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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Revenue DEPARTMENT

G.O. No.	4268	~~Press.~~
B.P. No.		Mis.
Dated	1. 8. 1877	197

Not to be folded or roughly handled.

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

23rd July 1877, No. 186 I.

Irrigation.

Read the following paper :--

No. 116. From J. O'SHAUGHNESSY, Esq., District Engineer, Nellore, to the Secretary to Government, Public Works Department, dated Nellore, 30th June 1877, No. 1,109.

In reply to G.O., dated the 7th May 1877, No. 14 I, I have the honor to report that the existing works on the tract of country proposed to be irrigated by the Sangam Project require an expenditure of Rupees 1,00,000 to render them fairly efficient.

2. The works required are surplus weirs, sluices, embankments, the principal of which is the embankment along the left margin of the Pennair, which in reference to G.O., dated 7th January 1875, No. 26, it is proposed to construct at a cost of about two lakhs of Rupees whether the Sangam Project is carried out or not.

3. The annual charges for the maintenance of these works has, for the last three years, averaged Rupees 26,670; a good deal of this expenditure has been incurred in repairing damages caused by the floods of 1874, much of the injury then caused has still to be repaired; but when the works are made fairly efficient, the annual cost of maintenance will probably amount to Rupees 20,000 a year, or about $7\frac{1}{2}$ per cent. of the revenue.

Vide G.O., dated 18th March 1871, No. 818.

4. The drainage of the country to be brought under the influence of the proposed anicut is naturally provided for in the most effectual manner by the Muldavi and the Pyderu, which run almost parallel with the proposed irrigation channels, and great care has been taken not to interfere with the natural drainage to any material extent; a glance at the map of the proposed works will explain this more clearly and readily than any written description that could be given of it.

5. The only portion of the proposed works that intercept drainage to any extent is the river embankment, and, owing to the configuration of the ground, this occurs in a few places along the line of that portion of the work where the drainage falls into the Pennair. The late Mr. Smith fully explained in paragraphs 44 to 53 of his report printed with G.O., dated 28th July 1870, No. 1,818, how this was to be provided for, and out of his estimate of Rupees 1,20,000 for the river embankment a sum of no less than Rupees 75,420 appertains to drainage outlets, a sum which I may here mention I consider much too great for the purpose. It may be as well to explain here that the portions of the river embankment which was to be formed by the excavation from the southern channel was not charged to the embankment, and that since the estimate for the Sangam Project was framed it has been found by the floods of 1874 that a greater embankment is necessary than was originally provided for; this

accounts for the difference between the provision of Rupees 1,20,000 made for the embankment in the project estimate and what the work is now estimated to cost independent of the project, viz., Rupees 2,00,000.

6. As I am in a position to give some information on the probable growth of the revenue, I hope it will not be considered out of place to do so though the question has not been referred to me.

7. In G.O., No. 2,130, dated the 26th July 1875, the Government of India was informed that it would be safe to assume that irrigation would spread as rapidly under the Sangam Anicut as it did under the Nellore Anicut 20 miles lower down the same river. This is considered a "vague basis" of calculation, because the growth of the revenue under the Nellore Anicut has not been specifically stated.

8. The following statements will remove all doubts in regard to this part of the question:—

A.

Area and Revenue of Lands to be irrigated by the Nellore Anicut during the four years before the work was commenced.

Year.	Area irrigated.	Revenue collected.
	ACRES.	RS.
1851-52	25,280	1,17,141
1852-53	22,457	1,01,715
1853-54	11,336	50,047
1854-55	17,536	76,964
Total, 4 years ...	76,609	3,45,867
Average for 1 year ...	19,152	86,466

B.

Area and Revenue of Lands under the influence of the Nellore Anicut during the construction of the work.

Year.	Area irrigated.	Revenue collected.
	ACRES.	RS.
1855-56	23,814	1,10,634
1856-57	27,309	1,25,768
1857-58	19,140	78,222
1858-59	29,128	1,18,996
1859-60	29,660	1,23,594
1860-61	32,588	1,05,033
1861-62	33,140	1,12,422
Total, 7 years ...	194,779	7,74,674
Average, 1 year ...	27,825	1,10,668

C.

Area and Revenue of Lands under the Nellore Anicut for 12 years after construction.

Year.	Area irrigated.	Revenue collected.
	ACRES.	RS.
1862-63	34,119	1,31,893
1863-64	37,932	1,54,251
1864-65	41,086	1,72,770
1865-66	41,204	1,73,200
1866-67	53,278	1,97,062
1867-68	51,856	1,81,326
1868-69	57,860	1,97,108
1869-70	55,128	2,00,838
1870-71	58,159	2,04,797
1871-72	52,667	2,00,380
1872-73	54,638	1,94,328
1873-74	53,402	1,86,519
Total 12 years ...	591,389	2,204,081
Average 1 year ...	49,282	1,83,673

9. In regard to Statement A it would be more satisfactory perhaps to have the example of a greater number of years to calculate upon, but accounts are not at hand for previous years. The years in the statement are those selected by the Revenue Department in the comparative statements printed with G.O., dated 17th January 1865, No. 156.

10. In regard to Statement B the anicut was commenced in 1855, completed in 1856, breached in 1857, restored and again breached in 1858, re-commenced in 1859, and completed in 1862; so that the work may be considered to have been in progress for the seven years entered in this statement.

11. Table C shows that the maximum revenue was reached in 1869-70, the maximum area in 1870-71, the former in 15 years, and the latter in 16 years after the work was commenced, or 7 and 8 years respectively after the work was completed. The accounts have been received from the Revenue Department, and no explanation is given why a lesser area yields a greater revenue than a greater area; there is not time now to inquire about it, but it may be that a portion of the revenue of 1868-69, when the maximum cultivation was nearly reached, was collected in the following year. This is very probable and fully accounts for the anomaly noticed in regard to 1868-69 and 1869-70, but there is evidently something wrong in the extraordinary difference between the returns for 1855-56 and 1861-62. There is also something seriously wrong in the amount of revenue credited to the work, because the average revenue before the work was commenced appears from the returns to have been about Rupees 18-0 per acre, during construction about Rupees 4 per acre, and after construction the average is under Rupees 3-12-0 per acre; this shall be inquired into and reported upon separately in connection with the Nellore Anicut, keeping, however, to the question of the growth of the revenue as stated. The average was 86,466 before the work was commenced; in 15 years it rose to 209,833, or nearly two and a half times the original revenue, the net increase being Rupees 1,23,372 annually, and it remains to be shown in the following statement how this increase grew year by year after the commencement of the work.

Statement showing the yearly growth of Revenue from the Pennair Anicut, Nellore.

Year.	Average Revenue before work was commenced Rupees 86,466, Revenue after-wards.	Increase or Decrease.	Percentage of maximum increase 1,23,372.
	RS.	RS.	
1855-56	1,10,634	24,168	19.59
1856-57	1,25,768	39,302	31.85
1857-58	73,222	—8,244	—6.68
1858-59	1,18,996	32,530	26.37
1859-60	1,23,594	37,028	30.01
1860-61	1,05,038	19,372	15.86
1861-62	1,12,422	25,956	* 21.04
1862-63	1,31,893	45,427	36.82
1863-64	1,54,251	67,785	54.94
1864-65	1,72,779	86,313	69.96
1865-66	1,73,200	86,734	70.80
1866-67	1,97,662	1,11,196	90.12
1867-68	1,81,326	94,860	76.89
1868-69	1,97,108	1,10,642	89.68
1869-70	2,09,838	1,23,372	100.00

* Anicut completed.

12. The disasters which attended the work at first as well as that it is not credited apparently with its proper revenue, renders it a most unfavorable example in estimating the result of any similar work which may now be undertaken, and which with the experience of years is sure to be carried out with less liability to accidents; but, taking the Nellore Anicut with all its drawbacks as an example of what may be expected from the Sangam Project, it proves as shown below that the assumptions of the Government of India regarding the growth of revenue from the latter work are much too unfavorable to the project.

Growth of Revenue from the Sangam Project.

Year from commencement of Work.	Assumed by the Government of India.	Assumed by Lieutenant Christie.	As calculated according to the Returns from the Nellore Anicut.
	RS.	RS.	RS.
1	...	46,623	...
2	...	20,000	75,818
3	...	40,000	-15,919
4	...	60,000	62,827
5	...	90,000	71,431
6	...	1,30,000	37,556
7	...	1,70,000	56,072
8	14,442	2,00,000	87,634
9	28,881	2,20,000	1,30,765
10	43,323	2,30,000	1,66,503
11	57,763	2,45,000	1,67,320
12	72,210	2,37,000	1,95,219
13	86,652	2,38,000	1,82,995
14	1,01,094	...	2,13,442
15	1,15,536	...	2,38,000
16	1,29,978	...	...
17	1,44,420	...	...
18	1,58,862	...	...
19	1,73,304	...	...
20	1,87,746	...	...

13. I understand the Government of India to say that Rupees 1,87,745 is to be the net revenue due to the work; that it will increase at the rate of one-third per cent. per annum until at the end of twenty years it will be 4.28, for convenience of calculation say $4\frac{1}{2}$ per cent.; one-third per cent. per annum would in thirteen years become $4\frac{1}{2}$ per cent., so that the Government of India appear to assume that there will be no increase of revenue for the first seven years after the commencement of the work, and that after the seventh year it will increase at the rate of one-third per cent. of expenditure, or one-thirteenth of the ultimate increase, until at the end of the twentieth year it will reach the ultimate increase of Rupees 1,87,745; one-thirteenth of this amount has, therefore, been entered for the eighth year in the column headed "growth of revenue assumed by the Government of India" in the above statement, and the same amount has been added progressively year by year until the maximum increase is reached at the twentieth year after the commencement of the work. I mention this because Lieutenant Christie, R.E., has calculated the income from the work as assumed by the Government of India in a different way and with different results, and his calculations may possibly be correct.

14. I am naturally much interested in a question which so seriously concerns the interests of the district in which I am placed, and I trust I may, therefore, venture to offer some remarks on the subject generally.

15. In regard to preliminary expenses the information obtained in regard to the part of the district concerned is well worth the cost. The present inquiry refers moreover to future and not to past expenditure. The question is will it pay to expend a certain amount of money *hereafter*, and in this view the addition of previous expenditure would seem to be an unfair charge.

16. In regard to the estimate for works it is very liberal, and if no misfortune happens during construction there should be a large saving upon it. The amount provided in it for the river embankment, Rupees 1,20,000, should for the reasons given in paragraph 2 be deducted from it. The amount required to put the existing works in efficient order should be deducted also; but as it is impossible to say when money for these works will be available it cannot be deducted directly from the estimate, and it must be credited to the Capital Account of the project. If the project is not carried out the works cannot, without sacrificing existing revenue, be deferred very long, and probably Rupees 20,000 a year for the next ten years may be taken as the amount that is likely to be spent upon them.

17. The estimate for establishment is very liberal also; but if the Government of India charge a lump sum of 25 per cent. of the cost of the works on this account it is useless to make an estimate for it at all. From my experience of large works I should say $12\frac{1}{2}$ per cent. of the estimate would be ample for working establishment exclusive of what might be charged for "Direction and Account." This Government has admitted that a proportional share of the cost of that part of the establishment classed as "Direction" and "Account" may be charged to the work, and if this admission is not withdrawn the amount fixed upon by Colonel Randall, *vide* G.O., dated 19th March 1874, No. 759, viz., 5 per cent. on the cost of the work, is certainly the most that should be charged on this account.

18. The estimate for Tools and Plant is, I think, ample.

19. I should allow nothing for maintenance during construction in the first place, but a very small amount would be required; and in the second place the maintenance allowance for the existing works will be ample for the purpose.

20. The capitalization of land revenue is enormously over-estimated. There seems to be some mistake in assessing the land required for the project at about Rupees 6 an acre; the full assessment is charged for unoccupied land, and nothing is allowed for remissions. The late Mr. Smith seemed careful to get what he called a "correct" instead of an "approximate" estimate of this item, but in no case has Rupees 6 an acre been mentioned as the current revenue of any portion of

the land in this part of the district; unoccupied "wet" land is, I believe, assessed at dry rates; the collections average only 75 per cent. of the assessment, and the capitalization is calculated on a basis of twenty-five years' purchase, when the Government would be willing to sell almost every bit of land they have at twenty years' purchase. The land referred to extends through many villages, and there would be much delay in going over the accounts again to verify or to authoritatively disprove Mr. Smith's accounts of its value. I am satisfied, however, that the following is a more accurate estimate:—

Wet land occupied 323,791, at 5 Rupees	= 16,189-55
Wet unoccupied and dry occupied and unoccupied 85,644, at 1 Rupee	= 856-44
	<u>17,045-99</u>
Deduct for remission at 25 per cent.	4,261-49
Probable actual revenue	<u>12,784-50</u>
At 20 years' purchase	= 255,690

21. Leave and Pension allowances at 20 per cent. of establishment charges are apparently admitted as a proper charge.

22. Interest on average outlay during construction is also admitted as a proper charge.

23. The question of revenue during construction has been variously stated. The Chief Engineer would leave it as a set off against charges for interest. The Government of India thinks it would merely counterbalance the cost of maintenance, and Lieutenant Chrystie assumes that it would amount to Rupees 2,10,000 in certain yearly proportions. I am of opinion that the increased revenue during construction will reach at least 2½ lakhs, which is very nearly equal to the interest charge as anticipated by the Chief Engineer. It will be seen from paragraph 162 of Mr. Smith's report, printed with G.O., dated 28th July 1870, No. 1,818, that even before the survey was finished numerous applications for unoccupied land were received, but they were rejected by the then Collector on the ground that such valuable property should not be parted with in a hurry, and to prevent rich men from monopolising it the decision may have been politic and wise; but the Government of India seem to look upon the subject in the light of a purely "commercial speculation," and in this view of the matter the Collector's decision seems to be wrong. From my own experience of large irrigation works I am sure that once the work is started or even sanctioned almost every bit of available land will be taken up at once, and I have calculated that the increase of revenue on this account the very first year will be at least Rupees 20,000. If the unoccupied land was sold by auction it would, I am certain, bring in a couple of lakhs at least, and for my part I can see no objection to the right of occupation being sold in this way just as land is sold in the Nilgiris and elsewhere.

24. In regard to the charge made for collection of revenue I have been informed by the Deputy Collector in charge of the Treasury at Nellore that the construction of the Nellore Anicut did not render any increase of Revenue establishment necessary. I have never heard of such a charge being debited against individual works of this kind before, and it is contrary to fact to suppose that the construction of the work will cause any increase to the Revenue establishment.

25. The financial condition of the Irrigation and Canal Company precludes the possibility of their claims having to be considered; even if it was otherwise the Sangam Anicut would be below their works and would not affect them in any way. The Company's anicut at Somaiswaram would no doubt affect the Sangam Anicut to some extent, but there seems to be no probability that the construction of the Somaiswaram Anicut will again be undertaken.

26. I should, in reference to the foregoing remarks, estimate the cost of the works as follows:—

	Rs.	Rs.
Works, Original Estimate	24,33,805	
Deduct cost of river embankments—vide paragraph 5.	1,20,000	
	<u>23,13,805</u>	
Establishment at 12½ per cent.	2,88,224	
Direction and account at 5 per cent.	1,15,000	
	<u>4,03,914</u>	
Tools and Plant	82,670	
Total Direct Charges	<u>28,00,389</u>	

Indirect Charges—

Capitalization of Land Revenue lost	2,55,690	
Leave and Pension allowances	80,783	
Interest at 4½ per cent.	2,86,475	
	<u>6,22,948</u>	
Total	<u>34,23,337</u>	

Deduct—

Revenue during construction	2,50,000	
Expenditure on old works during construction	1,00,000	
Salvage of tank beds	1,72,000	
	<u>5,22,000</u>	
Net Capital charge	<u>29,01,337</u>	

27. Interest has been calculated in the usual manner as shown in the statement annexed.

Year.	DEBITS TO CAPITAL.			CREDITS TO CAPITAL.			NET DEBITS TO CAPITAL.		Sums on which interest is calculated.			Interest at 4½ per cent.	Total including interest.
	Wakka, Establishment, Tools and Plant, Interest and Pension Allowances.	Capitalisation of Land Revenue.	Total Debits.	Revenue during Construction.	Expenditure on Works.	Sale of Tank beds.	Total Credits.	During Year.	To end of Year.	Debits to end of previous Year.	Half Debits during Year.	Total on which interest is calculated.	
	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.
1	3,00,000	3,00,000	3,00,000	20,000	20,000	..	40,000	2,60,000	2,60,000	..	1,30,000	1,30,000	2,65,800
2	5,00,000	5,00,000	5,00,000	30,000	20,000	..	50,000	6,00,000	8,60,000	2,50,000	5,00,000	6,60,000	6,66,900
3	2,00,000	1,00,000	3,00,000	45,000	20,000	1,00,000	1,65,000	7,65,000	15,25,000	8,50,000	3,67,500	13,27,500	7,00,207
4	5,00,000	1,50,000	5,00,000	65,000	20,000	75,000	1,67,000	7,45,000	23,43,000	16,95,000	3,74,846	19,68,846	5,37,311
5	3,81,172	..	3,81,172	90,000	20,000	..	1,10,000	2,71,172	30,14,000	23,43,000	1,05,568	24,79,379	3,92,709
Total ..	26,81,172	2,50,000	31,36,000	2,50,000	1,00,000	1,75,000	5,22,000	26,14,862	76,73,352	56,82,350	13,07,431	63,66,121	29,01,307

28. There is still 1,00,000 of Rupees which would be spent on the existing works to be credited to the project; but, as the expenditure of this sum could not commence until after the project would be completed, I have taken no account of it in the above calculations, and, indeed, I think there is no occasion to carry the calculations further to prove that, even as a "commercial" speculation, the project would be eminently successful.

29. I beg to ask, however, if the project should be looked upon from the "commercial" point of view only, and if the material progress and prosperity of the people and the country which it would help is not deserving of some consideration.

30. Referring again to the Nellore Anicut I beg to draw attention to paragraph 6 of Collector Dykes' letter printed with G.O., dated 17th January 1865, No. 156, which is as follows:—

"And it is a remarkable fact and well worthy of notice that thus as shown in the preceding paragraph the gross value of the excess produce of one year so soon after the anicut's completion is not only enough to feed a large population but also is worth a lakh more than the anicut has cost."

31. The anicut was finished in 1862. Mr. Dykes is writing of the increased produce of 1863-64, which was 11,200 puties (a puti is equal to 2,160 lbs.) in excess of previous years; at the prices then prevailing it was worth Rupees 4,48,000 and sufficient to feed a population of 20,000 people a whole year. Mr. Dykes calculated that an acre of land under the Nellore Anicut produced three-fourths of puti of paddy (rice in husk), and as before stated the selling price in 1863-64 was Rupees 40 a puti; the average produce of an acre of land is now quoted at 1 puti per acre, and prices rose considerably directly after 1863-64; but taking the yield and the prices quoted by Mr. Dykes the result of the construction of the Nellore Anicut from its commencement to 1873-74 has been—

For an average of one year:—

Increased revenue	Rs. 70,812
" produce, $2,225 \times \frac{1}{4} \times 40$	5,66,750

For the highest year:—

Increased revenue, 1860-70	1,23,372
" produce, 1870-71	11,70,210

For the 19 years:—

Increased revenue	13,35,928
" produce	1,26,68,250

32. In spite of this I have no doubt the Government of India in the Irrigation Department would show figures to prove that the Nellore Anicut is a "Commercial" failure. They would ignore the benefits to the people and to the country of produce worth the enormous sum of $1\frac{1}{2}$ millions sterling, and they would give the work no credit for the large indirect revenue which in a hundred ways arises by it.

33. It is well known that in the present famine large stores of grain, the accumulation of years, were thrown open in the villages influenced by the Nellore Anicut. One ryot alone produced sufficient from his stores to feed 5,000 people employed under him on the Coast Canal for many months, and if the temptation of high prices had not induced the people to export large quantities in the early part of the crisis we should have required but a very small quantity of imports to supply the wants of this district.

34. If the Sangam Project had been commenced in 1870 as proposed by this Government it would have saved almost the whole of the property valued at 4 lakhs of Rupees that was destroyed by the flood of 1874. It is true that the river embankment then proposed would probably have been insufficient to keep out those floods entirely, but as proved by the good effects of the small embankments that existed here and there on the south of the river it would certainly have saved much valuable

property and much individual suffering then, and it would have been almost invaluable in the present crisis. Taking the example of the Nellore Ament again which yielded an increase of 36 per cent. the year after its construction, we should have had an excess of 18,000 acres under cultivation in 1875-76 under the Sangam works, and the 54,000 acres of previously existing cultivation would no doubt have produced better crops; the excess cultivation of 18,000 acres would of itself have yielded 13,000 parties of paddy, which at the present prices of 80 Rupees would be worth Rupees 10,80,000, and would have supported 100,000 people for four months.

35. Looking at the project from any point of view, commercially or imperially, it is undoubtedly a good project, and the arguments against it are utterly fallacious in fact and principle.

No. 147. ORDER THEREON, 23rd July 1877. No. 186 L.

COMMUNICATED to the Revenue Department. Much that is contained in the foregoing letter from the District Engineer, Nellore, may be of use in furnishing the information asked for in paragraph 1 of G.O., No. 14 L., of the 7th May last.

2. It is understood that the assessment of wet lands under the Nellore Ament was reduced after the ament was built, and that under the recent resettlement the assessment has been raised. The bearing of these facts upon the figures given by Mr. O'Shaughnessy and by analogy on the financial value of the Sangam Project will have to be considered.

(True Extract)

C. P. P. P.

Ag. Under Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Revenue Department.

- .. Board of Revenue.
- .. Chief Engineer for Irrigation.
- .. District Engineer, Nellore.
- .. Examiner of Public Works Accounts.

31/7

Ed. C. Howarth.

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Revenue Dept
No 3495

DEPT. OF U.S. & MINDS
PUBLIC WORKS

7/15/95

31 July

2000 Revenue

JULY
Nos 110, 117
No. 4208
Communicated to the
Board of Revenue on
continuation of 804 June
1897 No 8131

1st Aug 95

Revenue Dept. Before the Board of Revenue
on the 1st day of August 1895
the following report was presented to the
Board of Revenue on the 1st day of August 1895
and was referred to the Revenue Department

With Order