

# ***SECTOR L***

***DAMAGE ASSESSMENT OF THE FLOOD 2001***

## VOLUME 3: SUPPORTING REPORT

### SECTOR L: DAMAGE ASSESSMENT OF THE FLOOD 2001

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## **SECTOR L      DAMAGE ASSESSMENT OF THE FLOOD 2001**

### **1.      OUTLINE OF THE CHAPTER**

This chapter attempts to describe the damages of the flood that struck the study area in 2001 from economic and social points of view. The sections below initially give a narrative description of the flood damages. The damages are subsequently translated into economic cost in monetary term employing findings of a structured interview survey undertaken during the first field survey. The valuation of the flood damages is subject to assessment of validity by comparing with a damage assessment for the same flood performed by the Punjab Government. The report further examines the cost of the flood that was not captured in monetary term casting a brief light to social dimensions of the flood damages. This part of the report will serve as the basis for economic analysis of the proposed projects.

### **2.      DESCRIPTION OF THE FLOOD DAMAGE 2001**

The Twin Cities of Islamabad and Rawalpindi received an unprecedented amount of rainfall in a matter of a few hours, which resulted in flash flood waters from the catchment area of Margalla Hills coupled with incessant downpour over the urban areas. The principal drainage artery, Lai Nullah, caused the worst havoc along its course overtopping its banks by more than 10 meters at several places. Thousands of houses along its banks were washed away, including the bridge on Pir Wadhai Road downstream of the Twin City dividing Principal Road and on near the Liaqat Bagh. According to the Emergency Relief Cell of the Federal Government, the number of people dead as a result of the flood stands at 209. The death toll in Rawalpindi is 64 while the number of deaths in Islamabad is reported at 10. As for the victims outside the study area, 105 deaths have been confirmed in Mansehra while 12 people are missing. In Buner, 30 people have died.

The people affected by the flood in Rawalpindi are those living in the slum areas, which are called as “encroachment”. The figure of the people affected by the flood is roughly estimated at 400,000 according to the Emergency Relief Cell. The Punjab Revenue Department in its initial assessment enumerated damages caused by the flood in the range of 10 to 15 billion rupees equivalent to 161 million to 242 million in US dollar term.

In response to this historical disaster, Rawalpindi was declared a calamity-hit area by the Government of Punjab. Five relief camps were established and food packets were provided to the affected people. The Government of Punjab dispatched 1,000 blankets and a cheque of Rs. 1 million for the affected areas. The Emergency Relief Cell also provided 20 rubber boats and 500 life jackets for relief operation in Rawalpindi.

### 3. ASSESSMENT OF FLOOD DAMAGE

#### 3.1 Methodology of the Assessment

Economic Damage Assessment of the targeted community areas of Lai Nullah was conducted with a view to collect qualitative data of the damage to residential and business parts. The residential part specifically targeted individual households, while, the business part evaluated economic damages to business entities within the study area. Both of the interview forms were derived from National Resource Economics Handbook<sup>1</sup>. The interviewees of the residents were selected by a multi-stage sampling process with stratified sampling within cluster samples dividing the population initially into groups by geographical boundaries, and then into three subgroups by apparent levels of wealth. The subgroups were interpreted in terms of housing value, which was further correlated with the result of a survey on housing conditions conducted by a local authority to enable more objective analysis. For the commercial and industrial part, a similar sampling process was adopted by dividing the population by geographical boundaries and subsequently by type of business including commercial and industrial enterprises. Total number of samples for residential part was 160 and that for business part was 50. The interview forms were pre-tested and revised based on the local settings before the actual interview. Four interviewers were trained to familiarize themselves with the formats using an interview manual in advance.

Table R L. 1 Number of samples for the Economic Survey

Part	Type	Region		Total
		Islamabad	Rawalpindi	
Residential Part	High*	5	26	31
	Middle	9	32	41
	Low	23	65	88
	Subtotal	37	123	160
Business Part	Commercial	8	34	42
	Industrial	2	6	8
	Subtotal	10	40	50
Total		47	163	210

Source: JICA Study Team 2002

\*: The types of residents were classified according the housing value.

In addition to the said structured interview survey, a series of haphazard non-structural interview as required was also conducted covering housewives of low-income households, community leaders including a leader of a Nazim Union, preachers of Muslim as well as Christianity to explore the social dimension of the flood impacts.

<sup>1</sup> National Resource Economics Handbook, Part 611 Water Resources Handbook for Economics, United State Department of Agriculture, National Resources Conservation Service, Chapter 4 Urban Flood Damage

### 3.2 Results of the Assessment

#### 3.2.1 Overview

The results of the interview survey are summarized in the table below. The table below indicates that the flood 2001 results in enormous amount of economic damage corresponding to about Rs. 28 billion in monetary term, nearly 99 % of which was resulted from damages in private sector. Nearly 54 % of the total damage was incurred to the business operation, while about 46 % of the damages have resulted from the residential part.

Table R L. 2 Assessment of the Damages of the Flood 2001

Sector		Damage Item	Damage/Expense (Rs. million)			% Contribution	
			Islamabad	Rawalpindi	Total		
Private	Residential	Direct Damage	Structure	1,057	6,624	7,681	27%
			Content	681	4,295	4,976	18%
		Indirect Damage	Loss of Income	17	107	124	0%
			Emergency Measures	2	14	17	0%
			Other	7	47	54	0%
		<i>Total Damage to Residential Part</i>			1,765	11,087	12,852
	Business	Direct Damage	Structure	617	3,868	4,485	16%
			Content	1,070	6,752	7,823	28%
		Indirect Damage	Business suspension	368	2,314	2,681	10%
			Emergency Measures	1	4	5	0%
			Flood Proofing Activity	22	138	159	1%
		<i>Total Damage to Business Part</i>			2,078	13,076	15,153
Public	Infrastructure				153	1%	
	Emergency Assistance*				34	0%	
<b>Grand Total of the Flood Damage</b>					28,193	100%	

Source: JICA Study Team 2002

\*Expenses as emergency assistance includes that from a NGO

#### 3.2.2 Damages to Private Properties and Business

The damages to private sector including residential and business parts amount to about Rs 28 billion, contributing nearly 99% of the total damages. Direct damages in the private sector accounts for about 89%, while, indirect damages contributes about 10 % to the total damage.

#### 3.2.3 Damages to Public Sector

The total damages to public sector amount to about Rs.153 million, including the damages to infrastructure such as bridges, road and water supply networks. In addition, governmental properties such as offices were also significantly damaged.

Table R L. 3 Loss to Public Sector

Content	(in Rs. 1000)	(in US\$ 1000)
Infrastructure in Islamabad	12,853	222
Infrastructure in Rawalpindi	120,000	2,069
Others	20,000	345
Total	152,853	2,435

Source: Federal Flood Commission, The Economic Flood Damage Survey, PATTAN Development Organization

### 3.2.4 Additional Expenses for Emergency Operation

To combat against the said serious damages to the whole community, emergency assistance was extended from various sources through bilateral as well as multi-lateral channels. The estimated total value of the assistance amounts to about 34 million Rupees.

Table R L. 4 Expenses for Emergency Operation Unit: Thousands Rs.

Source		(in Rs. 1000)	(in US\$ 1000)
Government	Government of Pakistan	10,000	172
	Government of Japan	17400	300
International Organization	WHO	2,900	50
	WFP	176	3
	UNICEF	2,205	38
	NGO (Red Cross*)	1,808	31
Total Value of assistance		34,489	595

Note: \*International Federation of Red Cross and Red Crescent Societies

Source: Flood Update Report No.5 by United Nations in Pakistan, PATTAN Development Organization

World Health Organization provided a total of 50,000 water purification tablets to the District Health Officer of Rawalpindi and US\$ 5,000 worth of medicine needed in the affected areas of Rawalpindi. The food items sent by World Food Programme comprised of 7.5 tons of wheat flour and 4.5 tons of edible oil. WFP also handed over 4 tons of edible oil to the relief authorities. UNICEF provided 3,000 jerry cans, 100,000 sachets of medicine and 250,000 water purification tablets.

### 3.3 Assessment by the Local Authority

#### 3.3.1 Interview by the local authority

The assessment of the flood damages undertaken by Punjab Revenue Department covers the whole affected individual households within Rawalpindi by mobilizing police force for structured interview survey. The interview covered damages to house structure, number of persons died and head of cattle lost as summarized in the table below.

According to an officer of Rawalpindi district, the damages to private business, the values were estimated by interviewing a limited number of businesspersons.

Table R L. 5 Summary of Damage Assessment by the Local Authority

1	Name of interviewee/ Number of Family member/ Ownership of house	
2	House damaged	Number of Kacha <sup>2</sup> damaged
		Number of Pacca <sup>3</sup> damaged
		Estimated damage
3	House demolished	Number of Kacha damaged
		Number of Pacca damaged
		Estimated damage
4	Persons died	Number of bread winner died
		Number of non-bread winner
5	Head of cattle lost	
Total Damage		Rp. 15,000,000.-

Source: Executive District Officer of Revenue Department, Rawalpindi District

### 3.3.2 Comparison of the Results

In comparison with the interview survey undertaken by JICA Study Team, the interview by the local authority contains shortfalls as itemized below.

- (1) *Regarding residential part;* Damages to contents of households were not covered in the interview by the local authority.
- (2) *Regarding business operation;* Damages to contents such as stocks in business operation were not specifically addressed. The damaged items in this category include merchandises in stock such as electric appliances, suits and dress materials, medicine and foods of wholesale markets extending to the east and the west of Raja Bazar and various shopping centers along Murree Road in Rawalpindi City. In addition, they include machinery, instruments and facilities of industries handling food and beverage, garage mechanics, furniture and printing such as news publishers.

## 4. SOCIAL DIMENSION OF THE FLOOD DAMAGE

### 4.1 Overview

The area affected by flood is heterogeneous urban part of the country, in which the poor and rich with their different levels of assets live together, and there are significant intra-urban differentials in social, environmental, and health conditions. This statement remains correct in manifestation in socio-economic impact of the flood. The average flood damages presenting overall damaged conditions cannot give a correct picture of impact of the flood. The part of the report casts a brief light to the social dimensions of the flood damages by referring to the

<sup>2</sup> Kacha means a mud constructed house.

<sup>3</sup> Pacca means a concrete constructed house

analysis of the interview survey and other available information<sup>4</sup>, which will help further explore the cost of the flood that was not captured in monetary term.

#### **4.2 Impacts at Regional Level**

The economic damages that were not captured in the assessment include cumulative impacts of the damages on the regional economy. This impact may have given rise to bankruptcy and decreased willingness to make investment within the potential flood-prone area. The impact of the flood to business sector may have differed by lifecycle of business operation, financial soundness of the pre-flood period and availability of external assistance. According to an interviewee, a larger proportion of pharmacies could maintain their operations as they had access to financial assistance from large-scale pharmaceutical companies that provided loans to the flood affected pharmacists. However, some small-scale retailers such as sports wear shops, which did not have any source of external assistance had no choice but to close their business. It was mentioned invariably by all different groups of people, according to an NGO, that it would take them another 15 to 20 years to reach the same economic level as prior to the flood 2001.

#### **4.3 Flood Impacts to Vulnerable Social Subgroup**

Poor households are extremely vulnerable to community-wide shocks. The fragility of the economic base of households means that these shocks are thoroughly destabilizing and can take many years before recovery is consolidated. Due to geographical settings of their community, their suffering has been broader and deeper than other groups of people in terms of loss of labour, resultant narrower income base and associated trauma of the flood damages. In the reality of this misery, they survived the past years after the flood through various coping mechanisms such as stringent management of household, informal financial arrangement and withdrawal of children from school.

##### **4.3.1 Loss of Labor and Resultant Narrower Income Base**

An interviewee of a poor breadwinner living in a small hut has suffered for more than a year from a serious injury that had resulted from collapse of the roof. The injury deprived his means of income generation in addition to medical expenses. Health shocks, which entail the loss of labor resources and significant costs for curative care and associated expenditure, will have larger and longer economic impacts.

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<sup>4</sup> This part of the report owes a great deal to the information provided by PATTAN DEVELOPMENT ORGANIZATION.



### 4.3.2 Associated Trauma of the Flood Damage

Poor people repeatedly stress anxiety and fear they experienced because they feel insecure and vulnerable. Most say they feel less secure and more vulnerable today than in previous times. The flood intensified the sense of insecurity particularly among those living in Kachi Abadi<sup>5</sup> in flood-prone area. They are mentally depressed and feel frightened as their houses may be collapsed in the next flood.

### 4.3.3 Various Coping Mechanism

#### 1) Stringent Management of Household

Price escalation after the flood has also selectively impacted the poorer households mainly through sudden rise in food price. The figure demonstrates relative significance of price escalation to the poorer group in the flood affected twin cities.

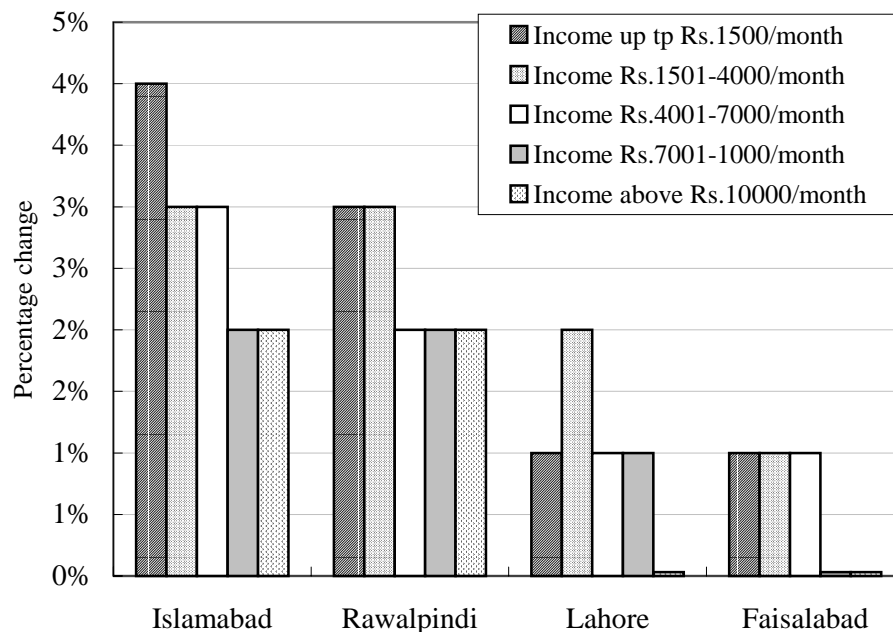


Fig. R L. 1 Percent change in consumer price index between June and August in 2001<sup>6</sup>

Women reported the increasing pressure to manage household expenditures and maintain the same living standard as prior to the flood with sharply decreased income. Some of the housewives reported that they were spending more time in household chores now as most

<sup>5</sup> Kachi Abadi means literally the mud abode, referring to the low-income residents living in encroachment.

<sup>6</sup> Source: Federal Bureau of Statistics Monthly Bulletins in 2001, Consumer Price Index Numbers by Income Group and Combined for selected cities

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of household gadgets had been destroyed in the flood and they were not able to replace them.

### **2) Informal Financial Arrangement**

Limited ranges of formal assistance were available for post-flood emergency recovery and recovering from the severe damages, and hence the flood affected households had to rely on informal financial arrangement through, for instance, kinship relation outside the affected community or they were forced to sell their limited assets unless they have enough savings to rebuild their business and family lives. It was reported that only a fraction of the total damage (19 percent) has been recovered in the past year.

### **3) Withdrawal of Children from School**

Withdrawal of children from school is a prevailing coping mechanism of the poor in external shocks. An eleven-year-old daughter of a greengrocer was also withdrawn from her school after the flood incidence and still lives in a small tent on roadside as her house was completely collapsed, and there was no external financial assistance to restore their livelihood even after one year of the flood 2001.