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Revenue DEPARTMENT

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

18th September 1877, No. 325 I.

Irrigation.
Account.

Read the following paper:—

No. 154 I.

No. 89. *Note by the Chief Engineer for Irrigation.*

THE following estimates from the No. 1 or Wallajah Range are forwarded by the District Engineer, North Arcot, with his No. 1,290, dated 18th July 1877. letter marginally noted:—

PALAR ANICUT SYSTEM.

Mahindravady Channel Group.

Taluq.	Village.	Work.	Amount.
			Rs.
Wallajah	Meridary	V. tank	720
Do.	Bagavaly	V. large tank	1,050
Do.	Do.	V. small „	1,020
Do.	Govindacherry	V. hissa „	1,320
Do.	Keelveeranum	V. tank	2,740
Do.	Paraperi	V. do.	2,030
Do.	Keelveedy	V. large tank	3,243
Do.	Kodambakam	V. small „	310
Do.	Do.	V. large „	1,350
Do.	Kattapakam	V. small „	890
		Total ...	14,673

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.	Assessment.	Average Revenue for five Years.	Highest Revenue for five Years.	OUTLAY. During the previous four Years.	Proposed Ordinary Agricultural Irrigation. Original Works.	Repairs.	Average Annual proportion of 3 Charges Revenue.
	ACRES.	RS.	RS.	RS.	RS.	RS.	RS.	PER CENT. RS.
Meridary tank	62	176	167	Not stated.	None.	...	720	86·2
Bagavaly large tank						210	840	
Do. small "	52	185	185	Do.	Do.			223·7
Govindacherry hissa tank						...	1,020	
Keelveeranum tank	412	1,307	878	Do.	Do.		1,320	30·0
Paraperi tank	99	452	305	Do.	Do.	1,050	1,690	179·6
Keelveedy large tank	200	1,011	587	Do.	Do.	880	1,150	69·1
Kodambakam small tank	595	3,353	2,440	Do.	Do.	980	2,263	26·5
Do. large "	13	73	88	Do.	Do.		310	70·4
Kattapakam small tank	13	77	99	Do.	Do.	400	950	272·7
	42	138	138	Do.	Do.	670	320	125·9
Total ..	1,488	6,778	4,887	...	...	4,090	10,583	60·0

II.—Hydraulic Details.

Name of Work.	Catchment Basin, Area.	Maximum Supply. Catchment per Second.	Maximum Supply. Channels per Second.	Length of Escape. Total.	Length of Escape. Effective.	Average Height of Bund. Above F.T.L.	Average Height of Bund. Above M.T.L.	Surplus discharged at M.T.L. per Second.	Tanks above.
	SQ. M.	C. FT.	C. FT.	FT.	FT.	FT.	FT.	C. FT.	NO.
Meridary tank	..	..	281	W 32	32	2·23	0·25	304·0	None.
Bagavaly large tank	..	..	281	W 32 Nil.	32 Nil.	4·5 2·7	2·5 0·7	304·0	Do.
Do. small tank	..	..	128	F 30 W 18	30 18	4·5 0·6	2·5 1·4 less.	0·0 2351·1	Do.
Govindacherry hissa tank	2·0	893	70	W 18 C 104	18 ..	4·5 3·44	2·5 1·44	171·0	Do.
Keelveeranum tank	0·5	354	592	W 104 Nil.	104 Nil.	4·5 ..	2·5	988·3	Do.
Paraperi tank	1·0	562	226	W 100 Nil.	100 Nil.	4·5 2·01	2·5 0·01	0·0 950·3	Do.
Keelveedy large tank	3·0	1,170	340	W 83 C 79	83 36	4·5 1·78	2·5 0·22	0·0 788·7	Do.
Kodambakam small tank	0·5	354	..	W 79 W 80 Nil.	159 Nil.	4·5 2·55	2·5 0·55	916·7 1510·9	1
Do. large tank	0·25	223	128	Nil. Nil.	Nil. Nil.	4·5 1·09	2·5 0·91	0·0 0·0	1
Kattapakam small tank	0·5	354	594	W 37 Nil. W 45	37 Nil. 45	4·5 3·36	2·5 1·36 less.	0·0 351·6	1
						4·5	2·5	0·0 427·6	1

NOTE.—The proposed dimensions of escapes and heights of bund are printed in large type; the existing dimensions in small type. The following abbreviations are used:—C.—Calingulah with dam stones. W.—Weir with over fall. E.—Escape at ground level. B.—Bund of tank. V.—Village. F.—Masonry flush escape.

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

All these tanks belong to the Mahindravady group, the various members of which receive a supply, either directly from the Mahindravady channel from the Palar river, or indirectly from that channel by means of surplus from other tanks of the group into which the channel or its branches pass. The total number of the tanks in the group is twenty-four. For ten of these, estimates are now submitted, for three* estimates have been locally sanctioned, and all the rest are stated to be in good order except the Maliamaydu tank, for which an estimate will be furnished shortly.

* (1.) Veeliyanellore.
(2.) Balakristnapuram.
(3.) Maleri tanks.

2. A sketch map accompanies the estimates for the tanks, and they will be dealt with in the numerical order thereon given commencing with the higher portion of the group. It is necessary first to notice that the circumstances of some of the tanks as set forth on the group map do not appear to have been sufficiently considered. Some of the tanks it would seem to be unnecessary to continue to maintain. It cannot apparently be requisite to maintain both the Kodambakam tanks, and it is more than probable that both might be got rid of. Several other of the petty tanks commanded by, and supplied principally from, the Mahindravady tank could likewise probably be given up without inconvenience and with advantage to economy.

3. *Meridary Tank* (*No.* 4).—The bank is low and weak and has a breach in it. The estimate provides for repairing it and for some slight repairs to the two Irrigation sluices.

4. The estimate is recommended for sanction reduced to Rupees 530 by disallowance of the provision for turfing.

5. The tank has an escape of 32 feet in length, which, as the tank is solely channel fed, is considered enough.

6. *Bagavaly Large Tank* (*No.* 5) *and Bagavaly Small Tank* (*No.* 6).—These tanks are contiguous and it appears that their ayacuts are not separable; their conjoined irrigated area is 52 acres with an assessment of Rupees 185. The estimates submitted for them amount to Rupees 2,070, and provide for repairing the banks, repacking revetments, turfing both sides of banks where not revetted, repairs to irrigation sluices, and the construction of a new 30 feet escape to the larger tank. In the estimate for repair of the bank of the larger tank, Rupees 190 may be struck out which have been provided for turfing; the top breadth of the bank may, in such an insignificant tank, well be 3 feet instead of 4 feet 6 inches, and a margin of $1\frac{1}{2}$ feet instead of $2\frac{1}{2}$ feet above M.W.L. would suffice, and the reduction will effect a saving of about Rupees 75.

7. The proposed surplus weir is also of a more expensive description than the circumstances seem to necessitate a bodywall raised at the ends for connection with the bund, and a dry stone apron would suffice.

8. The District Engineer should ascertain whether the reformation of one of the tanks or their amalgamation into one tank will be the better arrangement. Although these tanks are connected, different data appear to have been used for the levels, a very improper arrangement, and the point of connection is not indicated on the longitudinal section.

9. For the smaller tank, reductions may be made in the estimate similar to those recommended for the larger tank, viz., striking out turfing* and reducing† the top breadth of the bank to 3 feet and margin to $1\frac{1}{2}$ feet.

* Rupees 200.
† By Rupees 70.

10. The estimates have been returned to the District Engineer for reconsideration.

11. *Govindacherry Tank* (*No.* 9).—This tank receives the drainage of 2 square miles as well as a supply from the Mahindravady channel. It has a calingulah 104 feet in length, and this the estimate provides for converting into a weir with crest at F.T.L.

12. The estimate also provides for putting the bank into a thorough state of repair and is recommended for sanction, reduced however from Rupees 1,320 to

Rupees 1,050 by striking out the provision for turfing, which it is highly probable would not prove successful.

13. *Keelveeranum Tank* (*No.* 10).—It is proposed to spend nine years average revenue in repairing the bank of this tank and providing a weir of 100 feet in length of crest. The estimate for the latter work is Rupees 1,050; but as the area from which drainage is received is stated to be only half a square mile, whilst the supply from the channel is, it is supposed, or should be brought under regulation, it seems unnecessary to provide so extensive and costly a work, and the bodywall may be reduced to 45 feet in length, whilst so the surface soil at the site is "hard gravel," the apron may be of rough stone well packed and without any retaining wall along its skirt. These alterations will reduce the estimate for the weir from Rupees 1,050 to Rupees 485.*

* See revised estimate.

14. The estimate for repair of the bank may also be reduced from Rupees 1,690 to Rupees 1,320 by striking out the turfing.

15. The expenditure on the tank will thus be reduced to a sum more commensurate with its importance. It is not understood from the longitudinal section how the ends of the bund are protected from being turned; they do not abut on high ground, but apparently are on ground lower than F.T.L.

16. *Paraperi Tank* (*No.* 13).—The estimates submitted are for putting the bank into a thorough state of repair including turfing both sides of the bund, both old and new work where not revetted, and for building a weir with 83 feet length of crest, there being now no work by which to pass surplus out of the tank. The estimate for the bank may be reduced from Rupees 1,150 to Rupees 850, by cutting out the turfing, part of which work as provided for is useless and all of doubtful success.

17. The estimate for the weir will have to be increased* by Rupees 25 to provide for rough stone 6 feet wide along the skirt of the apron. As the rough stone in mortar is but little more than half the cost of the brickwork, it should be considered whether the former may not be extensively substituted for the latter without reducing the permanence of the work.

* To Rupees 905.

There are several points to be considered in connection with this tank before an estimate can be recommended for sanction.

1*st*.—Is the tank which is commanded by the Mahindravady tank really necessary at all? Apparently at least three-fourths of the area are irrigated by the water of the larger tank, and would be capable of equally effective irrigation without the smaller.

2*ndly*.—The south end of the bund is represented as terminating on ground below F.T.L., and if this be the case the F.T.L. has been placed too high.

3*rdly*.—The site chosen for the surplus weir is not an economical one. Near the north end the circumstances appear to be more favorable, and if a weir can be placed there, the kind of weir shown in type design No. 5, circular No. 67, would probably be applicable.

18. *Keelveedy Large Tank* (*No.* 14).—The estimates provide for closing the breaches in the bank and putting it into a thorough state of repair, repacking the old revetment,* and turfing both sides of the bank and for converting the existing calingulah into a weir with crest at F.T.L., and building a new weir 80 feet long.

* No revetment whatever is shown on the cross sections or on the longitudinal section.

19. The tank receives the surplus of 3 square miles, and the proposed provision for discharge of surplus 159 feet length of weir though ample is not excessive; the site chosen is not a good one, and it would appear to be better to lengthen the existing weir at its north end where the cost will not exceed Rupees 500 and will probably be less. The use of rubble masonry instead of brickwork may also be advisable.

20. The estimate for repair of the bank may be reduced from Rupees 2,263 to Rupees 1,610 by striking out "turfing." Moreover it is much better and safer where the F.T.L. is above the present bund to place the new earth inside rather than outside the bund, and it will take less soil to make up the bund to section in this way. Rupees 214 of the estimate are for clearing away prickly-pear.

21. *Kodambakam Small Tank* (*No.* 17).—The drainage area of this tank is said to be half a square mile, and the surplus from it to pass into the larger tank of the same name round the west end of the bund which divides the water-spread of the two tanks.

22. The estimate provides for repairing the bank, turfing both sides; Rupees 35 will be enough for all the turfing it is advisable to do, and the estimate may be reduced from Rupees 310 to Rupees 245.

23. *Kodambakam Large Tank* (*No.* 18).—This is contiguous to the last noticed tank and receives its surplus; it is evident therefore that the drainage area of this larger tank cannot as stated be only half of that of the higher lying one, and must in this case be almost exactly the same, viz., half a square mile.

24. The ayacut area of this tank is only 13 acres, and its average revenue but Rupees 99, whilst the estimates submitted for its repairs amount to Rupees 1,350. Of this Rupees 950 are for repair of the bank, but this may be reduced to Rupees 710 by striking out the provision for turfing.

25. According to the longitudinal section the ground surface at each end of the bank is just at F.T.L. at as from the note on the weir plan, it seems likely that the soil at the places is hard gravel, probably the discharge of surplus might be efficiently provided at a very small cost by pavements on the surface of the ground at F.T.L. at the ends of the bank. The estimate of Rupees 400 for the masonry weir is, therefore, not recommended for sanction.

26. The estimates require to be reconsidered with reference to—

1*st*.—The necessity for maintaining these tanks at all as they are commanded by the Mahindravady tank.

2*nd*.—If a tank must be maintained which of the two is to be selected for maintenance, both cannot be required.

3*rd*.—The provision of a cheaper form of surplus work placed at a more suitable site, viz., on ground at or very nearly approximating to F.T.L.

4*th*.—The reduction of the bund section to 3 feet top width and 1½ feet margin above M.W.L. quite sufficient for such petty tanks.

27. *Kattapakam Tank* (*No.* 21).—The estimates provide for repairing the bank and building a masonry weir 45 feet long. That for the former may be reduced to Rupees 230 by cutting out the provision for turfing.

28. The estimate of Rupees 570 for the weir cannot be recommended for sanction, because from the longitudinal section and the nature of the soil in the vicinity it would appear that the discharge of surplus might be as effectively and far more cheaply provided for by a rough stone escape of the character of design No. 5, circular No. 67.

29. The estimate is altogether excessive. A top width of bund of 3 feet and a margin of 1½ feet above M.W.L. will be ample for a tank of this size.

30. The levels of a group of tanks should all be referred to one datum without which connection it is impracticable to consider properly the relative circumstances. In this case moreover the datum should be that of the Palar anicut system, which is or can readily be reduced to mean sea datum, for the railway levels referred to that datum are available and the railway is but a short way to the north. A good deal of pains have been taken with the plans and estimates, but the Range Officer is evidently not fully informed as to the points which principally require attention in framing estimates for repairs and improvements, and the District Engineer should see that he is properly instructed. A good deal of time and labor would have been saved

in the preparation of plans had section paper been used for the longitudinal and cross sections.

FORT ST. GEORGE,
30th August 1877.

(Signed) G. T. WALCH,
Ag. Dy. Chief Engr. for Irrigation,
for Chief Engr. for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 90. ORDER THEREON, 18th September 1877, No. 325 I.

THE following estimates for Irrigation works in the No. 1 or Wallajah Range, North Arcot District, forwarded by the Chief Engineer for Irrigation with his No. 154 I, dated 30th August 1877, memorandum marginally noted are sanctioned:—

Irrigation.

	Name of Tank.	Provision of Estimate.	Fund, Ordinary Agricultural, Main Head Irrigation.	Amount.		Irrigation Register Number.
			CLASS	Rs.		
Palar Anicut System, Mahndravady Channel Group.	Meridary tank ...	Closing breach and repairing bund and two sluices.	Repairs ...	530		186 I.
	Govindacherry Hissa tank.	Repairing bund and three sluices.	Do. ...	900	1	187 I.
		Converting calingulah into weir.	Do. ...	150	2	
	Keelveeranum tank ...	Repairing bund and closing a breach.	Do. ...	1,320	1	188 I.
		Weir	Original Works	485	2	
	Keelveedy large tank...	Repairing bund and closing breaches and converting calingulah into weir.	Repairs ...	1,610	1	189 I.
		Weir	Original Works	500	2	

2. These sanctions are registered as shown above.

3. The attention of the District Engineer should be specially given to the remarks in the foregoing note and he should be careful to consider fully the bearing of all connected works of irrigation and not estimate for the continued maintenance of any which may be found to be unnecessary, while if any which appear from the group maps to be unnecessary require to be maintained, the circumstances should be clearly explained.

(True Extract.)

Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the District Engineer, North Arcot.
" Collector of North Arcot.
" Chief Engineer for Irrigation.
" Examiner of Public Works Accounts.
" Revenue Department.

Exd. E. C. Shunker.

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Revenue Depart
No 4191.

IRRIGATION.
ACCOUNT.

Sobt. of (1877) Madras.

PUBLIC WORKS.

To

The DISTRICT ENGINEER,
NORTH ARCOT,
&c., &c., &c.

Dated September 1877.

Rect. 28 Sept

Encl.

G. O., 18th September 1877, No. 325 I.-

SEPTEMBER.
Nos. 60-66.

Tanks, North Arcot District.—Estimates for repair of certain —, sanctioned.

No. 5901
Comm.r to the
Board of Revenue
28 Sept

28 Sept Revenue (Irrig.)