ESTIMATION OF WELFARE LOSS IN RURAL HOUSEHOLDS AND INTERVENTION GAP DURING FLOOD 2010 IN SINDH

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ABSTRACT

Present study is an attempt to estimate welfare loss in selected flood affected districts of Northern Sindh (Qamber Shahdadkot, Kashmore-Kandhkot, Jacobabad and Shikarpur). Ordinary Least Squares Method is used to estimate household demand equations of the selected items from household expenditure survey. The study is unique in its approach of measuring welfare loss using household data. Previous studies have applied either various risk measurement approaches to measure loss of lives. In addition some studies have used cost measurement approved to investigate the issue.

The estimated loss in all selected districts is approximately PKR 61.16 billion. The assistance provided to flood affected population in cash and kind under phases of rescue, relief, rehabilitation, and reconstruction was equal to PKR 47.2 billion. Total identified gap in intervention is of 22.8% on average or PKR 15 Billion. Given the average family size and number of households in rural areas of Sindh, the household loss is averaged up to PKR 11703.

Keywords: Floods, Household Welfare, Econometrics, Ordinary Least Squares Method, Marshallian Demand Estimation

INTRODUCTION

In the 2010 flash floods caused by the heavy monsoon rains inundated 20% of Pakistan's total area and brought it under water (Juren & Khan, 2010). The total losses due to the direct damage to infrastructure, (including private and public sector buildings and roads) and indirect damage due to the loss in the key sources of livelihood such as livestock and crops and damage to the warehouses. The income loss to the households in flood affected areas was due to direct damage to the standing crops and the livestock. Total population affected has been counted to 22 million across the area of 100,000 kilometers (NDMA, 2012).

According to the reports (NDMA, 2012) the most seriously flood affected component is the household economy. Whereas the greater impact of floods in Pakistan was visible in rural areas (69.5%) than in urban areas (33.3%). The households even 3 months after the floods, 66% of the households in these areas were not having enough income to buy essential food items and medicines.

Present study has estimated the damages to the society in selected four districts of North Sindh namely, Kandhkot-Kashmore, Jacobabad, Shikarpur and Qamber-Shahdadkot. These districts suffered heavy loss. People were killed, villages were destroyed and infrastructure was damaged. The change in the welfare at household level is estimated using Hicksian Compensated Variation. For that matter household basket of goods of frequent consumption has been taken to estimate the household demand equations. Marshallian Demand Estimations, Substitution and Income Effects and isolation of Income from Substitution effect has made us possible to estimate the compensation required. This is the compensation that is required to bring people of the region to their initial level of utility. Further, information on intervention by various nongovernmental and governmental organizations' has been collected from the published reports of NGOs and governmental websites of PDMA (Provincial Disaster Management Authority) and NDMA (National Disaster Management Authority). PKR 61.16 billion was the estimated compensation required in all selected districts. The intervention from government institutions and the non-governmental organizations provided has been equal to PKR 47.2 Billion. The gap of 22.81% or PKR 13.95 Billion remained.

Four districts of North Sindh have been selected for the analysis. These districts are; Kashmore-Kandhkot, Shikarpur, Jacobabad, Shikarpur and Qamber-Shahdadkot. The sole criteria of selection of these districts are the intensity of losses due to flood in these districts in the country. Economy of all these four districts is based on agriculture base with major crops of rice, wheat and livestock with few sugarcane farms (Javed, 2014). Following table presents the summary of the flood damage in the four selected districts in number of affected villages; persons affected damaged houses and affected crop area and killed cattle heads. The table presents the summary of the flood damages from the surveyed data on the number of villages and persons affected, crop area damaged (in acres) and the number of *Katcha* (mud) and *Pacca* (cemented) houses damaged during flood. The statistics reveal that the four districts under study cover 55.41% of the total number of villages affected, 46.73% of

the total persons affected, 69.07% of the crop area of the province and 46.77% of the total number of houses damaged in the province. Further, in case of the cattle heads the total impact is 24.03% in the selected districts, that is 24.03% of the total cattle heads died in the province happened in the selected four districts. This suggests that the scope of the study is sufficiently large for generalizability of the results over the whole province. The above paragraphs have been delineating the extent of the damage caused due to the floods 2010 to the social and physical infrastructure and the housing, agriculture and livestock as the main source of the household livelihood in the province.

TABLE-1
FLOOD DAMAGES (2010) ON VILLAGES, CROP AREA, PERSONS AFFECTED AND HOUSES DAMAGED IN SELECTED DISTRICTS IN SINDH PROVINCE

		Kashmore	Shikarpur	Jacobabad	Qamber Shahdadkot	Total (Percent)	Sindh Total
Villages Affected	Num-ber	1000 (13.74%)	1,359 (18.68%)	1,123 (15.43%)	550 (7.56%)	4,032 (55.41%)	7,277
Persons affected	Num-ber	615,000 (8.8%)	778,000 (11.13%)	892,500 (12.77%)	980,500 (14.03%)	3,266,000 (46.73%)	6,988,491
Crop Area Affected	Acres	400,124 (16.31%)	110,189 (4.49%)	687,000 (28.0%)	497,380 (20.27%)	1,694,693 (69.07%)	2,453,503
Houses Damaged	Katcha (mud)	74,545 (8.84%)	94,303 (11.13%)	108,182 (12.77%)	118,848 (14.03%)	847,089 (46.73%)	847,089
	Pacca (cemented)	18,636 (8.93%)	23,576 (11.29%)	27,045 (12.95%)	29,712 (14.23%)	98,969 (47.41%)	208,772
	Total	93,190 (8.825%)	117,890 (11.16%)	135,239 (12.81%)	148,574 (14.07%)	494, 847 (46.77%)	1,055,961 (100%)
Cattle Heads	Num-ber	17,500 (6.67%)	838 (0.32%)	615 (0.23%)	44,039 (16.80%)	62,992 (24.03%)	262,183

Source: Map Action (UNOCHA, 2010).

The table 1 given above presents a detailed picture of the intensity of the damages in the four selected districts for analysis. In case of the number of villages affected, 45.41% of the total numbers of villages affected in the province are affected in any of the four districts. The highest loss in the number of villages damaged is in the district of Shikarpur (18.68%). If the number of persons affected in the flood 2010 is taken as a bench mark for the intensity of flood damage, then the selected four districts have been suffering more than any other region in the country. Almost 46.73% of the persons affected due to flood in Sindh are in one of the four districts. The highest number of persons affected

(14.03%) of the total persons affected in the province are from Qamber-Shahdadkot district.

In terms of the crop area affected in acres then highest number of acres affected is in the Jacobabad District that stands at 28%. The crop area affected in the selected four districts is 69.03% of the total area affected in the whole province. In case of the houses damaged (cemented and non-cemented), approximately 46.7% of the total houses damaged in the province are in any of these four districts. The highest number of damaged houses is from the district of Qamber-Shahdadkot that is 14.07%. While looking at the cattle heads perished, it makes 24% of the total perished cattle heads in the province. The highest cattle heads (16.80%) damage has been recorded in Qamber-Shahdadkot.

One limitation of the study is the presence of corruption in the streams of expenditures. How much is allocated and how much is actually spent on the relief, rehabilitation and rescue of the flood stranded people.

LITERATURE REVIEW

Literature on empirical estimation of welfare loss at household level estimating their demand equations is scant. The issue is reviewed from various perspectives like risk management, rural economy effects and welfare loss. There are few studies who have estimated welfare losses in the rural areas because of the floods and other natural disasters. (Kousky, 2012) has reviewed literature on the welfare effects of the natural disasters and cited work of (Rose, 2012) quoting that the welfare of the households may be estimated in two ways: ex post (as compensation required to avoid loss) or ex ante (evaluation of the uncertainty in monetary terms). Further, the study (Rose, 2012) suggestively extends the argument that though the hypothetical welfare measures may be enlightening yet a comprehensive and wide ranging analysis of the welfare is often challenging that may not be possible empirically without the number of assumptions and generalizations. In this situation when the society is neutralized to the prevailing risks, the ex-ante welfare may be measured through estimation of the economic losses to the population.

Tenancy and the share cropping has been the deep-seated feature of agrarian society in the province. The social and economic vulnerability of the inhabitants of the province of Sindh is evident from the empirical studies (ADB, 2010) such as poverty rate in the rural part of the province in 2010 has been recorded as 53%. The fundamental trigger behind such enormous poverty rate in the rural parts of the province has been known as the concentrated land holding in the hands of few giant landlords (share of landholding of 25 acres or above is 88% that is highest in the

country in contrast the same is 38.6% in Punjab and 21% in KPK and 81.4% in Baluchistan). Further, (Zaidi, 2005) has highlighted that fact that the share of Sindhi districts in the bottom quartile has risen from 23.5% in 1970s to 35.2% in 1990s. Though the land reforms introduced in the country have not been very successful in effectively impacting the socioeconomic fiber of the whole country.

The natural disasters and calamities disrupt the economic activities at local and sometimes at national levels given the severity of the events. The magnitude and the duration of the events indeed determine the cost of the calamities. Floods have longer duration with varying magnitudes whereas earthquakes have smaller duration of happening time. On the other hand the structure of the local economy, the area affected by such calamities and the time during which the event occurs. Events occurring during the night times may bring more economic and human losses than events occurring in day time when most people are alert and active. These and many other factors make it difficult to estimate the accurate losses to the calamity hit areas. These costs may be in terms of the lost value of the wages for workers/jobs and thus output, destruction of the general property in public sector like roads, schools hospitals and other buildings and private property, human lives and the loss to transportation sector (Kliesen, 1995).

It is hard to calculate the damages of any natural disaster because of the types of the disasters vary and several factors like magnitude and duration of event, structure of the local economy and infrastructural development level, geographical location and the time of occurrence of the event either it is day or night.

Risk Management

In order to understand the mechanism of risk in the context of the vulnerability analysis; two models of disaster have been utilized by (Blaikie, Terry, Ian, & Ben, 1996).

First model is known as the "The Pressure and Release model" (or also known as the PAR model). The model is a simple tool that predicts, assesses and presents a true picture of vulnerable people when they are hit by the natural disasters. Though it may be the case that the social processes may be even remotely connected with the disaster itself, the disaster effects are seriously rooted in the social processes of the people in the disaster prone or affected areas.

The fundamental rule of the model is the notion that the disaster happens to be the intersection point of two opposing forces: first is the

force of the social processes that generate vulnerability in the society on one side, and the natural disaster (natural disaster may sometimes unfold slowly in a natural process) on the other. The impact of the disaster on the inhabitants of the region is always positive and direct. The pressure on the populace increases with the rising pressures from either side (higher vulnerability or higher severity of the hazard). For the sake of the conceptualization of the idea of 'release', the disaster will be less in intensity when the vulnerability is reduced.

The second model is known as the 'Access Model'. From perspective approach, the second model may even be considered as the extended version or the detailed approach of the first model. In effect it is an expanded analysis of the principal factors in the PAR model that relates to human vulnerability and exposure to physical hazard, and focuses on the process by which the natural event impacts upon people and their responses. It is a more magnified analysis of how vulnerability is in principle at the beginning generated by economic, social and political processes.

Distortion in Commodity Market

In addition to the damage to the infrastructure and the loss of human lives, the floods and other natural disasters affect the commodity markets hence distorting the price and the supply of the commodities particularly food items in the central and the regional markets. The analysis of the markets in the post flood times is very important in the sense that the governments and other intervention agencies about their action plans for recovering of the normal market functioning. The analysis of the commodity markets normally begins with the review of the market value of chain, supply of services and the impact on the environment. The value chain seemingly brings consumers, middle men and the retailers in the network as the major stakeholders and service providers (Creti, 2004).

The first distortionary impact on the commodity market starts from the damage to the warehouses of the food items at the wholesale market. Secondly, the remaining stored items available in the ware houses don't reach the market as a whole due to the damage to transport and communication sources due to floods.

The utility functions in the flood or other disaster affected areas may be depending on the state policies and the degree of intervention. These utility functions tend to change in a post-disaster decision so the ex-ante estimations of the preferences may not be same as the ex post

estimated preferences.[1]. Therefore a more comprehensive and holistic estimation would rather take consideration of these possibilities. In each of the case of utility change, the positive utility change may take place among the disaster affected populations if they are convinced that if they are victims they will receive substantial aid. Similarly the increase in anxiety or any other negative emotions and fear of the disasters may lead towards to loss in the utility. This can be measured and included in the cost-benefit analysis when the researcher has a specific objective to consider it (Adler, 2004).

Another study (Messner *et.al.,* 2007) has also provided guidelines for flood damage estimation meant for the practitioners of governments authorities as well as the nongovernmental organizations and the executing authorities dealing with ex-ante flood damage evaluation. In case of agriculture damages, classification of damages due to flood can be done in to three categories as (Dutta, Herath, & Musiake, 2003) has been suggesting. They are damages to the farm houses, farm infrastructure and farm product. In a developing country setting, the agriculture damage may shrink to the loss of livestock and standing crops that is the sole source of livelihood for the farmers. These farmers are mostly from the poor households and their ability to cope with the risks and uncertainties of natural disasters make them even more vulnerable. (Fafchamps, 2003) and (Dercon, 2005) have concluded in their research that the problem of flood damage exaggerates for the poor households who are not insured and governmental arrangements have not been sufficient in rural areas in developing countries.

METHODOLOGY

The general form of demand equation estimated for selected basket of goods is given as under in equation I:

$$Q_d = \alpha_0 - \alpha_1 P_{self} + \alpha_2 P_{subs} - \alpha_3 P_{comp} + \alpha_4 Y \quad + \varepsilon \text{ ---------- (I)}$$

For the purpose of avoiding stationarity of the data series, the time series has been transformed in to natural log form.

In equation II, the Q_d is the quantity of a good demanded by an individual or a household. α_0 is the intercept of the demand equation that measures the impact on the demand quantity that is the result of changes

[1] Given the situation that people wrongly weigh the risk before a flood hits the region, then ex ante effectiveness, accomplished through insurance contracts, may not remain same as ex post efficiency. The ramifications of this for government calamity help are talked about by (Jaffee, D., 2012).

in the factors other than the included variables. α_1 is the coefficient that would be estimated to measure the impact of change in the price of the selected good by one unit on the change in the quantity demanded of the selected good. In a general setting, this is the slope of the demand curve (*ceteris Paribas*). α_2 and α_3 measure the unit change in the quantity demanded of the good due to a one unit change in the price of substitute goods and complementary goods respectively. The P_{self}, P_{subs},andP_{comp}, are the prices of the good, its substitute and the complementary goods respectively. α_4 is the coefficient of the income, disposable income of an individual, per capita income or the household income that has a positive impact on the demand for a good. That is, higher the income of individuals or households, higher would be the demand for the normal good[2].

Income and substitution effects have been estimated using following equation

$$\frac{\partial x_i}{\partial p_i} = \frac{\partial x_i^{s}}{\partial p_i} + X_i \frac{\partial x_i}{\partial y_i} \quad \text{---------- (II)}$$

Slutsky Equation following equation known as Slutsky equation (Varian, 1992) presents the total effect and the subsequent parts of the effect in general form:

$$\frac{\partial x_i}{\partial p_i}.\frac{p_i}{x_i} = \frac{\partial x_i^{s}}{\partial p_i}.\frac{p_i}{x_i^{s}} + X_i \frac{\partial x_i}{\partial y_i}.\frac{y_i}{x_i}.\frac{p_i}{x_i} \quad \text{---------- (III)}$$

More Precisely $\frac{\partial x_i^{s}}{\partial p_i}$ is the substitution effect and $X_i \frac{\partial x_i}{\partial y_i}$ is the income effect.

Welfare loss is estimated using utility maximization approach and optimal choice bundle. Mathematically, it can be calculated using household expenditure as follows:

$CV = e(p_1, u_1) - e(p_1, u_0)$---------- (II)

Following are sources from the data for the study was taken:

- Household Income & Expenditure Survey, Federal Bureau of Statistics, Government of Pakistan. 2004 onwards.
- Budget Analysis, Finance Department, Government of Sindh. 2010-2015
- Annual Report, NDMA 2010, Government of Pakistan

[2] The analysis of the giffen or inferior goods is out of scope of this study

- Early Recovery Report, UNOCHA, 2012.
- Detailed Needs Assessment of Flood 2010, Asian Development Bank Regression Results

Compensation Required in KGs and PKR per Household

The difference between the Marshallian and the Hicksian estimated quantities is the quantities of the goods in kilograms that may be estimated as the compensation required by each household per month to obtain the same initial level of utility that they had before the flood damage. Following table 25 presents the compensation in quantities of goods in KGs per household per month.

TABLE-2
SUMMARY OF COMPENSATION REQUIRED IN KGS PER HOUSEHOLD PER MONTH

Year	1 Wheat	2 Milk	3 Rice	4 Moong	5 Chicken	6 Beef	7 Fish	8 Banana
2004	18.96	0.00	0.22	18.71	0.05	0.18	0.02	9.67
2005	11.93	0.00	0.49	31.74	0.05	0.21	0.03	10.60
2006	16.92	0.00	0.28	30.97	0.05	0.22	0.03	11.09
2007	16.13	0.00	0.31	31.34	0.05	0.20	0.03	10.51
2008	16.24	0.00	0.31	31.74	0.05	0.21	0.03	10.60
2009	13.57	0.00	0.43	47.46	0.05	0.20	0.02	10.02
2010	20.91	0.00	0.20	31.31	0.05	0.23	0.03	11.18
2011	16.42	0.00	0.31	32.41	0.05	0.22	0.03	10.76
2012	16.24	0.00	0.31	31.74	0.05	0.21	0.03	10.60
2013	16.24	0.00	0.31	31.74	0.05	0.21	0.03	10.60

	9 Apple	10 Potato	11 Tomato	12 Onion	13 other veg	14 sugar	15 gram	16 Chilies
2004	0.21	39.13	0.07	0.03	0.17	7.80	0.87	3.49
2005	0.19	73.29	0.00	0.02	0.14	7.85	1.03	4.00
2006	0.18	64.59	-0.01	0.02	0.12	12.90	0.96	3.27
2007	0.18	70.78	-0.01	0.02	0.14	7.64	1.01	3.91
2008	0.19	73.29	0.00	0.02	0.14	7.85	1.03	4.00
2009	0.19	122.35	-0.03	0.02	0.14	4.27	1.12	5.43
2010	0.19	66.56	0.00	0.02	0.12	13.19	0.98	3.33
2011	0.20	77.54	0.00	0.02	0.14	8.20	1.07	4.14
2012	0.19	73.29	0.00	0.02	0.14	7.85	1.03	4.00
2013	0.19	73.29	0.00	0.02	0.14	7.85	1.03	4.00

Source: Author Estimated

The information on the quantities presented in table 2 is multiplied by the prices of the goods in the selected districts to estimate the monetary value of the compensation required per month per household. Following table 3 presents the summary of the compensation required by each household per month in PKR.

TABLE-3
SUMMARY OF COMPENSATION REQUIRED IN PKR PER HOUSEHOLD PER MONTH

	Wheat	Milk	Rice	Moong	Chicken	Beef	Fish	Banana
2004	266.80	0.06	7.54	855.01	1.09	0.32	1.05	445.57
2005	247.48	0.02	9.92	2041.76	1.46	0.30	1.95	813.80
2006	320.40	0.04	9.86	1745.47	1.17	0.28	1.74	754.21
2007	334.77	0.04	10.64	2015.67	1.44	0.29	1.95	806.36
2008	337.04	0.04	10.67	2041.76	1.46	0.30	1.95	813.80
2009	421.20	0.05	15.03	4690.99	2.36	0.31	3.17	1250.98
2010	395.95	0.05	10.25	1764.82	1.18	0.28	1.74	760.16
2011	340.75	0.04	10.71	2084.69	1.48	0.31	1.97	825.99
2012	337.04	0.04	10.67	2041.76	1.46	0.30	1.95	813.80
2013	337.04	0.04	10.67	2041.76	1.46	0.30	1.95	813.80

	Apple	Potato	Tomato	Onion	other veg	sugar	gram	Chilies	Total
2004	9.67	2327.33	4.74	2.73	19.45	687.49	1.28	112.92	4743.05
2005	15.05	7696.75	-0.23	3.60	22.12	934.35	1.92	184.70	11974.95
2006	11.44	6999.31	-0.62	3.41	16.72	1345.31	1.68	144.38	11354.79
2007	14.57	7432.82	-0.61	3.60	21.91	909.57	1.88	180.70	11735.60
2008	15.05	7696.75	-0.23	3.60	22.12	934.35	1.92	184.70	12065.27
2009	27.58	17605.09	-4.08	4.79	34.14	765.63	2.79	347.53	25167.55
2010	11.77	7212.43	-0.29	3.41	16.86	1375.81	1.71	147.15	**11703.27**
2011	15.85	8143.44	0.42	3.61	22.45	975.82	1.98	191.34	12620.86
2012	15.05	7696.75	-0.23	3.60	22.12	934.35	1.92	184.70	12065.27
2013	15.05	7696.75	-0.23	3.60	22.12	934.35	1.92	184.70	12065.27

Source: Author estimated

According to the above table 3, the total compensation in PKR per month required to bring each household at the same pre flood level of utility in the year 2010 is PKR 11703.27/month and in subsequent three years is around 12065.27 in 2011, 2012 and 2013. The district wise estimated need of the monetary compensation per household per month is presented in the following table 27.

TABLE-4
SUMMARY OF DISTRICT-WISE FLOOD AFFECTED POPULATION AND COMPENSATION REQUIRED IN PKR

Flood affected Population[3]	Qambar Shahdadkot	Kandhkot-Kashmore	Jacobabad	Shikarpur
	980,500	615,000	892,500	778,000
Average Family Size 7.5 (NDMA, 2012)				
Flood affected families	130733.33	82000	119000	103733.33
Total PKR Required (2010)	530007528.43	959668159.1	1392689158	1214019232
Total Million PKR per Month	1530.01	959.67	1392.69	1214.02
Total Million PKR per Year	18360.09	11516.02	16712.27	14568.23 Total
Total Billion PKR per Year	**18.36**	**11.52**	**16.71**	**14.57 61.16**

Source: Author estimated

According to table 4, the compensation required per year in all four districts in total is PKR 61.16 billion per year. The compensation required in district Qamber-Shahdadkot is the highest (PKR 18.36 billion), followed by Jacobabad (PKR 16.71 billion), Shikarpur (PKR 14.57 Billion) and Kashmore-Kandhkot (PKR11.52 Billion).

Intervention

The intervention in the flood affected areas took place by the nongovernmental organizations, international NGOs and the government sector with the support from Pakistan army and the paramilitary forces. The type and duration of the intervention done is presented in the following table 5.

[3] NDMA (NDMA, 2012)

TABLE-5
RESCUE & RELIEF AND REHABILITATION EXPENDITURE IN PKR (BILLIONS): TOTAL & DISTRICT-WISE

Intervention	Qambar Shahdadkot	Kashmore-Kandhkot	Jacobabad	Shikarpur	Total	%age of funding
Rescue, Relief and Rehabilitation	7.03	4.41	6.40	5.58	23.42	49.65
Early Recovery	3.53	2.22	3.22	2.80	10.77	24.93
Reconstruction	3.60	2.26	3.28	2.86	12.00	25.42
Total (Billion PKR)	14.16	8.89	12.90	11.24	47.20	100

According to table 5, 50% of the funds allocated were spent on the Rescue, Relief and Rehabilitation. The total amount allocated for the flood affected areas was as high as PKR 47.20 Billion (Report, 2012) and (PDMA, 2010). The amount spent on Rescue, Relief and Rehabilitation is equal to PKR 23.42 billion. The amount spent in Qamber-Shahdadkot is PKR 14.16 billion that is highest spending among the selected four districts followed by Jacobabad (12.9) and Shikarpur (11.24) and Kashmore-Kandhkot (8.89).

The required amount for compensation is PKR 61.16 billion however the amount spent is around PKR 47 billion. Therefore it can be said that the intervention was short by approximately PKR 15 billion.

CONCLUSION

The compensation required by the flood affected population in selected districts using income and substitution effects has been summarised in following table 6. Further table 6 presents the amount of intervention provided in the selected districts and the subsequent gap.

TABLE-6
SUMMARY OF COMPARISON OF ESTIMATED COMPENSATION AND THE DISBURSED COMPENSATION IN SELECTED DISTRICTS AND THE ESTIMATED GAP IN PKR (BILLIONS): TOTAL & DISTRICT-WISE

District	Compensation (Billion PKR)	Compensation (Billion PKR)	Gap in Compensation	Gap in Compensation
	Required	Provided	(Billion PKR)	(Percentage)
Qambar Shahdadkot	18.36	14.17	4.19	22.82
Kashmore-Kandhkot	11.52	8.89	2.63	22.83
Jacobabad	16.71	12.9	3.81	22.80
Shikarpur	14.57	11.24	3.32	22.79
Total Compensation in PKR Billion	61.16	47.2	13.95	22.81

The estimated gap on average in all districts is equal to PKR 61.16 Billion. Each district was affected and suffered loss of differing amounts. Qambar-Shahdadkot suffered loss of PKR 18.36 Billion and was provided PKR 14.17 Billion faced gap of 22.82%. Kashmore Kandhkot suffered loss of PKR 11.52 Billion and was provided PKR 8.89 Billion faced gap of 22.83%. In case of Jacobabad, the value of damages was equal to PKR 16.71 Billion and the compensation provided was equal to PKR 12.9 Billion. Jacobabad district suffered the gap of PKR 3.32 Billion (22.79%).

For Shikarpur, the compensation provided through various phases of intervention was equal to PKR 11.24 Billion against the recorded loss of PKR 14.57 Billion. The gap was equal to PKR 3.32 Billion (33.79%).

Total gap between compensation required and compensation provided was equal to 22.81% or PKR 13.95 Billion.

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