

Review

Pakistan's flooding of July-August 2010: not only a natural Disaster

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Pakistan is a flood prone country on the globe. Over the last 37 years quantitatively Pakistan has faced 17 floods of various magnitudes and among these 50 percent has been classified as major floods. After the mega flood of 1929, another 'super flood' struck the lands of Pakistan during 2010. The present study is an attempt to explore the shocking impact of floods and the involvement of man for the serious devastation due to floods. It is a historically proven fact that not only in Pakistan at different intervals of time man has caused flooding at different intensities by indulging in various malpractices. The study also tries to identify where man is consciously involved and where unconsciously -lack of planning, mismanagement and lack of resources- causing floods. The study also tries to suggest how we can protect Pakistan from such hazards in future.

Key Words: inundations, magnitudes, merciless, damages.

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INTRODUCTION

Water is essential for human survival but it must be within its limits and in an appropriate quantity. Pakistani community has been appalled by the unprecedented social losses caused by the major flooding events in Pakistan. These floods mostly occur under the influence of Summer Monsoons¹

Indus River System had provided a well-built foundation for the social development of Pakistan.²This system comprises of five main its eastern and western tributaries. This system is supported by huge dams, barrages and an extensive net-work of canals. The contribution of Indus River System towards the socio-economic enhancement of Pakistan is definitely incredible.

Pakistan is recognized as a country with large population as well high population density and higher incidence of poverty³. Pakistan has been trying to attain sustainable development. Susceptibility to floods is primarily due to severe climatic variability which is marked by spatial as well temporal distribution of water resources existing at country's various places. Pakistan has been suffering from two major climate based problems droughts and floods.⁴

The season from June- to September is the season, when summer monsoons from Bay of Bengal, enter Pakistan and cause heavy rainfall in the north-eastern side and gradually move towards south-west. During the season monsoons winds also originate from Arabian Sea

Table 1. During the flood of July-August 2010, total numbers of 78 districts¹ were affected by flood waters.

Number of Flood Affected Districts, 2010 Floods			
Province/State	Severely affected	Moderately Affected	Total Affected Districts
KP	10	14	24
Punjab	7	4	11
Sindh	9	8	17
Balochistan	2	10	12
AJ and K ⁵	1	6	7
GB	0	7	7
Grand Total	29	49	78

Source: NDMA/ FFC

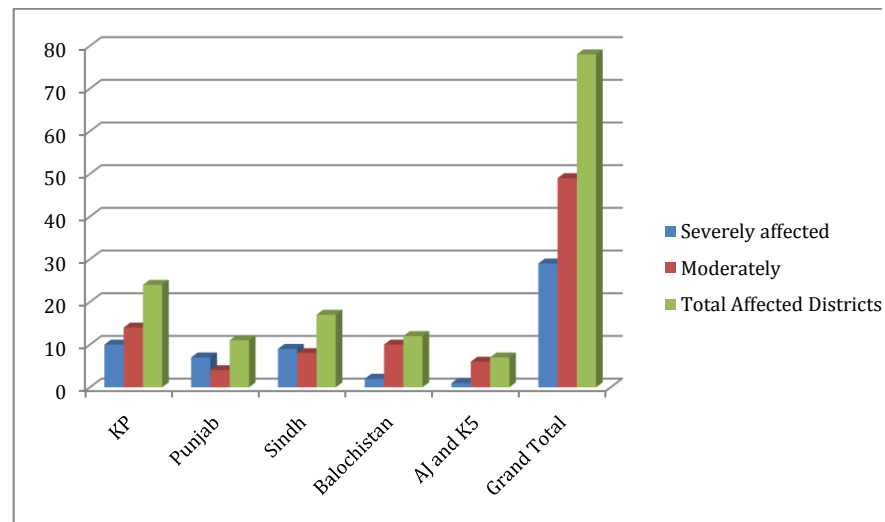


Figure 1

and also cause rainfall mainly in southern parts of the Sindh province.⁵This season is mainly recognized as the rainy-season for the country. During the season due to heavy rainfall caused by summer Monsoons cause major inundations like that of 1973, 1976, 1988, 1992 and 2010. These floods become more devastating due to higher rate melting of snow and glaciers in the northern mountainous ranges.⁶ It is the fact that nature is not single handedly responsible for massive flooding in the country but irresponsible human behavior is responsible for converting major floods into super floods like that of 2010.

METHODOLOGY

This study to focuses on the major causes of floods in Pakistan and tries to find the linkage between man and

major flooding events in the country. The study used academic literature, searched literature by using multiple search engines as well databases. Table 1

As a basic source of data collection, "Quantitative Informants Interviews" were also conducted. Interviews were conducted; from the persons who have been the eye-witness of most of the flooding events, Government officials, the relief workers, doctors working at the relief camps and NGOs representatives. Interviews were also made with the WAPDA spokesmen to get an insight into the situation. Interviews from Key persons like Dr Shahid Hassan Siddiqui (Economist and Scholar), Pakistan's Former Chief Meteorologist Mr. Shoukat Awan and Mr. Nadeem Ahmad Head of NDMA (disaster management Authority) were very important for discussing flood related information. The overall data obtained was carefully examined and compared with the science based reasons for the flooding. Figure 1

REVIEW OF LITERATURE

For many reasons, the last four decades (1970-2010) have been demoralizing and sad one for the people of Pakistan.⁷ Putting aside other disasters such as earthquakes, droughts etc. The floods in the history of Pakistan (1973, 1976, 1988, 1992 and 2010) have always brought with them disturbances for the socio-economic sectors. Various studies related to flooding in Pakistan clearly mention that the intensity and incidence of floods has increased during recent times.⁸ July-August 2010 flood is a practical example of this claim.

Dr Muhammad Hanif, in his report⁹ on the topic of: *Redistribution of Precipitation (Seasonal Shift) in Pakistan and Super Flood in Pakistan-2010*, gives detailed elaboration of Weather Forecasting System of PMD where he has thrown light on short range, medium range and seasonal weather forecasts and their chances of accuracy.

Sare Laerke, in her Ph D Thesis¹⁰ entitled as: "Ensuring a Sustainable Development within a Changing Climate", discusses that various methods and techniques must be used to prevent and mitigate climatic hazards such as floods.

Kazi Saeed Ahmad, in his article¹¹ entitled as, "Climatic Regions of West Pakistan" is of the opinion that better understanding of climatic issues may help to fight against climatic hazards such as floods.

A Report of Judicial Flood Inquiry Tribunal¹² on the causes of major breaches in River Indus during the "exceptionally high floods," of 2010, was prepared under the chairmanship of Justice Syed Mansoor Ali Shah. With the title of: "*A Rude Awakening*". This report was made public in November 2010. The report describes the historic floods in the history of Pakistan. The report mentions the root causes of breaches and authorities responsible for negligence. Judicial Flood Inquiry Tribunal in their recommendations with the title of: *A rude Awakening*, "A Report of the Judicial Flood Inquiry Tribunal on the Causes of Major Breaches in River Indus, During the Exceptionally High Flood of 2010." It also damaged irrigation infrastructure and flood control works at various places. Dams- Munds, Amendrah and Kuram Garhi Head works, RMB Jinnah Barrage, LMB of Tansa and Gudu Barrages were severely affected through flood waters.¹³⁴ TP link canal, Muzaffarabad canal, Head Regulators, drains, outlets, flood embankments, Tori Bund, Ghauspur Bund M.S. Bund etc. spurs and other structures were badly affected in response to July-August Flood 2010

Annual Report 2010-11 by Pakistan Institute of Development Economics¹³ also focuses on "reactive" approach. *Preliminary Rapid Damage Assessment in the Agriculture Sector for the flood affected areas of Pakistan*.

A research report curved out by Michael J. Hicks Ball State University & Mark L. Burton, the University of Tennessee in August 2010 has worked out on reactive approach, under the title, *Preliminary Damage Estimates for Pakistani Flood Events, 2010*.¹⁴ To make this study fruitful, economic and demographic data were collected from every possible source.

The structure and system of NDMA in the country focuses on to mitigate floods, it also provides rescue, relief and rehabilitation facilities. NDMA Annual Reports (2010, 2011 and 2012) discuss disaster management system¹⁵ in Pakistan like organizational structure of NDMA, and its response to major disasters in Pakistan.

Federal Flood Commission (FFC) it was established in January 1977.¹⁶ FFC has organized and implemented three National Flood Protection plans since 1978, covering period from 1978-88 (NFPP-I), 1988-1998 (NFPP-II), and 1998-2008 (NFPP-III). *Annual Flood Report 2010 floods*¹⁷, & *Annual Flood Reports 2011 and 2012*, These reports, describe the mechanics of floods with floods in Pakistan and historic flood events in Pakistan, Problems caused by floods and flood management and protection facilities.

Jessica Elizabeth in her Ph D thesis¹⁸ entitled as *The Impact of Flooding on the Value of Residential Property in the UK*. 2008. Discusses that due to flooding, flood affected community and their property is not safe.

Oliver Zenklusen in his Ph D thesis¹⁹ entitled as *Natural Disasters and Economic Development: A Neoclassical Review of Theoretical Perspectives and Empirical Evidence*, which was presented to the University of St. Gallen in 2007. The thesis discusses that due to flooding; the flood affected community has to face many economic problems. The thesis also identifies deforestation, global warming and many other factors cause flooding.

Syed Ali Rizwan Associate Professor University of Engineering & Technology Lahore in his entitled work: *Flood Frequency Analysis of Pakistani Rivers*. The most significant characteristic of this report is that it discusses almost all the major floods of Pakistan. The author blames both nature and man for floods in the history of Pakistan.

Disaster Risk Management Needs Reports 2010,²⁰ prepared by NDMA Government of Pakistan focuses on mitigating floods as well on relief and rehabilitation processes.

Prof. Dr. Amir Nawaz Khan Director Centre for Disaster Preparedness and Management University of Peshawar prepared a report about the hazardous effects of 2010 flood entitled as, a *Brief Report on Activities of CDDP in Floods 2010*²¹. The report indicates that floods have been a major natural calamity but human activities have their own role to intensify floods. The report mentions that Pakistan has a long history of flooding from the Indus River and its tributaries. The report also discusses the floods of 1928, 1929, 1955, 1957, 1959, 1973, 1976,

1988, 1992, 1995, 1996, 1997, 2003, 2007, 2008, and finally the flood of 2010.

F. Ahmad, S. F. Kazmi and T. Pervez (2011), "Human response to hydro-meteorological disasters:²² A case study of Pakistan 2010 flash floods in Pakistan", The work first introduces the area, and then discusses the deaths, injuries and home fewer people in brief. It also discusses the after effects of floods.

Dixit, A., in his article entitled as "Flood and Vulnerability: Need to Rethink Flood Management"²³ is of the view that among the most universal reasons floods are climate related, mostly prolonged phase of precipitation. Human impacts on river basins also manipulate flood behavior. To minimize problems caused by flooding, we must have to rethink our flood management strategies.

Literature review from different sources for the paper under discussion proved to be an interesting activity as available literature from most of the sources proved to be a great source of inspiration during the data analysis and concluding remarks.

Results and Discussion

It is a historically proven fact that man has caused flooding at different intensities by adopting different practices. Human activities can exacerbate flooding, when ever farmlands or woodlands are changed into urban structures such as roads. As a result of these changes the soil is converted into impermeable or less permeable surface. It's a proven fact that the process of urbanization increases surface runoff 2-6 times²⁴ more as compared to the normal situation. It has been observed that during urban flooding streets are changed in to swiftly flowing streams while basements act as death traps. Most part of this extra water volume of water reaches the river or stream channels, eventually causes flooding. If we relate this fact to the Indus plain, the sub-urban area of many cities have extended like that of Multan alongside the Chenab river in upper Indus plain, while in Lower Indus Plain Sukkur and Hyderabad cities alongside the Indus river present such examples.²⁵

Muhammad Tahir Qureshi, coastal ecosystem expert and forestry expert with IUNC- International Union for the Conservation of Nature- said:

"Indus River and canals originating from it form one of the largest irrigation systems in the world. As the Indus Plain comprises of flat and leveled lands and is an ideal area for practicing agriculture, constructing houses and also provides employment to large number of people. All of these factors and number of others have converted this plain into the most densely populated area. As this plain is generally a low-

land as well comprises of flat surface and a larger part of the plain have been converted into impermeable area, so, whenever there is flooding, it brings with it enormous social concerns."

Researchers say that at least 25% land area of a country must be covered with forest. Unfortunately, 4.4 % of Pakistan is covered with forest with annual rate of deforestation is more than 2% -highest rate in the world-. Lack of forestation result in flash flooding and also river carries a large load of silt reduces the water holding capacity of rivers as well dam's reservoirs which increases the chances of devastating floods.²⁶

Levees along-side the rivers also cause flooding.²⁷ However, these constructions around the rivers raise the water in the flooded river; this exerts an extensive pressure on the bunds which eventually leads to the failure of these bunds and bring catastrophic floods for the settlers residing around such rivers. There are several examples of the failure of such bunds in Pakistan. Number of times breaches in such bunds help to save economic structures. But in Pakistan many a times breaches had been created on political grounds like during 2010 flood breaches in Tori Bund were created to save the lands of big land lords and politically influential persons.²⁸ Although, sometimes fast flowing water create breaches by its own.

Dr Shahid Hassan Siddiqui (Economist and Scholar) in an interview claimed that:

"After the occurrence of natural flooding during 2010, the country also has suffered from imposed flooding. After the Earthquake of October 8, 2005, all the people of Pakistan looked like a nation without any discrimination of race, colour and ethnicity but after the July-August 2010 flood, the nation looked like disintegrated and it is purely due to poor governance. Baloch leaders blamed the politicians of Sindh Province that they are involved in the criminal act of creating breach in Tori bund which has resulted in massive flooding in Jaffarabad District. They clearly warned the government that such an imposed flooding cannot be tolerated."

After the July-August 2010 flood, there were charges of negligence on the government officials, for the purpose a judicial commission was shaped under the head-ship of Justice (ret'd) Zahid Kurban Alvi. This commission was given the responsibility to give its report on Tori breach in district Kandhkot and MS bund breach in district Thatta. The judicial commission in its report blamed Irrigation Department officials for their slackness.

The commission in its report mentioned:

“The Irrigation Department couldn’t take adequate and in time precautionary measures to save the affected people’s lives and their properties from flooding. We are forced to verify that the Irrigation Department had been definitely responsible for the collective negligence. On the basis of available evidence it is suggested that the officials responsible for all of these have no right to continue their jobs, rather should submit their resignations on moral grounds or be terminated”

When a question was asked in an interview from Babar Effendi (the Irrigation Department’s secretary) about the fate of the persons accused by the commission in its report, he replied:

“All of the officials found accountable for the breaches had faced departmental inquiries and been suspended. While on other hand, as a result of these inquiries, the persons who had been found clean been awarded with promotions,” Whenever there is flooding in Pakistan, we also blame India for the flooding.

Pakistan’s Former Chief Meteorologist Mr. Shoukat Awan cleared the situation as follows:

“Before the mega floods of 1988 and 1992 India informed heads of our relevant institutions well in time about the critical situation of rivers but it was the inefficiency and casual attitude of these officials that we could not plan ourselves to face the calamities and whole of the nation met with massive damages and destructions. No one outside Pakistan was responsible for economic losses but this was the irresponsible administration that dented the nation.”

Floods can also be posed by the upstream dams²⁹ such as Tarbela on Indus. There are two common ways of causing such flooding, one, when dams fail to hold to massive flood water and break down. One such example is the collapse of a newly constructed dam in Charsada District, KPK, during the summer 2010 flood, it damaged or destroyed 5,000 houses.³⁰

Number of times upstream dams don’t collapse but cause downstream flooding when such excessive volume of water accumulates behind the dam in its reservoir that it may result in collapse of dam. To save the dam extensive volume of water is released downstream into the river³¹ which causes flooding. This was officially done in Pakistan during 1988, and then during 1992 to protect Pakistan’s the major dams. After the release of excessive

volume of water from the dams, the country had to face substantial flooding downstream. As a result of this action during 1988, the country had to bear an economic loss of Rs.17 billion and in 1992, it killed 1334 people and directly affected 12,324,024 persons.³²

Mr. Nadeem Ahmad; Head of NDMA in an interview said:

“A third wave of flood is in Basham while on other hand Tarbela and Mangla Reservoirs have already been full of water and cannot hold this wave of water, so we have to direct this water towards the lowlands (upper and lower Indus Plains).Unfortunately, this part of the land has already been affected by two waves of flood water, where rescue and relief operations may be affected negatively”.

The flood of 1973 demolished more than three million houses and also killed 160 persons.³³ In August 1976 flood, economic loses reached the limit of about Rs. 6 billion while it killed 425.³⁴ In response, in January 1977, the Federal Flood Commission (FFC) was established³⁵ and in 1978 a National Flood Protection Plan was released.³⁶

Irrigation specialists accused FFC that it has poorly used funds and mismanaged flood prevention schemes. One of the irrigation experts Arshad Abbasi said:

“All these years, the FFC has approved and executed water control projects only on paper and FFC officials were never there to monitor the work done by the provinces on the ground or to hold provinces accountable for work done.”

In response to the criticism, FFC officials presented official documents that was indicating that FFC has “successfully prepared and executed” three National Flood Protection Plans (NFPP) worth Rs87.8 billion since 1978.³⁷ A fourth plan is still under implementation.

According to FFC Chairperson (Zarar Aslam) all of the above mentioned projects were executed in all the provinces, the Federally Administered Tribal Areas (Fata), Gilgit-Baltistan, and Azad Jammu and Kashmir. A list of projects “completed” in 2007-08 indicated that 17 projects were executed in Balochistan, 11 in Punjab, nine in Khyber-Pakhtunkhwa, nine in FATA, six in Sindh, and five in the area of Gilgit-Baltistan.³⁸

In the worst-hit districts of KPK, Nowshera and Charsada, the FFC claimed that it executed projects worth Rs27.3 million in 2007-08 and Rs52 million in 2008-09³⁹, according to the official documents, 92 percent of the projects were complete when July-August 2010 floods struck these areas.⁴⁰ Amazing fact about the document is that documentation is officially complete; the projects are yet to be identified on the ground.

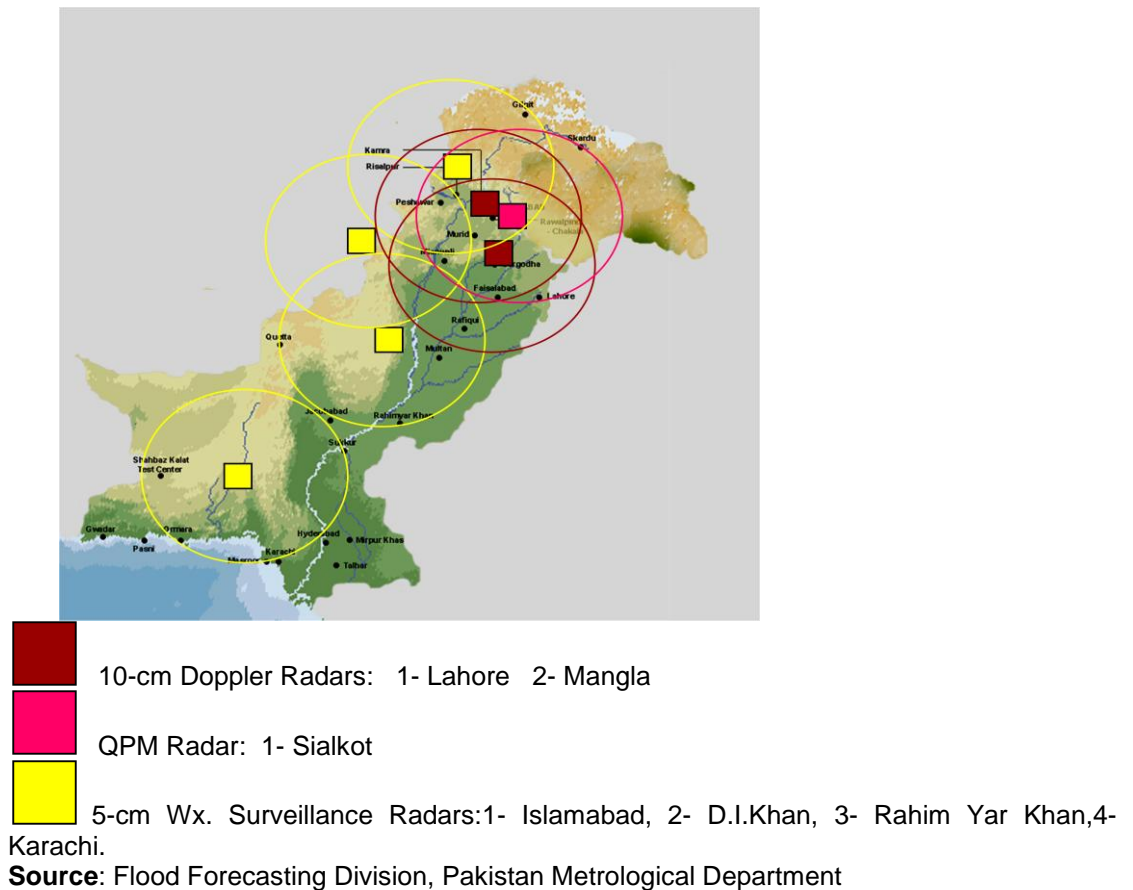


Figure 2. Weather Forecasting System of PMD (Radar Network of PMD)

In a report about corruption by watchdog Transparency International Pakistan, the chairperson of FFC (Mr. Zarah Aslam) was accused of misusing about 60 to 70 per cent of the budget. The amount was meant to be allocated to the provinces.

In response to the corruption charges by the watchdog Transparency International Pakistan, FFC, chairperson added:

“If this was the case, then in 34 years, the FFC could not have managed to build embankments along 6,796 kilometers of the river and 1,410 spurs across the country.”

The irrigation experts Arshad Abbasi said:

“If dykes along the river had been strengthened, devastation could have been prevented to a great extent and it’s the prime responsibility of the FFC not to overlook implementation of projects.”

But Pakistan’s Former Chief Meteorologist “Mr.

Shoukat Awan” looked really confident about the monitoring system of the country but blamed administration as follows:

Pakistan has its own water measurement system. In these days we receive on hourly basis pictures from satellite system which inform us about weather conditions well in time. In the presence of radars, satellite and telemetric systems, we are updated well in time and properly. These are administrative inefficiencies that have intensified our floods related problems.

But during the self-conducted survey, the respondents were of the view that when our administration is aware of the fact that Pakistan is a flood prone country and it has to experience floods of massive intensity on regular basis, why our authorities don’t consider this issue as a serious issue.. To save precious lives and to at least minimize the displacement of flood affected community, why flood saving structures are not looked after and maintained on regular basis. Figure 2

CONCLUDING REMARKS

While, concluding the study, it cannot be claimed that all the concerned aspects have been discussed and there is nothing beyond this discussion. It is the fact that field surveys, interviews and other available facts and figures forced me to formulate an opinion that our governments as well the people of Pakistan mostly respond to floods when floods strike the lands and during the relief and rehabilitation phase of floods. As the time passes by the government as well the people forget everything just like nothing has happened. This is the reason, we suffer from same problems with variable intensities time and again. Devastations caused by July-August 2010 flood indicate that nothing has been done on solid grounds and long-term basis to save the country as well nation from floods at least since 1947 till 2010. To me the establishment of institutions like FFC and NDMA has not proved their worth. It was the prime responsibility of FFC and NDMA least to save the nation from July-August 2010 flood or at least minimize the intensity of this flood. Is the responsibility of these institutes is just to provide relief and rehabilitation not to put efforts to minimize the chances of floods. Although more than Rs55 billion have been spent on the flood protection programs yet the country had to face an economic loss of over Rs385 billion since 1973. Facts and figures indicate that all of this happened primarily due to the second-rate constructions. July-August 2010 flood has been the most devastating flood in the history of Pakistan, when we have the most modernized equipments and techniques to handle floods while on other hand the amount of rainfall was unusual but not too much could have caused such a devastating flood. We should start our journey of handling floods by considering July-August 2010 as a basis and for the time-being leaving behind all the blunders that we have committed in the past. For the brighter economy of the country, every stake-holder must have to put its best and this is the only way through which we can save the nation from clutches of floods in future.

REFERENCES

1. Shamshad Akhtar (2011), "The South Asiatic Monsoon and Flood Hazards in the River Basin, Pakistan," *Journal of Basic and Applied Sciences*, Vol. 7, No.2, pp.101-115.
2. Ibid.
3. Government of Pakistan (2011), *Pakistan Social and Living Standard Measurement Survey (Pslm) 2010-11*, Islamabad: Federal Bureau of Statistics, Statistics Division, pp3-5.
4. World Meteorological Organization (WMO), 2010, WMO- Fact-Finding and Needs Assessment Mission Report to Pakistan, Islamabad: WMO, pp, 13-16.
5. Ibid.
6. Shaheen Hassan (2010), "Losses to the Tourism as a Result of Floods," *The Jang* (The Daily Urdu Newspaper, Lahore), September 27, 2010.
7. F. Ahmad, S. F. Kazmi and T. Pervez (2011), "Human response to hydro-meteorological disasters: A case study of Pakistan 2010 flash floods in Pakistan," *J. Geogr. Reg Planning*, Vol.4, No.9, pp.518-514.
8. Ibid.
9. Dr Muhammad Hanif (2010), "*Redistribution of Precipitation (Seasonal Shift) in Pakistan and Super Flood in Pakistan-2010*", Islamabad: National Weather Forecasting Centre PMD, pp.02-67.
10. Sare Laerke (2010), "Ensuring a Sustainable Development within a Changing Climate," *Unpublished Ph.D. thesis*, University of Copenhagen, Denmark, pp.1-136.
11. Kazi Saeed Ahmad (1951), "Climatic Regions of West Pakistan" *Pakistan Geographical Review*, Vol.1 No.1, pp.1-8.
12. A report of the Judicial Flood Inquiry Tribunal (2010), *A Rude Awakening*, Philadelphia: Chelsea House Publishers, pp.24-27.
13. Government of Pakistan (2011), *Pakistan Economist*, Islamabad: The Economist Pakistan, pp. 57-59.
14. Michael J. Hicks and Mark L. Burton (2010), *Preliminary Damage Estimates for Pakistani Flood Events 2010*, Muncie, Indiana: Center for Business and Economic Research, Ball State University, August 2010.
15. NDMA (National Disaster Management Authority) (2010), *Annual Report 2010*, Islamabad: Prime Minister's Secretariat, Islamabad, Pakistan, p.02.
16. Government of Pakistan (2011), *Unprecedented Floods and its Impact on the Fragile Economy of Pakistan*, Islamabad: Director General of Training and Research, p.10.
17. Ibid.
18. Jessica Elizabeth, "The Impact of Flooding on the Value of Residential Property in the UK", *Unpublished PhD Thesis*, University of Wolverhampton, United Kingdom, 2008, pp.1-359.
19. Oliver Zenklusen, "Natural Disasters and Economic Development: A Neoclassical Review of Theoretical Perspectives and Empirical Evidence", *Unpublished PhD Thesis*, University of St. Gallen, Germany, 2007, pp.1-261.
20. NDMA (2010), *National Disaster Risk Management Framework Pakistan*, Islamabad: National Disaster Management Authority Government of Pakistan, pp.1-91.
21. Dr. Amir Nawaz Khan (2010), *A Brief Report on, Activities of CDPM in Floods 2010*, Islamabad: Centre for Disaster Preparedness and Management University of Peshawar, pp.1-12.
22. F. Ahmad, S. F. Kazmi and T. Pervez (2011), "Human

- response to hydro-meteorological disasters: A case study of Pakistan 2010 flash floods in Pakistan”, *Journal of Geography and Regional Planning*, Vol.4, No.9, pp.518-514.
23. A. Dixit (2003), Flood and Vulnerability: Need to Rethink Flood Management, *Journal*, Vol. 28, pp. 155-179.
 24. 24. SMDC (2010b), “Unprecedented Floods in Pakistan,” *SAARC Newsletter*, New Delhi: Disaster Management Center, pp.2-3.
 25. Ibid.
 26. A.N. Khan (1996), “Planning for Reduction of Flood Hazard,” Proceedings of Pakistan Geographical Association, Bahawalpur Conference, pp.182-203.
 27. Ibid.
 28. A report of the Judicial Flood Inquiry Tribunal (2010), *A Rude Awakening*, Philadelphia: Chelsea House Publishers, pp.24-27.
 29. S.N. Jonkman (2005), “Global perspectives on loss of human life caused by Floods,” *Natural Hazards*, Vol. 34, No.2, pp. 151-175.
 30. *The Express Tribune*, Monday, September 27, 2010.
 31. OCHA (United Nations Office for the Coordination of Humanitarian Affairs) (2010), “Pakistan-Monsoon Floods,” *Situation Report #23*, September 9, 2010.
 32. Naseer Memon (2012), *Malevolent Floods of Pakistan*, Islamabad: Strengthening Participatory Organization (SPO), p.9.
 33. Ibid,
 34. Ibid.
 35. FFC (2010), Ministry of Water and Power of Pakistan, *FFC Annual Flood Report2010*, Islamabad: Pakistan, WAPDA, p. 13.
 36. Ibid.
 37. FFC (2012), Ministry of Water and Power of Pakistan, *FFC Annual Flood Report2012*, Islamabad: Pakistan, WAPDA, p. 13.
 38. Ibid.
 39. Ibid.
 40. Maher, Ayub, 2010,.Socio-economic Implication of Flood Crisis in Pakistan, *Business Recorder*, September 06, 2010.