411	48.9				
B	Sibi	4	3	4		1		12
B	Gawadar	25.47	0.392	45				
B	Gawadar	4	4	4	1	0	1	14
S	Badin	24.63	0.459	33.9				
S	Badin	4	3	3	1	1		12
S	Jacobabad	23.66	0.393	45				
S	Jacobabad	4	4	4	1	1		14
N	Buner	22.62	0.423	27.3				
N	Buner	4	3	2	1	0		10
S	Lasbela	22.3	0.514	46.2				
S	Lasbela	4	2	4	1	1		12
S	Thatta	22.14	0.447	40.7				

S	Thatta	4	3	4	1	0			12
N	Upper Dir	22.21	0.369	33.8					
N	Upper Dir	4	4	3		1			12
P	Rajanpur	20.73		48.1					
P	Rajanpur	4		4	1	0			9
B	Loralai	20.47	0.556	41.8					
B	Loralai	4	2	4	1	0			11
B	Kalat	19.86	0.412	49.6					
B	Kalat	5	3	4		1	1		14
B	Jafarabad	18.51	0.454	36.8					
B	Jafarabad	5	3	3		0			11
S	Tharparkar	18.32	0.343	72.4					
S	Tharparkar	5	4	5		1			15
N	Batagram	18.31	0.363	31.4					
N	Batagram	5	4	3	1	0	1		14
B	Killa Saifullah	17.55	0.455	49.7					
B	Killa Saifullah	5	3	4	1	1			14
B	Khuzdar	17.46		56.6					
B	Khuzdar	5		5		1	1		12
B	Zhob	16.78		56.8					
B	Zhob	5		5		1	1		12
B	Killa Abdullah	16.1	0.387	52.7					
B	Killa Abdullah	5	4	5		1			15
B	Bolan	15.78	0.36	62.2					
B	Bolan	5	4	5		1			15
B	Barkhan	15.67	0.42	51.5					
B	Barkhan	5	3	5		1			14
B	Kharan	15.05	0.346	68.6					
B	Kharan	5	4	5		0	1		15
B	Awaran	14.79	0.381	53.9					
B	Awaran	5	4	5		1			15
N	Shangle	14.73	0.332	37.4					
N	Shangle	5	4	4	1	0	1		15
B	Naseerabad	12.69	0.492	30.3					
B	Naseerabad	5	3	4		0			12
B	Jhal Magsi	12.28	0.345	51.5					
B	Jhal Magsi	5	4	5		1			15
B	Kohlu	12.15	0.348	57.1					
B	Kohlu	5	4	5		1	1		16
B	Dera Bughti	11.73	0.285	73					
B	Dera Bughti	5	5	5		0			15

N	Kohistan	11.08	0.332	37.3				
N	Kohistan	5	4	4		0	1	14
B	Musa Khel	10.37		68.9				
B	Musa Khel	5		5		1		11

According to the criterion explained above the final scoring of the districts according to the vulnerability is as following: -

	District	Literacy Rate 10+ (%)	HDI	%age of the poor	Flood	Droug ht	Earthqua ke	Cyclone	scoring
P	Faislabad	2		3		0			5
P	Toba Tek Singh	2		3		0			5
P	Lahore	1	2	3		0			6
P	Jhelum	1	1	3	1	0			6
P	Mian wali	3		3		0			6
P	Jhang	3	2		1	0			6
P	Kasur	3		3		0			6
S	Nawabshah		3	3		0			6
S	Karachi	1	1	3		0	1	1	7
P	Gujrat	1	2	3	1	0			7
P	Gujranwala	2	2	3		0			7
N	Haripur	2	1	2	1	0	1		7
N	Kohat	3		2		1	1		7
P	Sheikhupura	3	1	3		0			7
P	Layyah	3		3	1	0			7
N	Mardan	3	2	2		0			7
N	Swabi	3	2	2		0			7
P	Bahawalnagar	3		3	1	0			7
B	Ziarat	3	1	2		0	1		7
B	Kech	4	2			1			7
P	Rawalpindi	1	2	3	1	0	1		8
P	Sialkot	2	2	3	1	0			8
B	Quetta	2	2	3		0	1		8
P	Chakwal	2	2	3		1			8
N	Abbottabad	2	2	2	1	0	1		8
P	Narowal	2	3	3		0			8
P	Sargodha	3	2	3		0			8
P	Sahiwal	3	2	3		0			8
N	Noshera	3	2	2		1			8
N	Karak	3	3	2		0			8

P	Khanewal	3	2	3		0			8
N	Charsada	3	2	2	1	0			8
S	Mirpurkhas	3	2	3		0			8
P	Attock	3	2	3		0	1		9
P	Mandi Bahauddin	3	2	3	1	0			9
S	Hyderabad	3	2	3	1	0			9
N	Peshawar	3	2	2	1	0	1		9
P	Khushab	3	2	3	1	0			9
N	Chitral	3	3	2		0	1		9
S	Naushahro Feroze	3	2	3	1	0			9
P	Okara	3	2	3	1	0			9
P	Vehari	3	2	3	1	0			9
S	Dadu	3	2	3	1	0			9
P	Pakpattan	3	3	3		0			9
P	Bhakkar	3	2	3	1	0			9
P	Rahim Yar Khan	3	2	3	1	0			9
N	Bannu	3	3	2		1			9
S	Sanghar	3	3	3		0			9
N	Lower-Dir	4	3	2		0			9
P	Rajanpur	4		4	1	0			9
P	Hafizabad	3	3	3	1	0			10
N	Malakand P.A	3	3	2	1	0	1		10
N	Mansehra	3	3	2	1	0	1		10
S	Khairpur	3	3	4		0			10
P	Bahawalpur	3	2	4	1	0			10
S	Shikarpur	3	3	3		1			10
P	D.I. Khan	3	3	2	1	1			10
B	Pishin	3		4	1	1	1		10
N	Hangu	3	3	3		1			10
P	Lodhran	4	3	3		0			10
N	Lakki Marwat	4	3	2		1			10
N	Buner	4	3	2	1	0			10
S	Sukkur	3	3	4		1			11
P	Multan	3	3	4	1	0			11
S	Larkana	3	3	3	1	1			11
N	Panjgur	3	3	4		1			11
P	D.G Khan	3	3	4		0	1		11
N	Swat	4	3	2	1	0	1		11

B	Mastung	4	2	4		1			11
N	Tank	4	4	2		1			11
B	Loralai	4	2	4	1	0			11
B	Jafarabad	5	3	3		0			11
B	Musa Khel	5		5		1			11
S	Ghotki	4	3	4	1	0			12
B	Sibi	4	3	4		1			12
S	Badin	4	3	3	1	1			12
S	Lasbela	4	2	4	1	1			12
S	Thatta	4	3	4	1	0			12
N	Upper Dir	4	4	3		1			12
B	Khuzdar	5		5		1	1		12
B	Zhob	5		5		1	1		12
B	Naseerabad	5	3	4		0			12
N	Muzaffargarh	4	3	4	1	0	1		13
B	Chiaghi	4	3	4	1	1	1		14
B	Gawadar	4	4	4	1	0		1	14
S	Jacobabad	4	4	4	1	1			14
B	Kalat	5	3	4		1	1		14
N	Batagram	5	4	3	1	0	1		14
B	Killa Saifullah	5	3	4	1	1			14
B	Barkhan	5	3	5		1			14
N	Kohistan	5	4	4		0	1		14
S	Tharparkar	5	4	5		1			15
B	Killa Abdullah	5	4	5		1			15
B	Bolan	5	4	5		1			15
B	Kharan	5	4	5		0	1		15
B	Awaran	5	4	5		1			15
N	Shangle	5	4	4	1	0	1		15
B	Jhal Magsi	5	4	5		1			15
B	Dera Bughti	5	5	5		0			15
B	Kohlu	5	4	5		1	1		16

It is visible from the analysis of the data assembled that the districts in the western part of Pakistan, from north to south are most vulnerable.

There are inadequacies in terms of in terms of resource availability, development and literacy in these districts. There is also very little socio economic development in these districts.

Kohlu has been ranked as the most vulnerable district according to the scoring. Dera Bugti hosts 73% poor and it is also worst hit on other indicators as well for example HDI. Other extremely insecure districts in Baluchistan are Jhal Magsi, Shangla, Awaran, Kharan, Bolan, Killa Abdullah and Tharparkar.

Not only are these districts prone to natural hazards but in all these districts poverty is also multifaceted and complex. Because of the alarming situation of poverty in these districts their vulnerability in terms of coping with natural hazards increases many folds.

It is also important to note that the same districts have also very low literacy rates especially the female literacy rates.

There is an urgent need to reduce the vulnerability of these districts through long term planning, investment in agriculture, rural development and education. It is the only way to ensure security and development and a better future for the people of these areas.

Annexures I

Last Year Flood Damages¹³

S no	Description/Item	Punjab	Sindh	NWFP
1	No of districts affected	10	07	09
2	No of persons died	42	03	14
3	No of villages affected	1355	212	130
4	No of persons affected	3,49,751	13,481	12,072
5	Areas affected (acres)	12,72,121	Not reported	35,202
6	Crops affected (acres)	4,17,814	3,012	35,202
7	No of relief camps established	310	50	Not reported
8	Houses damages/demolished	24,940	275	3,714

Annexure II

DETAILS OF LOSSES / DAMAGES DUE TO RAINS / FLOODS -2005¹⁴

AS ON 16-8-2005

SR O.	DISTRICT	VILLAGES AFFECTED	PERSONS AFFECTED	AREA AFFECTED (ACRES)	CROPPED AREA AFFECTED (ACRES)	HOUSE DAMAGED PARTIALLY	HOUSE DAMAGED TOTALY	PERSONS DIED		CATTLE	RELIEF
								BW	NBW	HEADS LOST	CAMPS ESTABLISHED
1	Layyah	88	67970	159992	103763	6005	8006	2	3	7	42
2	D.G.Khan	168	17379	180362	86324	4792	2049	-	1	176	28
3	Rajanpur	279	113230	421237	35783	-	393	7	10	-	25
4	Mianwali	43	2942	67896	13311	211	716	-	-	-	24
5	Muzaffa	126	4842	139802	42486	920	51	2	4	122	22

¹³ Federal Flood Commission

¹⁴ Punjab Relief Department

	rgarh										
6	Sialkot	46	19393	-	28143	489		1	-	1	-
7	Bhakkar	26	200	4525	3924	17	10	-	-	-	11
8	Gujrat	34	-	-	1030	-	-	-	-	-	25
9	Gujranwala	38	-	-	22902	-	-	-	-	-	-
10	M.B.Din	16	-	-	7000	-	-	-	-	-	-
11	Rahimyar Khan	81	41715	147385	52262	1106	1102	2	2	16	24
12	Multan	46		23429	23429	-	-	-	-	-	17
13	Jhang	405	61825	3603819	129554	23	53	3		-	32
14	Kasur	4	54	-	-	19	33		4	9	5
15	Khanewal	22	1618	21417	5147	38	31	1	-	1	7
16	Khushab	12	-	-	-	-	-	-	-	11	12
17	Sargodha	32	-	-	-	-	-	-	-	-	3
		1466	331168	4769864	555058	13620	12444	18	24	343	277

Annexure III
Flood Protection Schemes Province wise

Punjab		
District	No.of scheme	Total Cost in million Rs
Sheikhupura	8	170.93
Okara	3	81.04
Gujrat	15	297.06
Gujranwala	4	48.1
Jhang	2	72.34
Multan	5	102.62
Muzaffargarh	10	302.88
Lodhran	1	6.58
DG Khan	10	209.21
Bhakkar	1	95.7
Bahawalpur	4	136.86
Khanewal	1	4
R.Y Khan	4	24.14
Rajanpur	13	213.28
Narowal	5	59.02
15	86	1823.76

NWFP		
District	No. of scheme	Total Cost in Million Rs

Swat	15	150.04
Peshawar	16	129.66
Charsadda	7	23.14
D I Khan	11	137.01
4	49	439.85

District	No.of schemes	Total Cost
Quetta	1	59
Ziarat	10	22.48
Harnai	9	15.89
Sibi	2	9
Pishin	4	60.93
Dadhar		3.65
Killa Saifullah	6	
Loralai	9	47.47
Zhob	2	13.43
Flood mangement of Ziarat Harnai	1	40.52
Flood mangement of Hill Torrents	1	108.52
Additional schemes	1	46.3
9	46	427.19

District	No.of schemes	Total Cost
Jacobabad	12	297.38
Thatha	7	187.15
Larkana	3	77.02
Khairpur	2	61.09
Skikarpur	2	63.91
Hyderabad		10.05
Khairpur	1	22
Nawab Shah	6	223.66
Connecting approach of Guddu Barrage	1	325.29
Guddu Sukhar Reach	1	306.72
Sukkur Kotri Reach	1	441.53
Kotri Sea reach	1	189.45
8	37	2205.25

Annexure IV
Detail of flood affected locations

Major River	Province	District	Locations	
Indus	NWFP	D I Khan		
		Punjab	Mianwali	Piplan
			Bhakkar	Kalurkot, Darya khan, Behal, Baddiani, Dajal
			Layyah	Karor, Nurpur, Basti Qazi, Naushera, Bakhri
			DG Khan	Bukhara, Taunsa, Basti Pir Shah Sadruddin
			Muzaffargarh	Jhunjhunwali, Ghazi Ghat, basti kubbar
			Rajanpur	Rekh Beghwala, Nurpur, Mithankot, Shahwali.
			Rahim Yar Khan	Chachrian, Bhung
		Sindh	Jacobabad	Kashmor, Miani, Haibat, Chauspar
			Ghotki	Ranwati, Sarhad, Sukhpure
			Sukkur	
			Shikarpur	Chak, Bagarji, Madeji, Nasrat
			Larkana	Abad Nawa, Dokri, Nehar
			Dadu	Sita, Ghot pat, Purana Dero, Mandar, Talti, Sehwan, Tirath, Amri, Sann, Manjhnad, Khano, Bhian, Bhudapur, Kotri, juno
			Naushahro Firoz	Kamaldero, Darbelo, Bharto, Mithiana, Deparja, Chanejo, Moro, Gachera, Shahpur, Daulatpur
			Nawabshah	Amirbad, Miro, Chattan Shah, Mehrabpur
			Hyderabad	Hala, Khandu, Sekhat, Matiari, Hatri, Muhana, Mullah Katiar
	Thatta		Bano, Belo, Sujanwal, Gungri, Chuhar Jamali, Jalbani, Goth Bagawah, Soban Shah	
	Thatta R.T Bank	Juna, Jherruck, Sonda, Hilaya, Tanka goth, Goth Asadullah Shah, AllahrakhioShah, Garho, Ghorabari		
Jehlum	Punjab	Jehlum	Maira, Darapur	
		Gujarat	Sarai Alamgir	
		Mandi Bahauddin	Rasul	
		Sargodha	Chachar Shahpur, Sahiwal, Mangowal, Nihnag	
		Khushab	Dhak, hamoka, Girot, Khai, Kalan, Kot Shakir, Kot Maldeo	
Chenab	Punjab	Sialkot	Marala, Khanki, Rasulnagar	
		Gujrat	Qadribad	

		Wazirabad	Khanki, Rasulnagar
		Hifizabad	Chak bhatti
		Sargodha	Midh Ranjha, Gurna, Rabwah, Chinabnaggar, Kalri, Chund
		Jhang	Chiniot, Trrimuth, Qaim Bharwana, Ahmadpur Sial, Basti Islam
		Multan	Ghazipur, Shihni
		Muzzaffargarh	Sitpur, Basti, Indrah
Ravi	Punjab	Narowal	Maddoke, Jassar, Sidhanwali
		Lahore	Babakwol, Shahdara, Dhamke, Sharqpur, Chungge, Manga
		Sheikhupura	Sayyid wala
		okara	Jamdraka, Sadr Gugero
		Sahiwal	Bawanni, dadra
		Multan	Talamba, Abdul Hakim, Bagar, Sarai Sidhu
Sutlej	Punjab	Kasur	Ganda Singhwala
		Okara	Mokal, Atari, Pir Ghani, Pakpattan, Hota, Macchi Singh
		Bahawalnagar	Rahmuke, Qasimka, Islam
		Vehari	Sathuka, Rukanpur, Maibi Syphon, Fatehpur
		Bahawalpur	Asrani, Bahawalur, Lodhran Bridge, Bharpal, Khaipur Jadid

Annexure V

Flash Floods

S no	Province	District	Major River/Nallah /Drain
1	NWFP	Buner	Barandq stream, Chamla Kanwar, Khandukhel, Bar Borai Khawar
2		Swat	River Swat,
3		Shangla	
4		Malakand	
5		Kohistan	Indus, Dubair river, Kandia River, Pattan nullah, Kayal nullah, Ashori nullah, Shatial river, Harban nullah, Zaid Khar nullah, Barseen nullah.
6		Batagram	
7		Mansehra	
8		Abbotabad	Kunhar, Haro, Dur, Siram, Karlal, Dhund
9		Haripur	Indus, Sirin, Dauor, Haro
10		Mardan	Kalpani, Baghiari Khawar, Muqam

			Khawar and Naranji Khawar.
11		Charsadda	River Kabul, River Khyali, River Jindi, River Swat
12		Peshawar	Adazai River, Naguman River, Shah Alam River, River Kabul
13		D.I.Khan	Indus river

S no	Province	District	Flash Floods location
1	Baluchistan	Quetta	
2		Ziarat	
3		Harnai	
4		Sibi	
5		Pishin	Toghai Manda
6		Loralai	Loralai river
7		Lasbela	Poralli river, Windar River, Naigong river
8		Mastung	
9		Turbat	Rakhsan river, Ketch Kaur river
10		Chagai	
11		Killa Saifullah	

Annexure V

Flood Protection Schemes 1995 to date

The important Flood protection Sector Projects and Flood Protection/Improvement schemes since 1995 for the flood prone districts of Pakistan are given below:

Punjab Table:4

S.No	District	No.of scheme	Total Cost in million Rs	Status
1	Sheikhupura	8	23.42	Complete
			22.1	Complete
			4.2	Completed
			22.21	Completed
			30	Completed
			23	Completed
			22	Completed
			24	Completed
			170.93	
2	Okara	3	27.2	Completed
			25	Completed

			28.84	Complete
			81.04	
3	Gujrat	15	26.86	Complete
			25.85	Complete
			25.07	Complete
			24.64	Complete
			26.4	Complete
			24.84	Complete
			32.29	Complete
			16.88	Complete
			19.97	Complete
			28	Completed
			28	Completed
			5.94	Completed
			2.83	Completed
			6.07	Completed
			3.42	Completed
			297.06	
4	Gujranwala	4	7.58	Completed
			11.25	Completed
			4.03	Completed
			25.24	Complete
			48.1	
5	Jhang	2	57.14	Completed
			15.2	Complete
			72.34	
6	Multan	5	9.71	Complete
			55.21	Completed
			4.66	Complete
			30	Complete
			3.04	Complete
			102.62	
7	Muzaffargarh	10	91.92	Complete
			16.12	Complete
			15.65	Complete
			18	Complete
			4.46	Complete
			32.15	Completed
			19.8	Completed
			16.55	Complete
			52.68	Complete
			23.37	
			12.18	
			302.88	
8	Lodhran	1	6.58	Complete
9	DG khan	10	26.45	Complete
			16.6	Complete
			20.02	Complete

			24	Complete
			30.28	Complete
			21.6	Complete
			9.2	Complete
			30.28	Complete
			21.5	Complete
			9.28	Complete
10	Bhakkar	1	95.7	Complete
			95.7	
11	Bahawalpur	4	19.07	Completed
			22	Complete
			73.6	Complete
			22.19	Complete
			136.86	
12	Khanewal	1	4	Complete
			4	
13	R.Y Khan	4	5.4	Completed
			7.9	Completed
			4.22	Completed
			6.62	Completed
			24.14	
14	Rajanpur	13	9.72	Complete
			9.25	Complete
			8.08	Complete
			21.87	Completed
			33.59	Complete
			14.31	Complete
			16.4	Completed
			17.6	Complete
			19.14	Complete
			18.65	Completed
			14.58	Complete
			18.81	Abandoned
			11.28	Completed
			213.28	
15	Narowal	5	5	Complete
			17.77	Complete
			5.27	Complete
			30.98	Complete
			59.02	

NWFP

S.NO	District	No. of scheme	Total Cost in Million Rs	Status
1	Swat	15	16.53	Completed
			10	Completed
			5.86	Completed

			10.5	Completed
			2.4	Completed
			1.51	Completed
			4.06	Completed
			8.5	Completed
			10.05	Completed
			6.86	Completed
			21.77	Completed
			4.47	Completed
			12.13	Completed
			16.58	Completed
			18.82	Completed
		Total	150.04	
2	Peshawar	16	10.2	Completed
			4.34	Completed
			5.6	Completed
			0.92	Completed
			2.96	Completed
			6.21	Completed
			10.33	Completed
			5.31	Completed
			4.07	Completed
			3.93	Completed
			5.14	Completed
			2.46	Completed
			6.77	Completed
			35.36	Completed
			5.12	Completed
			20.94	Completed
		Total	129.66	
3	Charsadda	7	7.56	Completed
			7.12	Completed
			2.9	Completed
			1.93	Completed
			0.49	Completed
			0.61	Completed
			2.53	Completed
		Total	23.14	
4	D I Khan	11	14.55	
			11.95	Completed
			27.66	Completed
			10.28	Completed
			11	Completed
			10.37	Completed
			21.82	Completed
			20.15	Completed
			4.98	Completed

			8.9	Completed
			9.9	Completed
		Total	137.01	

Baluchistan

S.No	District	No.of schemes	Total Cost	Status
1	Quetta	1	59	Completed
		Total	59	
2	Ziarat	10	1.15	Completed
			0.8	Completed
			0.53	Completed
			0.95	Completed
			4.5	Completed
			2.74	Completed
			2.38	Completed
			4.04	Completed
			5.39	Completed
		Total	22.48	
3	Harnai	9	1.15	Completed
			1.12	Completed
			1.73	Completed
			1.54	Completed
			0.6	Completed
			3.84	Completed
			3.68	Completed
			0.91	Completed
			1.32	Completed
		Total	15.89	
4	Sibi	2	6	Completed
			3	
		Total	9	
5	Pishin	4	16.91	Completed
			18.78	Completed
			19.03	Completed
			4.1	Completed
			2.11	Completed
		Total	60.93	
6	Dadhar		1.83	Completed
			1.82	Completed
		Total	3.65	
7	Killa Saifullah	6		
8	Loralai	9	4.98	Completed
			4.93	Completed
			2.63	Completed

			15.51	Completed
			4.24	Completed
			9.71	Completed
			2.4	Completed
			1	Completed
			2.07	Completed
		Total	47.47	
9	Zhob	2	11.93	Completed
			1.5	Completed
		Total	13.43	
10	Chagai		4.45	
		Total	4.45	Completed
11	Flood mangement of Ziarat Harnai	1	40.52	Completed
12	Flood mangement of Hill Torrents	1	108.52	Completed
13	Addional schemes	1	46.3	Completed

Sindh

S.No	District	No.of schemes	Total Cost	Status
1	Jacobabad	12	16.86	Completed
			4.21	Completed
			65.3	Completed
			79.56	Completed
			20.5	Completed
			43	Completed
			10.03	Completed
			31.48	Completed
			18.71	Completed
			7.73	Completed
		Total	297.38	
2	Thatha	7	66.18	Completed
			56.33	Completed
			2.18	Completed
			11.14	Completed
			4.27	Completed
			17.89	Completed
			29.16	Completed

		Total	187.15	
3	Larkana	3	4.87	Completed
			17.72	Completed
			13.43	Completed
			41	Completed
		Total	77.02	
4	Khairpur	2	39.09	Completed
			22	Completed
		Total	61.09	
5	Skikarpur		19.11	Completed
			44.8	Completed
		Total	63.91	
6	Hyderabad		10.05	Completed
7	Khairpur	1	22	Completed
8	Nawab Shah	6	32.5	Completed
			8.2	Completed
			8.64	Completed
			59.48	Completed
			34.84	Completed
			80	Completed
		Total	223.66	
9	Connecting approach of Guddu Barrage	1	325.29	Completed
10	Guddu Sukhar Reach	1	306.72	Completed
11	Sukkur Kotri Reach	1	441.53	Completed
12	Kotri Sea reach	1	189.45	Completed

Annexure VI
Ranking of the Districts Province wise

Province	District	Literacy Rate 10+ (%)	HDI	%age of the poor	Flood	Drought	Earthquake	Cyclone	scoring
B	Ziarat	3	1	2		0	1		7
B	Kech	4	2			1			7
B	Quetta	2	2	3		0	1		8
B	Pishin	3		4	1	0	1		9
B	Mastung	4	2	4		1			11
B	Loralai	4	2	4	1	0			11
B	Jafarabad	5	3	3		0			11
B	Musa Khel	5		5		1			11
B	Sibi	4	3	4		1			12
B	Khuzdar	5		5		1	1		12
B	Zhob	5		5		1	1		12
B	Naseerabad	5	3	4		0			12
B	Chiaghi	4	3	4	1	1	1		14
B	Gawadar	4	4	4	1	0		1	14
B	Kalat	5	3	4		1	1		14
B	Killa Saifullah	5	3	4	1	1			14
B	Barkhan	5	3	5		1			14
B	Killa Abdullah	5	4	5		1			15
B	Bolan	5	4	5		1			15
B	Kharan	5	4	5		0	1		15
B	Awaran	5	4	5		1			15
B	Jhal Magsi	5	4	5		1			15
B	Dera Bughti	5	5	5		0			15
B	Kohlu	5	4	5		1	1		16

Province	District	Literacy Rate 10+ (%)	HDI	%age of the poor	Flood	Drought	Earthquake	Cyclone	scoring
N	Haripur	2	1	2	1	0	1		7
N	Kohat	3		2		1	1		7
N	Mardan	3	2	2		0			7
N	Swabi	3	2	2		0			7
N	Abbottabad	2	2	2	1	0	1		8
N	Noshera	3	2	2		1			8
N	Karak	3	3	2		0			8
N	Charsada	3	2	2	1	0			8
N	Peshawar	3	2	2	1	0	1		9
N	Chitral	3	3	2		0	1		9
N	Bannu	3	3	2		1			9
N	Lower-Dir	4	3	2		0			9
N	Malakand P.A	3	3	2	1	0	1		10
N	Mansehra	3	3	2	1	0	1		10
N	Hangu	3	3	3		1			10
N	Lakki Marwat	4	3	2		1			10
N	Buner	4	3	2	1	0			10
N	Panjgur	3	3	4		1			11
N	Swat	4	3	2	1	0	1		11
N	Tank	4	4	2		1			11
N	Upper Dir	4	4	3		1			12
N	Muzaffargarh	4	3	4	1	0	1		13
N	Batagram	5	4	3	1	0	1		14
N	Kohistan	5	4	4		0	1		14
N	Shangle	5	4	4	1	0	1		15

Province	District	Literacy Rate 10+ (%)	HDI	%age of the poor	Flood	Drought	Earthquake	Cyclone	scoring
P	Rawalpindi	1	2	3	1	0	1		8
P	Sialkot	2	2	3	1	0			8
P	Chakwal	2	2	3		1			8
P	Narowal	2	3	3		0			8
P	Sargodha	3	2	3		0			8
P	Sahiwal	3	2	3		0			8
P	Khanewal	3	2	3		0			8
P	Attock	3	2	3		0	1		9
P	Mandi	3	2	3	1	0			9

	Bahauddin								
P	Khushab	3	2	3	1	0			9
P	Okara	3	2	3	1	0			9
P	Vehari	3	2	3	1	0			9
P	Pakpattan	3	3	3		0			9
P	Bhakkar	3	2	3	1	0			9
P	Rahim Yar Khan	3	2	3	1	0			9
P	Rajapur	4		4	1	0			9
P	Hafizabad	3	3	3	1	0			10
P	Bahawalpur	3	2	4	1	0			10
P	D.I. Khan	3	3	2	1	1			10
P	Lodhran	4	3	3		0			10
P	Multan	3	3	4	1	0			11
P	D.G Khan	3	3	4		0	1		11

Province	District	Literacy Rate 10+ (%)	HDI	%age of the poor	Flood	Drought	Earthquake	Cyclone	scoring
S	Nawabshah		3	3		0			6
S	Karachi	1	1	3		0	1	1	7
S	Mirpurkhas	3	2	3		0			8
S	Hyderabad	3	2	3	1	0			9
S	Naushahro Feroze	3	2	3	1	0			9
S	Dadu	3	2	3	1	0			9
S	Sanghar	3	3	3		0			9
S	Khairpur	3	3	4		0			10
S	Shikarpur	3	3	3		1			10
S	Sukkur	3	3	4		1			11
S	Larkana	3	3	3	1	1			11
S	Ghotki	4	3	4	1	0			12
S	Badin	4	3	3	1	1			12
S	Lasbela	4	2	4	1	1			12
S	Thatta	4	3	4	1	0			12
S	Jacobabad	4	4	4	1	1			14
S	Tharparkar	5	4	5		1			15

Annexure VII

Template for District Disaster Profiling

1. Overview of the District

Table 1.1: District at a Glance

Total Geographical area	
Total population (in thousands)	
Male	
Female	
Geology	
Mountain and Hills	
Average annual rainfall	
Major Rivers	
Drainage/Nullahs	
Lakes and Marshes	
Forestry	
Railways	
Roads	

1.2 Literacy Rate

Male	
Female	
Total	

2. Risk/Hazard Analysis

2.1 Potential hazards prevailing in the district and probable time of occurrence

Types of Hazards	Probable time of Occurrence	Potential impact
Tsunami		
Cyclone		

2.2 Seasonal Calendar of Crops

Crop	Area in acres
<i>Kharif</i>	
<i>Rabi</i>	

2.3 History of Disasters in the District

Type	of	Year	of	Affected area	Summary of Damages
------	----	------	----	---------------	--------------------

Hazard	occurrence		

2.4. Livelihood sources in the district

<i>Employed population by occupation</i>	
<i>Skilled agriculture and fisheries</i>	
<i>Elementary occupation</i>	
<i>Service workers, shop</i>	
<i>Craft and related operators</i>	

<i>Employed population by industry.</i>	
<i>Agriculture, forestry, hunting and fishing</i>	
<i>Whole sale, retail and hotel business</i>	
<i>Construction</i>	
<i>Transport</i>	
<i>Community, Social and personal</i>	
<i>Manufacturing</i>	

3. Resources available in the district

In order to assess the capacity of the district and the resources available relevant information

Police stations	Fire stations	Hospitals	BHUs/Dispensaries	Schools	Colleges	Earth moving equipment	Storage facilities	List of organizations Working in the district	Addresses/phone numbers of organizations working in the district

is provided in this section:

4 Institutional arrangements for Emergency Operation /State of Readiness

4.1 Latest District Disaster Management Plan i.e. Flood/drought/earthquake management plans

4.2 State of readiness of the plans

4.3 Evacuation, search and rescue plan /preparedness

Early warning system	Arrangement of boats/vehicles for evacuation	Food storage	Medical staff	Stock piling of life saving drugs	Potential sites for shelter and transitory camps

Important Phone numbers:

Name	Office	Residence	Mobile no
District Nazim			
DCO			
Tehsils Nazim			
Tehsils Nazim			
Tehsils Nazim			
Disaster Management Committee officials			

Police Station	Phone:
Fire Station	
Hospital1	
Hospital 2	
Hospital/BHU	
Local NGOs	

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