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How Successful Pakistan has been to fight against major floods of its history (1970-2010): With special reference to July-August 2010 flood

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Abstract
As Pakistan is situated in an exceptional geo-climatic zone, so it is recognized as top disaster prone country on the globe. About 60 percent landmass of the country is vulnerable to floods. It has been found through quantitative assessment that Pakistan has faced 17 floods of various magnitudes over the last 37 years - 1973, 1975, 1976,1977,1978,1982, 1988, 1992, 1994, 1995, 1997, 2001, 2003, 2005, 2006, 2007 and 2010, among these 50 percent have been identified as mega floods. The flood 1973 flood demolished three million houses and killed 160 persons. During August 1976 death toll reached the limit of 425. The flood of 1988 killed around 508 people. During the flood of 1992 number of flood affected people were 10 million and the number touched the limit of 20 million during the flood of 2010.
Pakistan wishes to avoid or at least minimize damage caused by floods. Indus River System has been supported by huge dams like Tarbela, barrages like Rasul and an extensive net-work of inundation canals. FFC was established in 1977 to fight against major floods of 1973 and 1976. NDMA was established in 2005 to fight against natural disasters. In the presence of both of these institutes Pakistan had to face the Super flood of 2010. In the recent times, both engineering and non engineering approaches are utilized for the flood mitigation**.** In Pakistan Flood Forecasting Network (FFN) is responsible for sending flood related information collected via satellite and other sources to every flood prone region of the country. Introduction of radars system, construction of irrigation infrastructure such as bunds and dams are also the efforts to fight against floods. In Pakistan, it has been the responsibility of the Ministry of Water and Power to issue flood forecasts as well flood Warnings and the Ministry has given this assignment to the flood commissioner. Telemetric system of WAPDA is one of the significant sources of the hydrological data for Pakistan.

Keywords: inundations, magnitudes, vulnerability, damages and disasters.

1. Introduction

Floods are the most frequent of all ecological hazards and most commonly cause deaths of 20,000 people every year and badly affect something like 75 million humans all over the world. The summer flood of 1950 took the lives of 2190 people[1], inundated around 10,000 villages[2] and this flood submerged an area of 17,920 km^2. During 1955 summer flood, in the province of Punjab 2,420 villages were inundated by the flood waters and out of these villages,1321 villages were completely destroyed by the natural calamity.[3] The mentioned natural disaster killed around 679 humans in Punjab and KPK[4]. Standing crops over an estimated area of 101,911 hectares were completely damaged. A significant feature of irrigation 'Ravi Syphon' over river Ravi and also link canal carrying water from Chenab River to Sutlej River were damaged. The overall estimated damage caused by the flood was around Rs 83 million. From 1972 to 1977 three major floods -1973, 1976, and 1977- affected around 15 million people in the catchment areas of Indus River.[5] As a result of these three floods around1,600 people lost their lives. The only 1973 summer flood inundated 3.6 million hectares of land, which brought with it the cumulative economic losses Rs 5,137 million**.** The year of 1988 brought with it devastating floods. Around 800 hectares of agricultural lands were covered with around 1.5 meter thick layer of sand. The floods affected an area around 6144 sq-km.[6]The floods killed 508 people and also affected 100 villages all over the country.[7]
The flood of 1992 affected area around 38,758 km square and also damaged or destroyed around 13,208 villages**.** As a result of this flooding 1,008 people lost their lives and the cumulative economic losses had been estimated around US$ 3,010 million.[8]The 1995 flood affected area around 16,686 km square and also affected about 6,852 villages. The economic

losses were around US $ 376.25. The flood also killed 591 people without any discrimination of age, sex and religion.[9]

July-August 2010 flood forced around 8.1 million people to displace,[10] these people stayed at self- managed makeshift camps established by affected people themselves/ and private donors , schools, colleges, play grounds , under trees , alongside the roads at safer places and many of them migrated to the areas not affected by flood waters. Total displaced persons from Balochistan were recognized as 218,000,the number of displaced person in KPK were reported as 651,700, the total number of flood affected displaced for Punjab were numbered as 2,666,000, the counting for such displaced persons from Sindh was 4,596,000 and the total number of such persons from all over the country were 8,131,700.[11]

During the period from1950 to 2009 floods caused an economic loss of US$ 20 billion, these also killed 8887 people and damaged or destroyed 109822 villages. While as compared to this, July-August 2010 flood alone brought with it an overall economic loss of US$10 billion, it also killed 2000 people and damaged or destroyed 17553 villages.[12]

Flood organization procedure in our country is multi-functional in the sense as it involves lots of institutes[13]. The incredibly initial stair in the course is the issuance of the submerge warning. This task has been given to the Pakistan Meteorological Department (PMD), in view of the fact that the fundamental root of the inundation in Pakistan is the rainwater which could be best examined as well forecasted by PMD make use of the satellite cloud pictures as well the quantitative rainfall gauging radar data. On one hand convectional weather forecasting methods are used to predict floods and on other hand hydrological statistics are used for quantitative inundation forecasting. For the collection of the hydrological information, we are facilitated by WAPDA as well the Provincial Irrigation Department. It is the fact that the telemetric system of WAPDA is one of the significant sources of the hydrological data for Pakistan.[14] These safety measures are supported by the manually collected statistics by the WAPDA's Surface Water Hydrology Project.[15]Along with this data collection, a section of irrigation department spots out realistic locations at significant barrages and also at nullahs to sustain some system of manually hydrological data collection. The data collected by above mentioned methods and such other approaches is used for the flood warnings or alerts in the drainage features such as nullahs, streams and major rivers. In time release of such alerts/ warnings help to avoid or at least minimize flood losses and damages to the bordering areas of streams and nullahs. This data also plays a substantial role for flood forecasting in the main rivers- Chenab, Jhelum and Indus- before the flood waters strike the lands.

Flood Losses as a Result of July-August 2010 Flood

Province	injured	Deaths	Population Affected
Punjab	262	110	6,000,000
Sindh	1,235	411	7,274,250
KPK	1,198	1,156	3,800,000
Baluchistan	104	54	700,000
All over the country total	2,946	1,985	18,074,250

Source: NDMA, PDMAs, GBDMA (November21, 2010)

In Pakistan, it has been the responsibility of the Ministry of Water and Power (WAPDA) to issue flood forecasts as well flood Warnings and the Ministry has given this assignment to the flood commissioner.[16] In response to well in time flood warnings/ alerts, the flood affected community is able to take appropriate steps and shift themselves, their families and other valuables to safer places. As a result of major floods- 1973, 1988, 1992 and 2010- during monsoon season from July- September, many breaches appear which inundate larger areas of land. This is the reason a country like Pakistan with poor economy, where a larger part of its citizens are living below poverty line and where overall standard of living has been very low, desires a superior, efficient and effectual flood mitigation system for the protection of its natives and economy.

The classy flood combating approach is all the time a combination of engineering along with non engineering approaches.[17] Floods are mainly caused in Pakistan by meteorological phenomenon which is normally not exclusively in the control of the human beings,(even updated countries of the world like USA, are not able to avoid flooding exclusively) this is the reason the incidence of precipitation as well checking floods is really a hard task. On the other hand latest information related to meteorological events could be taken into consideration to predict inundations and take up necessary protection related steps well in time. In the recent times, both engineering and non engineering approaches are utilized for the flood mitigation[22] and also for flood management in the Indus Valley. The flood mitigation plans are launch through water-shed management above the rim stations[18] (steps taken to manage floods before the entrance of river in Pakistan). As the river enters Pakistan, here rim stations (gauging stations) have been installed to mitigate floods. The flood mitigation planning does not finish here; rather it continues to work even below the rim stations, where numerous safety steps are taken to combat floods.

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. All the data used in this study have been accessible for the judgment of the status of the study. The study used academic literature, searched literature by using multiple search engines as well databases.

During the flood of July-August 2010, total numbers of 78 districts[1] were affected by flood waters. Out of these 78 floods affected districts 24 belonged to KPK, 17 belonged to Sindh, 12 to Balochistan, 11 to Punjab and remaining 14 belonged to AJ &K and GB.

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 K5	1	6	7
GB	0	7	7
Grand Total	29	49	78

Source: NDMA/ FFC

As a basic source of data collection, "Quantitative Informants Interviews" were also conducted form the flood affected communities. Interviews were conducted, particularly from the persons who have been the eye-witness of most of the flooding events. Government officials like the meteorologists who were working at met offices as well the relief workers and officials from organizations such as

NDMA. Doctors working at the relief camps as well the members from different NGOs were also interviewed. In many cases foreigners working at the relief camps were also considered as a source of information as most of the time such people responded in an unbiased way. Interviews through cell phone and telephone with NGO staff members who had been involved in the recent post flood situation in Pakistan and interviews were also made with the Water and Power Development Authority staff member 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.

Literature Review

Federal Flood Commission (FFC) works under the influence of Ministry of Water and Power Government of Pakistan, in January 1977, the Federal Flood Commission was established.[19] 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-II).[20] For flood protection these plans appeared to be outstanding like under NFPP-II, two S-Band radars were planned to be installed one at Mangla and other has been installed at Sialkot. Annual Flood Report 2010 floods, by the Office of the Chief Engineering Advisor and Chairman, Federal Flood Commission, Islamabad, & Annual Flood Reports 2011 and 2012 floods, by the Office of the Chief Engineering Advisor and Chairman, Federal Flood Commission, Islamabad. 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. These also describe the historical background, functions and achievements of federal flood commission. Flood management mechanism has also been described in the reports in an expressive way.

Judicial Flood Inquiry Tribunal in their recommendations with the title of: A rude Awakening, [21] "A Report of the Judicial Flood Inquiry Tribunal on the Causes of Major Breaches in River Indus, During the Exceptionally High Flood of 2010," mentions that July-August2010 flood affected total number of 78 districts throughout the country.[22] Total injured persons as a result of flood were around 2,946 while the dead were around 1985. Flood also affected 20,186 million people all over the country. The flood also affected 17,553 villages as well 1,608,184 houses. Flood damaged 13,042 water courses. 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 Tunsa and Gudu Barrages were severely affected through flood waters. 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

Economic surveys of Pakistan (2010-11, 1972-73, 1988-89 & 1992-193)[23] These and other editions published by the ministry of finance and economic wing, has always mentioned clear socio economic impact of natural hazards like floods and drought on the economy and social sector of the country. Realistic analysis of the impact floods on people and economy has always presented through its publications. Analysis made during July-August 2010 flood[99] are about same what the analysis been published by Asian Development Bank and World Bank. This report shows reactive approach.

Annual Report 2010-11 by Pakistan Institute of Development Economics[24] also focuses on "reactive" approach. Preliminary Rapid Damage Assessment in the Agriculture Sector for the flood affected areas of Pakistan, September 2010 by agriculture Cluster. This report mainly discusses relief and rehabilitation efforts for the agriculture sector in Pakistan in response to damages caused by July-August 2010 flooding.

NDMA Annual Reports (2010, 2011 and 2012)[25] discuss disaster management system[108] in Pakistan like organizational structure of NDMA, and its response to major disasters in Pakistan like to July-August flood 2010 and Air Blue Crash in Margalla Hills and major challenges. The report also discusses disaster risk reduction plans. It also gives the details of human resources, finance, accounts and audits. Achievements, challenges and recommendations have been the focal points of every annual report.

Asian Development Bank and World Bank, in 2010 published a DNA[26] entitled as, Pakistan Floods 2010: Damage and Needs Assessment; the purpose of this DNA (Damage and Needs Assessment) has been to assess the damage and losses caused. DNA also calculates the cost of reconstruction. As well relief items provided to the flood affected community. The guiding principles of the needs assessment and recovery strategy are the key points of discussion.

Disaster Risk Management Needs Reports[27] 2010, prepared by NDMA Government of Pakistan focuses on mitigating floods as well on relief and rehabilitation processes. Pakistan has been affected by natural disasters such as landslides, hill torrents and flooding. Over the last 3 years, at least 30 million Pakistani citizens have been affected by disasters.[125]On one hand these disasters have led to huge migration of the affected community while on other hand loss of infrastructure; make it really difficult to continue educational services as well to provide health basic facilities to the affected community. All of these factors and many others increase the level of poverty throughout the country and also lower down the living standards.

A CRSS (Center for Research and Security Studies) report[28] entitled as "Pakistan- Flood Situation and Aftermath." Which was published in September 2010, claims that 5,000 miles of roads and railways all over the country have been damaged or destroyed as a result of July-August flood 2010. The flood waters have also badly affected 7,000 educational institutes as well more than 400 health centers. According to the available data, the flood has affected around 1.3 million dwellings. Five million people need shelter and thousands other people are crying for medicines to fight against flood-borne diseases such as diarrhea.

A Validation Report, under the title, Pakistan: Second Flood Protection Sector Project 2008, prepared by the Operations Evaluation Department of Asian Development Bank. This project was completed in July 2008. The primary objective of the project was to reduce damage as a result of flooding in areas lying along Pakistan's rivers for shielding communities, particularly the poor, who make up the most vulnerable segment of the population. The project, formulated in line with the National Flood Protection Plan,

will help reduce the level of damage faced by agricultural producers and provide reliable flood forecasts to the communities exposed to flood risks. The capacity building component of the project will lead to better design and planning of flood protection works on a sustained basis. This participatory approach will help in mobilizing the local communities in planning, implementation, and maintenance of the project facilities.

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 CDPM in Floods 2010[29]**.** The report indicates that floods have been a major natural calamity and the country 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. The report discusses in the year of 1973, more than three million homes were destroyed and 160 persons lost their lives. The 1976 floods demolished over 10 million houses while 425 lives were lost with losses amounting to Rs.6 billion. [30]In 1988, an unprecedented flood occurred towards the end of September inflicting about Rs.17 billion worth of damage to the exchequer. The report claims that the current flood of 2010 surpassed all previous records of floods not only in Pakistan but also at international level. The report claims that the people affected in this current flood is more than combined affected population of Tsunami 2004, Pakistan earthquake 2005,and Haiti earthquake 2010.

F. Ahmad, S. F. Kazmi and T. Pervez (2011),"Human response to hydro-meteorological disasters:[31] 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 described as follows; after the struck of flood, road access through the affected regions, leading to the main cities and valleys, has been interrupted by excessive water. Though the army has restored the major road network, there are countless settlements far beyond the reach of these roads. Currently the situation of the affected people is desperate and the expected winter rain in the lower elevations, along with cold temperatures and snow in the mountains, will severely aggravate it.

Dr Muhammad Hanif, in his report[32] 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. Most of the work is elaborated with the help of maps and diagrams. To discuss, Main causes of July-August 2010 flood and its socio economic impact has been discussed logically. Through his work he has tried to prove that if in Pakistan floods can't be avoided at least their effects can be minimized by the effective use of forecasting system. Kazi Saeed Ahmad, in his article[33] 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.

Then, MAPRA Paper on FLOODS 2010: Some Implications for Environment and Human Capital by Dr. Syed Nisar Hussain Hamdani, Associate Professor Economics Department University of AJK, and Muzaffarabad and by Syed Akhtar Hussain Shah PhD Associate, PIDE, Islamabad, is equally important to understand the topic under discussion. This paper helped in the correlation of facts about the most distress floods in the History of Pakistan.

The structure and system of NDMA in the country focuses on third approach as on one hand these tries to avoid and mitigate floods while on other hand after the strike of a flooding event it also provides rescue, relief and rehabilitation facilities. NDMA Annual Reports (2010, 2011 and 2012) discuss disaster management system in Pakistan like organizational structure of NDMA, and its response to major disasters in Pakistan like to July-August flood 2010 and Air Blue Crash in Margalla Hills and major challenges. The report also discusses disaster risk reduction plans. It also gives the details of human resources, finance, accounts and audits. Achievements, challenges and recommendations have been the focal points of every annual report[109].

Results and Discussion

The floods which start from northern region of Pakistan in July and gradually spread south wards downstream along the Indus River System in August[34] have been extraordinary in their harshness, causing large number of deaths and injuries, widespread displacement and destruction of resources. This study gives the methodological approach of apparent flood threat, susceptibility and hazard examination.

Years	Direct Losses US$ Million @1US$=PKR 86	Lost Lives No	Affected Villages No	Flooded – Area KM^2
1950	488.05	2,190	10,000	17,920
1955	378.40	679	6,945	20,480
1956	318.20	160	11,609	74,406
1957	301	83	4,498	16,003
1959	234.35	88	3,902	10,424
1973	5134.20	474	9,719	41,472
1975	683.70	126	8,628	34,931
1976	3485.15	425	18,390	81,920
1977	337.55	848	2,185	4,657
1978	2227.40	393	9,199	30,597
1981	298.85	82	2,071	4,191
1983	135.45	39	643	1,882
1984	75,25	42	251	1,093
1988	857.85	508	100	6,144
1992	3010	1,008	13,208	38,758
1994	842.80	431	1,622	5,568
1995	376.25	591	6,852	16,686
2010	10,000	1,985	17,553	160,000
Total	29184.45	10,152	1,27,357	5,67,132

Source: Annual Flood Report 2010, Federal Flood Commission, Ministry of Water & Power

Above mentioned facts indicate that floods affected lives, killed humans and affected villages but this means not government of Pakistan has done nothing to fight against floods.[35] The economy of the country has been poor throughout its history and instable political governments are also one of the reasons for extensive losses as a result of floods in Pakistan. Even then our governments tried to face floods through their efforts.[36]

Government of Pakistan establishes Federal Flood Commission (FFC) at the federal level in order to ensure comprehensive integrated flood management on country basis. Since its establishment, FFC has so far prepared and executed three National Flood Protection Plans. NFPP-I was the first plan given by FFC for flood protection and its covering period was 1978-88.[37] FFC gave second flood protection plan NFPP-II, with covering period from 1988-98, FFC gave third flood protection plan NFPP-III, with covering period from 1998-2008.[38] FFC also presented

NFPP-IV for approval, to the Planning Commission for the period of 2008-2018. In the meanwhile flood protection works are being undertaken through Emergent Flood Programme on yearly basis to meet urgent needs of Provinces and Federal line Agencies. According to the FFC, the 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 shows that 17 projects were executed in Balochistan, 11 in Punjab, nine in Khyber-Pakhtunkhwa, nine in Fata, six in Sindh, and five in Gilgit-Baltistan.[39]

In the recent times, both engineering and non engineering approaches have been utilized for the flood mitigation and also for flood management in the Indus Valley.

Flood Protection Infrastructure in Pakistan

Province	Embankments (in Km)	Spurs (Number)
Punjab	3,334	496
Sindh	2,424	46
KPK	352	186
Balochistan	697	682
Total	6807	1410

Source: Federal Flood Commission, Ministry of Water& Power.

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."

Another irrigation expert said:

"But building structures is not enough; the structures have to be looked after on a regular basis, especially during the monsoon season when floods are being expected. The big crime FFC have committed that some of the structures, have not been upgraded since 1929"

Tarbela Reservoir across Indus River presently has an estimated storage capacity of 6.77 MAF while Chashma Reservoir across the same river has an estimated capacity of 0.26 MAF.[40] Such reservoirs in Pakistan do somewhat attenuate the flood peaks. We cannot deny the fact that their capacity for effective flood control is very limited[41].

Mulk, ul Shams,(Ex Chairman, WAPADA), in an Interview, expressed his views related to improvements in flood management and it looked like that he is not happy flood management system of the country.

Many government officials claim that there are a lot of improvements in responding to floods and flood management. But we have to check this claim on technical grounds. On the basis of devastating floods in 1973 and 1977, FFC was established in 1977 but as this institute could not prove its worth during the floods of 1988 and 1992. The government initiated another institute, NDMA, in 2005 to deal with hazards. But, the flood of July-August 2010 exposed the efforts of all of these institutes. The institutes have reactive approach rather defensive approach. The institutes start their work after the strike of floods of just construct bunds and embankments as a safety measures. I have hundreds of times asked the authorities to construct dams to minimize the intensity of floods and desilt your reservoirs like that of Tarbela and other related water bodies. As in our country rate of deforestation is highest in the world (2.0 percent) which is responsible for heavy siltation in to our water bodies. Under current economic conditions of the country, the best way is to adopt aggressive approach against floods by constructing huge reservoirs behind dams.

Dr Shams ul Mulk, (Ex Chairman WAPADA), who has been the great supporter of Kalabagh dam August expressed his views about the reactive approach of our management:

On 29 August 1929 there was no Kalabagh dam even then Nowshera was massively inundated. This massive flood submerged GT road. The flood waters extended from Kkairabad to Nowshera and from Nowshera to Pabbi. The history repeated itself after a period of 81 years, when the area was massively flooded again in July-August 2010.The opponents of Kalabagh claim that the dam will cause massive flooding in Nowshera. But, as an expert and technical person, I have always as viewed that the Kalabagh dam will act as a savior from floods. These two floods are the practical answer of my claims as without Kalabagh dam Nowshera and KPK experienced massive floods of its history that have resulted in extensive socio-economic problems. I again claim that the dam will not affect Mardan (200kms away), Swabi (160 kms away) and Pabbi (230 kms away) plains negatively through water logging and salinity. The backwater impact of Kalabagh reservoir ends 10 miles downstream of Nowshera. In short the solution to socio-economic problems caused by floods is simply dams.

Judicial Flood Commission[42] which was established in response to massive devastation as a result of July-August 2010 flood, the commission was not happy with the way floods are being dealt in Pakistan.

Judicial Flood Commission in its "Report" (JFCR) asked for the up gradation of pre-existing flood warning systems within a couple of years. The report demanded the installation of radars system to cover upper catchment area of river Indus. The report strongly stressed on realistic flood management plans and also insisted on integration with Weather related international Organizations, so that the harmful effects of this calamity may be minimized.

Mr. Muhammad Riaz (Chief Meteorologist, Flood Forecasting Division Lahore) claimed:

"Now we are working to upgrade the fore-casting and flood warning system up to the level of modern world. This modernized and well equipped system would include automation of service observing systems and real-time data acquisition."

If we analyze the statement of Mr. Muhammad Riaz, he looks like dis-satisfied with the existing flood management system of the country but looks hopefull about the future. As compared to all above mentioned experts, some experts believe in bit different approach. 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.

Ishrat Husain (an economist and Director of the Institute of Business Administration in Karachi) expressed his analysis as follows:

It's the fact that floods and climatic changes have massive impact on the economy of the country as during last three years (2010-13) the economy of the country grew at an average rate of 2.9 percent. Potentially, Pakistan's economy could have been managed to grow at an average rate of 6.5 percent per year. The major recognized reasons behind, this

very low economic growth are economic and human losses caused by floods.

From the analysis of dr Ishrat Husain we can conclude that he is not satisfied with the flood management system and the way this system is being dealt.

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

"After the occurrence of natural flooding during 2010, the country suffered from imposed flooding."

He further added:

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 have blamed the politicians of Sindh Province that they are involved in the criminal act of creating breech in Tori bund which has resulted in massive flooding in Jaffarabad District. They have clearly warned the government that such an imposed flooding cannot be tolerated.

Although, there are allegations of mismanagement on most of the institutions including NDMA, as it is considered as that these institutes could not handle floods properly, which resulted in massive loss of life and property in this modern era. But NDMA, as an institute is not ready to accept this allegation.

Lieutenant General (Retd.) Farooq Ahmad Khan, in a discussion Ex-Chairman NDMA, expressed his views as follows:

It's just a blame game as reality is quite different from it, there is a long list of our works which as an institute we have done all over the country and these works are not hidden from any one. As flood was wide-spread all over the country, so our opponents take a few unfortunate examples and highlight them everywhere. We have published over achievements in our annual report and newsletters. If someone studies these reports consciously can understand how much work and under what circumstances this work has been done by NDMA. It's not a negligence or mismanagement on the part of NDMA; it's rather an unconscious behavior about our tremendous achievements.

He stressed one should see the efforts put by the government of Pakistan not simply a few negative cases which always take place whenever there is a large scale calamity.

A brief overview of the key achievements of the government

Helicopters deployed	61
Boats deployed	1238
People rescued	1.4 million
Tents Provided	310, 000
Relief Camps established	5392
Health Services Provided	4.7 million people
Watan cards distributed	977570 (PKR, 20,000 per family)
Blankets distributed	1.1 million
Troops deployed for relief & rehabilitation	60,000
International troops deployed for relief & rehabilitation	2500

Source: NDMA (October 26, 2010)

Mr. Shahid Masood (an expert and a crop scientist with Pakistan Agricultural Research Council) expressed his views, how the governments of Pakistan have dealt with floods as follows:

The most unfortunate aspect of our agriculture is that we are experiencing floods since the creation of Pakistan but we are unable to introduce flood-resilient varieties of crops while in this field other countries of the world are well-ahead, we even have not tried to get benefit from their research works.

Even during the self conducted surveys and interviews flood affected community looked unsatisfied with the efforts put by the governments of Pakistan to handle floods. During 2010 flood in rural parts of Pakistan situation remained alarming. This can be illustrated with the help of an interview with 35 years old woman from Kandhkot (Sindh).Zakia Bibi described her grief in a way:

In my village immediate communication is not an easy task as here poverty and literacy prevail all over the area.

She further added with pride:

I am from one of those families in the village that have a radio set with them. When her family listen the news on radio about the upcoming flood, she immediately ask her son to inform others in the village but after that she could not see her son as roaring flood waters took her son away.

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. This part of the country is the most densely populated part of the country, when our political governments are elected by the votes of the people, why the governments leave their voters in lurch during floods. Every respondent questioned that why our governments don't plan for the residents of flood-plains. Why they don't construct flood resistant structures in the flood prone areas. To avoid floods, why they don't construct dams and flood canals. To save precious lives and to at least minimize the displacement of flood affected community, why flood saving structures such as bunds and levees are not looked after and maintained on regular basis.

Concluding Remarks:

While, concluding the discussion, it cannot be claimed that each and every thing have been discussed here and there is nothing beyond this discussion. Through field work, facts and figures forced me to formulate an opinion that our government as well the people of Pakistan, they respond in a better way just before, during and just after the floods. As the time passes by the government as well the people forget everything as nothing has happened. This is the reason we sufferer from the same problems with variable intensities depending upon the intensity of flood waters. Devastation caused by July-August 2010 flood indicates that nothing has been done on solid grounds and long-term basis to save the country as well nation from floods at least since 1973 till 2010. The devastating floods of 2012 and 2014 are the reflection of the efforts put by the government of Pakistan in response to super flood of 2010. To me the establishment of big instaurations like FFC in 1977 and NDMA after the Kashmir earthquake of October 08, 2005, have not proved their worth or in other words we can say they have done nothing special for the people of Pakistan. As after the establishment of such institutes the people as well the government started thinking that now floods are in their control.

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