

(1) Number of Pages 20
(2) Date of repair 8.6.68
(3) Initials of the Referencer PS

MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

G.O. No.

390

Press

B.P. No.

Mis.

Dated

26.2.1875

196

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No. 440.

Read the following papers:—

No. 720-A.

MEMORANDUM.

THE difficulty, or rather impossibility, which has been experienced this year of providing for even the more pressing demands on account of Irrigation Works, not under execution from Loan Funds, and the necessity that has arisen, owing to the very limited funds made available under Agricultural, Ordinary, for leaving the incomplete works of 1873-74 unfinished in this year also, render it desirable that the whole subject of the way in which the wants of Agricultural Works, other than Extraordinary, should be provided for, and of the amount of money, which should be devoted to meet these wants, should be considered.

2. It appears to be necessary, in the first instance, that it should be remembered that Agricultural Works are not necessarily confined to those which are connected directly or indirectly with irrigation, but that, on the contrary, there are works which are needed for the security and advantage of the unirrigated lands, and of the population engaged in their cultivation, which must be classed under Agricultural, and for which it is only fair and right that money in moderation should be provided. The area of land irrigated is usually not more than from one-third to half of the gross area, and river embankments and drainage works are needed as much for the benefit of the unirrigated as of the irrigated portions of any given district or part of a district. Indeed, seeing that dry crops are generally more liable to serious injury from submergence than are those which are cultivated with an artificial supply of water, it may be shown that the former are more interested in protective works and in those for disposing of surplus rainfall than are the latter.

3. The introduction of the system of carrying out directly remunerative works from Loan Funds has undoubtedly enabled certain large projects to be carried out or prosecuted with much greater rapidity than would have been practicable had surplus revenue only been made available, and certain parts of the country have benefited greatly by the arrangement. On the other hand, the requirements of other parts of the country and of smaller works have not only not been adequately provided for, but the allotments of funds for Major and Minor Works not of a decidedly remunerative character have become so reduced of late years, that practically works of this useful but unretending description are making little or no progress. Again, owing to the difficulty of obtaining funds for Agricultural Works, unless these could be shown to be highly remunerative and capable of yielding a return not only on all expenditure due to them directly, but of bearing also a share of general charges not created or rendered necessary by them, has led to a tendency to throw upon the few highly remunerative Irrigation Works which this Presidency possesses, the cost of improvements, the greater part of which does not rightly belong to them. It may be apprehended that the result of so doing will be that, as in the past, so in the future, the actual financial condition of Irrigation Works will be very difficult of ascertainment. In the past the recorded returns from Irrigation Works have been considered liable to material reduction, because many descriptions of charges had been left out of the debit side of the account, while now there is an at least equal risk of the returns being

anduly reduced by including in the Capital outlay on projects expenditure not appertaining to them.

4. It is submitted that the Agricultural Budget should, apart from Loan Fund Works, provide

1st.—For the up-keep of existing works.

1st.—For the up-keep of existing works.
2ndly.—For such minor improvements as are from time to time found necessary: for, in other words, Minor New Works.

3rdly.—For Major Works.

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(a.) For improving and rendering more efficient old or existing irrigation works, for the better utilization of the water-supply available, and for the extension on a comparatively small scale of irrigation where necessary and practicable.

(b.) For agricultural improvements of all kinds, unconnected with the application of water-supply to irrigation, but requisite for the security and efficiency of cultivation irrigated and unirrigated, or for the health of the population engaged in agriculture.

5. For the first of these purposes, the maintenance of Irrigation Works, the funds made available have of late years been somewhat augmented. They are still inadequate, and they should be increased gradually as the management of Irrigation Works becomes more systematized and efficient. A reformation in this direction, as it is hoped, been started, and in the course of a few years it may be anticipated that an abundant rainfall will be a blessing to the country generally in which it occurs, instead of, as regards at least the tanks, on which so much of the prosperity and comfort of a great part of the Presidency depends, being the cause of disaster and heavy loss. Whatever the sum made available under Agricultural, Ordinary, in any year, the maintenance of existing works should first be adequately provided for, and then the distribution of the balance should be made. This essential to the efficient administration of Irrigation Works has not always been attended to.

It has to be remembered in determining what assignments for maintenance should be made that in the last 15 or 20 years the conditions under which the works are managed have been materially changed. In the first place the cost of work has very materially increased, part of such increase, though certainly not always the whole, being justified by circumstances. The execution of work at fair and moderate rates and in a satisfactory manner is a matter depending upon the composition and strength of the establishments employed. Where these are efficient and equal to the work to be done, the Government do now get cheap and good work; elsewhere the reverse is the case. Formerly, again, much of the Irrigation Repair Work now done by Government was carried out by the villagers, to whom the payments made did not cover the full value of the work done, but were rather in effect grants-in-aid, the proportion between the payment and the value of the work depending very much upon the amount which the Collector happened to have at his disposal. Then, too, a good deal was done by customary, or people's labor, as it was called, an arrangement not necessarily burdensome, and often as beneficial to the villagers as to the Government. The custom, except as regards channel clearances, no longer exists, and the idea of its revival has, it is understood, been abandoned by Government. Village institutions have been undergoing changes, and no doubt the enforcement of the obligation to attend to the

petty repairs of village tanks, etc., would now be difficult. Moreover, while assessments have been in many cases lowered, and generally equalized, and while, at any rate, the revenue derived from Irrigation Works, irrespective of extensions and improvements, has not kept pace with the enhanced cost of maintenance, the people have been called upon of late years to contribute largely to Road, Educational, Municipal, and other Funds, and this fact cannot be overlooked.

With regard then to agricultural repairs, it appears to be understood that all the work, which may be required to put and keep Irrigation Works in order, must be paid for; and, if that end is to be secured, the money to pay for the work must be provided. The statistics of irrigation for 1872-73 were reviewed.

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Vide Note, paragraph 1, No. 269-A, printed in those Proceedings.

No. 1,380, of the 22nd May last, and the following is a summary and comparison with the preceding year:—

The charges for maintenance, inclusive of establishments, were in—

							Rupees per Acre.	Per cent. on Revenue.
1871-72	...	...	...	...	...	...	0.31	7.76
1872-73	...	...	...	...	...	...	0.35	8.41
							0.66	16.17
Average ...							0.33	8.08

The grant for the current year is Rupees 13,67,050 which approximates closely to that of 1872-73, and this having been found inadequate, the Government of India have been asked to increase it to 15 lakhs. Whether this will be done or not is uncertain, but, at any rate, in future, 15 lakhs appear to be the smallest sum which should be provided for *works* under agricultural repairs, and it may be necessary ere long to increase it to, say, 8 per cent. on the revenue from irrigated lands. All works maintained from the Agricultural Repair Grant are not Irrigation Works. River conservancy, embankments, drains, etc., are among the exceptions. It may be considered proper hereafter to distinguish between Irrigation and Non-irrigation Work under Agricultural.

6. In considering what funds should be granted for improvements, Minor and Major Works must, it is thought, be taken together, so that the 2nd and 3rd (a) items of paragraph 4 above may be dealt with as one demand. It would seem that 5 per cent. of the revenue derived from Irrigation Works is not too much to spend on their improvement, and this percentage will be about 10 lakhs. For the

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present it will be desirable to devote a good deal of money to Minor New Works, the safety of tanks being mainly dependent upon carrying out such works, while there are hundreds of river channels the heads of which are unregulated, and which, on the occurrence of a flood, a fact of annual, if not more frequent recurrence, in a good many districts, suffer and occasion much damage. Two-and-a-half, or perhaps three lakhs, may be well spent on such essential works in 1875-76 if timely notice be given to District Officers. Owing to the refusal of funds in past years, the estimates of works on which the greater part of the remainder of the proposed grant would be spent are not now ready, and the investigations have been in abeyance. There are many which will be ready for 1876-77 if funds are likely to be forthcoming. It seems to be more than probable that the Rooshkoolia project in Ganjam will have to be provided for under ordinary, also several minor projects in that district and Vizagapatam, while in almost every district there is much of the same kind of work to be done.

Paragraph 4, item 3 (b).

7. The grant for non-irrigation, Agricultural Works should, it is thought, be considered with reference to the Land Revenue

which for 1872-73 appears to have amounted to—

	RS.
* Asylum Press Almanac for 1874, page 366.	4,57,90,388
Deducting from this the Land Revenue irrigated	2,01,35,083
Land Revenue other than irrigated	2,56,55,305

Two per cent. on this revenue would seem to be not an unreasonable proportion for improvements, and the amount available would then be in round numbers five lakhs.

8. The amount which would be chargeable annually to the ordinary grant would, under the proposals now made, be—

1st, for repairs	15 lakhs.
2nd., for improvements, Irrigation, { Major and Minor }	10 do.
3rd., for improvements; † non-irrigation or general (Miscellaneous)	5 do.
Total	30 do.

† No direct returns would be expected from these.

‡ 25 per cent. plus 1 lakh for Conservancy Establishments.

The addition ‡ for establishments would be about 8½ do.

Total expenditure debitable to Ordinary 38½ do.

9. The Budget entries for Major and Minor Works from 1862-63 to 1874-75 have been as follows—

§ Provision not shown separately under Major and Minor.	§ 1862-63	{ Major Works }	6,92,675
		{ Minor do. }	
	§ 1863-64	{ Major do. }	4,36,935
		{ Minor do. }	
	§ 1864-65	{ Major do. }	3,83,597
		{ Minor do. }	
	1865-66	{ Major do. }	3,46,370
		{ Minor do. }	2,17,000
			5,63,370
	1866-67	{ Major do. }	3,02,122
		{ Minor do. }	2,15,000
			5,17,122
	1867-68	{ Major do. }	12,00,000
		{ Minor do. }	3,00,000
			15,00,000
	1868-69	{ Major do. }	1,63,000
		{ Minor do. }	2,00,000
			3,63,000
	1869-70	{ Major Works }	2,00,000
		{ Minor do. }	3,35,000
			5,35,000

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			RS.	RS.
1870-71	{ Major do. }	65,000		
	{ Minor do. }	3,31,000		
				3,96,000
1871-72	{ Major do. }	1,19,200		
	{ Minor do. }	1,75,000		
				2,94,200
1872-73	{ Major do. }	1,30,000		
	{ Minor do. }	1,20,200		
				2,50,200
1873-74	{ Major do. }	2,15,940		
	{ Minor do. }	2,26,000		
				4,41,940
1874-75	{ Major do. }	1,08,000		
	{ Minor do. }	1,03,550		
				2,11,550

Appended to this memorandum is a statement giving the above particulars, as also the repair grants, etc.

It will be seen that for the current year the provision for New Works is less than in any year from 1862-63, while it is less than one-third of the grant for that year; that the variations have been great, and the sums asked for and granted have apparently been determined arbitrarily, and without reference either to the claims or wants of the country.

The expenditure on works from Loan Funds in the seven years from 1867-68 to 1873-74 has amounted to Rupees 46,81,815, or at the rate of

Vide Statement.

rupees nearly yearly. Such outlay is, of course, of no moment as regards the Presidency generally, the condition and advancement of which, as regards Agricultural Works, must depend upon the grants under Ordinary. The transferring of certain works to Extraordinary should have led to other works being taken up under Ordinary; this has unfortunately not been the case hitherto, and improvements of this class have made of late years even less satisfactory progress than was obtained formerly.

OOTACAMUND, (Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
17th September 1874. Chief Engineer for Irrigation.

Statement of the Budget provision under Ordinary for Agricultural Works, New, and Repairs.

Year.	NEW WORKS.		Total.	Repair.	Total Works.	Conservancy, etc., Establishment.	Grant for Work as passed by Government of India.	Remarks.
	Major.	Minor.						
1862-63	RS. 6,92,675	RS.	RS. 6,92,675	RS. 9,74,198	RS. 16,66,873	RS. 56,381	RS. 17,23,254	
1863-64	4,36,935		4,36,935	9,47,247	13,84,182	56,627	14,30,112	
1864-65	3,83,597		3,83,797	10,85,281	14,68,878	*	15,75,065	
1865-66	3,46,370	2,17,000	5,63,370	10,00,000	15,63,370	*	12,59,818	
1866-67	3,02,122	2,15,000	5,17,122	9,63,454	14,80,576	*	15,91,376	
1867-68	12,00,000	3,00,000	15,00,000	6,99,850	21,99,850	*	22,00,000	12 lakhs extraordinary.
1868-69	1,63,000	2,00,000	3,63,000	10,75,000	14,38,000	*	14,38,000	
1869-70	2,00,000	3,35,000	5,35,000	14,00,000	19,35,000	*	19,35,000	12 do. do.
1870-71	65,000	3,31,000	3,96,000	14,00,000	17,96,000	*	15,96,200	18½ do. do.
1871-72	1,19,200	1,75,000	2,94,200	12,00,000	14,94,200	*	14,94,200	15½ do. do.
1872-73	1,30,000	1,20,200	2,50,200	12,00,000	14,50,200	*	17,24,895	8'77 do. do.
1873-74	2,15,940	2,26,000	4,41,940	13,60,000	18,01,940	*	17,01,000	9'06 do. do.
1874-75	1,08,000	1,03,550	2,11,550	13,67,050	15,78,600	*	15,81,000	6'03 do. do.

* Not included in Part II.

† Minor Works... Rs. 88,940.
Reserve 1,37,000.

District.	Description of Work.	EXPENDITURE.							Total.	Remarks.
		1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.		
Godavery.	Raising Godavery anicut ...	RS. 15,468	RS. 6,531	...	...	...	...	...	RS. 21,999	
	Aqueduct over Chintapully calingul channel.	1,548	...	...	...	...	...	...	1,548	
	Constructing a lock and calingulah below the Gunnam aqueduct.	8,445	780	...	...	...	...	...	9,225	
	Irrigation Works of Ellore high level canal.	2,465	5,000	...	...	...	...	...	7,465	
	Calingulah on Mandapetta canal.	...	759	...	...	...	...	...	759	
	Masonry aqueduct over Thapaswaram drain.	...	122	...	...	...	...	...	122	
	Scouring sluice and ring channel to Cocanada lock.	...	1,269	...	...	...	...	...	1,269	
	Under-tunnel under Oondy channel.	...	322	...	...	...	...	...	322	
	Improvements to Akeed canal.	17,045	52,116	7,734	447	...	...	...	77,342	
	Rebuilding side wall of Gannaram aqueduct.	4,979	4,668	4,388	23	...	...	...	14,058	
	Widening and improving Samulcottu canal.	25,715	59,093	26,145	20,730	...	...	...	1,31,683	
	Extension of irrigation from Ellore canal.	...	38,681	27,637	4,626	...	...	...	70,944	
	Aqueduct across Cowsica drain.	1,761	51	46,509	22,199	63,995	1,19,844	1,49,580	1,710	
	Extension of irrigation from Western Delta.	...	11,289	305	...	...	...	...	11,594	
	Works for the cross drainage Ellore high level canal.	...	...	...	19,165	...	...	...	19,165	
	Constructing lock and weirs on Cocanada canal, Eastern Delta.	...	...	...	14,517	...	...	...	14,517	
	Canal from Ellore high level canal to Weyaru.	...	...	...	...	95,233	1,18,853	85,008	2,99,094	
	Extension of irrigation from Eastern Delta.	...	...	...	...	...	...	...	...	
Total, Godavery...		77,426	1,80,579	1,12,718	81,707	1,59,228	2,38,697	2,34,588	10,84,945	

Channel from Wallabapooram to Tide water.	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	Total.	Remarks.
First-class lock at Duggeralla.	15,844	9,549	...	...	...	...	...	25,393	
Second-class lock at Jagarlamoody.	7,357	6,790	...	...	...	...	...	14,147	
Cutting a new channel from Pedavallapoodu to Nizampettam.	9,570	9,080	...	...	...	...	...	18,650	
Drainage channel from outlets across the Ranapoor swamp.	675	487	...	...	...	...	...	1,162	
Excavating channel from the terminus of the Eastern side channel of the Masulipatam canal near the Aukunurroo lock to Gokeveram.	5,329	294	...	...	...	...	...	5,623	
Irrigation channel from 14th mile of Polraz Codoo.	...	10,384	...	...	...	...	...	10,384	
Compensation for land by Civil Officers.	...	610	...	...	...	...	...	610	
Enlargement, extension, and improvement of the channels in the Masulipatam Section of the Kistna Delta.	41,015	34,297	21,547	25,466	21,157	6,862	10,328	1,60,672	
Irrigation channel on the west side of Masulipatam canal from 13th mile to Aukunurroo.	14,503	17,389	6,734	7,182	4,003	...	...	49,811	
Widening the head of Masulipatam canal for 100 yards from the anicut to the head of the Ellore branch.	7,741	8,927	1,656	5,811	10,000	14,608	16,000	61,612	* Compensation.
Side channel from Doogeralla to Nizampattam.	...	...	11,026	1,510	...	...	...	12,536	
Enlargement and improvement of Ryves' channel and its branches and construction of the masonry works.	...	44,352	36,513	37,865	41,710	54,504	42,035	2,60,093	† Do.
Extension of the Commamore channel and construction of the necessary masonry works.	49,921	30,289	17,023	1,708	45	438	402	99,826	
Slipping down the banks of the main canal from the southern flank of the anicut and enlarging the head of main canal from Seelanagarum to Doogeralla.	14,346	12,606	6,702	7,823	5,46	4,857	3,007	67,687	

Statement of Outlay on Works from Loan Funds from the commencement up to 1878-74.—(Continued.)

District.	Description of Work.	EXPENDITURE.						Total.
		1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.
	Channel from Ravendrapand to tide water or Western bank channel.	RS. ...	RS. ...	RS. 17,679	RS. ...	RS. ...	RS. ...	RS. 17,679
	Excavating Ramarazpolliem channel towards Gokaran.	...	...	3,009	...	...	...	3,009
	Constructing an accommodation bridge across the Commamore canal at Kollakaur.	...	...	{ 2,807 } 4,825	...	...	...	10,837
	Improvements to the lower portion of Pallair.	6,805	409	967	641	...	...	8,822
	Drainage channel to dispose of four drains which at present run into the Vellatoo channel and restrict its means of irrigation.	4,75	3,764	896	818	...	...	10,232
	Nizampatam Canal	...	...	937	...	...	...	937
	Improvements to the eastern embankment of the Kistna from Yanamala Coedoore to Mope-davy.	...	1,476	1,222	...	...	...	2,698
	Constructing first-class lock at Doogeralla to connect Nizampatam canal and Commamore channel.	19,097	21,597	1,202	...	...	...	41,896
	Lock and calingulah at Jaggerlamooly.	...	...	2,331	...	...	...	2,331
	Excavating an irrigation channel on the east side of Masulipatam canal from Pallairu at Pamurru to Ankumuru.	12,845	799	...	561	...	...	14,205
	New cut to Commamore channel at Kollakaur.	...	...	...	...	...	4,132	4,132
	Total, Kistna ...	2,09,802	2,08,697	1,37,676	94,371	82,361	81,269	92,006
								9,06,182

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District.	Description of Work.	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	Total.
		RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Nellore.	Improvements to the Survapully channel.	57,228	71,596	59,998	66,980	80,000	18,384	25,011	3,79,197
	Canal of Irrigation from Nellore to Kistnapatam.	5,135	223	...	...	...	...	...	5,358
	Compensation for land by Civil Officers.	...	29	...	...	...	...	...	29
	Total, Nellore ...	62,363	71,848	59,998	66,980	80,000	18,384	25,011	3,84,584
Madras.	Madras Water Works	2,85,153	2,50,375	2,42,247	...	...	...	...	7,77,775
	Chembrambakum Tank Project	...	84,743	93,800	...	...	...	...	1,78,543
	Compensation for land by Civil Officers.	...	7,188	...	...	...	...	...	7,188
	Total, Madras ...	2,85,153	3,42,256	3,36,047	...	...	...	...	9,63,456
	Regulating works for the improvement of the river Cauvery.	28,309	56,684	2,446	5,494	...	...	...	92,933
	Completing a front and rear retaining wall and apron along the south branch of the Lower Coleroon anicut.	...	12,072	5,677	3,324	2,063	...	...	23,136
	Surplus sluice on the north bank of the Coleroon.	...	969	...	...	...	...	...	969
	Construction of a sluice of 7 arches and completion of an additional sluice and rough stone apron at the northern extremity of the south branch of the Lower Coleroon anicut.	...	2,642	...	...	...	...	...	2,642
	Regulating works at the Pandavayaur and Coravayur heads.	...	...	...	...	...	...	...	...
	Do. do at the Vettair heads	...	...	8	...	...	...	...	8
	Regulators for the principal branches of the Vennaur.	...	...	83	28,079	1,01,791	44,771	21,337	1,96,008
	Pandavayaur bridge, Vellayaur bridge	...	...	...	...	...	...	10,147	10,147
	Fixing bench-mark stones along both banks of Coleroon, and incidental expenses connected with the Agunda Cauvery and Coleroon survey.	...	...	...	...	...	...	...	20
	Total, Tanjore ...	28,309	2,367	8,214	36,397	1,01,791	44,771	21,337	1,96,008

Statement of Expenditure on Works, from the commencement up to 1873-74 (continued).

District.	Description of Work.	EXPENDITURE.						Total.	Remarks.
		1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	
Trichinopoly.	Constructing surplus sluice for the Weyacundai channel.	RS. ...	RS. 1,825	RS. 400	RS. ...	RS. ...	RS. ...	RS. 2,225	
	Weyacundai Channel Extension Project.	...	8,117	2,637	...	...	...	10,754	
South Arcot.	Total, Trichinopoly...	...	9,942	3,037	...	...	...	12,979	
	Constructing sluices across the Pella river at Pelandurai.	...	...	...	36,834	34,355	59,561	1,87,443	
Tinnevely.	Anicut on the Tambrapoorney river in the Tinnevely District.	...	1,04,469	...	...	...	...	1,04,469	
	Stroeriguntum Anicut Project	...	...	3,17,847	{ 72,143 *22,171 }	99,588	1,50,507	49,103	* Compensation.
	Total, Tinnevely...	...	1,04,469	3,17,847	94,314	99,588	1,50,507	49,103	
	Grand Total...	6,63,053	9,90,158	9,75,537	4,11,103	5,59,386	5,92,139	4,90,389	

No. 940-A.

MEMORANDUM.

No. 441.

THE following additional information on the subject of the proposals contained in my Memorandum of the 17th September last for a radical and permanent increase of the grant under "Ordinary" for works classed as Agricultural is submitted, with reference to the Minute, dated 29th October, by His Excellency the Governor.

2. In a certain technical sense it is true that the principal increase of expenditure proposed is for new Irrigation Works; but, if paragraph 2 of the Memorandum be referred to, it will be seen that extensions of irrigation occur in a very secondary position, and that, although I do propose to carry out a great many New or Major Works in which class all works costing more than Rs. 2,500 each, which are not Repairs, come, the chief part of the additional expenditure will be upon improvements, with the object of remedying the defects of existing works and making them more efficient.

3. There is very little difference, except as regards the cost of individual works, between Major and Minor New Works of the kind referred to. One tank wants a surplus weir, and the estimated cost being under 2,500 rupees, the weir would be a Minor New Work. In another case the cost would be 3,000 rupees, and the work would be a Major Work. Head sluices to channels and distributaries follow the same rule. Just now there has arisen also a necessity for lengthening anicuts which have been in existence a good many years. The Thamarapaukum anicut, which supplies the Madras Water Works, was lengthened last year; the Koratur anicut on the Cooum will probably have to be lengthened; the Pennair anicut at Nellore must be extended across the breach beyond the north wing walls; the Pooniar Anicut in South Arcot must be similarly treated, and there are many other cases which will have to be dealt with. These works, moreover, will require to be commenced next January; but how the money is to be obtained is not clear, for there are no funds at the disposal of Government to meet emergent demands, and they cannot be found by stopping other works, or curtailing the allotments of these, seeing that already such curtailment has been

* Madras Water Works.
Chembrumbaukum Tank.

carried so far in the case of the only two works* that any grants of any magnitude as to preclude further transfers.

Again, Government have decided that greater attention is to be paid to the convenience of villagers in respect of the provision of crossings over canals and irrigation channels; and, if this decision is not to remain a dead letter, a very considerable sum will be absorbed in carrying it into effect. A commencement has been made with the head sluices of the Tambrapoorney channels, and all these works will be major. A commencement has yet to be made with the Tambravutty channels in Coimbatore, and their head sluices, too, will be Major Works. All over the country there are rivers to be similarly dealt with. It would, in my opinion, be of little use to make out lists of works required, and to give rough estimates of their cost. Such information takes time to collect, and it may be added that nobody has any belief that it ever leads to anything being done, and nobody takes any interest in it. It may still be a matter of opinion whether it is better and more economical to go

on, as has hitherto been pretty much the custom, wait till accidents occur in such numbers and with such persistency that the evils to be remedied are at last felt to be intolerable, and something, it is admitted on all hands, must be done; then confining this something to the locality immediately affected, ignoring the fact that far off the same or similar conditions are to be found, which in due time and in their turn will lead up to and ensure similar disasters. Perhaps an absolute demonstration that it is not a wise and economical plan so to act is hardly feasible; the proof is easy enough for particular instances after the loss has been sustained, and in the case of each separate proposal for expenditure, the circumstances can be clearly set forth; but, unless money be made available as a tolerable certainty, the proposals are not likely to be made. Officers are perpetually going through the country and seeing that works are insecure and that public and private interests are imperilled, which could often be made safe at a cost which would frequently be but a very small premium for insurance. I should perhaps qualify the remark as to seeing, by saying that many officers have long since ceased to see, because they have found it to be useless to do so, and another generation is becoming more or less blind to the matter under notice, as the inevitable result of the absence of any useful exercise of sight for a long time.

My wish is to get something done towards remedying a condition of things which is appears to me, very far from creditable. If a beginning be made to-morrow, this generation will not see the work accomplished, there being something required in all parts of all the districts; there are thousands of little matters to be attended to, and only some tens can be dealt with, and not these until some money is given. The work to be done, then, being almost unlimited, the proposal that some definite moderate sum shall be devoted to it year by year, and of necessity a certain sum was suggested, and the relation of this to the revenue derived from Irrigation Works was mentioned. The details are open to correction and alteration, and it is submitted that there has been sufficient proof within the last two or three years that outlay for the purposes indicated is urgently required.

5. Another class of agricultural work is that referred to in clause 3 (b) of paragraph 4 of the Memorandum. In the case of improvements not directly connected with irrigation it is perhaps even more absolutely necessary if anything is to be done, that some amount should be fixed for the annual outlay. In a few instances where the danger to important works of irrigation has been imminent, river conservancy and protective embankments have received attention, and something has been spent to prevent loss and damage, instead of on the repair of that which had occurred. In Tanjore a very considerable change for the better has taken place, and high freshes do little or no damage. A great deal of what was practically new work has been done as repairs. The agricultural expenditure there is principally on river conservancy and embanking, and system having been introduced in dealing with such matters, the results have been satisfactory; damage has been prevented, instead of being only made good.

In the Godavery and Kistna Deltas the occasional washing away of parts of the bank canals led to the necessity for exercising some control over the rivers being recognized, but, for the most part, nothing beyond the meeting of present emergencies has been attempted. In the deltas large sums are being expended in

extending irrigation and providing water communications, and from Local Funds equally large or even larger amounts are being laid out upon roads, bridges, etc., and it will not be wise to risk the loss of much of this property at any rate by causes which are preventable.

The Government have taken up the delta drainage question, and this improvement is to be gone on with as speedily as may be. Money will be required, and at present there is none, or next to none. A lakh of rupees was to be provided in the Budget annually, but in the absence of any recognized allotment for the wants of the Presidency, the provision could have been made only on paper. There is now virtually no money at the disposal of Government. However needful anything may be deemed to be, there is no certainty whatever that a place for it will be found in the Budget as passed by the Government of India. Few things can be more urgent than Minor New Works, such as tank and channel sluices, surplus weirs, etc., but no money beyond the altogether inadequate sum in the Budget could be obtained this year for them, and those whose belief in the future is based on their knowledge of the past can have but faint hope that any greater liberality will be experienced hereafter, unless the grant be determined on some fair principle. A percentage on the revenue derived from Irrigation Works and something in the same way on the Land Revenue (other than irrigation), if it is submitted, a just and reasonable way of determining what means of dealing with matters of very great importance are to be placed at the disposal of this Government.

6. Lord Hobart wishes to know whether, if increased funds are given for the construction of escapes, head sluices, etc., the outlay on Repairs can be diminished. The answer to this question is that ultimately the cost of maintaining Irrigation Works will be reduced to the extent of nearly all the outlay now incurred in repairing breaches and upon all work other than fair wear and tear, but that for many years to come expenditure on Repairs will be determined, not by the wants of Irrigation Works, but by the money given and by the adequacy of the establishment available. The case is somewhat as follows:—Repairs are enormously in arrears; it has been impracticable to do in any year more than a part of what was needed; not only has ordinary up-keep been frequently postponed too long or left unattended to, but works have been breached and left unrepaired. So much more has to be done than is likely to be accomplished, that the limit of necessary and useful expenditure is imposed rather by the inability of the department to spend money properly than even by want of money. The first thing to be done is to ensure that as possible that work once done shall be done effectually, and shall not be doing over again. A great deal of the time of establishment has been wasted, partly by their fault and partly by no fault of theirs, in doing things improperly over and over again. The crops of the year current must be saved if possible, and so patchwork has to be allowed as the less of two evils; and there is unfortunately in seasons which ought to be good, but which as matters now stand are disastrous, so much patchwork to be done, that there is but little time for anything else. Government must, I think, be content to look to net results for the justification of expenditure, instead of hoping for its diminution. What is spent is, and will be, directly apparent in any case. What is saved or gained directly in revenue can

*Proceedings of the Madras Government, Public Works Department,
17th February 1875.*

be ascertained definitely only in particular cases, though, of course, the statistics of the Presidency will afford an indication of some value. In 1872-73, for instance, the revenue was 10-13 lakhs more than in the preceding year, the additional outlay in the latter year being 2-10 lakhs, or 0-65 per cent., and, compared with the acreage, the difference between 0-31 and 0-35 rupees an acre. There can be, it is thought, no room for doubt that had the tanks of Chingleput and North Arcot, to take only two districts, been rendered as safe and efficient prior to 1872, as they may perhaps have been made by 1882, it would have been of great advantage to the Treasury.

7. The notes of the tours of inspection made in the several districts are submitted from time to time to Government, and afford a good deal of information regarding the state of the comparatively few works which can be visited. A tour of five weeks in Tinnevely has just been completed, and there, as elsewhere, the Irrigation Works are by no means in a satisfactory state. The Tambrapoorney anicuts and channels, on which so large a revenue depends, have many defects and need more time and money to be devoted to them if disasters are to be avoided. The tanks of the Nanganeri taluq are many of them lamentably inefficient, and they ought certainly to be put to rights. Both the Revenue and the Public Works Officers are fully alive to the need of reformation, but the means available are altogether inadequate. If those means be increased, doubtless at the end of ten years a great improvement will be manifested. The revenue has been augmented and will be still further increased. Probably no better system can than that which will give District Officers more money, in proportion to the good which they do with that which they have placed at their disposal, could be devised. The small percentage on the Revenue proposed to be devoted to its security, and to the carrying out of such improvements as will make the efficient maintenance of Irrigation Works possible, will add nothing to the State burdens, wherever reasonably good management can be secured, but will steadily diminish them by increasing the net revenue. In Tinnevely, for instance, Mr. Puckle, who knows the district remarkably well and has had abundant opportunities of noticing how ineffective patchwork really is, has told me that he is anxious to see the irrigation of each river and of each group of tanks taken up in succession and dealt with systematically; his views are entirely in accordance with the instructions which have been issued for the guidance of District Officers of this department, but practically, under existing circumstances, very little progress can be made in carrying them out, for emergent wants all over the district must be attended to; and when these have been met, there is but little time or money left for anything else.

8. The great change for the better which is to be desired must be a work of time, but it will be an important step in the right direction if the need of reform and of the means necessary to that end be recognized. There are many officers in the department who will do their utmost to introduce and carry through a better and more intelligent manner of dealing with Irrigation Works if the opportunity be allowed them; there are others, sufficiently numerous, who require more or less pressure to make them think and act, but this pressure cannot be applied to any good purpose so long as they can plead that over and over again

*Proceedings of the Madras Government, Public Works Department,
17th February 1875.*

their predecessors have made efforts which have ended in nothing; they will not believe that any other result will be possible until they find that the first step, a moderate provision of funds, shall have been taken.

9. With regard to the remarks in the Minute, dated 14th October, by the Honorable Mr. Robinson, and concurred in by the Honorable Mr. Sin, it is suggested that whatever may be the percentage of the grant for Major and New Works on the Revenue, about one-half should be allotted to ~~the~~ ^{the} expenditure in making existing works safe; this allotment will be disposed of on estimates which being below 2,500 rupees each will not be shown in detail in the Budget. The other half will then be available for Budget works, and it is thought that it will hardly be practicable to distribute it to districts, though District Engineers may be instructed to endeavour to furnish estimates to the extent of 2 or 3 per cent. on the revenue, and those which cannot be provided for in one year may be reserved for that following. For the agricultural, but non-irrigation, grant the distribution will have to be made specially to such works as the Government may find to be most urgently required, and for some time to come the Northern Deltas, for village drainage, embanking especially that of the ~~lands~~ ^{lands} of Polaram and Divi, and river conservancy, are likely to absorb the principal part, though, as soon as it is known that there is any prospect of similar work elsewhere being sanctioned and money given, there will be plenty of applications from which to make a selection.

10. The Government are probably aware that my views regarding the administration of the Irrigation Department have been, and continue to be, opposed to taking up entirely new projects until old or existing works shall have been rendered much more efficient than is the case at present, but this is a very different thing to omitting to carry out such new works in connection with existing irrigation as may be necessary for improving its efficiency, making the most of the water-supply, etc. If a tank receives but a precarious supply, whether it be rain-fed or otherwise, and if consequently the area of cultivation and revenue fluctuate greatly, it should be seen what can be done to remedy this evil, and an evil it undoubtedly is; and if a project, which will bear examination and criticism, can be prepared, it should, as soon as circumstances will admit, be carried out. A case in point may be mentioned.—The Vizianarayanam tank in the Nanganeri taluq of the Tinnevely District has a supply channel from the Numbiyaur, which channel also acts as a catch-water channel for the drainage of a large tract of country. The tank usually receives very little water, and when the monsoon happens to be a good one, the channel breaches in many places, and the water goes where it is not wanted, instead of into the fine tank where it would be of great value. Heavy remissions have been granted in many years, and it is proper that a remedy should be applied. A considerable expenditure will be needed, not only at the head of the channel, a complete reformation of the channel itself with ample provision for the discharge of surplus land drainage, and radical improvements to the tank have been ascertained to be necessary. Such work must be classed as "New Works," for it will introduce arrangements which have never before existed, and, moreover, it would be impracticable to provide for such extensive alterations from the repair grant, which will suffice for maintenance only of

existing works, and for very moderate improvements generally of detail, and not for the construction of works to be afterwards maintained.

Of particular works, as also of the circumstances of particular parts of the country, I necessarily know a good deal, and I do not apprehend that any difficulty will be experienced in ensuring that funds, which may be made available for projects, the necessity for which can be clearly demonstrated, and also that the revenue results will justify the expenditure proposed. Indeed, there is so much to be done that will pay, that in all but very exceptional cases, nothing in the way of new work, which will not pay, should be attempted.

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

13th November 1874.

No. 442. ORDER THEREON, 17th February 1875, No. 475.

IRRIGATION, No. 31.

Account.

THE proposals contained in the Memorandum submitted for consideration by the Chief Engineer for Irrigation, and the additional information which

has been laid before Government during the discussion which has followed, have satisfied His Excellency the Governor in Council that it would not be right any longer to postpone bringing to the notice of the Government of India the urgent need that exists for placing at the disposal of this Government such funds as will enable the Irrigation Works of this Presidency to be dealt with in a manner which shall prevent wasteful outlay, give greater security to the revenue, and obviate the heavy losses which are of periodical recurrence.

2. The events of the last three years have demonstrated that in several districts the Irrigation Works are not in a fit state to withstand the strain put upon them by heavy rainfalls, of a character which, though not of annual, is by no means of infrequent occurrence. Nellore, Cuddapah, North Arcot, Chingleput, Salem, and South Arcot, have all been visited by storms which have occasioned very serious and wide-spread damage, not only to tanks and channels, but also to roads and to the Railway. The extent of the damage from the most recent storm, that of October last, is not yet more than partially known, but the disasters on the South-West and North-West Lines of the Madras Railway are an indication of very extensive inundations over an area of many thousand square miles, and the details of damage to Irrigation Works from the storms of May and October 1872 and of May 1874 render it certain that similar, but probably even more extensive, damage will be found to have been again sustained.

3. It is perfectly well known that, given similar conditions of rainfall elsewhere, the same results would follow, for out of thousands of tanks, but very few are provided with adequate means of disposing of surplus, and among these few are to be numbered those which have very recently been attended to. Numerous estimates have been laid before Government from the information furnished with which it has been made evident that accidents in successive years have been due to radical defects of arrangement, and that on the early application of a remedy will depend future immunity from preventable damage, and equally preventable

loss of revenue. Over and over again breaches from water overflowing or reaching nearly to the top of bunds have taken place, the cause being that the surplus weirs, where there were any, were altogether insufficient, while in great numbers of cases the tanks were without any surplus works at all; and, if it were possible to save them from destruction, this possibility was dependent upon the promptitude and resource of the villagers who, if ready to expose themselves at such time and in such weather, might not rightly estimate the extent of the danger, or be able to decide what measures would avert it. Again all over the country numerous supply or irrigation channels are taken off from rivers, and are without head sluices for the exclusion of flood waters and the regulation of the supply, and the floods due to local rainfall have been aggravated most inopportunely by water from the rivers. A first necessity therefore is the provision of adequate surplus works to all tanks which are to be retained as Irrigation Works, and the construction of head sluices to all river channels which are so circumstanced as to render this safe guard requisite.

4. What is the case in the districts named is true also for all the rest, with the exception of the very few in which artificial irrigation is the exception rather than the rule.

5. It is, moreover, the fact that numerous anicuts or weirs across the river, both great and small, throughout the Presidency, are in danger of being turned either because their wing walls are below the level of the highest known floods, or because there are no flood banks to confine the river water to its proper channel at such points. There have unfortunately been several instances recently of accidents due to these causes, and the necessary result is that very many times the amount, which would have sufficed to prevent damage, have been or will be required to repair it.

6. His Excellency is convinced that it is essential that earnest and sustained effort should be made to remedy a state of things so opposed to the long continuance is very far from creditable, and it is necessary to consider how the requisite means of applying a remedy are to be provided.

7. From the statements submitted by the Chief Engineer for Irrigation, it appears that of late years not only have the grants entered in the Budget under Agricultural, Ordinary, New Works, with reference to the approximate assignments made by the Government of India diminished greatly, but even these small sums have in the orders on the Budget been still further reduced, until in the current year it has happened that for the whole of this Presidency, with its irrigated area of 4.8 millions of acres, and revenue of 201 lakhs, the sum set apart for improvements, major and minor, is but 2.12 lakhs, or just over 1 per cent. on the revenue, the sum asked for having been the very moderate amount of 5 lakhs, or 2½ per cent. on the revenue. Moreover, the Major Works of this Budget are seven in number, or about one to every three districts, for which the Budget entries amounted altogether to 1.08 lakhs; but out of this provision, under the orders of the Government of India, Rupees 44,117 had

G. O., No. 2,265, dated 15th August, and No. 2,273, dated 17th August.

be transferred to meet in part, and they could be met in part only, the demands on account of incomplete works of 1873-74. So that even the few petty works of

that year could not be completed in 1874-75, and have had to be postponed until 1875-76.

8. His Excellency in Council feels it incumbent on him to bring under the serious consideration of the Supreme Government the grievous injury which is inflicted on the interests public and private, of this Presidency, by inadequate provision for the maintenance and improvement of its Irrigation Works. This Government would even prefer to leave the prosecution of new works in temporary abeyance, until existing works can be placed in a reasonably efficient and safe condition. The first duty is clearly to render the old works efficient and safe, to carry out such improvements as circumstances may show to be really requisite, and to complete those minor systems or individual works which for want of some necessary additions or extensions do not now irrigate properly the lands which they are intended to supply.

9. The amount of work to be done in this way is certainly enormous. There are some 39,000 tanks on the registers, and if only 20,000 of these have to be provided with escapes or additional means of discharging surplus at an average cost of Rupees 300, and if the moderate estimate of two sluices to 10,000 and one sluice to 20,000 tanks, at an average of Rupees 100 each, be taken, the total outlay for works of this class will be 100 lakhs, so that 20 years will be needed at the rate of 5 lakhs annually for these first essentials to security. Even a rough estimate of the cost of head sluices cannot be at present adduced. But few of the old channels have them, and but few should be without such means of regulation.

10. For the other works of improvement which have been indicated, and which are in many cases but little less urgent, funds are required to an extent which will enable something more than nominal progress to be made. It is essential indeed that district officers should understand that the Government are in earnest about this all-important matter of the removal of preventable causes of accidents and the consequent waste of money and loss of revenue; that also the circumstances of works which are inefficient from whatever cause with which the Public Works Department is concerned must be attended to, and that such works must be made to answer their purpose if it be found that this can be done at a cost not out of proportion to the revenue or other interests involved.

11. After giving the subject the careful consideration which it undoubtedly demands, His Excellency in Council is of opinion that the smallest amount which will meet in a reasonable degree the requirements of this Presidency for Major and Minor New Works is 12 lakhs of rupees, from which sum it will probably be practicable to carry out the emergently required improvements to existing works already detailed; to provide for the construction and improvement of river embankments, the need of which in several cases, as at the Polaram island in the Godavery District, Divisions Kistna, the Poniar in South Arcot, has been forcibly demonstrated; and to secure to the villages of the Delta Districts, such improved sanitary condition as will result from their drainage, a matter to which the attention of Government has been lately forcibly directed by the prevalence of much fever and a high rate of mortality in the Godavery Delta, while the state of the Kistna Delta is very similar, or perhaps worse: these works of embanking and drainage, though not directly connected with Irrigation, will have to be provided for from Agricultural

Funds. The above sum is, His Excellency considers, fair and moderate when compared with the Revenue,* and while the several districts all none of them have more money than can be well and profitably expended, all in which Irrigation Works are of considerable importance will have sufficient to make the year's outlay something more than nominal.

12. It has not been overlooked that the first result of increased outlay on rendering Irrigation Works safe and efficient should be a decrease in the cost of maintenance, and this result will undoubtedly be obtained at least to the extent of saving all, or nearly all the expenditure on repair of damages caused by the defective arrangements which will be abolished. As the case at present stands, however, repairs are almost everywhere greatly in arrears, and these arrears must be brought up before reduction of expenditure under this head can be brought about, while, moreover, as has been shown, a very long period will elapse, however great the energy applied may be, in putting existing works to rights, and rendering accidents infrequent and improbable. The Government are convinced that not only is it necessary that the repair grant should be fixed for some years to come at 15 lakhs, but that a direct and immediate gain will be secured by spending this sum, or that, in other words, the net revenue will be increased, and the State advantaged in two ways, first, in possessing a more valuable property, and, secondly, in obtaining a larger net income.

13. The adoption, to the extent noticed in this order, of the proposals which have been discussed in these Proceedings, will entail the following Budget provision in future years under Agricultural, Ordinary.

	lakhs.
1st, for repairs	15
2nd, Major and Minor New Works, Irrigation	12
3rd, improvements, non-irrigational or general	—
Total for Works	27

and the addition of 25 per cent. for general establishments, with 1½ lakhs for conservancy establishments, will make the total of the grant 35 lakhs of rupees.

Ordered that the following letter be sent:—

(Here enter No. 475-A, dated 17th February 1875.)
(True Extract.)

Ch. Walker Colonel, R.E.,
Secretary to Government.

To the Chief Engineer for Irrigation.
To all Superintending and District Engineers.
To the Revenue Department,
" Controller of Public Works Accounts.

Exd. A. Grubert.

100 Spare Copies sent separately.

N^o 088
Revenue Department
Govt. of [1875] Madras.

PUBLIC WORKS.

To

THE CHIEF ENGINEER for IRRIGATION

do. do. do.

Dated February 17th.

Recd. - 24'

Recd.

G. O. 17th February 1875, No. 475.

As per

FEBRUARY.

Nos. 440-442

24/2

N^o 390
Communicated to the
Board of Revenue

W. L.
26 Feb 75

Agricultural Works. - Passing orders
on Memorandum by the Chief Engineer
for Irrigation regarding the limited
provision made for Ordinary Agriculture
Works of the Madras Presidency.

79 To the Board of Revenue