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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

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56,

Read the following papers :—

No. 498. From Captain J. PENNYCUIK, R.E., District Engineer, North Arcot, to Lieut.-Colonel, J. MULLINS, R.E., Chief Engineer for Irrigation, dated Camp at Palamanair, 3rd April 1876, No. 14.

I HAVE the honor to forward herewith plans and estimates for the repair and improvement of the tanks shown in the enclosed statement, with the following remarks.

6 Detailed Estimates.	
11 Abstract do.	
6 Plans.	
17 Sections.	
1 Sketch.	
1 List.	

2. *Velary Tank*.—This tank was greatly damaged during the storm of May 1874, and the bund is in a highly irregular condition; it has no escape, and one of dry stone, 140 feet long, is proposed to be constructed. The estimate also provides for constructing a permanent kondam to feed the supply channel, and for rebuilding a sluice which is in a state of ruin.

3. *Palayanoor Tank*.—This tank also has badly breached in 1872, and extensive repairs to the bund are required. Provision is made for increasing the escape from its present length of 48 feet to 81 feet, which will discharge the surplus with a depth of 3 feet, and for converting it into a flush escape by the removal of the dam stones and the raising of the crest to full tank level; this work ought perhaps to be charged to Capital, but as it is small in comparison with the total of the estimate, it has been thought better to charge the whole to Revenue.

4. *Pinnapady Tank*.—This tank also was damaged in 1874, but the repairs required to the bund are not very extensive. Provision is made for the construction of an escape 130 feet long, which will discharge the surplus due to the drainage area with a depth of 3 feet, for the reconstruction of an injured sluice, and for the construction of a new one. It is believed that if this tank be put into complete order, more land will be brought under cultivation and the revenue proportionately increased.

5. *Keelpady Tank*.—Has no escape, and the bund is in very bad order, as will be seen from the sections; it breached in several places in 1872, a sluice being at the same time carried away. The estimate provides for restoring the bund, rebuilding the sluice above-mentioned, constructing a new sluice on a somewhat higher level, and providing a dry-stone escape 80 feet in length.

6. *Oyalay Chittary*.—This is a very trifling work, and it is doubtful whether it is worthwhile to keep it up at the expense of Government; the ayacut area of 12 acres ought, however, to produce a revenue of at least Rupees 80. The difference between which and the present revenue will be nearly 10 per cent. on the estimate.

7. *Oyalay Large Tank*.—This tank also breached in 1872, and the bund is in bad order throughout. It has no escape, and provision is made for a dry-stone escape 80 feet in length. It is fed by a channel from one of the drainage channels supplying the Kunnanoor tank, and the "kondam" for diverting the water having been destroyed, it is proposed to restore it in a more substantial manner. The estimate is high, but it is probable that a revenue greater than the nominal ayacut, which is low for the acreage, will be realized, as the water-supply is ample if the tanks be put into order.

8. A sketch showing the relative positions of these tanks is enclosed.

9. I request that the plans and estimates may be returned when no longer required.

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23th July 1876. No. 1,927.

No. 114-W.

No. 498-A. Note by the Chief Engineer for Irrigation.

The following estimates from the No. 3 or Vellore Range are forwarded by the District Engineer, North Arcot, with his letter marginally noted:—

No. 14, dated 3rd April 1876.

Taluk.	Village.	Work.	Amount.
Arcot...	Velary	V. Tank	Rs. 2,310
Do. ...	Palayanoor	V. Do.	6,310
Do. ...	Pinnapady	V. Do.	2,060
Do. ...	Keelpandy	V. Do.	2,950
Do. ...	Oyalay	V. Chittary Tank	510
Do. ...	Do.	V. Large Tank	3,150

2. The financial and hydraulic details of the Irrigation Works concerned are exhibited in the following statement:—

I.—Financial Details.

Name of Work.	Ayacut Area.	Kandamudi.	Average Revenue for 5 years.	Highest Revenue for 5 years.	During the previous 4 years.	OUTLAY.			PER CENT.
						Original works.	Repairs.	Average annual portion of Charges to Revenue.	
Velary Tank	100	114	513	513	478	...	2,310	104.7	
Palayanoor Tank	159	1,111	1,111	1,111	...	410	6,900	113.5	
Pinnapady Tank	97	699	668	668	560	490	1,570	78.4	
Keelpandy Tank	85	424	424	424	...	360	2,990	139.1	
Oyalay Chittary Tank	12	32	32	32	...	60	350	318.7	
Oyalay Large Tank	55	174	174	174	...	520	2,930	262.0	

II.—Hydraulic Details.

Name of Work.	Catchment Basin Area.	MAXIMUM SUPPLY.		LENGTH OF ESCAPE.		AVERAGE HEIGHT OF BUND.		Surplus discharged at M. T. L. per Sec.	Tanks above.
		Catchment per Second.	Channel per Second.	Total.	Effective.	Above F. T. L.	Above M. T. L.		
Velary Tank	3	1,170	...	140	140	3.53	1.53	0.0	Not stated.
Palayanoor Tank	4	1,417	...	140	Not known	4.50	2.50	836.9	do.
Pinnapady Tank	8	2,250	...	130	130	5.13	2.13	1414.0	2
Keelpandy Tank	1.5	737	...	80	80	5.50	2.50	2269.5	...
Oyalay Chittary Tank	5	394	...	56	56	4.50	2.50	506.8	...
Oyalay Large Tank	1.5	737	...	80	80	4.50	2.50	354.7	5

NOTE.—The proposed dimensions of escapes and heights of bund are entered in large type. The existing dimensions in small type. The following abbreviations are used:—K.—Kalingulah with dam stones. W.—Weir with flash crest. E.—Escape at ground level. B.—Bund of tank. V.—Village. S.—Revenue Survey.

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3. The following is a summary of the work proposed to be carried out in each case:—

Velary Tank.—Raising and repairing the bund, planting nanel grass, reconstructing an irrigation sluice, constructing a loose stone escape and masonry dam or kondam to the supply channel.

Palayanoor Tank.—Raising and repairing the bund, planting nanel grass along the top of the revetment, repairing the sluice, improving and extending the existing kalingulah and converting it into a weir.

Pinnapady Tank.—Raising and repairing the bund and planting nanel grass, reconstructing an irrigation sluice, constructing a masonry weir and an irrigation sluice.

Keelpandy Tank.—Closing breaches and repairing the bund, constructing a loose stone escape, reconstructing an old and building a new irrigation sluice.

Oyalay Chittary Tank.—Repairing the bund, closing a breach, repairing the sluice, raising the revetment of the bund with new stones, and constructing a loose stone escape.

Oyalay Large Tank.—Raising and repairing the bund, closing the breaches and also repairing an irrigation sluice and supply channel, raising the revetment of the bund with new stones, constructing a loose stone escape and a masonry dam or kondam to the supply channel.

4. The object of estimating for tanks by groups being the consideration of the circumstances of the group as a whole it is desirable that the financial and hydraulic details of the whole of the tanks in a group should be brought together into one statement. From the sketch-map forwarded with the District Engineer's report it is apparent that one tank at least has not been included in the statements, and the reason assigned is that the work of repair has been sanctioned and is in progress. It should be understood in future that the features of the group in the gross, whether as regards cultivation and revenue or outlay, are to be brought into view.

One important object in dealing with tanks in groups is to see whether the maintenance of all the tanks is really necessary. In the present case it is by no means clear that the Pinnapady tank should be retained. The catchment basin above it is altogether 8 square miles, but of this area 7 square miles are intercepted by the Velary and Palayanoor tanks, and, judging from the sketch-map, it would not be difficult to bring the whole of the irrigation under the last-named tanks. The outlay proposed is Rupees 490 on a new weir, and Rupees 1,570 on repairs, the average revenue being Rupees 668, and the ayacut Rupees 699. It should be shown clearly that the retention of this tank is necessary before any large expenditure is sanctioned.

The Oyalay Chittary is a petty tank, irrigating something less than 12 acres, with an average revenue of Rupees 32. The expenditure proposed is Rupees 510, and probably the revenue which this outlay would secure would be 20 to 25 Rupees. It is considered that it would involve a waste of money to pass this estimate as it stands.

The rate for earthwork is 1½th Annas, an unnecessary rate for a petty tank at which the lead and lift are probably small. This item should be reduced, say, to Rupees 186.

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The turfing should be omitted, as also the new stone revetment. The other items will be—

	RS.
Repairs to sluice	25
Escape (lengthened 16 feet)	75
	286
Sundries	4
Total	290

The Oyalay large tank lies as short distance below the Chittary, the average revenue is Rupees 174, and the estimates for repair and improvement amount to Rupees 3,150.

The following reductions can be made—

	RS.
New revetment	520
Supply channel, kondam or dam	1,070

Supply Channel.

	RS.
By altering rate of earthwork from $1\frac{1}{2}$ to 1 Anna	29
Turfing	64
Sundries	4

Tank Bund.

	RS.
Rate from $1\frac{1}{2}$ to 1 Anna	155
Turfing	309
Sundries	19
	2,170

leaving the amount to be sanctioned at Rupees 980 which is still more than five years' revenue. There should be no need for payment for land compensation it is thought.

The Keelpaudy tank estimate is very high and is capable of considerable reduction—

Tank Bund.

	RS.
The rate for earthwork should be reduced to 1 Anna	225
Turfing must be omitted	518
Sundries	27

Reconstructing Sluice.

	RS.
Reduction of height and length of front wings	50
Land compensation which is an unintelligible item in connection with such a work	50
New sluice	360
	1,230

leaving Rupees 1,720 which will suffice for all the more important requirements of the tank. Turfing is in a great many cases a waste of money, and if the soil be suitable, grass will grow without laying down turf sods, especially if a little

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be dibbled in here and there to give the growth a start. An additional sluice may be desirable, but the ayacut acreage is but 85, and if the plug-holes of the reconstructed sluice be made large enough, probably the whole ayacut and a few acres besides may be irrigated therefrom. Expenditure for extension of irrigation should be based on definite information as to the circumstances.

The Palayanoor tank is mentioned by the District Engineer to have been badly breached in 1872, and the longitudinal section shows 10 breaches, some very large, the bund being in wretched order. There is but one rate, $1\frac{1}{2}$ Annas a cubic yard, shown in the estimate for earthwork. This high rate may be proper for some of the work, but it is manifestly inapplicable to all of it, and the greater part of the work being on a low level, it is believed that $\frac{1}{2}$ at 1 Anna, $\frac{1}{3}$ at $1\frac{1}{2}$ Annas, and $\frac{1}{4}$ at $1\frac{1}{2}$ Annas will suffice. The reduction on earthwork will thus be Rupees 705. It is to be noticed that an average rate for a large quantity of earthwork to be carried out under widely differing conditions is not proper and cannot be accepted. Turfing may be allowed for the breaches and for interior slopes where not otherwise protected. The item of Rupees 740-4-0 on this account may be reduced by Rupees 500. The rate, 1 Rupee a cubic yard, entered in the surplus weir estimate for the demolition of the east wing-wall is most extravagant, 4 Annas a cubic yard will probably be more than ample. The item is small and the amount of the estimate need not be altered, but the entry is referred to, because in North Arcot the rates have a tendency to be higher than is necessary and they require readjustment generally.

The original estimate provided for a certain amount of new stone revetment which the District Engineer struck out, substituting nanel planting and putting in an item of Rupees 400 on this account. The quantity of stone was to have been 2,230 cubic yards, $\frac{1}{2}$ a yard thick, or 4,460 square yards of superficies. This number of square yards of nanel planting at 6 Pies a square yard would cost under 140 Rupees, and a sum of Rupees 150 would appear to be ample. The rate for nanel planting depends entirely upon the distance whence the grass may have to be procured, and on this point nothing has been said; but it is not worthwhile to bring this grass from a great distance or to plant it in soil not well adapted for its growth. The cuscus grass, though inferior as a breakwater, can be made to answer this purpose, and is more abundant and more hardy.

	RS.
The reductions suggested amount to Rupees 705 + 500 + 250 =	1,455
Sundries	45
Total	1,500

and the balance of the estimate will be Rupees 4,810.

The provisions of the Velary tank estimate require remark in two cases. In lieu of $381\frac{1}{2}$ cubic yards of new revetment, $\frac{1}{2}$ a yard thick, or 763 square yards, the District Engineer has entered Rupees 200 for nanel. This number of square yards of the latter would probably cost about 25 Rupees. The proposed kondam or dam at the head of the offtake of the Palayanoor tank channel is of doubtful propriety. It would prevent any water going to the latter tank until more than 3 feet were passing down into the Vellary tank, and the ayacut under the latter is only $\frac{2}{3}$ of that of the former. This may be a proper division of the water, but as the work appears to be an innovation, if necessary its estimate should be separately submitted for sanction

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with the information required to enable the suitability of the arrangement to be understood. The deductions to be made as above noted are—

Nanel planting	RS. 175
Constructing a regulating weir	560
Total ...	735

leaving Rupees 1,475 as the balance of the estimate which will be all chargeable to Repairs.

Local terms like kondam should not be used.

The following statement shows the proposed distribution of the outlay recommended for sanction, to the debit of the several heads of account involved :—

Name of Tank.	Items of Estimate.	FUND.		Total for each Tank, &c.
		ORDINARY AGRICULTURAL.		
		Original Works.	Repairs.	
Velary Tank	Raising and repairing the bund and planting nanel grass	...	675	1,475
	Reconstructing an irrigation sluice	...	480	
	Constructing a loose stone escape	320	...	
	Repairing the bund, planting nanel grass, and repairing the sluice	...	4,400	4,810
Palayanoor Tank	Improving and extending the present kalingulah and converting it into a weir	410	...	
Keelpandy Tank	Repairing the bund	...	1,010	1,720
	Constructing a loose stone escape	130	...	
	Reconstructing an irrigation sluice	...	580	
	Repairing the bund, closing the breach, and repairing the sluice	...	215	290
Oyalay Chittary Tank.	Constructing a loose stone escape	75	...	
Oyalay Large Tank.	Raising and repairing the bund, closing the breaches, and also repairing an irrigation sluice and supply channel	...	900	980
	Constructing a loose stone escape	80	...	

A. DE C. SCOTT, Major, R.E.,
Deputy Chief Engineer for Irrigation,
for Chief Engineer for Irrigation.

No. 499.

ORDER THEREON, 28th July 1876, No. 1,927.

IRRIGATION, No. 54.

Account.

No. 114-W., dated 24th July 1876.

The following estimates for Irrigation Works in the No. 3 or Vellore Range, North Arcot District, forwarded by the Chief Engineer for Irrigation with his Memorandum marginally noted are sanctioned.

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Irrigation.

Name of Tank.	Provision of Estimate.	FUND.	Amount.	Irrigation Register No.
		Ordinary Agricultural.		
			RS.	
Velary Tank	Raising and repairing the bund and planting nanel grass	Repairs	675	1 } 80 I
	Reconstructing an irrigation sluice	Repairs	480	
	Constructing a loose stone escape	Original Works...	320	
Palayanoor Tank.	Repairing the bund, planting nanel grass, and repairing sluice	Repairs	4,400	1 } 81 I
	Improving and extending present kalingulah and converting it into a weir	Original Works...	410	
	Repairing the bund	Repairs	1,010	
Keelpandy Tank.	Constructing a loose stone escape	Original Works...	130	2 } 82 I
	Reconstructing an irrigation sluice	Repairs	580	
	Repairing the bund, closing breach, and repairing the sluice	Repairs	215	1 } 83 I
Oyalay Chittary Tank	Constructing a loose stone escape	Original Works...	75	
	Raising and repairing the bund, closing the breaches, and also repairing an irrigation sluice and supply channel	Repairs	900	
Oyalay Large Tank	Constructing a loose stone escape	Original Works...	80	2 } 84 I

2. These sanctions are registered as shown above.

(True Extract.)

W. H. French Colonel,
Offg. Under Secy. to Govt., P.W.D.

To the District Engineer, North Arcot.

" Collector of do.
" Chief Engineer for Irrigation.
" Examiner of Public Works Accounts.
" Revenue Department.

Exd. W. H. French.

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To

THE DISTRICT ENGINEER

North Arcot.

Co., &c., &c.

Dated July 28th.

Issued

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G. O., 28th July 1876, No. 1,927.

JULY.

Nos. 498-499.

Dis. 2/2/76

Tanks, North Arcot District - Estimates
for the repairs of certain —, sanctioned.

No 1963

Communicated to the Govt. of Madras

19 August 1876

11 Tanks P. D. and 2 P. D. 2024 day

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GOVERNMENT OF MADRAS