Employment Program in the Flood Affected Areas

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Contents

Introduction

Pakistan encountered one of the worst flooding of its history in the summer of 2010. More than 20% of the country's landmass, 72 out of the 132 districts in the country were affected and an estimated 220 million individuals were displaced. Response to the devastation by the Government of Pakistan, foreign governments & national and international donors in providing relief to victims was prompt and highly praiseworthy. It was because of this early response that the number of deaths was contained to around the 2000 individuals and no major outbreak of an epidemic has been recorded as yet.

While the relief phase has been conducted with vigour and commitment, rehabilitation and reconstruction work is more long term and requires appropriate planning and requisite financing. The World Bank and the Asian Development Bank (ADB) have conducted an initial diagnostic report on the nature of destruction wreaked by the floods.[1] Similarly the UN has also conducted an initial assessment of damages and the requirements of a future reconstruction and rehabilitation program.[2]

The running theme across different reconstruction and rehabilitation plans has been damages to homes and to public infrastructure. Flood related infrastructure (dams, barrages and dykes), agricultural (canals and waterways), communications (roads, bridges and culverts) and social & administrative infrastructure (schools, hospitals & clinics, courts, police stations, etc) are the focus of attention for donors as well as the Federal and Provincial Governments. To prioritize rebuilding of homes and of larger infrastructure is the appropriate approach. However, the area which has not appeared amongst priorities of policy makers in any substantive manner is focus on livelihoods and reconstruction of village and intra-village level infrastructure.

The focus of this study is to address the livelihoods loss issue in conjunction with the rebuilding of small infrastructure. Based on a rapid assessment of flood affected areas, we identify employment programs at the village level that create short term livelihood possibilities for the poorest affectees. Given the nature of work as well as the area affected,

[1] World Bank and Asian Development Bank, *Pakistan Floods 2010: Preliminary Damage and Needs Assessment*, Islamabad. 2010
[2] United Nations, *Floods Relief and Early Recovery Response Plan*, Islamabad, November, 2010

we have drawn cost estimates for each scheme and then aggregated them at the provincial and national levels. Provision of costs for both the federal and provincial governments is important given prevailing budget constraints faced by these governments.

One important constraint in the adoption and implementation of an employment program in Pakistan has been the lack of an appropriate institutional framework. This study will propose some institutional mechanisms to resolve this problem based on a study of best practices internationally as well as discussions with potential institutional entities in the field.

2. Rapid Assessment in the Field

Soon after the floods had subsided, a 3 member team conducted a rapid assessment of flood affected areas across the four provinces of Sindh, Punjab, Khyber Pakhtunkhwa (henceforth KP) and Balochistan. The assessment covered four districts in Sindh, three in KP and each each in Punjab and Balochistan (Names of districts given in Appendix 1).

A three member team undertook the Assessment. The team consisted of one economist and institutional expert, a civil engineer with experience in village infrastructure delivery and a liason cum technical officer.

Based on the TORs provided by ILO, the team assessed the flood affected areas along three dimensions. First was a visit to flood affected villages to assess the extent of damage caused to public infrastructure. This also included Focus Group discussions with village inhabitants on the nature of infrastructure needed, the extent of livelihood losses and availability of labour if an employment program is initiated.

The second aspect of the rapid assessment was to liase with Government officials and enquire about their plans on rehabilitation work as well as the willingness and ability of government to undertake and administer village level infrastructure work through an employment program. In this regard, the team met with the Distrct Coordination Officers (DCOs), the Executive District Officers (EDOs) for Works and Tehsil level Works Officers.

The third element of the rapid assessment was to touch base with local as well as national & international NGOs that intended to work on livelihood programs, infrastructure

rehabilitation and their experience as well as willingness to associate themselves with a proposed employment program in the affected areas. The list of organizations contacted for this purpose is provided in Table A1 in Appendix 1.

3. Assessment of Public Infrastructure Damages at the Village Level

While there were variations observed in the nature of damage incurred due to the floods, there were a number of similarities at the village level. The first encounter one has with devastation is the destruction of pathways to and within the village. Inter-village pathways and dirt tracks that served as communication links were completely destroyed. The next encounter with devastation is the destruction to homes, hearths, and other structures in the village. This destruction is much more devastating in Khyber Pakhunkhwa (KP) than in other provinces because of the intensity of flash floods that hit the region. Everywhere, however, there is considerable debris that has accumulated because of the destruction. In addition, there is also accumulation of silt in varying degrees across provinces and districts. Unless the debris and silt is not cleared, it will not be possible to carry out rehabilitation work at any level in the village. While some of this work will be done on a self help basis, clearance of silt and some forms of debris will require a collective effort and resources – human and material – which may not readily come forth from within the village.

Damage to public physical infrastructure is also pronounced with water and sewerage drains and water pumps completely destroyed. Virtually all hand/electricity pumps used for getting sub-soil water have stopped functioning because of silt/debris accumulation.; drains, water channels into the village and tube wells are also choked. Apart from the damage it has done to the sewerage and potable water infrastructure, damage/destruction of water channels has impacted water availability for agriculture significantly.

4. Proposed Employment Scheme

The conceptual basis for employment program in the flood affected areas is taken from earlier work on the proposed Employment Guarantee Program for Pakistan (Sayeed and Cheema, 2010). The loss of livelihood and destruction of infrastructure has provided an immediate need to initiate this scheme in the flood affected areas. Based on the rapid assessment conducted, in this section, we first discuss the criteria for choosing infrastructure

schemes at the village cluster level and then discuss the proposed design and costing of these schemes.

4.1. Criteria for Choosing Employment Schemes at the Village Level

It is apparent from the above description that the reconstruction effort at the village level will have to be substantial. For a public employment program, however, it is preferable that the reconstruction effort should be focused on public goods rather than private goods. As such, home construction, water channels going to private farms, construction of private toilets, etc. will not be part of our proposed program. In any case, government as well as local & international donors have been forthcoming in the home rebuilding process.
Repair/rebuilding of water channels fall somewhere in between public and private goods. Although lands that are irrigated by river water are privately owned, they are an important source of livelihoods for the village community. In other words, if the lands are not irrigated, employment generated through farm activities will not come forth. However, the incentive structure with a quasi public good like water channels is such that the landlords will themselves expend resources to rebuild the channels.

Focus, therefore, will be on public goods and because the primary purpose of the program is to generate employment, emphasis will be on those schemes that are labour intensive in nature. Another criterion is where employment schemes can improve the quality of village infrastructure, while fulfilling the employment intensity criterion. Based on the assessment of village level devastation, we propose the following schemes;

- Debris Clearance
- Street Pavements
- Sanitation System

There are two areas of work, which though needed, were not included. They are rehabilitation of tube wells and hand pump water connections. The reason for non-inclusion are that the

former is highly capital intensive and the latter has a high component of skilled as opposed to unskilled labour.

4.2.Design and Costing of Schemes

The basic criterion, as mentioned above is to maximize employment for the poorest. Schemes are designed to provide employment for 100 days in a year to one member of the affected households and those residing in the village or the cluster of villages.

One of the tricky aspects of the design of any employment scheme is wage setting for the beneficiary population. Minimum wages in most developing countries tend to be higher than the market wage for unskilled work. As such, if the wage is set at the rate higher than the market, it is said to distort the labour market and crowd out employment in the private sector. Fortunately, the market wage in flood affected areas was found to be higher than the minimum wage. As such we have kept the wage level at the national minimum wage in Pakistan. This will make the scheme self-targeting also.

Material costs were determined by surveying the market for materials in flood affected areas and then determining quantities required for each scheme. Details are provided in Appendix 4.

Scheme Wise Design Details of Schemes

Table 1: Debris Clearance

	No. of workers (Man days)	No. of workers	Wage rate	Estimated cost (Rs)
Un Skilled workers	28938	289	233	6742554
Skilled Workers	None	-	-	
Equipment/ machinery				550000
Material Cost				
Overhead				729255
Total				**8021809**

Table 2: Street Pavement

	No. of workers (Man days)	No. of workers	Wage rate	Estimated cost (Rs)
Un Skilled workers	6755	18	233	1573915
Skilled Workers	1750	68	500	875000
Equipment/ machinery				330000
Material Cost				3088400
Overhead				593280
Total				**6460595**

Table 3: Sanitation

	No. of workers (Man days)	No. of workers	Wage rate	Estimated cost (Rs)
Un Skilled workers	2765	27	233	644245
Skilled Workers	739	7	500	369500
Equipment/ machinery				170000
Material Cost				3237161
Overhead				593280
Total				**5014186**

4.3. Distribution of Schemes Across Provinces: Employment Provision and Cost

In Table 4, we provide an aggregate picture of employment generated and cost schemes. Schemes have been distributed across provinces based on the area affected by the floods. Based on data provide by the National Disaster Management Authority (NDMA) and its provincial affiliates on the districts affected (as well as villages within the districts) and number of households affected/displaced within the district, we have distributed schemes across the four provinces (for more details, see Annexure 3).

Table 4. Distribution of Schemes across Provinces: Employment and Cost

Province	No. of Schemes	Employment	Cost (million Rupees)
Punjab	1236	158208	7,899.9
Sindh	3465	451548	22,146.8
Khyber Pakhtoonkha	252	32256	1,610.7
Balochistan	1078	123287	6,731.4
Total	**6031**	**765,209**	**38,388.8**

The total number of employment schemes proposed is 6031 (Distribution of schemes in each province is provided in Annex 3). The program will generate employment for roughly 765000 individuals and the total cost will be in the vicinity of Rs. 38 Billion. It needs to be remembered that our calculations should be taken as indicative, based on existing data and cost structure of materials at the time of the survey. However, if an employment scheme is to be launched, the broad parameters in terms of employment generated and cost will be in the range suggested in this study.

5. Institutional Design for the Employment Program

The actual implementation design of an employment program has remained a vexed issue in Pakistan. The international best practice suggests that the ultimate execution agency for such programs is the local government, with other tiers of government involved in financing and

monitoring such schemes. Below we first present capacity issues with the local government in Pakistan and then propose the possibility of linking up with NGOs in order to execute the employment program.

5.1. Structural and Capacity Constraints with Local Government in Pakistan

There are two attributes of local governments that make them the appropriate executing arm of government. First, local governments are the repository of local information and because small infrastructure works come under their jurisdiction, there is relative technical expertise to execute such programs. Second, because work has to be carried out at the local level and beneficiaries chosen at that level, political responsibility and accountability in the implementation of schemes should reside there.

Since 2001, Pakistan has an elaborate three tier local government system. While the capacity of the top tier in particular (the district level) and to some extent the second tier (tehsil level) were developed, the lowest tier – the Union Council – which will be the unit at which much of the capacity for implementing an employment scheme out to reside. As such, the first attribute of capacity at the local level cannot be fulfilled at this point in time in Pakistan. The second condition at this point can also not be fulfilled since the elected arm of local governments do not exist and prospects for local government elections in the immediate future are remote.

5.2. Partnership with NGOs

Pakistan has a vibrant and growing non-governmental sector which is active in carrying out local level development work. Some of these organizations have also developed extensive outreach to mobilize communities for a variety of developmental initiatives. Some of these organizations, such as the NRSP, SRSO, Thardeep, Fisherfok Forum, etc. have been very active in the flood affected areas and also have experience in carrying out livelihood programs that include small rural infrastructure development also.

While we are aware that a public employment program should ideally be administered by public sector entities, but because of the limitations of local government discussed above we propose a public sector partnership with NGOs.

Such a partnership will require a formal agreement between the district or *tehsil* government on the distribution of work and accountability structure. All financial control should be retained by the local government while designing of the scheme. Mobilization of labour, organization of material and supervision of works should be conducted by the NGO. Payment to workers and maintenance of registry of workers (households) should be maintained by the local government.

Funds disbursement and financial/technical audit should be carried out by the District Government, which in most cases, has the capacity to undertake such functions. To provide a political umbrella to the work, a Program Steering Committee should be instituted. This Steering Committee will be responsible for approving policies and programme guidelines including the criteria for eligibility and selection of public works. It will also determine the jurisdiction of the programme; the criteria for the allocation of funds and it will also be responsible for coverage and phasing of the programme. The PSC secretariat can be the EDO Planning office and will include all MPAs and MNAs of the district.

Appendix 1: Field Sites Visited

Table A1: Field Side visited and Met with NGOs

Sindh	Village	NGO's
Jamshoro	2	NRSP, Fisher Folk Forum and TRDP
Kambar Shadadkot	1	PIRBHAT Women Development Society, SROS
Jaccobabad	1	
Thatta	1	Fisher Folk Forum, Sindh Radial Organization, Thatta
Punjab		
Muzafargarh	4	Insaf Foundation and Hirak development Centre, Kot Addu
Khayber Pakhtoonkhwa		
Peshawar	1	NRSP
Charsadda	1	SRSP, Job creating development Society
Naushera	2	SPO
Balochistan		
Jaffarabad	3	BRSP

Appendix 2: Flood affected areas

Table A2: Damages caused due to flood by Province

	No. of affected districts	Total affected population	% share	Total affected HH	% share	No of villages affected	% share	Village Clusters(Deh)
Punjab	11	7329358	41.03	1110509	40.70	2676	20.10	412
Sindh	19	6749915	37.79	1124986	41.23	7507	56.40	1155
Khyber Pakhtoonkhwa	23	2880339	16.13	360042	13.20	544	4.09	84
Balochistan	12	902639	5.05	132741	4.87	2584	19.41	398
Total	65	17862251	100.00	2728278	100.00	13311.00	100.00	2048

Source: http://www.pdma.gov.pk/, http://floodrelief.punjab.gov.pk/, : http://www.pdma.pk/
www.pakresponse.info/figures/**balochistan**/**Damage_Updates**_6Sept2010.xls

Appendix 3:
Detailed Estimates of Employment schemes in Flood Affected Areas
Summary Cost Project Wise: Aggregate

Table A3: Debris Clearance
Total Number of schemes : 1951

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs. Million
Unskilled Worker	56457199	563839	233	13154.53
Equipment and machinery				1052.36
Sub Total				14206.89
Contingency 10%				1420.69
Total				15627.58

Table A4: Street Pavement
Total Number of schemes: 2031

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs. Million
skilled Labor	3490265	35908	500	1745.13
Unskilled Worker	13725173	138108	233	3197.97
Sub Total				4943.10
Material				6228.30
Equipment and machinery				642.60
Sub Total				11814.00
Contingency 10%				1181.40
Total				12995.40

Table A5: Sanitation
Total Number of Schemes: 2049

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs. Million
skilled Labor	1452229	13831	500	726.11
Unskilled Worker	5642946	55323	233	1314.81
Sub Total				2040.92
Material				6510.54
Equipment and machinery				326.55
Sub Total				8878.01
Contingency 10%				887.80
Total				9765.81

Punjab

Table A6: Debris Clearance
Total number of schemes : 412

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
Unskilled Worker	11922279	119068	233	2777.89
Equipment and machinery				222.23
Sub Total				3000.12
Contingency 10%				300.01
Total				3300.13

Table A7: Street Pavement
Total number of Schemes : 412

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	708020	7284.16	500	354.01
Unskilled Worker	2784230	28016	233	648.73
Sub Total				1002.74
Material				1263.45
Equipment and machinery				130.36
Sub Total				2396.54
Contingency 10%				239.65
Total				2636.19

Table A8: Sanitation
Total Number of schemes : 412

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	292005	2781	500	146.00
Unskilled Worker	1134648	11124	233	264.37
Sub Total				410.38
Material				1309.10
Equipment and machinery				65.66
Sub Total				1785.13
Contingency 10%				178.51
Total				1963.65

Sindh

Table A9: Debris Clearance

Total Number of Schemes : 1155

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
Unskilled Worker	33422893	333795	233	7787.53
Equipment and machinery				623.00
Sub Total				8410.54
Contingency 10%				841.05
Total				9251.59

Table A10: Street Pavement

Total Number of Schemes: 1155

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	1984863	20420.4	500	992.43
Unskilled Worker	7805305	78540	233	1818.64
Sub Total				2811.07
Material				3541.95
Equipment and machinery				365.44
Sub Total				6718.45
Contingency 10%				671.85
Total				7390.30

Table A11 Sanitation

Total Number of Schemes: 1155

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	818606	7796.25	500	409.30
Unskilled Worker	3180870	31185	233	741.14
Sub Total				1150.45
Material				3669.92
Equipment and machinery				184.07
Sub Total				5004.44
Contingency 10%				500.44
Total				5504.88

Khyber Pakhtoonkhwa

Table A12: Debris Clearance
Total number of Schemes: 84

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
Unskilled Worker	2430756	24276	233	566.37
Equipment and machinery				45.31
Sub Total				611.68
Contingency 10%				61.17
Total				672.84

Table A13:Street Pavement
Total Number of Schemes : 84

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	144354	1485	500	72.18
Unskilled Worker	567659	5712	233	132.26
Sub Total				204.44
Material				257.60
Equipment and machinery				26.58
Sub Total				488.61
Contingency 10%				48.86
Total				537.48

Table A14: Sanitation
Total Number of Scheme: 84

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	59535	567	500	29.77
Unskilled Worker	231336	2268	233	53.90
Sub Total				83.67
Material				266.90
Equipment and machinery				13.39
Sub Total				363.96
Contingency 10%				36.40
Total				400.36

Balochistan

Table A15: Debris Clearance
Total Number of scheme : 300

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
Unskilled Worker	8681271	86700	233	2022.74
Equipment and machinery				161.82
Sub Total				2184.56
Contingency 10%				218.46
Total				2403.01

Table A16: Street Pavement
Total Number of Schemes: 380

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	653028	6718.4	500	326.51
Unskilled Worker	2567979	25840	233	598.34
Sub Total				924.85
Material				1165.32
Equipment and machinery				120.23
Sub Total				2210.40
Contingency 10%				221.04
Total				2431.44

Table A17: Sanitation
Total Number of Schemes: 398

	No. of workers(Man days)	No. of workers 100 days	Wage/Day	Estimated Cost Rs.
skilled Labor	282083	2686.5	500	141.04
Unskilled Worker	1096092	10746	233	255.39
Sub Total				396.43
Material				1264.61
Equipment and machinery				63.43
Sub Total				1724.47
Contingency 10%				172.45
Total				1896.92

Appendix: 4 Design and layout of Schemes

A4.1. Scheme Dimensions

Scheme dimensions provided in this study are based on 'typical' measurements of a village cluster. This was necessitated by the fact that across provinces and in some cases, across districts, the spatial dimensions as well as populations of a village differ greatly. Villages in KP are very large (more than 4000 average population) whereas those in Sindh and Balochistan are small hamlets (population on average of 100) and those in Punjab somewhere in between.

The dimensions we have chosen correspond to the typical village size in KP, in Punjab, Sindh and Balochistan a cluster of villages (known as *muaza* in Punjab and *deh* in Sindh and Balochistan). This categorization is used officially for administrative purposes and is also the lowest level of aggregation at which the Census data is presented.

Based on the 1998 Census data (adapted for growth) we have taken the average population for muaza and deh in Punjab and Sindh/Balochistan respectively as the unit of analysis for a scheme. Spatial dimensions for the clusters were measured while conducting the Assessment in the field.

It needs to be remembered, therefore, that these are averages and each scheme on the ground will vary in size and scope. The crucial ball park figures on the number of beneficiaries and cost are reasonable approximations.

DESIGN CRIETERIA

3.1 General

Following four projects are identified for Development of the locality.

1 Debris clearance

2 Street pavement (brick pavements)

3 Sanitation

Project Design Features

(1) Debris Clearance :

(A) Removing the deposit silt, mud and other rubble from residential areas by manual labor. This will also include manual excavation. The average length is 800ft, Width 1430 and average depth 2ft of streets pathways and affected areas of the village.

(B) Removal/excavation of deposited silt and rubble from irrigation channels. Average dimension are estimated at 4500 ft in length, 2.5ft width and 3ft depth.

(2) Street Pavement (Brick Pavement):

Brick Pavement of 14000 ft would be provided in streets of the villages and across hamlets in the clusters. Width of pavement would vary from 8-ft to 15-ft depending upon the space available in the streets. Average width is estimated at 10 ft. Total thickness of brick pavements will be 4.5" thick and all the bricks would be laid in panels. An embankment will be formed by earth filling that will serve as base course for the pavement, if necessary. 2" thick sand layer would also be provided over compacted earth filling

(3) Sanitation:

Sanitation works will consist of two distinct components:

(A) Sewerage drain:

Construction of sewerage lines to drain out waste water from households. These drains will then be connected to manholes at appropriate spaces. Total length average: 12000ft, width 2.5 ft with 3" PCC by 1:4:8, PCC: 1:2:4 and 9" masonry walls of drain

(B) Disposal Station

Disposal station consists of a screening chamber, stabilization tank and disposal chamber.

(1)Screening Chamber:

Wastewater from the main sewer line will lead into a 6x 6 feet screening chamber. Screen provided in front of the inlet will check the solid waste floating bodies coming along with the sewage. In the process, the floating bodies will be removed. Then the water will make its way to the septic tank for further treatment.

(2)Stabilization Tank:

Water received from the screening chamber will be stored in a Stabilization tank of 36-ft x18-ft. The water depth of the tank will be 6ft. The stored water in the septic tank will be given a detention period of 24-hours for allowing reactions to take place. During the detention period, sewage is purified and the effluent is conveyed to the disposal chamber for disposal.

(3)Disposal Chamber

Purified water received from stabilization tank will be collected in the 6-ftX6-ft disposal chamber. From the disposal chamber water will be conveyed to the drain through 4" GI pipe with reciprocating pump operated by diesel engine. Diesel engine of 10 hp will be required for this purpose.

Scheme 1
Debris Clearance

Table A18: SUMMARY OF COST

Sr. No.	Description	Detail			Estimated Cost (Rs.)
A	**LABOR**	***NO:OF WORKERS (MAN DAYS)***	***NO: OF WORKERS (100 DAYS OF WORK)***	***WAGE/DAY***	
1	Skilled				
2	Unskilled	28938	289	233	6742554
Sub Total (A)					**6742554**
B	**EQUIPMENT/MACHINERY COST**	***QANTITY***	***UNIT***	***COST***	
1	SHOVEL	80	RS	400	3200000
2	TROLLY(MANNUALL)	60	RS	2500	15000000
3	TRACTOR ON HIRING	3	RS	1500	150000
Sub Total (B)					**18350000**
C	**10% CONTIGENCY**				2509255
Total (A+B+C)					**27,601,809**

Table A19: LABOUR COST

DESCRIPTION	M/DAYS	WAGE /DAY	LABOR COST	TOTAL LABOR COST
SKILLED LABOR				
UN-SKILLED LABOR	28938	289	233	6742554
TOTAL	28938	289	233	**6742554**

Table A20: EQUIPMENT/MACHINERY COST

DESCRIPTION	QUANTITY	PER UNIT COST	UNIT	TOTAL COST
SHOVEL	80	400	RS	3200000
TROLLY (MANNUAL)	60	2500	RS	15000000
TRACTOR HOURS	3	1500	RS	150000
TOTAL				**18350000**

Table A21: QUANTITIES OF MATERIAL & LABOR

Sr. No	Description	Dimensions			Quantity	Unit	Hand Trolley	Labour M/Days		No of workers employed for 100 days	
		Length ft	Width ft	Depth ft			Trips	Skilled labour/days	Unskilled labour/days	Skilled	unskilled
1.00	**Debris clearence**										
a	Remove/excavate deposited/ dameged material of infarstructure due to heavy flood up to 300ft lead.	800.0	1430.0	2.0	2288000.0	CFT	915200.0		28600		286
b	Remove/excavate deposited silt or mud from irrigation channel/watercourses	4500.0	2.5	3.0	33750.0	CFT			338		3
	Total				**2288000.0**	CFT	**915200.0**		**28938**		**289**

Scheme 2
Street Pavement (Brick Pavement)

Table A22: SUMMARY OF COST

SR. NO	DESCRIPTION				Estimated Cost (Rs.)
A	**LABOR**	***NO: OF WORKERS (MAN DAYS)***	***NO: OF WORKERS FOR 100DAYS***	***WAGE/DAY***	
1	SKILLED	1750	18	500	875000
2	UN-SKILLED	6755	68	233	1573915
Sub Total (A)					**2448915**
B	**MATERIAL**	***QUANTITY***	***UNIT***	***UNIT RATE***	
1	BRICKS	784000	1000 NOS	3800	2979200
2	TRIPS OF RIVER SAND	182	TRIPS	600	109200
Sub Total (B)					3088400
C	**EQUIPEMENT/MACHINERY USAGE FOR 100 DAYS**	***QUANTITY***	***PER UNIT COST***	***UNIT***	***TOTAL COST***
1	SHOVEL	20	400	RS	8000
2	HOD	15	250	RS	3750
3	PAIL/BUKKET	20	500	RS	10000
4	TROLLY (MANNUAL)	25	2500	RS	62500
5	PIPE FOR WATERING	2	5000	RS	10000
6	TRACTOR HOURS	2	500	RS	100000
Sub Total (C)					**194250**
D	**10% Contingency**				573157
Total (A+B+C+D)					**6,304,722**

Table A23: MATERIAL COST

DESCRIPTION	**QUANTITY**	**PER UNIT**	**UNIT RATE (Rs.)**	**TOTAL MATERIAL COST**
BRICKS	784000	1000 NOS	3800	2979200
TRIPS OF RIVER SAND	182	TRIPS	600	109200
TOTAL				3088400

Table A24: LABOUR COST

DESCRIPTION	**M/DAYS**	**WAGE /DAY**	**LABOR COST**	**TOTAL LABOR COST**
SKILLED LABOR	1750	500	875000	
UN-SKILLED LABOR	6755	233	1573915	
TOTAL			**2448915**	**2448915**

Table A25: EQUIPMENT/MACHINARY RENT COST

DESCRIPTION	***QUANTITY***	***PER UNIT COST***	***UNIT***	***TOTAL COST***
SHOVEL	20	400	RS	8000
HOD	15	250	RS	3750
PAIL/BUKKET	20	500	RS	10000
TROLLY (MANNUAL)	25	2500	RS	62500
PIPE FOR WATERING	2	5000	RS	10000
TRACTOR HOURS	2	500	RS	100000
TOTAL				**194250**

TABLE A26: QUANTITIES OF MATERIAL & LABOR

Sr. No	Description	NOS	Dimensions			Quantity	Unit	Material Requirements		TRACTOR TROLLY /Hand Trolly	Labour M/Days		No of workers empolyed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Sand (cft)	Trips	Skilled labour/days	Unskilled labour/days	Skilled	unskilled
2	**BRICK PAVEMENT**													
a	Excavation, leveling, watering and hammering		14000.0	10.0	0.8	105000.0	CFT					3500.0		
b	laying sand cuhsion		14000.0	10.0	0.2	22400.0	CFT		22400.0	112.0		280.0		
c	Laying First class bricks with Edging		14000.0	10.0		140000.0	SFT	784000.0			1750.0	2800.0		
d	laying sand On the top of brick pavement to fill joint.		14000.0	10.0	0.1	14000.0	CFT		14000.0	70.0		175.0		
	Total							**784000.0**	**36400.0**	**182.0**	**1750.0**	**6755.0**	**18**	**68**

Scheme 3
Sanitation

Table A27: SUMMARY OF COST

Sr. No.	Description	Detail			Estimated Cost (Rs.)
A	**LABOUR**	***NO:WORKERS (MAN DAYS)***	***NO: OF WORKERS FOR 100DAYS***	***WAGE/DAY***	***TOTAL COST***
1	Skilled	739	7	500	369500
2	Unskilled	2765	27	233	644245
Sub Total (A)					**1013745**
B	**MATERIAL**	***QUANTITY***	***UNIT***	***UNIT RATE***	***TOTAL COST***
1	BRICKS	322198	1000 NOS	3800	1224352
2	CEMENT	3959	BAGS	355	1405445
3	CURSH	9848	PER 100 CFT	3000	295440
4	HILL SAND	13767	PER 100 CFT	1800	247806
5	STONE BALLAST	2304.7	PER 100 CFT	2500	57618
6	IRON GIRD	1	NOS	2500	2500
7	PRE-CAST RCC COVER	2	NOS	2000	4000
8	GI PIE 3"AND 4" L-10 FT	2	FT	1500	3000
9	RCC PIPE 6",9"DIA LENGTH 10 FT	3	NOS	2000	6000
10	DISEL ENGINE 10 HP	1	NOS	45000	45000
Sub Total (B)					**3237161**
C	**EQUIPEMENT/MACHINARY COST**	**QUANTITY**	**PER UNIT COST**	**UNIT**	***TOTAL COST***
1	SHOVEL	30	400	RS	12000
2	HOD	20	250	RS	5000
3	PAIL/BUKKET	5	500	RS	2500
4	TROLLY (MANNUAL)	10	2500	RS	25000
5	PIPE FOR WATERING	2	5000	RS	10000
Sub Total (C)					**54500**
D	**Add 10%Contigency**				430540
Total (A+B+C+D)					**4,735,946**

Table A28: MATERIAL COST

	MATERIAL	QUANTITY	UNIT	UNIT RATE	TOTAL COST
1	BRICKS	322198	1000 NOS	3800	1224352
2	CEMENT	3959	BAGS	355	1405445
3	CURSH	9848	PER 100 CFT	3000	295440
4	HILL SAND	13767	PER 100 CFT	1800	247806
5	STONE BALLAST	2304.7	PER 100 CFT	2500	57618
6	IRON GIRD	1	NOS	2500	2500
7	PRE-CAST RCC COVER	2	NOS	2000	4000
8	GI PIE 3"AND 4" L-10 FT	2	NOS	1500	3000
9	RCC PIPE 6",9"DIA LENGTH 10 FT	3	NOS	2000	6000
10	DISEL ENGINE 10 HP	1	NOS	45000	45000
TOTAL					**3237161**

Table A29: LABOR COST

DESCRIPTION	M/DAYS	WAGE /DAY	LABOR COST
SKILLED LABOR	739	500	369500
UN-SKILLED LABOR	2765	233	644245
TOTAL			**1013745**

Table A30: EQUIPMENT/MACHINERY

DESCRIPTION	*QUANTITY*	*PER UNIT COST*	*UNIT*	*TOTAL COST*
SHOVEL	30	400	RS	12000
HOD	20	250	RS	5000
PAIL/BUKKET	5	500	RS	2500
TROLLY (MANNUAL)	10	2500	RS	25000
PIPE FOR WATERING	2	5000	RS	10000

TOTAL				**54500**

Table A31: QUANTITIES OF MATERIAL & LABOR

Sr. No	Description	NOS	Dimensions			Qty.	Unit	Material Requirements					Labour M/Days		No of workers employed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Cement (Bags)	Sand/Hill sand (cft)	Crush (cft)	Stone Ballast (cft)	Skilled labour days	Unskilled labour days	Skilled	unskilled
3	**Sanitation**															
A	**Sewerage Drain**															
	Excavation		12000.0	2.5	1.5	45000.0	CFT									
	P C C 1:4:8		12000.0	2.5	0.3	9990.0	CFT		1758.2	4395.6	8791.2		83.3	333.0		
	Brick massonary .08'/9-inch		24000.0	0.8	1.2	21060.0	CFT	284310.0	1152.0	5054.4			210.6	421.2		
	PCC 1:2:4		1200.0	1.0	0.1	139.9			20.1	67.2	123.1		1.4	7.0		
	Plaster internal 1:4 by ratio 1/2"		24000.0	1.8		43200.0	**SFT**		345.6	1728.0			288.0	540.0		
	1.Manhole 250 no	**250.0**														
	Excavation		3.0	3.0	2.0	4500.0	CFT							90.0		
	P C C 1:4:8		3.0	3.0	0.5	1125.0	CFT		198.0	495.0		990.0	9.4	37.5		
	Brick massonary 1:4 walls 4		2.0	0.8	1.5	2250.0	CFT	30375.0	0.1	540.0			75.0	45.0		
	PCC 1:2:4		1.0	1.0	0.3	82.5	CFT		11.9	39.6	72.6		0.8	4.1		
	Plaster internal 1:4 by ratio 1/2"		2.0		2.0	4000.0	**SFT**		32.0	160.0			26.7	50.0		

Sr. No	Description	NOS	Dimensions			Qty.	Unit	Material Requirements					Labour M/Days		No of workers employed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Cement (Bags)	Sand/Hill sand (cft)	Crush (cft)	Stone Ballast (cft)	Skilled labour days	Unskilled labour days	Skilled	unskilled
B	**Disposal Station**															
	1.Screening Chamber															
	Excavation															
	L/walls	2	8.75	2	6.5	227.50	cft									
	S/Walls	2	4.75	2	6.5	123.50	cft									
	Flooring	1	6	6	5.33	191.88	cft									
	Total Excavation					**542.88**	**cft**							6.8		
	PCC 1:4:8															
	L/Walls	2	8.75	2	0.5	17.50	cft									
	S/Walls	2	4.75	2	0.5	9.50	cft									
	Flooring	1	6	6	0.5	18.00	cft									
	Total PCC 1:4:8					**45.00**	**cft**		7.9	21.6		39.6	0.4	1.5		
	PCC 1:2:4															
	Flooring	1	6	6	0.33	11.88	cft									
	Topping	4	6.75	0.75	0.167	3.38	cft									
	Total PCC 1:2:4					**15.26**	**cft**		2.2	7.3	13.4		0.2	0.8		
	B/Masonary in 1:4 C/Sand															
	L/Walls 1st Step	2	8.25	1.5	0.5	12.38	cft									
	L/Walls 2nd	2	7.875	1.125	1	17.72	cft									

Sr. No	Description	NOS	Dimensions			Qty.	Unit	Material Requirements					Labour M/Days		No of workers employed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Cement (Bags)	Sand/Hill sand (cft)	Crush (cft)	Stone Ballast (cft)	Skilled labour days	Unskilled labour days	Skilled	unskilled
	Step															
	L/Walls 3rd Step	2	7.5	0.75	6.33	71.21	cft									
	S/Walls 1st step	2	5.25	1.5	0.5	7.88	cft									
	S/Walls 2nd Step	2	5.625	1.125	1	12.66	cft									
	S/Walls 3rd Step	2	6	0.75	6.33	56.97	cft									
	Total Brick Masonary					**178.81**	**cft**	2413.901	8.6	42.9			6.0	3.6		
	Plastering(1:3)															
	Interior Side of Chamber	4	6	6.5		156.00	Sft									
	Exterior Side up to 2-ft	4	7.5	2		60.00	Sft									
	Total Plastering					**216.00**	**Sft**		1.7	8.6			1.4	2.7		
	Iron Grid					**1.00**	**Nos**									
	2.Disposal Chamber															
	Excavation															
	L/walls	2	8.75	2	8.25	288.75	cft									
	S/Walls	2	4.75	2	8.25	156.75	cft									
	Flooring	1	6	6	7.58	272.88	cft									
	Total Excavation					**718.38**	**cft**							9.0		
	PCC 1:4:8															

Sr. No	Description	NOS	Dimensions			Qty.	Unit	Material Requirements					Labour M/Days		No of workers employed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Cement (Bags)	Sand/Hill sand (cft)	Crush (cft)	Stone Ballast (cft)	Skilled labour days	Unskilled labour days	Skilled	unskilled
	L/Walls	2	8.75	2	0.5	17.50	cft									
	S/Walls	2	4.75	2	0.5	9.50	cft									
	Flooring	1	6	6	0.5	18.00	cft									
	Total PCC 1:4:8					**45.00**	**cft**		7.9	19.8		39.6	0.4	1.5		
	PCC 1:2:4															
	Flooring	1	6	6	0.33	11.88	cft									
	Topping	4	6.75	0.75	0.167	3.38	cft									
	Total PCC 1:2:4					**15.26**	**cft**		2.197692	7.32564	13.43034		0.15262	0.7630875		
	B/Masonary in 1:4 C/Sand															
	L/Walls 1st Step	2	8.25	1.5	0.5	12.38	cft									
	L/Walls 2nd Step	2	7.875	1.125	0.5	8.86	cft									
	L/Walls 3rd Step	2	7.5	0.75	8.583	96.56	cft									
	S/Walls 1st step	2	5.25	1.5	0.5	7.88	cft									
	S/Walls 2nd Step	2	5.625	1.125	0.5	6.33	cft									
	S/Walls 3rd Step	2	6	0.75	8.583	77.25	cft									
	Total Brick Masonary					**209.24**	**cft**	2824.784	*10.04*	50.22			1.39496	2.6155406		
	Plastering(1:3)															
	Interior Side of Chamber	4	6	8.75		210.00	Sft		1.68	8.4			1.4	2.625		

Sr. No	Description	NOS	Dimensions			Qty.	Unit	Material Requirements					Labour M/Days		No of workers employed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Cement (Bags)	Sand/Hill sand (cft)	Crush (cft)	Stone Ballast (cft)	Skilled labour days	Unskilled labour days	Skilled	unskilled
	Exterior Side up to 2-ft	4	7.5	2		60.00	Sft									
	Total Plastering					**270.00**	**Sft**									
	Precast RCC cover for chamber	1				1.00	Nos									
	GI pipe of 4" dia for disposal					15.00	RFt									
	GI pipe of 3" dia for disposal					10.00	RFt									
	Diesel Engine 10 HP					1.00	Nos									
	Excavation of disposal channel	1	1130	3	5	16950.00	cft									
	3. Stablization Tank															
	Excavation															
	L/walls	2	36	1.5	0.5	54.00	cft									
	S/Walls	2	18	1.5	0.5	27.00	cft									
	Flooring	1	36	18	11.08	7179.84	cft									
	Trapezoidal Sides (Long Sides)	2	36	78.78		5672.16	cft									
	Trapezoidal Sides (Short Sides)	2	18	78.78		2836.08	cft									

Sr. No	Description	NOS	Dimensions			Qty.	Unit	Material Requirements					Labour M/Days		No of workers employed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Cement (Bags)	Sand/Hill sand (cft)	Crush (cft)	Stone Ballast (cft)	Skilled labour days	Unskilled labour days	Skilled	unskilled
	Total Excavation					**15769.08**	**cft**							197.1135		
	PCC 1:4:8															
	L/Walls	2	36	1.5	0.5	54.00	cft									
	S/Walls	2	18	1.5	0.5	27.00	cft									
	Flooring	1	36	18	0.5	324.00	cft									
	Trapezoidal Sides	1	108	18.5	0.5	999.00	cft									
	Total PCC 1:4:8					**1404.00**	**cft**		247.104	617.76		1235.5	11.7	46.8		
	PCC 1:2:4															
	Flooring	1	36	22	0.33	261.36	cft									
	Topping	2	108	0.75	0.167	27.05	cft									
	Trapezoidal Sides	1	108	18.5	0.33	659.34	cft									
	Total PCC 1:2:4					**947.75**	**cft**		136.4766	454.9219	834.0235		9.47754	47.3877		
	B/Masonary in 1:4 C/Sand															
	L/Walls 1st Step	2	36	1.125	0.5	40.50	cft									
	L/Walls 2nd Step	2	36	0.75	1.33	71.82	cft									
	S/Walls 1st step	2	18	1.125	0.5	20.25	cft									
	S/Walls 2nd Step	2	18	0.75	1.33	35.91	cft									
	Total Brick Masonary					**168.48**	**cft**	2274.48	8.08704	40.4352			5.616	3.3696		

Sr. No	Description	NOS	Dimensions			Qty.	Unit	Material Requirements					Labour M/Days		No of workers employed for 100 days	
			Length ft	Width ft	Depth ft			Bricks (Nos)	Cement (Bags)	Sand/Hill sand (cft)	Crush (cft)	Stone Ballast (cft)	Skilled labour days	Unskilled labour days	Skilled	unskilled
	Plastering(1:3)															
	Interior Side of Walls	2	108	2		432.00	Sft									
	Exterior Side up to 2-ft	2	108	2		432.00	Sft									
	Total Plastering					**864.00**	**Sft**		8.08704	8.08704			5.76	10.8		
	TOTAL							**322198**	**3959**	**13767**	**9848**	**2305**	**739**	**2765**	**7**	**27**