(1 Number of pages _____

2 Date of Depan _____

(3) Initials of the Reference _____

TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

DEPARTMENT

G O No B.P. No.	Press Mis
Dated	197

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

1st April 1878, No. 288 I.

Irrigation.

Account

Read the following papers:—

No. 15. From Major J. O. HASTED, R.E., Superintending Engineer, Kistna, to the Chief Engineer for Irrigation, dated Mangalagiri, 19th January 1878, No. 194.

With reference to your memorandum, No. 35 KS, dated 26th November 1877, I have the honor to submit revised statements showing the expenditure on Delta Canals chargeable to Navigation. Form A showing in detail the expenditure on each canal in the six years 1870-71 to 1875-76, divided under heads relating to "Navigation Repairs Proper," and "Repairs to Navigable Canals;" and Form AA, an abstract of the above, showing the total charges on repairs debitable to Navigation.

One Statement A.
One do. AA.
One Revised Statement of Receipts and Charges.
One Memorandum of Capital Outlay.

2. It has been difficult to divide the expenditure of past years in accordance with the heads, it being customary in former years to include several distinct works in one estimate (for instance, clearance of lock channels has generally been included in lock repair estimates), but I have carefully gone through the list of estimates myself and divided the items as correctly as possible.

3. The expenditure on tow-paths is an approximation. Estimates are prepared yearly at certain rates per mile, according to the circumstances of each canal, for clearing the tow-paths and maintaining canal plantations, that is, plantations on the lunkas and banks; on some canals milemen are kept up, and these men attend to both works. When the present classification was introduced the estimates were classed under "Navigation," clearing tow-paths; but as the principal part of the work on the larger canals related to "Plantations," which are now becoming extensive, and the value of wood sold from these plantations is credited to Irrigation, "Revenue Miscellaneous," I classed the estimates under Irrigation. Considering the work that has to be done yearly not only in clearing bushes from the tow-paths, but eradicating bull-rushes and other grass, I think it will be fair to charge one-fourth of the estimates to "Navigation" and the remaining three-fourths to "Irrigation." I have therefore entered in Form A an additional column to show the three-fourths chargeable to "Maintenance of Canal Plantations," which cannot be entered under "Repairs to Navigable Canals."

4. The proportion of "Repairs to Navigable Canals," which, after personal consultation with you, I have charged and proposed to charge to Navigation, is as follows for each canal:—

Eastern Delta.

Main Canal	25 per cent.	
Ellore Canal	50 „ „	
Masulipatam Canal ...	25 „ „	for 12 miles to Kankipand.
	50 „ „	30 miles from Kankipand to Akumarru.
	100 „ „	7 below Akumarru.
Pamarru Junction Canal...	100 „ „	
Pullera	..	
Polrazkodu	... at present 50 per cent. when made navigable.	
Bantumilli Canal... ...	Do. do.	

Western Delta.

Main Canal	25 per cent. for 8 miles to head of Bank canal.
	50 per cent. for next 5 miles to Duggirala lock
Nizampatam Canal ...	50 per cent.
Bank Canal	... at present 50 per cent. when improved.
Commamur Canal ...	25 per cent. for 15 miles to Chebrole at present.
	25 per cent. for 8 miles to Jagerlamudi, and
	50 per cent. below when improved.

5. The arrangements above-mentioned have necessitated the preparation of a revised statement of receipts and charges under Navigation for the year 1876, which I enclose with a schedule attached, as suggested in paragraph 3 of your memorandum under reply, to show the items of expenditure chargeable as Capital Outlay to Navigation.

No. 15-A. From Major J. O. HASTED, R.E., Superintending Engineer, Kistna, to the Chief Engineer for Irrigation, dated Masulipatam, 15th March 1878, No. 247.

Your memorandum No. 16 KS, dated 26th ultimo.

I have the honor to return Statement AA therewith received, together with

Two Statements AA. one corrected, as directed, in the above
One Statement E. memorandum, also with statement in Form E as called for.

2. The mileage of canals given in my statement, dated 21st April 1877, was found to require correction, and measurements having now been taken, the correct lengths according to the Divisional Officer's reports to this office have been given. In future returns the lengths now given will be shown.

3. Please have "Budamoru Canal" entered in Statement A under Ellore Canal with blanks in all columns of expenditure opposite thereto.

A.

Statement showing the Expenditure on Repairs of Navigable Canals in Kistna District in six years from 1870-71 to 1875-76.

Name of Canal.

Navigation Rivers Penna.

Name of Canal.	Channels of Lock Channels.	Repairs to Locks and Lock Walls.	Clearing Towpaths (1 coat).	Repairs to Tank Establishment Sluices	Dredging.	Total.	Silt Clearances in Canals.	Repairs to Masonry Works	Dredging.	Total.	Maintenance of Canal Plantation (1 coat).	Total of Columns 7, 12, and 13.	Repairs to Canal Banks.	Silt Clearances in Canals.	Repairs to Masonry Works	Dredging.	Total.	Total of Columns 7, 12, and 13.
	2	3	4	5	6	7	9	10	11	12	13	14	8	9	10	11	12	14
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs.	Rs. A. P.	Rs. A. P.	Rs.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Main Canal	..	14 4 3	..	..	..	14 4 3	17,737 3 1	8,667 6 6	2,919 0 6	29,323 9 1	..	29,337 13 4	..	21,580 1 6	8,667 6 6	2,919 0 6	33,166 14 6	33,180 18 10
Ellore Canal	..	3,667 3 11	..	..	4,898 13 6	28,578 5 7	43,750 14 9	165 9 10	..	67,013 13 10	..	67,013 13 10	..	15,926 0 1	165 9 10	..	16,091 9 11	16,091 9 11
Masulipatam Canal ...	..	2,560 2 0	1,239 14 1	..	1,123 9 11	4,923 9 0	46,361 12 7	201 3 3	..	46,563 15 10	..	46,563 15 10	..	2,783 2 9	201 3 3	..	2,984 6 0	2,984 6 0
Pamarru Junction Canal ...	..	12,604 9 3	1,894 8 10	..	857 0 0	65,379 6 1	5,620 12 7	554 7 3	..	6,175 3 10	..	6,175 3 10	..	4,420 15 9	554 7 3	..	4,975 6 0	4,975 6 0
Pullera	..	694 15 3	95 9 6	..	..	790 8 9	..	31 3 10	..	31 3 10	..	821 12 7	..	..	31 3 10	..	31 3 10	31 3 10
Polrazkodu	..	25 1 6	87 11 8	..	..	113 1 2	..	497 0 3	..	497 0 3	..	497 0 3	..	..	497 0 3	..	497 0 3	497 0 3
Bantumilli Canal ...	..	18,672 6 4	3,422 11 3	104 6 0	..	22,199 11 7	2,893 5 4	103 9 0	..	2,997 2 4	..	25,196 14 11	..	1,16,119 8 10	8,667 6 6	2,919 0 6	1,27,706 15 10	1,52,903 10 9
Main Canal	..	3,317 14 8	..	..	..	3,317 14 8	..	..	250 0 0	3,567 14 8	..	3,567 14 8	..	21,580 1 6	8,667 6 6	2,919 0 6	33,166 14 6	36,734 13 2
Ellore Canal	..	11,770 14 11	1,445 0 11	..	..	13,216 15 10	147 13 11	165 9 10	166 14 0	480 1 9	..	13,696 13 7	..	15,926 0 1	165 9 10	..	16,091 9 11	29,788 6 6
Masulipatam Canal ...	..	952 11 6	642 1 10	..	..	1,594 13 4	46 2 9	201 3 3	..	247 6 0	..	1,841 9 1	..	2,783 2 9	201 3 3	..	2,984 6 0	4,825 15 1
Pamarru Junction Canal ...	..	1,365 7 6	3,139 4 6	..	..	4,504 12 0	546 14 11	554 7 3	366 6 6	1,467 8 8	..	5,972 4 8	..	4,420 15 9	554 7 3	..	4,975 6 0	10,947 10 8
Pullera	..	17,607 0 3	3,278 0 2	..	..	20,885 0 5	741 1 7	31 3 10	681 14 10	1,454 3 3	..	22,339 3 8	..	790 8 9	31 3 10	..	821 12 7	23,160 16 5
Polrazkodu	..	36,279 5 6	3,709 11 4	101 0 0	1,018 15 7	41,108 12 5	6,159 0 10	497 0 3	1,018 15 7	7,675 0 8	..	48,784 13 1	..	113 1 2	497 0 3	..	497 0 3	48,784 13 1
Bantumilli Canal ...	..	38,279 5 6	3,709 11 4	101 0 0	1,018 15 7	41,108 12 5	6,159 0 10	497 0 3	1,018 15 7	7,675 0 8	..	48,784 13 1	..	22,199 11 7	2,997 2 4	..	25,196 14 11	73,980 13 0

* Cost of widening canal.
† Including Rupees 1,613-6-10 for clearing silt creek below Lock.

(Signed) J. O. HASTED, Major, R.E.,
Superintending Engineer, Kistna.

AA.

Revised.

Abstract of Statement A.

Name of Canals.	Navigation Receipts, Average of 5 years ending 1875-76 (Column 11, Statement A).	Repairs to Navigable Canals, Average of 5 years ending 1875-76 (Column 11, Statement A).	Proportion of Charges in connection with Navigation.		Length open to Navigation.	Proposed Length of Canal.	Remarks.
			Percentage.	Amount.			
					Miles.		
1	2	3	4	5	6	7	8
Eastern Delta.	Rs. A. P.	Rs. A. P.		Rs. A. P.			
1. Main Canal ..	367 14 10	3,709 11 9	25	946 10 11	0 45	0 45	
2. Ellore ,, ..	602 2 3	11,193 15 3	50	5,284 7 1	0 45	0 45	
3. Bodameru ,, ..	...	...	...	...	...	...	
4. Mandigadem ,, ..	2,737 8 1	9,361 11 3	25	627 9 0	13	25	
			50	2,886 1 3	30	45	
			100	1,168 9 3	49	49	
Total ..	4,382 13 5	26,565 13 10	..	4,881 9 5	49	49	
5. Peruru Junction Canal ..	407 3 8	997 14 11	..	...	0	46	
6. Pullery Canal	165 0 5	647 9 7	..	...	37	63	
7. Palamadoo Canal ..	16 4 7	457 7 8	..	...	26	26	
8. Kaddamilli ,, ..	14 14 7	532 14 7	..	...	14	24	
Total ..	4,982 13 5	26,565 13 10	..	4,881 9 5	49	49	
Western Delta.							
1. Main Canal	627 16 8	3,923 15 6	25	605 10 11	8	13	
			50	754 9 8	5	13	
			100	1,556 4 7	13	13	
2. Nizampatam Canal ..	2,956 6 7	3,698 7 4	50	2,932 9 10	27	27	
3. Bank ,, ..	272 8 0	5,003 8 11	..	...	21	21	
4. Coulavaroo ,, ..	804 7 2	4,795 7 8	100	276 10 6	35	35	
Total ..	4,051 5 5	15,398 6 7	..	4,369 8 10	..	..	
Grand Total ..	8,344 2 10	42,469 4 6	..	15,777 4 9	..	..	
				24,927 7 7	267	13	

N.B.—The proportion of expenditure in Column 4 is taken on the present lengths of canals in miles, viz.,
49 Mandigadem Canal.
50 Coulavaroo ,,

(Signed) J. O. HASTED, Major, R.E.,
Superintending Engineer, Kistna.

MASULIPATAM,
13th March 1878.

B.

REVISED.

STATEMENT of Receipts and Charges, Kistna Delta Navigation, for the Year 1876.

RECEIPTS.			CHARGES.		
Description.	Amount.	Remarks.	Description.	Amount.	Remarks.
	Rs.			Rs.	
License fees for passenger boats, first class	..		Lock establishments ..	8,456	
License fees for passenger boats, second class	2,649		Lock and lock weir repairs ..	4,316	
License fees for cargo boats ..	14,218		Repairs of Navigation buildings	..	
Do. for private do. ..	23		Tow-paths maintenance ..	2,073	One-fourth of 8,292 Rupees.
Tolls for passenger boats ..	..		Dredging { lock channels ..	1,342	Includes Rs. 577 for clearing.
Do. for cargo do. ..	..		Dredging { sundry ..	..	
Do. for private do. ..	..		*Miscellaneous (proportionate charge)*	15,777	As per statement A A, column 7, attached.
Do. for rafts	1,118			31,963	
Miscellaneous	* 369		Interest for the year on capital outlay on navigation works proper	300	
	18,377				
Balance Deficit	13,886				
Total ..	32,263		Total ..	32,263	

* 318 sea-going boats.
35 boats passing locks.
16 duplicate licenses.
369

STATEMENT of Capital Outlay on Navigation Works Proper of the Kistna Delta from the Year 1870-71 inclusive.

Sections of Delta.	To end of 1874-75.	For 1875-76.	Total.
Eastern Delta	6,004		6,004
Central do.	..	..	..
Western do.	..	..	..
Total ..	6,004		6,004

N.B.—The current interest for 1876 was calculated on the capital expenditure to end of 1875-76 at 5 per cent.

C.

MEMORANDUM showing the Items of Expenditure chargeable as Capital Outlay to Navigation from the Year 1870-71 inclusive.

Items.	Amount of Estimate.	Expenditure to end of 1874-75.	Outlay in 1875-76.	Total Outlay.	Remarks.
	Rs.	Rs.	Rs.	Rs.	
Quay wall, Main Canal, Eastern Delta.	6,724	..	..	6,004	Part of estimate of Rupees 13,330 for widening Main Canal.
		Cannot be given, as no details are kept before 1875-76.			

CAMP, MANGALAGIRI,
19th January 1878.

(Signed) J. O. HASTED, Major, R.E.,
Superintending Engineer, Kistna.

D.

Statement showing the Revenue obtained in License of Boats in 1875 and 1876.

Particulars	Class.	1875. Total Number	1875. Tonnage.	1875. Number of Passengers.	1875. Amount of License.	1876. Total Number	1876. Tonnage.	1876. Number of Passengers.	1876. Amount of License.	Amounts that would have been realized under Old Rules in 1875. Number of Passengers.	Amounts that would have been realized under Old Rules in 1875. Tonnage.	Amounts that would have been realized under Old Rules in 1875. Amount of License.
					Rs. A. P.				Rs. A. P.			Rs. A. P.
Cargo boats { full year.	Class.	223	9,746	..	3,746 0 0	603	13,334	..	13,621 0 0	..	13,551	50 0 0
Cargo boats { half year.	Do.	24	434	..	217 0 0	26	768	..	634 0 0	..	705	25 0 0
Passenger boats { half year.	Do.	1	..	14	34 8 0	1	..	60	37 9 4	..	..	50 0 0
Pleasure boats	..	..	..	..	..	..	..	..	..	..	..	..
Ferry-going boats	..	..	..	..	399 7 11	..	..	..	217 11 11	..	..	217 11 11
Hats { tank	..	178	..	..	175 12 0	468	..	..	409 0 0	..	..	1,022 9 0
Hats { country	..	64	..	..	64 0 0	84	..	..	84 4 0	..	..	106 10 0
Hats { bamboo	..	448	..	..	448 12 0	621	..	..	624 11 0	..	..	312 6 0
License fees on boats passing locks	..	..	..	..	62 0 0	..	..	..	34 0 0	..	..	35 0 0
Fees for duplicate licenses	..	..	..	..	15 0 0	..	..	..	15 14 8	..	..	15 14 8
Total ..	..	..	..	..	7,779 2 11	..	..	..	18,577 5 7	..	..	19,011 5 1

MASULIPATAM,
27th June 1877.

(Signed) J. O. HASTED, Major, R.E.,
Superintending Engineer, Kistna.

E.

STATEMENT showing the Names of the Navigable Canals in each part of the Kistna Delta and the Lengths open for Navigation.

Names of Canals.	Proposed Total Length. MS.	Proposed Total Length. CHS.	Navigable up to 1876 inclusive. MS.	Navigable up to 1876 inclusive. CHS.
Eastern Delta.				
Main Canal	0	45	0	45
Ellore do.	40	0	40	0
Budameru Canal	37	0	20	0
Masulipatam do.	49	13	49	13
Pamarru Junction Canal	0	40	0	40
Pullern Canal between Weyyoor Calingulah and Cowtaram ...	*26	62	17	62
Bantumilli Canal	24	60	†14	20
Polnzkodu do.	26	16	16	51
Total ...	204	76	158	71
Western Delta.				
Main Canal	13	0	13	0
Nizampatam Canal	27	78	27	78
Bank Canal	45	60	21	0
Commamore Canal	56	40	46	30
Total ..	143	18	108	28
Grand Total ...	348	14	267	19

* Distance between head sluice and Cowtaram Lock.
† At present navigation is prevented by rough stone dams in the canal.

MASULIPATAM,
13th March 1878.

(Signed) J. O. HASTED, Major, R.E.,
Superintending Engineer, Kistna.

No. 32 I.

No. 15-B. *Note by the Chief Engineer for Irrigation.*

THE information regarding the Kistna Delta Navigation required by G.O., 27th February 1877, No. 662, to be submitted has delayed the disposal of the report which it has been usual to lay before Government. It being desired to give in a convenient form the receipts and expenditure connected with the navigation of the Delta Canals, and the charges being some direct and some indirect, it was necessary to ascertain what the several kinds or descriptions of expenditure on canals had been, and then to settle what shares of outlay common to irrigation and navigation should be charged to the latter. The circumstances of the Kistna Canals differ considerably from those of the Godavery, and it was found requisite to deal with each canal individually; and further to take into account its present state in connection with navigation, as well as the arrangements which will exist when the work provided for in the completion estimates have been carried out. The result of the investigations made is given in the letter from the Superintending Engineer now submitted, and in its accompanying statements; and on the approval of Government being given to the basis on which indirect charges have been fixed, the accounts for 1877 will be at once completed. The percentages for indirect charges have been fixed with reference to the greater or less quantities of water carried for irrigation, and to the length of canal available for fairly efficient navigation.

2. The statement of receipts and charges of 1876 shows the latter to be in excess of the former to the extent of Rupees 13,836.

The charges consist of —

		Rs.
(1.)	Navigation establishment	8,456
(2.)	Direct charges for repairs	7,730
(3.)	Indirect do. for do.	15,777
(4.)	Interest on capital outlay	300

Measures have already been taken to reduce the first item, and a revised scale of establishment has been approved by G.O., No. 36 I., dated 14th January 1878 Government. Full particulars will be found in statements A and AA of the several descriptions of expenditure making up items (2) and (3).

In statement D also the receipts for 1875 and 1876 are shown for purposes of comparison, and it will be seen that those of the later year are considerably more than double those of the former year, the increase having been for the most part on license fees for cargo boats. It will not be necessary to show in future statements D the amounts which would have been leviable under the old rules, and in lieu of the columns for this purpose the actuals for three years instead of for two may conveniently be included.

Superintending Engineer's No. 99, dated 6th September 1877

Superintending Engineer's No. 172, dated 22nd December 1877.

3. The fees on sea-going boats and casual fees on boats passing locks were not provided for in the rules in force in 1876, but provision has been made in the rules introduced from the 1st January 1878 for traffic both regular and occasional.

4. Attention should be given to the reduction of charges generally wherever feasible. Although the entries for 1876 are based on an average of six years, it is probable that as the canals are brought into better order the cost of their up-keep will be diminished. The information now for the first time recorded with fair completeness will at any rate prevent matters which may require attention remaining unnoticed.

5. Charges for interest will necessarily increase considerably as new navigation works are carried out, and the small item for 1876 on this account refers as indicated only to capital outlay incurred from 1870-71 inclusive, in accordance with the decision of Government.

Proceedings, Madras Government, No. 662, dated 27th February 1877.

6. It is believed that within a moderate number of years navigation receipts and expenditure will be balanced or nearly so, and there is no room for doubting the beneficial effect on returns from irrigation, of facility of communication and transport. Maintenance charges will be always heavier in the Kistna than in the Godavery, owing to the difference in the quantity of silt carried by the water of the former river, but the Kistna navigation revenue may be expected to approximate to that of the Godavery, and in the latter the unenhanced rates in 1877 exceeded 45,000 Rupees.

7. A statement E is appended showing the names of the navigable canals in each part of the delta, and the lengths open for navigation.

CAMP, GODAVERY,
Central Delta,
1st February 1878.

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

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

No. 16. ORDER THEREON, 1st April 1878, No. 288 I.

THE papers submitted by the Chief Engineer for Irrigation with the foregoing note show the navigation receipts and charges of the Kistna Delta for 1876, and the way in which charges other than direct have been determined. The arrangement

recommended for sanction are approved, and accounts for 1877 and future years should be similarly prepared.

2. The expenditure of 1876 exceeded the receipts by Rupees 13,886; but it is anticipated that the reduction of navigation establishments will admit of more favorable results in 1878, and the extension of irrigation in the delta is, as the Chief Engineer for Irrigation points out, to a material degree, due to the facilities which navigable canals secure for the disposal of produce. These canals doubtless have their effect also on the revenue derived from irrigated land, of which there is a considerable area in the delta. The information which has now been obtained and recorded will certainly be of service in producing improved management.

(True Extract.)

(Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

(True Copy)

Major, R.E.,
Under Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Superintending Engineer, Kistna.
" " " Godavery.
" Chief Engineer for Irrigation.
" Examiner of Public Works Accounts.
" Revenue Department.

2914

Exd. T. D. Ryan.

20 Spare Copies

IRRIGATION.
ACCOUNT.

Govt. of India, 30 Letters.

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER,
KISTNA,
&c., &c., &c.

Dated April 1st.

Recd. April 29. Encl.

G. O., 1st April 1878, No. 288 I.

APRIL.

Nos. 15-16.

Sol. Obs. 3-6

No 13 Bom

Sir Jervois

To be
communicated to
the Board of Revenue -
1 May 1878

Northern Canals and Charges of the Kistna Delta for 1876 reviewed and the arrangements recommended for sanction, approved.