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- (1) பக்கங்களின் எண்ணிக்கை 18
(2) புதுக்கித் திருப்பிய நாள் 18/5/78
(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம் 3

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

பெரியசாலை
2-வது
பெரியசாலை
துறை

அரசாணை எண்.	400 I	அச்சகம்
மு. கோப்புத் தாள் எண்.	1429	பலவகை
நாள் :	13-5-1878	
	18-5-1878	10-6-1878

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

1427

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

13th May 1878, No. 400 I.

Read the following papers :— Irrigation.

No. 55. Endorsement of the Chief Engineer for Irrigation, dated Fort St. George, 25th February 1878, No. 50 I.

From T. D. HARRIS, Esq., District Engineer, Ganjam, to the Chief Engineer for Irrigation, dated Berhampore, 5th February 1878, No. 45.

I HAVE the honor to forward herewith copy of a petition from the ryots of Ganjam regarding the irrigation of their lands, together with copy of letter to the Collector, on the subject for consideration.

PETITION from the Ryots of Ganjam, to the District Engineer of Ganjam.

THE humble petition of the ryots and inamdars of Ganjam, Palibanda, Damodarpur, and Kanchipuram of Ganjam Sub-division in Ganjam district.

We 404 ryots, inamdars, and inhabitants of the above villages most humbly beg to lay our grievances before your honor, so that the deplorable circumstances attending us may be got rid of by your honor; and we fully hope that your honor in finding a remedy for the calamity which has been ravaging us for the last nine or ten years from a disastrous paucity of rains and the consequent failure of crops, will seek a permanent means whereon we may depend on our agricultural pursuits and cultivate our lands, as all expectations of realizing our labors in cultivation barely depending upon rains had become from our experience of the last ten years a mere delusion and snare.

What we mean by permanent means is to provide for us a permanent source of irrigation for the cultivation of our lands. This your honor is aware can be done by utilizing the waters of Mullada Tampara. Five years ago we petitioned C. G. Master, Esq. and Captain Beckley; the latter gentleman having got up the surveys of Mullada Tampara had reported with his full investigations the project quite feasible, and he even was pleased to explain the method in which he proposed the scheme. His words, we remember, made lively impression upon our minds, as they are "to stem the Korakori river, divert its waters to Mullada Tampara, and thence to let down the united waters into a butty dug for the purpose of irrigating our lands."

We look and depend upon your honor to revive this long-since forgotten scheme and protect us and our families, consisting in all upwards of 3,000 souls. This project will not only prevent the recurrence of disasters such as had been experienced by us during the last ten years, but will make us happy, providing us with plenty of food, and besides being thus useful to us it will extend its utility to the zemindary lands of Birdy, Hooma and Paloor, and be remunerative to Government.

There is considerable distress among us and many who could not realize even seeds from the yield of last year's crops have been so discouraged as not to till their lands. Not only have we to suffer for want of food, but our cattle are worse off, for there has been no proper outturn of straw from our fields, there are no pastures for cattle to graze upon, and there is no water for the use of human beings and beast as the tanks are quite dried up.

There is a likelihood of dire distress to befall us in a short time, as we see it impending already from the symptoms already presented to our conceptions.

We therefore with one voice deplore our calamitous circumstances to your honor to undertake our cause and thereby avert the impending calamity.

The annexed is the statement of wet and dry land in the four villages above-mentioned with the net revenue of all kinds paid to Government by us, and we agree to pay one-eighth upon every acre for water-tax :—

Ganjam—		A. CTS.		RS. A. P.		A. CTS.		RS. A. P.	
Jerayati wet land	...	679	7	1,434	3	5			
Inam do.	...	79	0	26	8	0			
Jerayati dry land	...	170	3	186	5	3			
Inam do.	...	4	1						
		933	10	1,647	0	8			
Road-tax	...			122	1	7			
				933 40	1,769	2 3			

	A. CTS.	RS.	A.	P.	A. CTS.	RS.	A.	P.
Palibundat—								
Jerayati wet land ...	28 53	656	0	0				
Inam do. ...	22 53	0	12	0				
Jerayati dry land ...	30 73	32	11	4				
Inam do. ...	1 3	1	0	0				
	382 82	690	7	4				
Road-tax ...		45	15	10				
		382 82	736	7 2				
Damodarapuram—								
Jerayati wet land ...	103 75	224	7	2				
Inam do. ...	8 13	0	4	0				
Jerayati dry land ...	22 86	83	0	11				
Inam do. ...	7 73							
	182 47	307	12	1				
Road-tax ...		20	3	4				
	182 47	327	15	5				
		182 47	327	15 5				
Cunchipuram—								
Jerayati wet land ...	57 27	195	9	5				
Inam do. ...	17 9							
Jerayati dry land ...	28 10	35	11	4				
Inam do. ...	1 69	0	8	0				
	102 25	238	2	9				
Road tax ...		16	4	7				
		102 25	254	7 4				
		1,600 94	3,088	0 2				

From T. D. HARRIS, Esq., District Engineer, Ganjam, to the Collector of Ganjam, dated Berhampore, 4th February 1878, No. 369.

I HAVE the honor to forward herewith copy of a petition from the ryots of Ganjam for your kind consideration. I have forwarded the original to the Chief Engineer; this is only one of the many I have received from the ryots in the district regarding the irrigation of their lands. I can recommend the project; it is needless for me to say more, but I can safely affirm that it is a pity such works have been so long deferred.

SUBMITTED for the consideration of Government.

2. The Mullada Tampara Project is one of many improvements the carrying out of which is dependent upon the increase of the ordinary grant for irrigation. Had famine relief-works been undertaken in Ganjam, probably it would have been carried out. Major Beckley's estimate amounts to Rupees 18,258, and the remark made on the scheme by the undersigned when preparing the lists of works available for relief purposes was, "the work appears to be likely to prove beneficial and remunerative." There is no money available for Major Works in 1878-79.

(Signed) JOHN MULLINS, Lt.-Col., R.E.,
Chief Engineer for Irrigation.

No. 55-A

Read the following Proceedings of the Madras Government in the Revenue Department, dated 3rd June 1875, No. 864.
Proceedings of the Board of Revenue, dated 21st May 1875, No. 1,381.
From R. DAVIDSON, Esq., Acting Collector of Ganjam, to the Acting Secretary to the Board of Revenue, dated Chatterpore, 19th April 1875, No. 915.
ADVERTISING to paragraph 3 of the Board's Proceedings of the 8th February last, No. 286, on the subject of the Mullada Tampara or Korakori Ancient Project, I have

the honor to enclose translation of a letter, dated 9th instant, which the Zemindar of Biridy has written to me after I had personally explained to him all the circumstances of the case.

2. It will be observed that he assents to the proposal set forth in paragraph 12 of Major Beckley's report recorded in the Board's Proceedings under reply, with the following provisos, viz.:—

(1.) That the land to be given up by him for embankments, &c., should not exceed 50 or 60 acres.

Note.—This extent will, I believe, suffice for the purpose.

(2.) That the existing bed of the Mullada Tampara should not be enlarged.

Note.—It is not intended that the bed should be enlarged, vide paragraph 10 of Major Beckley's report recorded in the Board's Proceedings under reply.

(3.) That a calingulah should be built at the head of the channel which will be excavated from the Tampara, so as to discharge its surplus water and thus prevent the lands in the vicinity being inundated at times when the water may be excessive.

Note.—It is intended that provision should be made to prevent flooding, and, if the calingulah is really necessary, it should be constructed.

(4.) That he should be allowed to open minor channels wherever necessary to irrigate his lands, and get water both from the main channels and from the Tampara free of charge.

Note.—Digging of minor channels will be allowed, vide paragraph 12 of Major Beckley's report.

3. The Zemindar is not inclined to pay any water-rate, and I gather from the Board's Proceedings under reply that no cess will be demanded from him. It is this consideration that has now removed the difficulty that was experienced in coming to terms with the Zemindar before.

4. In estimating the returns from this irrigation in my letter of the 13th October 1874, No. 2,211, recorded in the Board's Proceedings under reply, I included a sum of Rupees 307 on account of water-cess payable by the Biridy Zemindar at 2½ Rupees an acre for 123 acres of rain-fed paddy land of his zemindari, which will be irrigated by the proposed works. This sum is not to be expected under the circumstance above explained.

ENCLOSURE No. 1.—Translation of Arzi.

SUBMITTED to Government with reference to G.O., dated 4th March 1875, No. 355.

2. The Biridy Zemindar has consented to the execution of the project on terms which seem to the Board satisfactory.

(A true Copy and Extract.)

(Signed) H. E. STOKES,
Acting Secretary.

REFERRED to the Public Works Department in continuation of G.O., dated 4th March 1875, No. 355.

(True Extract.)

(Signed) A. MACGREGOR,
Acting Secy. to Govt.

Statement showing the particulars of Land which will be irrigated by the Mullada Tampara Project.

4

PUBLIC WORKS DEPARTMENT, 13TH MAY 1878, No. 400 I.

The Government of Madras will be irrigated by the Mullaata Tampara Project.

Taluk.		TOTAL EXTENT OF CULTIVATION IN THE VILLAGE.										EXTENT OF LAND WHICH WILL BE IRRIGATED BY THE PROJECT.										
1	2	3	DAY.		WET.		GARDEN.		TOTAL.		12	13	JERAYAT.					ISAM.			21	
			Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment.			Wet Land which will be converted into Wet Cultivation.	Rain-fed Paddy Land which will be irrigated.	Wet Land already irrigated, but which will receive better supply.	Unirrigated Land which will be hereafter irrigated.	Land already irrigated but which will receive better supply.					
		ACRES.	RS.	ACRES.	RS.	ACRES.	RS.	ACRES.	RS.	ACRES.	RS.	RS.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	
Khalilada		892	78	73	679	922	..	..	1,000	600	..	..	..	..	..	..	..	..	..	..	16	
Birdy		210	29	23	135	294	..	..	164	323	..	..	..	..	..	..	..	..	..	..	16	
1. Battia ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
1. Santosapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
2. Hattavanavagam ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
3. Mollado ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
4. Bahabapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
5. Sreebema ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
6. Kanchapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
7. Khandaidevuli Battimalo ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
8. Borigam ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
9. Kartikedi ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
10. Khotia Rama Chendrapuram Easman ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
11. Hummiri Dharmasarenapuram Nasanapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
12. Palasingipalli Agraharam ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
13. Bhuvabhuri ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
14. Kontipally ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
15. Ramchendrapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
16. Chinnia Pourase ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
17. Nondanapally ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
18. Nandagohiri ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
19. Ravulebandho ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
20. Borsda ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
21. Kalianapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
22. Jagannadapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	

PUBLIC WORKS DEPARTMENT, 13TH MAY 1878, No. 400 I

5

23. Longura ..	289	70	91	164	344	..	..	254	435	435	..	..	..	..	64	64	..	36	36
24. Jhainkudla ..	1,066	16	20	970	1,566	..	..	986	1,585	1,586	..	..	..	..	675	675	..	295	295
25. Jompodora ..	185	6	7	157	298	..	..	163	400	400	..	..	..	..	131	131	..	19	19
Total ..	6,481	577	968	4,583	10,907	5	20	5,265	11,685	11,685	..	..	138	2,769	2,922	68	559	627	
Hemach ..	1,555	130	105	918	1,721	..	..	1,037	1,826	1,826	..	..	..	..	409	767	21	130	131
1. Tole Hemach ..	48	10	20	25	73	..	..	41	95	95	..	..	..	..	10	19	..	6	6
2. Rumbhapully ..	1,553	155	125	943	1,726	..	..	1,098	1,921	1,921	..	..	..	..	376	786	21	156	157
Total ..	1,430	175	156	758	1,459	..	..	933	1,856	1,855	..	..	38	683	..	791	75	..	75
Berhampore, 1. Gasjam, Fyvetola ..	1,300	30	52	352	657	..	..	352	689	622	..	..	49	239	..	378	23	..	23
2. Palibanda ..	1,268	28	36	66	292	..	..	91	238	238	..	..	4	58	..	62	8	..	8
3. Kanchipuram ..	980	63	83	110	225	..	..	173	308	308	..	..	..	104	..	104	6	..	6
4. Damodarapuram ..	4,934	396	397	1,239	2,563	..	..	1,482	2,890	2,823	..	..	91	1,174	..	1,265	112	..	112
Total ..	12,800	1,406	1,358	7,431	16,078	6	20	8,662	17,496	17,029	400	..	61	1,713	3,209	5,013	212	683	901
Grand Total ..																			

CHATTERJEE,
16th September 1874.

(Signed) T. SEVARAMIAH,
Deputy Collector,
for Acting Collector of Ganjam.

(Signed) T. SEVARAMIAH,
Dputy Collector,
for Acting Collector of Ganjam.

CHIEF OFFICE,
16th September 1874.

List of Plans connected with the Korakori or Mullada Tampara Project.

- 1 Plan of weir with proposed addition.
- 1 Plan of old weir now in existence.
- 1 Plan of head sluice.
- 1 Cross section at site of weir.
- 1 Longitudinal section of channel from wooden bridge to Mullada Tampara.
- 3 Cross sections of do.
- 1 Longitudinal section with cross sections of channel from Mullada Tampara towards Ganjam.
- 1 Longitudinal section of high level channel.
- 1 Plan of surplus weir near wooden bridge.
- 1 Plan of embankment of Tampara.
- 1 Plan of sluice.
- 1 Sheet of cross sections of Korakori river.
- 1 Tracing map of the project.

(Signed) H. SMALLEY, Major, R.E.,
Offg. District Engineer, Ganjam.

ABSTRACT of Estimates for reconstructing and enlarging Korakori Weir and reforming channel from Weir to Mullada Tampara and Ganjam.

Names of Works.	Number of Estimate.	Amount.
Weir	1	Rs. 3,800
Head sluice	2	430
Embankment on left bank of river	3	9
Do. on right bank of river	4	3,480
Surplus weir near wooden bridge on Aska and Ganjam road	5	740
Reforming channel from wooden bridge to Mullada Tampara, A to B	6	5,180
New channel from B to C	7	774
Reforming channel from C to E	8	1,014
New high level channel from E to G	9	1,838
Regulating sluice at E	10	170
Embanking Mullada Tampara	11	260
Two regulating sluices each Rupees 200	12	400
Channel from D to C	13	163
Total		18,258

No. 1.

ABSTRACT Estimate for reconstructing and lengthening Weir over Korakori Nullah.

Quantity.	Description of Work.	Rate.	Amount.
	<i>Oldest or Out-stone portion.</i>		
63-14	Cubic yards of finely cut stone work	Rs. A. P. 10 0 0	Rs. A. P. 631 6 4
21½	Do. of rubble masonry	2 0 0	42 3 6
29-9	Do. of face dressed rubble masonry	2 12 0	82 3 7
...	Lowering weir and repointing, &c., not deducting value of stones		75 0 0
127-5	Cubic yards of rough stone packing	0 6 0	70 15 0

ABSTRACT Estimate for reconstructing and lengthening Weir over Korakori Nullah—(Contd.)

Quantity.	Description of Work.	Rate.	Amount.
	<i>Oldest or Out-stone portion—(Contd.)</i>	Rs. A. P.	Rs. A. P.
7	Sluice gates of wood, iron barred and revolving on iron pintles 2½ inches diameter each	60 0 0	420 0 0
315-25	Cubic feet of Sāl wood, wrought and put up	1 0 0	315 4 0
573	Lbs. of iron work	0 3 0	107 7 0
	<i>Second Portion.</i>		
28½	Cubic yards of fine concrete work	2 4 0	65 0 0
31-2	Square yards of hydraulic plaster, three coats and well polished	4 0 0	124 12 9
...	Lowering crest, 3 inches		50 0 0
	<i>New Portion.</i>		
113½	Cubic yards of rubble masonry	2 0 0	226 15 4
341	Do. of face dressed rubble masonry	2 12 0	937 12 0
18½	Do. of excavating rock foundation	0 4 0	4 10 8
1,200	Do. of earthwork	0 1 0	75 0 0
...	Revetting to river sides where required		200 0 0
...	Baling		30 0 0
			3,458 10 2
...	Contingencies at 10 per cent.		341 5 10
	Total		3,800 0 0

ABSTRACT Estimate of Head Sluice.

Quantity.	Description of Work.	Rate.	Amount.
	<i>Oldest or Out-stone portion.</i>		
31-42	Cubic yards of rubble masonry	Rs. A. P. 2 0 0	Rs. A. P. 62 13 5
57-28	Do. of face dressed rubble masonry	2 12 0	157 8 3
11-8	Do. of cut stone work	10 0 0	148 0 0
18½	Do. of earthwork	0 4 0	4 10 8
4	Shutters, each	4 0 0	16 0 0
	Contingencies at 10 per cent.		389 0 4
	Total		430 0 0

ABSTRACT.

Quantity.	Description of Work.	Rate.	Amount.
141 1/4	Cubic yards of earthwork	RS. A. P.	RS. A. P.
	Contingencies at 5 per cent.	0 1 0	8 13 6
			0 2 6
	Total ...		9 0 0

No. 4.

ESTIMATE of Embankment on Right Bank of Korakory River from Weir to Bhovrabhooyee Hill.

Particulars.	Length.	Area in Square Feet.	Contents.	Rate.	Amount.
Section 1 + 2	Earthwork	600	241.125 + 346.5	176,287.5	RS. A. P.
	Revetment	600	27 = 6,529.1	0 1 0	403 1 1
Section 2	Earthwork	900	48.375 + 57.375	31,725	1,175
	Revetment	900	346.5	311,850	11,550
Section 2 + 3	Earthwork	900	57.375	51,637.5	1,912.5
	Revetment	900	346.5 + 137.625	217,855.26	8,968.75
Section 3	Earthwork	200	57.375 + 38.375	43,537.5	1612.5
	Revetment	200	137.625	18,762.5	599.7
River	Earthwork	120	38.375	3,937.5	145.83
	Revetment	120	238	28,560	1057.7
			48	5,760	213.3
	Contingencies at 5 per cent.				3,313 2 1
	Total ...				166 13 11
					3,480 0 0

No. 5.

ABSTRACT Estimate for constructing a surplus Weir near wooden bridge Korakory or Mullada Tampara Channel.

Quantity.	Description of Work.	Rate.	Amount.
114.07	Cubic yards of rubble masonry	RS. A. P.	RS. A. P.
137.28	Do. of face dressed rubble masonry	2 0 0	228 2 2
148.88	Do. of rough stone packing	2 12 0	377 8 3
228.14	Do. of earthwork	0 6 0	55 13 3
		0 1 0	14 4 1
	Contingencies at 10 per cent.		675 11 9
			64 4 3
	Total ...		740 0 0

No. 6.

ESTIMATE of Reforming Channel from Wooden Bridge on Aska and Ganjam Road to Mullada Tampara, A. B.

Section.	Distance in Feet.	Total Distance.	Area in Square Feet.	Contents.	Rate.	Amount.
Section 1	...	...	...	...	RS. A. P.	RS. A. P.
" 2	...	...	...	...	...	...
" 3	...	1,010	0 336	...	...	...
" 4	...	1,542	0 860	...	...	...
" 5	...	517	0 1,023	...	...	...
" 6	...	212	0 1,093	636 = 23	0 1 0	1 7 6
" 5 + 6	...	225	0 1,168	2,250 = 83	0 1 0	5 3 4
" 6 + 7	...	196	0 1,234	2,352 = 87	0 1 0	5 7 1
" 7 + 8	...	326	0 1,342	2,772 = 241	0 1 0	15 1 6
" 8 + 9 + 10 + 11 + 12	300 feet each Section 31 + 300 = 9,300.	2 922	3,795.5	1,138,650 = 42,172	0 1 0	2,637 0 3
Section 39 + 40	...	300	2 1,022	29,040 = 1,108	0 3 35	232 2 8
" 40 + 41	...	300	2 1,122	25,080 = 1,040	0 6 0	390 0 0
" 41 + 42	...	300	2 1,222	31,740 = 1,175	0 3 21	285 13 8
" 42 + 43 + 44 + 45	300 feet each Section 2 + 300 = 900.	2 1,522	264	79,200 = 2,933	0 1 0	183 5 4
" 45 + 46	...	300	2 1,022	15,300 = 566	0 5 31	168 0 11
" 46 + 47 + 48	300 feet each Section 2 + 300 = 600.	3 62	53.6	16,080 = 595	0 12 0	146 10 8
" 48 + 49 + 50	300 feet each Section 2 + 300 = 600.	3 262	11.2	3,360 = 124	0 12 0	93 5 4
Rough-stone escapes where found necessary	...	...	...	...	...	500 0 0
Contingencies at 5 per cent.	...	...	...	...	...	4,933 10 1
						246 5 11
	Total ...					5,180 0 0

No. 7.

ABSTRACT.

Quantity.	Description of Work.	Rate.	Amount.
11,806 1/2	Cubic yards of earthwork	RS. A. P.	RS. A. P.
	Contingencies at 5 per cent.	0 1 0	787 14 8
			36 1 4
	Total ...		774 0 0

No. 8.

ABSTRACT.

Quantity.	Description of Work.	Rate.	Amount.
15,452 1/2	Cubic yards of earthwork	RS. A. P. 0 1 0	RS. A. P. 965 12 7
...	Contingencies at 5 per cent	...	48 3 5
Total ...	...	...	1,014 0 0

ESTIMATE for Approximate Cost of New High Level Channel from E to G Length, 5.25 Miles.

Particulars.	Distance in Miles.	Rate.	Amount.
New high level channel from E to G, length 5.25 miles	MILES. 5.25	RS. 350	RS. 1,838
Per mile	...	...	...
Total	...	...	1,838

No. 10.

ABSTRACT ESTIMATE of Regulating Sluice at E.

Quantity.	Description of Work.	Rate.	Amount.
33 1/2	Cubic yards of rubble masonry	RS. A. P. 2 0 0	RS. A. P. 66 10 8
24 1/2	Do. of face-dressed rubble masonry	...	...
45	Do. of rough-stone packing	...	...
66 1/2	Do. of earthwork	...	...
1	Shutter complete	...	...
...	Contingencies at 10 per cent.	...	157 4 1
Total ...	...	...	170 0 0

No. 11.

ABSTRACT.

Quantity.	Description of Work.	Rate.	Amount.
5,250	Cubic yards of earthwork	RS. A. P. 0 0 9	RS. A. P. 246 1 6
...	Contingencies at 5 per cent.	...	13 14 6
Total ...	...	...	260 0 0

11

No. 12.

ABSTRACT ESTIMATE for constructing Sluices at B and D to regulate Ingress and Egress of Water at Mullada Tampara.

Quantity.	Particulars.	Rate.	Amount.
38	Cubic yards of rubble masonry	RS. A. P. 2 0 0	RS. A. P. 76 0 0
29.2	Do. of face-dressed rubble masonry	...	...
43.5	Do. of rough-stone packing	...	...
3	Shutters complete	...	...
76	Cubic yards of earthwork	...	...
...	Contingencies at 10 per cent.	...	186 5 9
Total for one Sluice ...	...	...	200 0 0
Total for two Sluices ...	...	...	400 0 0

No. 13.

ABSTRACT.

Quantity.	Description of Work.	Rate.	Amount.
2,477 1/2	Cubic yards of earthwork	RS. A. P. 0 1 0	RS. A. P. 154 13 4
...	Contingencies at 5 per cent.	...	8 2 8
Total ...	...	...	163 0 0

(Signed) T. BECKLEY, Major, R.E., District Engineer, Ganjam.

Report on Mullada Tampara Project.

THE Mullada Tampara Project consists of a weir across the Korakori river about two miles above its junction with the Rooshkoolia, and from the weir a channel to irrigate lands belonging to the Biridy and Hoomunpa Zemindars, and also Government lands in the neighbourhood of the town of Ganjam is a tampara or natural marsh that it was thought might be converted into a reservoir or tank and filled by the channel; the project would be the restoration and improvement of old works that have been constructed at different periods but have never fully answered their intended purposes and that are now almost obsolete; we have the advantage of finding a good deal of work done and paid for, and the people are fully alive to the advantages to be derived if they could obtain irrigation from the weir and channel; on the other hand the difficulties that have hitherto proved insurmountable still exist, and though I believe that they can be overcome still there is some difficulty in planning the works and still more in showing that they will prove remunerative, and I could not therefore recommend that it be carried out as a "Loan Work;" if done at all the project will have to be done as a district work to be carried out gradually as funds are available or when relief work rendered imperative by famine.

2. The Korakori drains down to site of weir are about 190 square miles of hilly country where the rainfall varies from 35 to 70 inches and is more unfailing than it is to the south of the Rooshkoolia; the maximum discharge according to the formula $D = 75,000 M \frac{1}{2}$ would be nearly 2 1/2 million cubic yards per hour. I am not acquainted with the character of the river in its own valley, but where it enters the alluvial valley of the Rooshkoolia which is nearly level transversely, the channel of the Korakori is only sufficient to convey at most one million cubic yards per hour consequently it floods the country, the flood water finding its way into the Rooshkoolia; when that river is simultaneously in flood the country is flooded for days, the depth

of water varying from 1 to 7 feet; the Korakori reaches the valley of the Rooshkoolia two miles south of Purushottapore, but its bed being lower, it flows with very little fall parallel and probably in an old course of that river and joins it six miles lower down; the difficulty is to construct a weir that shall raise the small floods nearly to the level of the country without submerging any considerable tract of country during moderate and therefore frequent floods and not liable to injury from severe floods; the weir can do no harm during even ordinary heavy floods, as the whole country is already flooded for miles around both above and below, and the subsidence is dependent on the capacity of the Rooshkoolia to discharge it into the sea.

3. In estimating the effect of the weir we must I consider confine ourselves to the floods in the Korakori up to the surface of the ground: when they rise higher the country is flooded, and these floods spread over a large extent of country have little velocity. The cultivation is all wet, and by fertilising the soil they probably do more good than harm. The people at any rate are accustomed to them. From the sections taken and enclosed it will be seen that the sectional area of Korakori up to ground level varies from 900 to 1,300 square feet. The fall of ground is very gentle, being from site of weir to one mile above 28.67—27.01=1.66. Below weir the fall is greater for some distance, but the ground rises again as we approach the Rooshkoolia; the bedfall for one mile above weir is nothing, in two miles above less than 1 foot, whilst to half a mile below there is a rise. It is quite impossible to ascertain with even tolerable correctness the fall of surface. It cannot be very great or the crops would be destroyed, which is never the case; if we take 2 feet per mile we shall be, I think, well above the truth; if we take sectional area at 1,200 square feet and hydraulic mean depth at 12 feet the velocity would be 7,300 yards per hour and discharge = $1,200 \times 7,320 = 978,000$ and therefore the Korakori floods up to level of

9

ground do not exceed one million cubic yards per hour.

4. Apparently the weir was first commenced about 100 years ago, but the present cut-stone portion was built by the Zemindar twenty years ago; the second portion appears to have been built by the Department Public Works or Revenue Department in 1861, when the Estate came under the Court of Wards; the third portion was built two years ago by the present Zemindar. From the weir direct only a small quantity of land belonging to Biridy Zemindari ever appears to have been irrigated owing to the work having breached. The channel from the weir to the tampara and from the tampara to Ganjam also appears to have been excavated 100 years ago, and formerly irrigated a good deal of land belonging to the Biridy Zemindari, but never much of any belonging to Ganjam or to Government partly because the flow was intercepted by Biridy ryots, but a tank in Ganjam was filled from the tampara; in fact the history of the work shows it almost exceeded but failed.

5. The weir as it now stands consists of a massive cut-stone work built, I believe, about 1770: it is 102 feet long, the crest being M.S.L. + 26 feet for 79.6 feet and M.S.L. + 27.95 feet for 22.4 feet, there are four vents 5.5×7.5 , one vent 6.25×7.5 feet, and two vents 5.25×6 feet so the work is really a sluice weir. This work is founded on rock and in perfect order; the second portion of the weir of later date, built about 1820, is of brick of inferior quality, but there is a superabundance of material and with a coating of good concrete and plaster will do well enough; it also is on rock and in fair order, the length is 101.64 feet and level of crest is M.S.L. + 25.25 feet, the 3rd portion of work is half wing wall and half weir, length about 50 feet level of crest M.S.L. + 28.95. This portion is founded on rock, but has been turned by river, is breached and useless. I believe many attempts have been made to keep the work from being so turned and breaching, but the failure was inevitable unless the ends of the weir were connected by wing walls and revetted embankments with the two isolated hills between which the Korakori flows. The weir has a channel bed of on left side; it is short but runs into a capacious jheel or old river course; it is unprovided with a head-sluice, so during heavy floods far too much water flowed down it, but being cut out of hill side the channel head could neither be damaged nor much enlarged.

6. In the reconstruction of the weir I propose that the first and second existing portions shall be lowered to M.S.L. + 25 feet the third breached portion will be removed and replaced by a new length of 62 feet, also with crest M.S.L. + 25 wing walls will be added on right bank and connected with hill by a strongly revetted embankment; on left bank will be a strong masonry wing wall and short embankment connecting the work with the hill on that side. In this wing wall will be four vents each 4 feet $\times$ 2 feet forming the sluice at the supply channel head, the under sluices in the oldest portion will be maintained, as it is desirable to increase the discharge as much as possible, and also because by discharging freely through these sluices, the water above and below will have less difference of level, and the weir and embankment be less severely tried during moderate floods. To effectually work these sluices an over-bridge will be required, and I think shutters revolving on a vertical axis will be the most convenient, the river brings down very little driftwood; the total clear overfall of the weir is 260.74 feet.

7. At site of weir the ground level is M.S.L. + 27, and the discharge of river at this height we have calculated to be—

$D = 1,000,000$ cubic yards per hour or 7,500 cubic feet per second.

	SQ. FT.
Section of river	= 1,200
Mean velocity	= 6.25
Surface velocity	= $6.25 \times \frac{4}{3} = 8.33$
Submerged depth of weir	= 27 feet — 25 feet = 2 feet.
Length	= 260 feet
X	= overfall

Taking Mr. Downing's C.E. formulae, but multiplying first portion by $\frac{1}{2}$ as there is no reason for a co-efficient of .66 in a long weir, the contraction on weir is fully allowed for by co-efficient on lower portion and the overfall should be more than the theoretical discharge as the water under it has a velocity greater than its own; then—

$$\begin{aligned}
 \frac{D}{260} &= 3.5 \times \frac{1}{2} \times \sqrt{d + .035^2} + 4.96 \times \frac{1}{2} \times \sqrt{d + .01^2} \\
 &= 3.5 \times \frac{1}{2} \times 1.75 \sqrt{1.75 + .035 \times 8.33^2} + 4.96 \times 2 \sqrt{1.75 + .01 \times 6.25^2} \\
 &= 3.5 \times \frac{1}{2} \times 1.75 \times \sqrt{4.178 + 4.96 \times 2 \sqrt{2.14}} \\
 &= 9.1875 \times 260 \times 2.044 + 9.92 \times 260 \times 1.462 \\
 &= 4,882.605 + 3,770.7904 \\
 &= 8,653.3954 \text{ cubic feet per second} = \frac{8,653.3954}{.6675} = 1,153,786 \text{ cubic yards per hour,}
 \end{aligned}$$

that is 1.75 feet rise would give a discharge of 1,153,786 cubic yards per hour, but with 1.5 feet rise the under-sluices with an aggregate area of 254.687 square feet or 28.3 square yards would have a velocity of 7,860 yards per hour and discharge of 222,438 cubic yards per hour, so that the total rise caused by weir to a flood when the river was very full but not overflowing would be about 1.5 feet. I may here remark that all the land that would be in any way affected by floods belong to Biridy Zemindar, but there will not be any difficulty or complaints on this score; the weir we propose building will be lower and longer than the one constructed by himself and ancestors, the ground level at site of weir therefore is M.S.L. + 27 crest of weir + 25 feet height to which flood of M.S.L. + 27 would be raised is M.S.L. + 28.5 feet height of ordinary flood at present M.S.L. + 29 feet flood of 1872 M.S.L. + 31. Flood of 1862 M.S.L. + 32, highest reported flood, viz., of 1815 M.S.L. + 34. The wing walls and bridge will be M.S.L. + 35 and the top of embankment will be M.S.L. + 38 feet in the heavy floods the water at this point would have very little motion and it would be useless to make the wing walls higher.

8. The head-sluice consists of four vents each 4 feet $\times$ 2 feet and calculated to pass 20,000 cubic yards per hour with a head of 1 foot as follows:—velocity = 6,400 yards per hour, sectional area = $4 \times 4 \times 2 = 32$ square feet = $8\frac{1}{2}$ square yards — $6,400 \times 8\frac{1}{2} = 22,755$ cubic yards per hour. The head of the supply channel near the sluice does not require deepening and the water would then find its way down to the wooden bridge on Asaka and Ganjam road through a deep and broad jheel or old water course, but eventually to avoid disputes it might be well to dig a channel from a short distance below sluice to this bridge, the area of land that the channel would irrigate between the sluice and wooden bridge is from survey 1,200 acres belonging entirely to the Biridy Zemindari. It is already wet land depending on drainage for irrigation; there would also be some land irrigated on right bank of river also depending on drainage for irrigation; there would also that out of consideration; the irrigation it obtains will, however, compensate for any excess of water caused by weir.

9. The channel from the wooden bridge has to be re-made. I calculate it will have to irrigate 5,000 acres and should carry 10,000 cubic yards per hour with 3 feet of water occasionally; much more would be passed down and so short periods of drought often to be compensated for by excessive watering. I take the water-level at the bridge at M.S.L. + 24.25 feet, allowing a fall of .75 foot or 55 feet per mile; if a straight channel were cut to the head sluice, this fall would be more than sufficient if the water were permitted to pass freely down the jheel. Near this wooden bridge an escape weir 50 feet long crest M.S.L. + 24.25 is required to prevent too much water passing down channel; in addition to water from Korakori it receives the drainage of about 20 square miles. For the first two miles the channel has a fall of 1 foot per mile, for the third mile 1.25, and for the last half mile .5 foot per mile; this brings us to a small existing channel leading to the Mullada Tampara, the level of water being at the end of the channel 24.25—3.75 = 20.5 + M.S.L. In the survey the beginning of a channel is marked A and the end is marked B; at B will be a sluice to regulate flow of water into Mullada Tampara. Several rough-stone escapes also may be necessary for which a lump sum of Rupees 500 is allowed in estimate.

10. The area of the Mullada Tampara encircled by a contour of 19 feet + M.S.L. is 5 of a square mile and therefore its useful capacity, if water were kept in it on a level of 20.5 + M.S.L. and drawn off at a level of 17.5 feet + M.S.L., would be $5 \times 640 \times 4,840 \times 1 = 1,518,800$ or not much more than 1½ million cubic yards; this is not much, but as the channel B to C passes round, the reservoir having been filled during a flood, the sluice at B would be closed and water would only be drawn off at sluice D when water could not be obtained from the channel direct. No doubt the tampara might be filled during floods to a level of one yard higher, viz., M.S.L. + 23.5 feet when it would hold 3 million cubic yards, new embanking however would be required to prevent lands belonging to the Biridy Zemindar being flooded; the present estimate only provides for embanking to keep the water up to 20.5 + M.S.L. He like all Zemindars objects to selling land for public purposes. By keeping water up to 20.5 + M.S.L. no land will be flooded. We shall simply keep full the existing tampara with a small embankment on lower side; it is a matter for consideration whether we might not at once raise the high water of the tampara to M.S.L. + 23.5 feet and so retain 3 million cubic yards. The channel that I propose excavating ends at E, where there will require to be a regulating sluice that is allowed for in the estimate. Below E towards Ganjam and the coast are a number of small irrigation channels that only need ordinary repairs, but above E a new high level channel should be taken off round the sloping ground to command as much land as possible. It has been surveyed for with a fall of one foot per mile, and I have allowed an estimate Rupees 350 per mile, its length being 5.25 miles a bank on lower side only would be required, it would be entirely for the Biridy and Heoma lands, and unless these Zemindars pay a full water rate, they should dig it themselves and this item be left out.

11. The estimate is as follows:—

	Rs.
1. Weir	3,800
2. Head-sluice	430
3. Embankments on left bank of river	9
4. Do. on right bank of river	3,480
5. Surplus weir near wooden bridge on Aska and Ganjam road	740
6. Reforming channel from wooden bridge to Mullada Tampara, A to B	5,180
7. New channel from B to C	774
8. Reforming channel from C to E	1,014
9. New high level channel from E to G	1,838
10. Regulating sluice at E	170
11. Embanking Mullada Tampara	260
12. Two regulating sluices at 200 Rupees	400
13. Channel from D to C	163
Total	18,258

12. As regards revenue several propositions have been made to Biridy Zemindar by Mr. Thornhill, M.C.S., Mr. Master and former Collector, as to his bearing a share of cost of project, but no terms have been arrived at. He talks of being paid for work done, which is out of the question, as although some of it is useful it is not so in proportion to what it has cost. I believe he has also mentioned something about a loan without interest, but I do not think we shall be able to show that is work that should be undertaken on a loan of any kind. What I propose is that the Biridy Zemindar shall make the weir over Government and shall also give the little land required for embanking; in return the Government shall not be bound to keep up the weir and head works, but the 1,200 acres on the left bank owned by the Biridy Zemindar shall have free of all charge the first claim to the water passing through the head sluice; he shall not be allowed to put banks across the channel, but may will naturally flow on to his fields, and as they are mostly low lying he will in this way be first moved. On the right bank of river above the weir he may also draw off as much water as he requires free of charge in compensation for any flooding the weir may occasion; he must be made to understand that the weir will be lower and longer than formerly and will therefore cause less flooding.

13. In the neighbourhood of the tampara there is about 500 acres, and between sluice E and the head sluice B there is about 500 acres, and I consider we ought to be able to obtain a revenue of 3 Rupees per acre, if only 2 Rupees were paid it would give Rupees 10,000, and allowing Rupees 2,000 per annum for repairs and improvements and establishment this would leave Rupees 8,000 or 30% per cent. on outlay. I have not yet had time to and of course some returns and estimates will be required from Revenue authorities. The people of Ganjam and surrounding hamlets are very anxious for the work and appear in conversation and by their petitions perfectly willing; in deed anxious to pay a fair water rate. I do not suppose the returns will be as much as I have suggested, and

* This must be a mistake for 44 per cent.—H.S.

survey in boundaries of Government lands required from Revenue authorities. The people of Ganjam and surrounding hamlets are very anxious for the work and appear in conversation and by their petitions perfectly willing; in deed anxious to pay a fair water rate. I do not suppose the returns will be as much as I have suggested, and

of course estimates for works of the nature are likely to be carried out. It ought to be remunerative directly to the Ganjam ryots of late years so frequently increasing the prosperity of the people of the town will be no difficulty in obtaining labor for the manufacture of salt.

to be exceeded; still I think the work should on the water-rate, the remissions of revenue granted will not be called for again, and by of Ganjam and neighbouring villages there manufacture of salt.

(Signed) T. BECKLEY, Major, R.E.,
District Engineer, Ganjam.

N.B.—From the Collector's statement it would only be 16 per cent.—H.S.

appear the percentage of return on outlay

From the Controller of Public Works Accounts, to
March 1875, No.

Engineer for Irrigation, dated 24th
391.

With reference to the Chief Engineer's memo received in this office 22nd idem), the undersigned
*Ganjam District.

Idem, No. 275, of the 11th March 1875, the honor to state that, judging from the of this office and the progress reports of the Sigaole and Berhampore Ranges, no Pampara Project in Ganjam.

(Signed) T. MOSS,
Controller of Public Works Accounts.

No. 55-B. Proceedings, Madras Government

dated 3rd April 1875, No. 27.

No. 55-C.

Note by the Chief Engineer

for Irrigation.

In G.O. of the 3rd April 1875 an early
No. 355, dated 4th March 1875.

report on the Korakori or Mullada Tampara Project in Ganjam was called for and in the Revenue Department Proceedings therewith communicated it was intimated that certain concession on the part of the Biridy Zemindar was necessary before the project could be carried out. In Proceedings, Madras Government, Revenue Department, 3rd June 1875, No. 864, it was shown that the Zemindar had agreed in certain conditions to give his consent to the project: these conditions are—

1st.—That the land to be given up by him for embankments, &c., shall not exceed 50 or 60 acres.

2nd.—That the existing bed of the Mullada Tampara should not be enlarged.

3rd.—That a calingalah should be built at the head of the channel to be excavated from the tampara, so as to discharge its surplus water and thus prevent the lands in the vicinity being inundated at times when the water may be excessive.

4th.—That he should be allowed to open minor channels wherever necessary to irrigate his lands and get water both from the main channels and from the tampara free of charge.

As regards the extent of land required there is nothing in the papers submitted with the project to show what number of acres will be required. It will apparently be necessary to show what land will be needed for each part of the proposed works, and to distinguish Zemindary from Government lands. The embankments near the ancient tampara is 6,440 feet in length and will require a width of about 45 to 50 feet, say 7½ acres; the channel DC, 1,858 feet long, will need possibly some additional land, say ½ an acre; for the channel EG, 5½ miles long, there are no cross sections, perhaps 30 feet width would suffice as it is to be single banked, and if so the land required would be about 20 acres. Altogether then the land required is likely to be within the 50 or 60 acres named by the Zemindar, and all will not be within his zemindari.

2. Although Major Beckley has suggested the enlargement of the Mullada Tampara as a possible advantage, the project contemplates no enlargement, but provides only for retaining water up to the old level.

3. The project does not provide for a surplus weir to discharge water from the tampara, and it is not apparent why it should be more necessary after the project is carried out than it now is, seeing that all the water admitted to the channel at the anicut will be under regulation, while that entering it from upland drainage is to be disposed of. Whether there would be difficulty or not in getting rid of surplus

Paragraph 9 of Major Beckley's report is not clear, but whatever may be requisite to prevent the water in the tampara continuing for more than a limited period above 20.5 + M.S.L. can no doubt be effected either directly by a surplus weir in the bank of the tampara or indirectly by surplus works in the channel above it.

4. Provided it be clearly understood that neither the Zemindar nor any one else irrigating under this project will be allowed to put dams across the channels belonging thereto, and that all distribution channels taking off from the Government channels are furnished with head sluices, there need be no objection taken to the construction by the Zemindar of any tributaries he may find to be required.

5. Major Beckley's estimate for the project is given in paragraph 11 of his report, and amounts to Rupees 18,258 of which, it will be noticed, Rupees 1,838 are for a new high level channel intended to irrigate only Beredy and Hooma Zemindari lands, so that the construction of this by Government would be dependent upon a fair water rate for the supply afforded being agreed to. The estimate for this channel is evidently a very rough one, for there are no cross sections, and it is not stated what the acreage under it will be. It will cross some drainage and two roads. This part of the scheme may, it is considered, be left for more complete preparation, when the Zemindars for whose lands the water could be provided express a wish to have the channel constructed.

6. The rest of the small project has been worked out in detail, and provides for the improvement of imperfect works already in existence. Major Beckley's report printed in Proceedings, Madras Government, Revenue Department, 4th March 1875, No. 355, fully describes what is intended to be done.

7. The principal items of the estimate are—

No. 1.—Weir across Korakot	Rs.
...	3,800.

There is a plan illustrating the work as it now is, and another showing what is to be done to it. A new weir has to be built across the breach and connected with wing walls and flood banks to prevent the work being again turned. A wooden bridge on masonry piers is proposed by Major Beckley to be put up over that part of the weir in which there are under-sluices to enable them to be worked.

It is not advisable to build a double right wing as shown on the plan; a single wall will do if the earthwork be properly overlapped on both sides and well revetted. The top should be at 36.50 or 1½ feet higher than that shown on the plan. The other details are shown on the revised section.

It is noted that the under sluices are to be provided with shutters revolving on a vertical axis to be worked from the bridge. This axis would be some 21 feet in length, and it is doubtful whether the arrangement could be made efficient. It appears to have been overlooked that the sides of the vents would need alteration to adapt them to revolving shutters. This might be done by fitting in a shutter frame with but a slight projection beyond the sides of the vents and probably this would be the only feasible plan as the alteration of the masonry would be troublesome and expensive. It would then be a question whether it would not be better to work the shutters by moveable levers placed on the axes of the ancient crest level, and to dispense with the bridge. The shutters could then be worked with a foot of water going over the anicut, and probably more easily worked than from the bridge—

Head-sluice	Rs.
...	430

The arrangements shown would not admit of regulation, and a revised section has been sketched on the plan: probably Rupees 750 will suffice—

2433

IRRIGATION.

Gobt. of (1878) Madras.

PUBLIC WORKS.

THE DISTRICT ENGINEER,
CANAL
&c. &c.

Dated May 1878.

Issued

Recd. *June 6*

Recd.

G. O., 13th May 1878, No. 400 L.

MAY.

Nos. 55-56.

No 1429
Communication to the
Board of Revenue.

10 June 1878

Mullada Tampara Project, Ganjam District.
—The District Engineer requested to
resubmit the estimate for the — with more
complete information for sanction and entry
in the Budget of 1879-80.