

PROJECT REPORT

1. Introduction:

Jhalawar town is situated in south east of Rajasthan State. It is a border district and is surrounded by Kota district of Rajasthan in northwest and border of Madhya Pradesh State in rest of the periphery. The latitude and longitude of the district varies from 24°45'20" N to 24 ° 52'17" N and 75 ° 27'35" E to 76 ° 56'48" E respectively.

The Vindhyan ranges passes through this district and some portions of the land are hilly and rocky. Jhalawar is a district having abundant water availability and above average rainfall.

Jhalawar town is mainly situated on the banks of Kalisindh & Ahu river. Both the rivers are tributary of river Chambal and join near Gagron fort of Jhalawar. The confluence of river Kalisindh & Ahu is as below:



Confluence of Kalisindh & Ahu river

The river after confluence point traverses through a nearly narrow vertical Gorge. The approximate length of Gorge is nearly 2.0 Kms.

In this section, there exists a very narrow section named as Balinda Ghat which is shown below:



D/S view of BALINDA GHAT



U/S view of BALINDA GHAT

During the times of high flood, either in river Kalisindh or in river Ahu, the available river section at Balinda Ghat unable to pass the full discharge without causing afflux & thus causes back water effect which in turn causes increase in water level near Jhalawar town which in turn results in flooding of the low-lying colonies & agriculture fields as well.

Due to this constricted flow and back water effect from Balinda Ghat, there is also back flow in the various local streams joining Kalisindh river which further causes flooding of the areas situated near these local streams viz Khandiya near Dhanwara colony and near sewerage treatment plant. The flood prone area on google network is enclosed at Plate 1.

2. Flood Affected Areas:

Due to the above mentioned back water effect, local drains draining in river Kalisindh causes flooding of various areas. The colonies of Jhalawar town situated at following levels which are in endanger from submergence during high flood are as follows:

S. No.	Colony/Basti
1	Khandiya Colony
2	Dhanwara Colony
3	Basera Mohalla
4	Gagron Road Basti
5	Panchkuia
6	Idgah Road

खाल में बहे दो

जने, एक लापता भवानीमंडी अकखेड़ी और मण्डलाड़ी के बीच खाल में जनिवार दोपहर करीब तीन बजे खाल में दो जने छह मर। कुछ देर बाद करीब आधा दिनांक दूर एक जना किनारे लग गया। इससे जो बच गया। दूसरे का पता नहीं चला। पटनामवल तक जाने वाले मार्ग के बीच इंदरगिरा व मोल्दा के मार्गों में भी भारी उफान से प्रशासन देर घाम तक भीकें पर नहीं पहुंच सका। जलसिंधार मलमोलन गुला ने बताया कि अकखेड़ी निवासी बालुमिंद (58) पुत्र मंगल सिंह और देवीलाल मेघवाल (70) जिन से अकखेड़ी लौट रहे थे, दोनों एक दूसरे का हाथ चककर नंगा पर कर रहे थे, तभी तेज उपरन में जा गए। सूचना पर जलसिंधार खाना हुए, लेकिन हठबलित व मोल्दा के मार्गों में भी भारी उफान से जे घटनास्थल तक नहीं पहुंच सका। शाम करीब 6 बजे प्रशासन को सूचना मिली की बालुमिंद अंधा किमी दूर किनारे लग गया। जहां दूसरे का पाग नहीं पता सका।



इलाहाबाद में दुर्गेश मार्ग पर बहता बरिस का पानी। फोटो



तेजाव जे खाल पर कही गुलिका पर आटा पछी



सुनेस में राजकीय बालिका उच्च माध्यमिक विद्यालय की छिन्नी चार डैबरी।

बारिश नदियों में उफान, सड़कों पर पानी

पश्चिम बंगाल सेटर्क
राजधानी नगर में बारिश के अकखेड़ी निवासी बालुमिंद (58) पुत्र मंगल सिंह और देवीलाल मेघवाल (70) जिन से अकखेड़ी लौट रहे थे, दोनों एक दूसरे का हाथ चककर नंगा पर कर रहे थे, तभी तेज उपरन में जा गए। सूचना पर जलसिंधार खाना हुए, लेकिन हठबलित व मोल्दा के मार्गों में भी भारी उफान से जे घटनास्थल तक नहीं पहुंच सका। शाम करीब 6 बजे प्रशासन को सूचना मिली की बालुमिंद अंधा किमी दूर किनारे लग गया। जहां दूसरे का पाग नहीं पता सका।

स्कूल की चार-दीवारी धराशायी

सुनेस कस्बे में जनिवार सुबह से हुई बारिश से राजकीय बालिका कन्याशाला में रेस्क्यू ऑपरेशन कर छवी के एग्से से करीब 55 बहिला-पुल्लो ब बच्चों की घरे से निकाल कर सुरक्षित स्थानों पर पहुंचाया।

बस्तियों में भरा पानी, बचाव दल ने सुरक्षित निकाला

धवानीमंडी शहर की कलाव कालीनी की कच्ची के परिवारों को प्रशासन व नगर पालिका कर्मचारियों ने रेस्क्यू ऑपरेशन कर छवी के एग्से से करीब 55 बहिला-पुल्लो ब बच्चों की घरे से निकाल कर सुरक्षित स्थानों पर पहुंचाया।



3. Background Note, Survey & Investigations:

Earlier in year 2006-07, studies were conducted for widening of Balinda Ghat to protect Jhalawar town from flood by Water Resources Department. As per records available it was observed that there is a 2 Km long gorge at Balinda Ghat in the D/S of confluence of Kalisindh & Ahu river. The event of heavy rainfall in the catchment areas of Ahu & Kalisindh river resulted in maximum inflow which failed to pass through the gorge at Balinda Ghat and thus resulted in flooding of Jhalawar city & nearby villages. As per the studies conducted previously, an estimate amounting to Rs 2.00 crores was prepared for widening of Balinda Ghat but somehow the work could not be executed.

The proposal for widening of Balinda Ghat was submitted to the Chief Engineer ID&R WR Unit JLN Marg Jaipur vide Additional Chief Engineer Water Resources Zone Kota letter no. Petition/276-282/ACE/WR/Tech/06/1228 dated 22.1.2007.

CE IDR Jaipur vide letter no. CE/ID&R/DD/T821/1327 dated 26.2.2007 desired various data which are as follows:

- a) Index Plan on GT Sheet of scale 1:2,50,000.
- b) Catchment area plan of Kalisindh river upto Balinda Ghat.
- c) Irrigation projects with their catchment areas lying in catchment area of Balinda Ghat.
- d) X sections of Balinda Ghat at 50 m intervals in region in which the widening of existing cross section is needed.
- e) L section of Balinda Ghat for 3.0 km U/S and 3.0 km D/S from the proposed site.
- f) HFL marked on cross section & L Section of river to estimate the peak flood.
- g) Equivalent stream/river slope at Balinda Ghat site.
- h) Possibility of saving Jhalawar city by raising river banks.
- i) Geological investigations of various river banks at Balinda Ghat.

- j) Safe highest flood level at Balinda Ghat so that Jhalawar city is not subjected to flooding.

Additional Chief Engineer WR Zone Kota vide letter no. 15446-49 dated 14.8.2007 (enclosed for ready reference) submitted the desired information, but somehow the matter couldn't be finalized.

The preliminary feasibility reports are prepared based upon the data available in the offices & cross sections, topographic survey as per the google maps.

4. Hydrology & Deign Flood:

As per the guidelines/recommendations of Ganga Flood Control Commission for flood control works, it is recommended to adopt flood of design flood level at

- 25 year flood frequency for protection of agriculture land.
- 100 year flood frequency for protection of townships, industrial areas.

In view of the above, design flood frequency of 100 years return period may be considered. The hydrology of the project was examined at ID& R Organization Jaipur and vide Chief Engineer SWRPD (ID&R Wing) letter no. 178 dated 10.06.2016 the designed flood for such flood protection works has been estimated as 26467 cumecs.

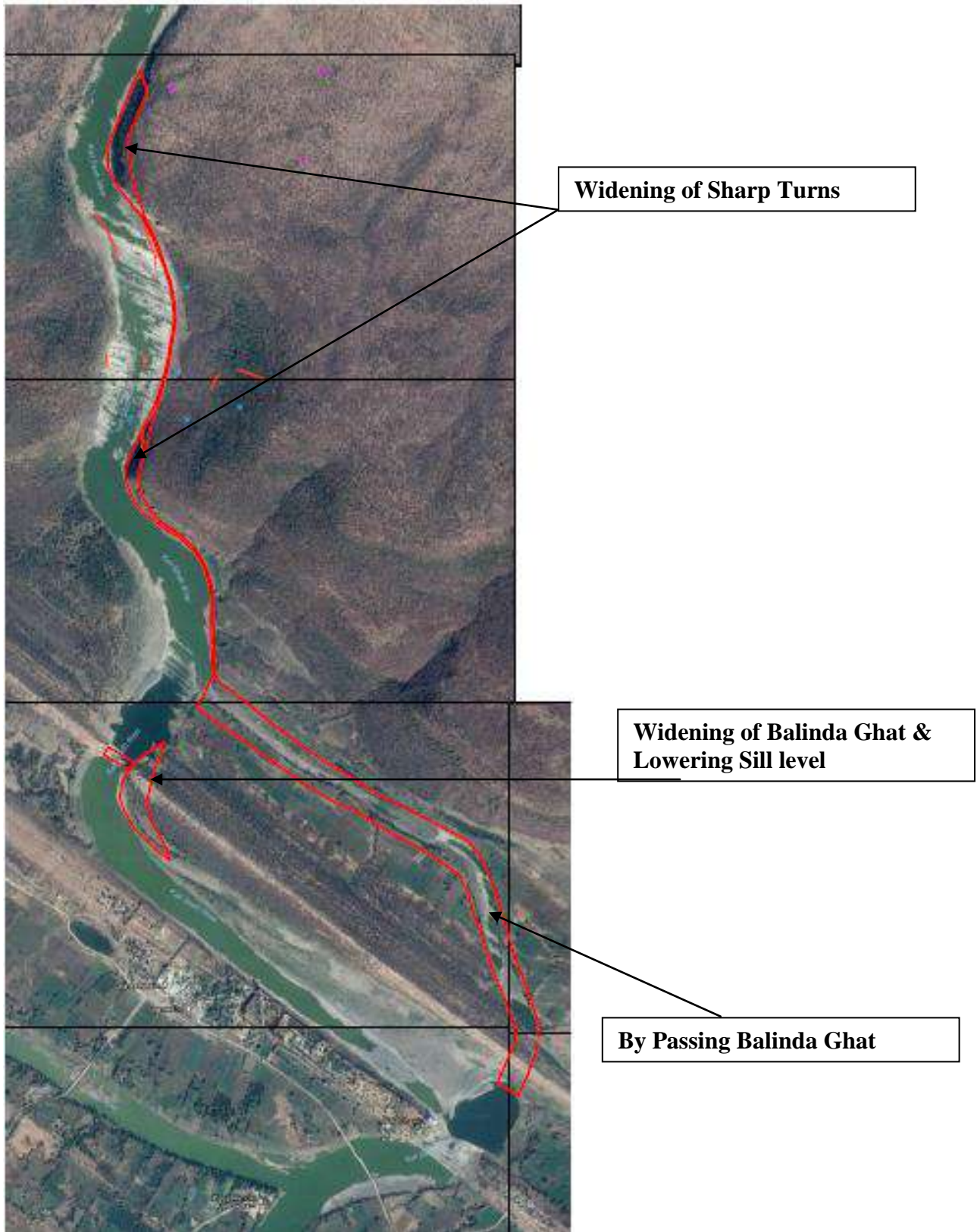
Accordingly, this flood protection works has been deigned at flood magnitude of 26400 cumecs.

5. Possible Solution for improvement of Drainage Path:

To provide relief to the residents of Jhalawar town, the possible solutions are bifurcated into flowing sub works:

- **Part A** **-Lowering sill level of Balinda Ghat**
- **Part B** **-Widening of existing constricted section of Balinda Ghat**
- **Part C** **-Partial Bypassing Balinda Ghat during events of high Flood**
- **Part D** **-Widening of two sharp turns on Kalisindh River at D/S of Balinda Ghat**

The proposed drainage path improvement of Kalisindh river is depicted as below:

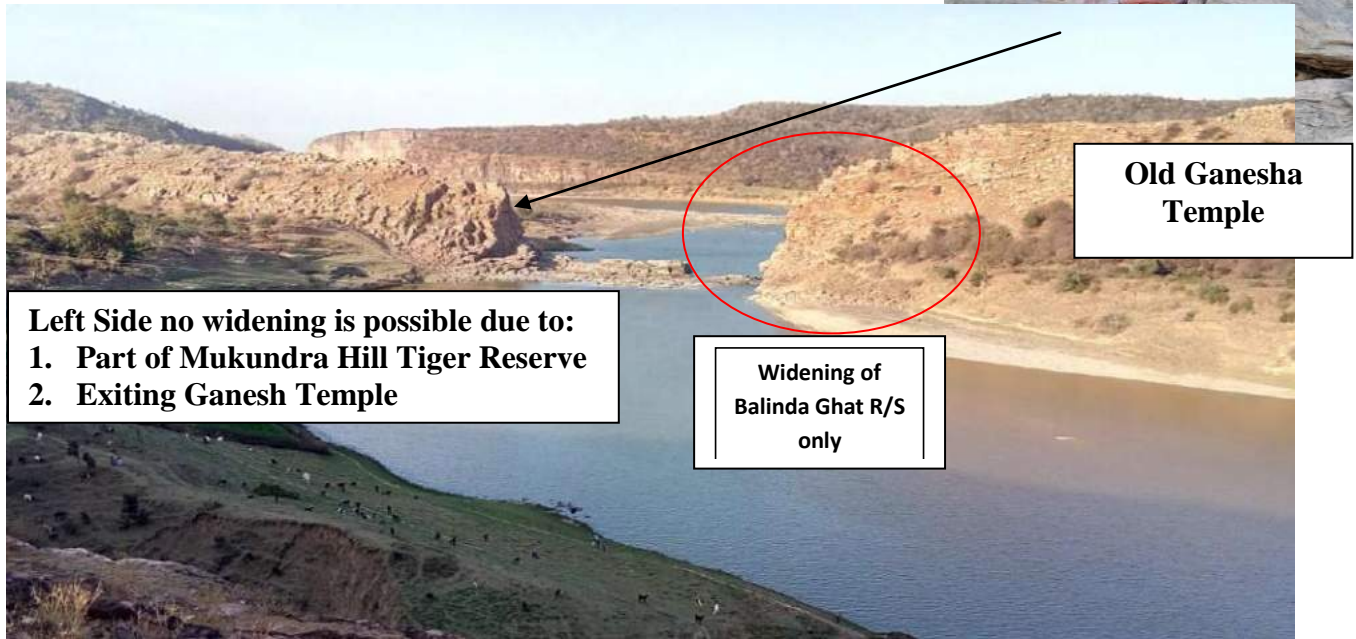


PART A: Lowering Sill Level of Balinda Ghat



Part A - Lowering sill level of Balinda Ghat

Part B: Widening of Balinda Ghat



U/S View of Balinda Ghat

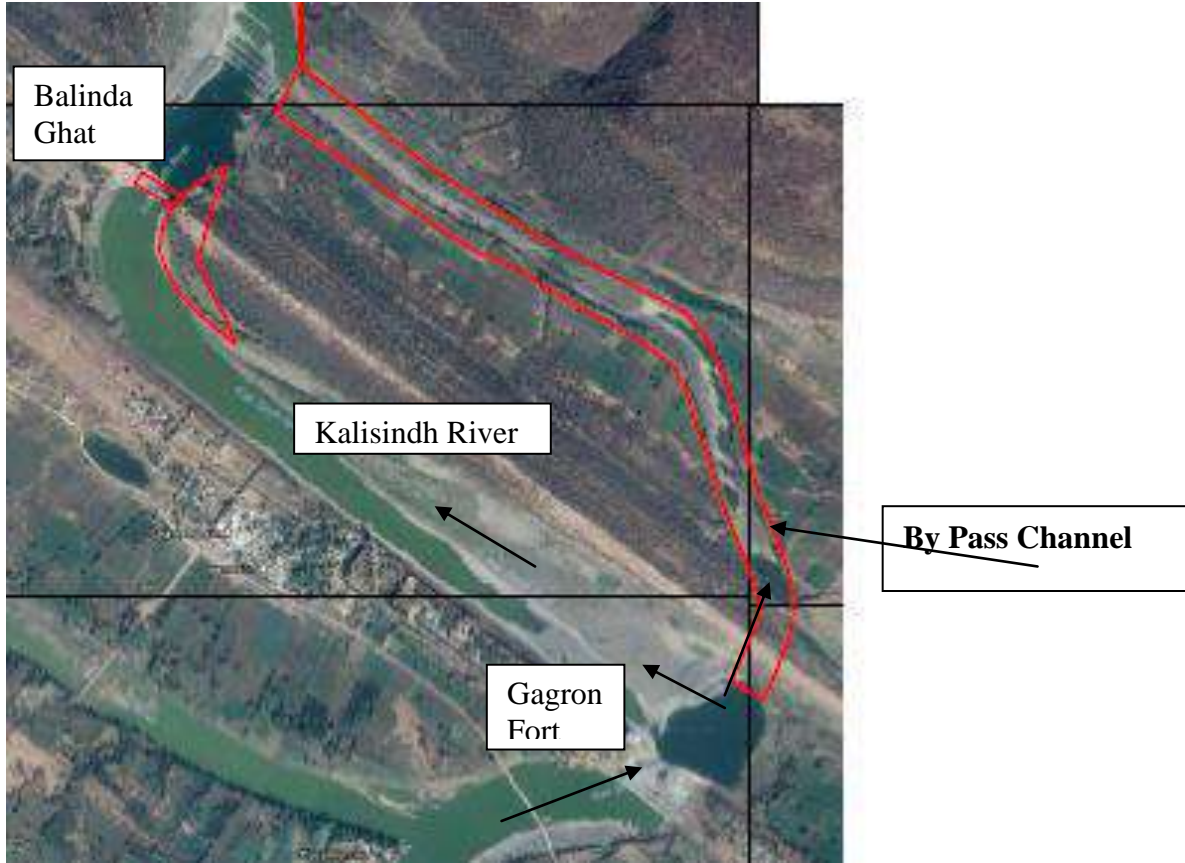


D/S View of Balinda Ghat

Part B - Widening of existing constricted section of Balinda Ghat

Part C: Partial Bypassing Balinda Ghat during events of high Flood

At Balinda Ghat, Kalisindh River is bifurcated into two streams



Part C - Partial Bypassing Balinda Ghat during events of high Flood

Part D: Widening of 2 nos sharp turns at D/S of Balinda Ghat



Part D - Widening of two sharp turns on Kalisindh River at D/S of Balinda Ghat

6. Limitations:

The drainage area proposed for improvement and disposal of muck lies in Forest land. The left bank of Kalisindh river beyond Balinda Ghat is the boundary of Mukundra Hills National Park and also there exists an old temple of Lord Ganesha whereas the right flank lies in protected forest. Therefore, the entire drainage path improvement works are proposed on the right flank of Kalisindh river thereby protecting the National Park and old Ganesha Temple. The details of the forest area proposed for diversion is as under:

S. No.	Work Component	Name of Village/ Block	Khasra No.	Area Proposed for Diversion in sqm
1	Part C -Partial Bypassing Balinda Ghat during events of high Flood with disposal of muck	Changeri/ Jhalarapatan	4	2978
			43	346
			3	193715
			5	1942
		Hichar/ Khanpur	387	728
			385	38348
		Sub Total		
2	Part D -Widening of two sharp turns on Kalisindh River at D/S of Balinda Ghat	Hichar/ Khanpur	384	6335
			348	45748
			382	3017
		Sub total		
3	Approach Road	Hichar/ Khanpur	385	2503
			384	3987
			348	203
			382	447
			381	1694
			380	4409
		Sub Total		
G Total			306400	
			30.64 Ha	

While framing the proposal, efforts have been made to prevent National park and old Ganesha Temple which is adjoining to left flank of Kalisindh river.

In addition to diversion of above forest land, total land requirement of the work is estimated as:

SN	Purpose	Govt Land in Sqm	Pvt Land in Sqm	Forest Land in sqm	Total Land in sqm
1	Widening of river	41810	-	55100	96910
2	Partial By Pass Channel and disposal area	-	2654	238057	240711
3	Approach Road	-	-	13243	13243
	Total	41810 sqm 4.18 Ha	2654 sqm 0.26 Ha	306400 sqm 30.64 Ha	350864 sqm 35.0864 Ha

7. Engineering Aspects (estimated lowering of HFL)

- a. Flood Discharge:** Flood discharge for these studies is determined/vetted from ID&R Jaipur is 26400 cumecs and accordingly calculations are carried out.
- b. Back Water Studies:** Back water studies have been computed as per conveyance factor method.

The flow parameters i.e. wetted area & perimeter available at different cross sections viz. (i) At Harish Chandra Sagar Pickup weir (most D/S point) (ii) 2nd Sharp Turn (iii) 1st Sharp Turn (iv) Balinda Ghat and (v) Gagrion fort are used for study. The existing wetted area & perimeter at these locations is given at Table 1 whereas existing cross-sections are attached at Dwg 1. The modified/proposed cross-sections after cutting is enclosed at Dwg 2 with its modified wetted area & perimeter at Table 2.

The computed water profile elevation under existing sections & proposed sections are given at Table 3 and Table 4 respectively.

Other flow parameters such as Manning's coefficient, slope etc. are taken same in both the conditions i.e. existing profile & modified profile. The Manning's coefficient has been taken as 0.025 during high floods; surface irregularities are insignificant in comparison to flow magnitude. The slope is taken same as per in Hydrological studies of Kalisindh Dam i.e. 1.38 m per km length.

As per above, it is estimated that HFL of the river will be lowered to the tune of 1.5 - 2 m after modifying the existing river profile.

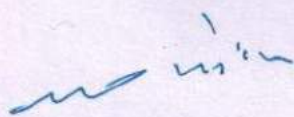
8. Cost Estimates:

The flood mitigation work may be executed in phases. Firstly, action for widening & lowering sill level of Balinda Ghat may be executed & thereafter work of Bye Pass Channel may be taken up and in last phase widening of two nos. sharp curves may be taken up.

The cost estimate for the work is prepared on the basis of schedule of rates as per BSR WR Jhalawar district 2014. The total cost has been calculated as Rs. 1492.85 lacs.

Head-wise cost estimate for the work is as below:

ABSTRACT OF PROJECT COST						
			(Rs in Laacs)			
S. No.	Particulars		Priority I	Priority II	Priority III	Total
1. Direct Charges of Works						
Sub heads						
1	A -	Preliminary (1% of 'C' works)	1.53			1.53
2	B -	Land 0.26 Ha acquisition of private land @ Rs 30 Lac/Ha)	7.80			7.80
3	C -	Works (as per details)	153.05	431.01	603.96	1188.02
4	K -	Buildings				0.00
5	M -	Plantation	0.00			0.00
6	O -	Miscellaneous (1% of C works)	1.53	4.31	6.04	11.88
7	P -	Maintinance				0.00
8	Q -	Special T & P	0.00			0.00
9	R -	Communications				0.00
10	X -	Environment & Ecology NPV, CA etc charges for diversion of 30.64 Ha Land) Provision of @ Rs 2 Lac/Ha	61.28			61.28
	I.	Total of works	225.19	435.32	609.99	1270.51
		Add protata Charges @ 17.5%	39.41	76.18	106.75	222.34
		GRAND TOTAL	264.60	511.50	716.74	1492.85


(धीरू जीहरी)
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खण्ड झालावाड