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Government of Madras.

Public Works DEPARTMENT.

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Proceedings of the Madras Government, Public Works Department, 4th February 1869.

Read the following papers:—

No. 131. Proceedings of the Board of Revenue, dated 10th November 1868, No. 7,939.

Read the following letter from the Collector of Tinnevelly, to the Secretary to the Board of Revenue, dated Circuit Cutcherry at Sankaranainarkovil, 6th March 1868, No. 108.

1. I have the honor to furnish the information called for in the Board's Proceedings, No. 7,514, dated 18th November 1867; this would have been submitted earlier, but I have endeavoured to go into details, and have spent the last three months in a close examination of the area proposed to be irrigated.

2. The following projects, though separate and distinct from each other, may all be classed as the extension of irrigation from one river and its tributaries, they are:—

The Tambrapurni.

I. The construction of a large reservoir on the Tambrapurni river above the point where it falls from the hills at Papanasam.

Ambasamudram Talook.

II. The construction of a large reservoir on the Gatina tributary below the point where it falls from the hills at Alwarkurichi.

Ambasamudram Talook.

III. The re-construction of a ruined anicut on the Sittar tributary, and the repair of a large ruined tank at Siviliperi formerly fed from this anicut.

Tenkarei Talook.

IV. The extension of irrigation on the east bank of the Tambrapurni from the Marudur anicut.

Tinnevelly and Tenkarei Talooks.

V. The extension of irrigation on the west bank of the Tambrapurni from the Marudur anicut.

Tenkarei Talook.

VI. The construction of a new anicut in the Tambrapurni at Strivycuntam.

Tenkarei Talook.

3. The irrigation works already existing have made Tinnevelly the prosperous district it is, and have enabled it to rank next to Tanjore and Godavery, in a revenue point of view. The greater part of these works, however, existed when we came to the country, and those of later date were mostly constructed by Colonel Horsley, whose name is remembered in this district, as that of Colonel Lawford is

Nos. 1, 4, 6.

Names of Rivers.	Talooks in which they are.	Area irrigated by them in acres.
1. Karupanar		3,337
2. Anumanadi		4,800
3. Hariharanadi		361
4. Bandanadiswaranadi or Gundar	Tenkasi.	143
5. Amdalaruvinadi ..		246
6. Sittar ...		13,200
7. Arudakanmirar ...		1,755
8. Ramanadi		413
9. Varanadi		2,001
10. Jambunadi		63
11. Ramanadi		854
12 Ilupanadi		193
13. Gatinai	Ambasamudram.	6,232
14 Tambrapurni		59,303
15. Manimuota		1,117
16. Koryar		373
17. Pacheiyar		5,110
18. Tamariyar		2,330
19 Karumpandiyammankal	Nanguneri.	7,250
20. Nambiyar or Sindunadi		7,007
21. Anumanadi		1,699
	Total ..	1,17,787

in Trichinopoly and Tanjore: in addition to the works he constructed (by which he increased the revenue by three lacs of Rupees,) Colonel Horsley projected the larger works now reported on; and had the mutiny not intervened, and had he remained in the district, he might have irrigated another 100 square miles of country, and have added another five lacs to the revenue.

4. The geographical position of the district at the foot of the Western Ghauts is of course very much in its favor, as twenty streams that have their rise within the influence of the south-west monsoon descend the hills to the eastward, and irrigate 184 square miles in the valley that extends from the hills to the sea. These rivers are crossed by no less than sixty anicuts, and hundreds of channels carry water to tanks throughout the whole length of the valley; these tanks, however, are badly supplied towards the sea, as the last anicut is nearly thirty miles from the mouth of the principal river, and vast floods of water are annually lost to the district.

The Strivycuntam anicut, which will cross the river nineteen miles from the sea.

No. 3 ... ... 3,250 acres.
,, 4 ... ... 5,550 ,,
,, 5 ... ... 6,000 ,,

Total... 14,750 acres = 23 square miles.

5. No. 6 in the foregoing list* will partially check this wastage, and will irrigate sixty-four square miles on the coast, while Nos. 3,4 and 5 higher up the stream will irrigate twenty-three square miles, total eighty-seven square miles.

6. There is not an engineering difficulty in any one of these projects;† all that is required is to make use of the water now wasted, and let it flow over a country which is naturally laid out to receive it, and which is now partially irrigated from the very same points on the river.

† Nos. 3, 4, 5 and 6.

7. Nos. 1 and 2 are, however, more difficult works, and are intended to act rather as auxiliaries of irrigation by securing the crops for a month during any severe season of drought, than as sources of irrigation in themselves; they are quite independent of the other works, and are not of the same pressing importance.

8. No. 1.—The site of this work has been surveyed, and data for an estimate were collected in 1856. The object in view is to block up the pass through which the Tambrapurni discharges itself over the Papanasam water-fall, and so head up water‡ to be sent down the river when the stream is low, and there is danger of losing the crops which now often partially fail for want of a few

The Papanasam reservoir.

‡ Estimated at 1,82,00,000 cubic yards or sufficient to irrigate 15,000 Acres of rice for a month; calculating that each acre requires 40 cubic yards a day, the entire area under the Tambrapurni is 60,000 Acres, so that one-fourth of this area or about the extent that ever would be in danger from drought would be saved.

1,83,616 Rupees were remitted for withered crops in this district in Fusly 1263, while the scheme was in course of projection—*Vide* Lieutenant Roberts' letter of 26th August 1856.

weeks water; the remissions for withered crops down the course of this river have averaged 17,474 Rupees a year, during the last fifteen years, and this sum represents the minimum return that may be expected from a work estimated to cost 1,50,000 Rupees, but which at present prices would probably cost three times that amount, or say five lacs of Rupees.

9. Besides saving the crops from failure, a very large area at the ends of the channels and under the more distant tanks would be converted from single to double crop, but I cannot now give exact statistics for this.

Extract Minutes Proceedings, No. 295, 18th December 1855.

Extract Minutes Proceedings, No. 295, 18th December 1855.
Engineer to Collector, No. 25, 11th April 1856.
Collector to Engineer, No. 664, 30th May ,,
Engineer to Collector, No. 414, 4th June ,,
Collector to Engineer, No. 694, 7th June ,,
Collector to Chief Engineer, No. 697, 7th June 1856.
Extract Proceedings of the Chief Engineer, Department Public Works, No. 5,914, 20th August 1856.
Civil Engineer to Chief Engineer, No. 143, 26th August 1856.
Collector to Chief Engineer, No. 1,040, 1st September 1856.
Extract Proceedings of the Chief Engineer, No. 6,265, 4th September 1856.
Collector to Superintending Engineer, No. 1,179, 27th September 1856.
Extract Minutes Proceedings, No. 1,004, 26th May 1857.
Collector to District Engineer, No. 235, 8th June 1857.
Engineer to Collector, No. 317, 9th July 1858.

10. The Government have recorded their opinion that "a work of the "kind would be found easy of execution, "and would be of great utility for the "irrigation of the country below."

11. Enclosed is a sketch of the drainage at the head of the river and a map of the Tambrapurni and its tributaries from Papanasam down to the sea.

12. The correspondence on this subject is noted in the margin.

13. No. 2.—The Gatina tributary descends the hills in a magnificent cascade, some two hundred feet in height, and has a considerable further fall in the next two miles of its course; it then flows through a gorge in a rocky ridge where it would be apparently no great work to topple over the adjacent rocks, and so head back the water to form a lake between this ridge and the hills. Such a scheme would be especially acceptable to the neighbouring cultivators, whose crops are now destroyed by the deer, pigs, and jungle fowls that inhabit the wild tract of country that would form the bed of the lake.

The Gatina reservoir.

14. At the very spot proposed to be bunded across, there is a small natural anicut which turns water through an orifice in the rocks to supply a channel that irrigates 1,000 Acres. A very little labor bestowed on this anicut and channel would double the water supply, and this might be done at once irrespective of forming a reservoir. The construction of the proposed reservoir would throw water into several high level channels to irrigate all the dry lands of Alwarkurichi, Ambur, Durmapuram, Madam, and Papankolam, and so convert into rice fields a poor tract at the foot of the hill that the people now hardly cultivate.

15. The spot is very inaccessible, and I made my way to it with difficulty; but when once there, I was struck with its capabilities, though I do not think that the project has ever engaged the attention of an Engineer Officer.

16. I have classed the lands below and seen how the channels would run; the Gatina now irrigates 6,000 Acres, and this area might be increased to 10,000 Acres with a store of water always in hand to throw down the river in case of drought at any particular season.

17. The idea is my own, and there is no correspondence on record.

The Siviliperi tank and anicut.

18. No. 3.—The Sittar tributary is crossed by fifteen anicuts, the last of which is eight miles above the point where the Sittar falls into the Tampraparni; there was another anicut once, some three miles lower down, but it now lies in ruins, and much of the stone has been taken away for revetting the bank of the river.

19. This ruined anicut once fed the large Siviliperi tank breached in 1796 and never since repaired; the bed of this tank is now cultivated with dry grain, but the ryots have suffered so much of late years from drought that they will gladly resign their cultivation in the bed of the tank, and will render all aid in their power to make the tank hold water, as they feel convinced that on this the prosperity of their village depends.

20. I have lately been over the ground, and feel hopeful of not only heading up water sufficient to cultivate a large area of fine rich soil in Siviliperi and Kaliyayur on a low level, but by diverting the Puwanipatti nullah which crosses below the tank, and carrying the surplus from the waste weir of the tank along the nullah south-eastwards, to throw water *into the high level tanks* of Kaliyayur, Valnad, and Manakarei, and command the whole country between the Valnad hills and the proposed high level branch of the eastern channels from the Marudur anicut.

To Civil Engineer, 8th Division, 16th August 1856.

21. The work now reported on was surveyed in 1856, by Mr. McNair, who has given a full description of it; the cost of re-construction was then estimated at 20,000 Rupees, and the people engaged to cultivate 1,500 Acres, which would have given a return of 7,200 Rupees per annum, in Siviliperi alone. Nothing then came of the project, and no extension of the Irrigation beyond Siviliperi was thought of; but it is perfectly certain that the surplus water from the fields in Siviliperi must find its way to the south-west into the Kaliyayur tank below, and that every good flood in the Sittar must send water over the waste weir in the tank to flow, if properly guided, towards the sloping ground on the south-east, where it will be caught in a series of tanks till every drop is exhausted.

22. The best criterion of the feasibility of the scheme is the eagerness of the villagers to embark in it, and their offer of 10,000 Rupees as a contribution towards it. They wish to tax themselves at the rate of 5 Rupees for each cottah of land to be irrigated, and they calculate that 2,000 Cottahs or 3,250 Acres will be irrigated.

It seems to me to be very much higher. The old anicut was in a bad position too far down the river; the site now proposed is much better.

23. The tank is 2½ miles from the Sittar which is crossed by a rocky ledge, said by Mr. McNair to be a level with the top of the waste weir: allowing three feet for the fall of the channel to the tank, a six foot anicut on this ledge would head up water in the tank three feet above the top of the waste weir, which will consequently have to be heightened: the sluices are all in good order, and a great deal of the bank remains; it is nearly three miles in length, and 3,000 cubic yards of rough stone are lying along it all ready to be placed in position; any further quantity of stone is procurable within a mile of the bank.

24. The tank has a water-spread of three square miles and was calculated by Mr. McNair to be capable of heading up 62,81,740 cubic yards of water, or enough to irrigate 1,500 Acres. Mr. McNair, however, calculated that it would be filled but twice in the year, while in reality the Sittar comes down in fresh perhaps twenty times in the year, and the Kytar nullah between the Sittar and the tank, and which will be diverted into the tank, brings down a flood of water after every shower that falls.

25. The work would now cost 40,000 Rupees or double the estimate of twelve years ago, and the extension towards the foot of the Valnad hills would cost 10,000 Rupees more, total 50,000 Rupees.

26. The returns from 3,250 Acres, at a water-rate of 4 Rupees an acre, will be 13,000 Rupees if a single crop only is grown; to this, add 3,250 Rupees, the land assessment of 3,250 Acres, at 1 Rupee an acre, total 16,500 Rupees, from which deduct 5,000 Rupees, the present assessment of the irrigable area, and of the land to be resigned in the bed of the tank, the remainder 11,500 Rupees represents the net revenue to be derived from the work.

Engineer to Collector, No. 592, 25th Aug. 1856.
Collector to Engineer, No. 1,304, 25th Oct 1856.

27. The correspondence on this subject is noted in the margin.

The Marudur Eastern Channel.

28. No. 4.—The extension of the irrigation from the Marudur anicut (now the last on the river) is a matter of the greatest importance. The anicut is of native construction, and is so contrived as to turn all the water that does not flow over it, or through the sluices, down two large channels, one on either side of the river. The water so turned is not stored to the best advantage, as only 21,378 Acres are irrigated from a work capable of irrigating quite double that area.

The proposed Strivycuntam anicut *nine miles below Marudur* is calculated to turn water sufficient for 40,000 Acres.

29. The Eastern Channel supplies but 8,339 Acres, and is capable of irrigating at least 12,000 Acres more. My proposals for the improvement of this channel are:—

(1.) To heighten the anicut one foot.

(2.) To add three more tanks to the present chain of tanks.

(3.) To raise the embankment all along the channel and tanks, and so render each tank capable of holding a much larger water supply than at present.

The fall is excessive, upwards of two feet in the mile.

(4.) To take off a branch from the main channel further north, to supply a fresh chain of tanks parallel to, and above the chain now supplied by the main channel.

30. The cost of these works would be 1,50,000 Rupees, namely, embanking wenty-five miles, at 2,000 Rupees a mile, 50,000 Rupees, constructing one new tank and extending the main channel to two tanks already existing, 20,000 Rupees, and cutting a high level branch and repairing ten old and constructing five new tanks along it, 80,000 Rupees.

31. This is a liberal estimate, and supposes the work to be done entirely with borrowed capital; but I could get it done for a fifth of this sum,* or an actual cost to Government of not more than 30,000 Rupees.

* 1,50,000, Rupees.

(1.) There is an allotment of 44,600 Rupees from the Road Cess for a new road along the north bank of the river from Tinnevelly to Strivycuntam; if this road is entrusted to me, I will have it carried for the last ten miles on the top of the channel bank instead of parallel to the channel, and will see that the bank for this distance is strengthened, and the road completed for the amount allowed in the estimate for these ten miles of road alone.

20,000 Rupees.

(2.) There is an allotment of 1,940 Rupees for strengthening the Strivycuntam tank bank: if the expenditure of this is entrusted to me, I will make it enough to widen the bank sufficiently to carry a road; this brings the road-way and line of irrigation as far as the Perur tank.

(3.) One of the new lines about to be proposed from the Road Cess is from Strivycuntam to Perungulam along the Perur, Sevalai, and Perungulam tank banks; with 2,000 Rupees a mile for this, or 20,000 Rupees from the Road Cess, I can finish both road and bank; this brings the road-way and line of irrigation up to the Perungulam waste weir, the end of the Eastern Channel.

Will be entered in next year's Budget.

32. The water that finds its way through and over this weir now floods a lower level, and is drawn off to the river by means of a syphon sluice, after doing considerable damage to a large extent of country; it is this water that I propose to economize by arranging the waste weir, so that the water will flow on to two tanks beyond Perungulam, instead of returning to the river; these tanks are owned by single proprietors who undertake to bear all the expenses of carrying the water on to them; in addition to this, the villagers along the line offer 15,000 Rupees towards the work, and engage to find labor and material at the lowest possible rates.

33. If my scheme is adopted, the total sum to be laid out on the line from the Road Cess will be 40,000 Rupees, from contributions 15,000 Rupees, and from allotment for repairs 2,000 Rupees, total 57,000 Rupees; and the existing channel and the lower chain of tanks may be improved for this sum without any actual cost to Government.

34. The returns will be the certainty of saving the crop on every acre between the channel and the river, the bringing under cultivation 550 Acres of dry land assessed (at a 4 Rupees water-rate) at 2,200 Rupees, and securing a second crop on 3,000 Rupees, assessed (at a 2 Rupees water-rate) at 6,000 Rupees, total 8,200 Rupees.

The land assessment to be charged on this area will remain much the same as at present.

35. The high level channel and the upper chain of tanks proposed will irrigate all the north of the talook, and will carry water to a fine cotton plain where the richest crops may be produced; many tanks already exist, and others can be constructed with ease; the people of these northern villages express their readiness to pay another 15,000 Rupees towards this work, and if Government will give double this sum, say 30,000 Rupees, 5,000 Acres of dry land, assessed (at a 4 Rupees water-rate) at 20,000 Rupees, may be brought under cultivation at once.

The land assessment to be charged on this area will remain much the same as at present.

36. The total returns expected are thus 28,200 Rupees per annum, and an enormous addition to the wealth of the talook for a present outlay from Imperial Funds of only 30,000 Rupees.

	RS.
By lower channel	8,200
By upper channel.	20,000
	28,200

37. The work could not be done in this way by the Department of Public Works, but it can be done by the Revenue Department working hand and glove with the villagers, at a time when they are anxious to improve their lands, and are willing to lay out their money freely; unskilled labor must, however, be under professional guidance, and though the work may be done in a popular manner it should be thoroughly well done, and must, therefore, be under the superintendence of an Engineer Officer to be associated with the Collector for laying out and superintending the work.

38. The idea is my own, and there is no correspondence on record.

The Marudur Western Channel.

39. No. 5.—The Western Channel from the Marudur anicut now irrigates 13,039 Acres, and might irrigate very much more, were the water not wasted by being discharged back into the river in freshes, instead of into branch channels to the rain-fed tanks above the present line of irrigation; on the south, the crops under these rain-fed tanks have, this year, failed entirely, more notably in the village of Ponakolam, where there are no less than forty rain-fed tanks, many of which may hereafter be supplied from the river.

40. The Palayan channel from the second anicut above Marudur ends at Krishnapuram in the Tinnevelly Talook, and the Western Channel from Marudur continues the irrigation along the south bank of the river; a branch from the Western Channel taken off below Krishnapuram would catch up the surplus water of the Palayan channel, and would also be well supplied from the Western Channel itself; this branch would pass south-west of Seidunganallur, and irrigate part of a fine cotton plain in Tadankulam and Karaseri, the frontier villages of the Tinnevelly and Tenkarei Talooks. From thence it would pass to the Vallakolam tank, diverting several nullahs that now flow across the line; further south, the rain-fed

tanks would all get a certain supply, until Ponakolam is reached, where the channel would be nearly exhausted, were it not reinforced by the greater part of the Tenkarei surplus, which now flows into the Kadamba tank and irrigates 3,000 Acres below; the Kadamba tank will not need this surplus, in fact would be better without it, when its own separate channel is cut, as it shortly will be, from the river at Strivycuntam; the Tenkarei surplus will thus be available for the irrigation of 3,000 Acres elsewhere, and may be carried on in the channel proposed towards the foot of the western face of the terei, to convert into Rice fields the shifting sands on which only Palmyras now grow; this soil indeed is almost useless when dry, but when irrigated (as it is in some places from springs in the terei) it is so very rich, that the whole country round is supplied with the plantains and pumpkins that grow there.

The terei is peculiar to Tinnevelly and consists of loose stone below, with gravel, earth and sand in distinct strata above. These teries rise to the height of 60 or 80 feet and are generally some miles in length by from 1 to 2 miles in breadth; they run north and south along the coast, and the red dust raised from them is visible for miles out to sea: the surface is shifting sand, made more shifting by the people pulling up every weed that grows, for fuel; an attempt is now being made to fix this sand in places by encouraging the umbrella thorn and undergrowth, and I think there is every chance of success. The low hills at the back of Pondicherry are not very dissimilar in appearance, but they are free from the shifting sand; the country west of the terei is for miles, deep in sand.

41. The total area to be irrigated would be 6,000 Acres, which at a 4 Rupees water-rate would pay 24,000 Rupees.

42. The line has not yet been surveyed, but is said to have been thought of by Captain Oakes when Acting Civil Engineer of this district. It is, moreover, a popular idea with the villagers, and they have accompanied me over the ground and shewn me how apparently easily the water may be taken from tank to tank, and what vast benefits the water will confer on one of the poorest tracts in the district.

43. The feasibility of the scheme is of course dependant on levels, and if levels admit of the water flowing by the course I have indicated, the cutting would be inexpensive, as the tanks already exist and they all lie close together.

Less than half a lac of Rupees.

44. The villagers offer the same assistance as on the other side of the river, and will pay 15,000 Rupees if the Government undertake the work.

In my rough estimate of cost I have set down the Government contribution as double this sum or 30,000 Rupees.

45. The idea is my own, and there is no correspondence on record.

46. This anicut was sanctioned by Government in 1856, but the mutiny intervened, and the work was put off indefinitely; an allotment of 58,100 Rupees has, however, now been made in the Budget (for 1868-69) and there is every prospect of the work being shortly pushed forward with vigor.

The Strivycuntam Anicut.

47. An Officer of Engineers has been sent down to see if Colonel Horsley's scheme can be extended, and I have taken the opportunity to accompany him over

the ground, and prepare a Statement of the probable results of the work in a revenue point of view.

48. As this work has already been sanctioned, under ordinary circumstances, it would have been unnecessary to trouble the Board with further particulars of it; but it forms so essential a part of the scheme I now advocate for extending irrigation in this district, and its magnitude and probable results are so little known and appreciated, that as I have had rare opportunities of acquiring local knowledge by conducting settlement operations in the villages likely to be affected by it, and as I have lived surrounded for months past by people all deeply interested in a scheme that promises them so much good, I take the opportunity of placing on record the statistics I have been able to glean.

49. Colonel Horsley proposed to irrigate about 3,000 Acres to the south, and 5,000 Acres to the north, of the river; whether he fixed on this minimum area to be on the safe side as to returns, or whether intending to adapt the channels to the system of coast canals then projected, he wished to make irrigation secondary to navigation, is more than I can say; but this is certain, that he only proposed to irrigate 8,000 Acres, while he shewed by statistics that he had water enough to irrigate 40,000 Acres.

There is a large area of "Ayacut Nunjah" land irrigated only on paper in the villages between the Kadamba tank and the sea; this was no doubt excluded from Colonel Horsley's calculations and only fresh ground brought to account.

50. As the idea of making the canal navigable has fortunately been abandoned, I have given my attention to finding 40,000 Acres to irrigate, and have succeeded in finding about this area in such positions as to be commanded by tanks of sufficient size to render irrigation permanent.

51. In this I have been greatly assisted by the villagers who have accompanied me over the ground, and have pointed out the best sites for tanks and the area to be irrigated by them, and have otherwise given me much useful information.

52. The Board are aware of the confidence felt by these people who have paid down 32,450 Rupees, and are now cutting a channel at their own expense to connect the Kadamba tank with the river. Their enterprize indeed is unbounded. Men, money, and material are forthcoming. All they ask for is the assistance of authority to reconcile rival factions, and keep all working together;* and as this has been afforded them, I trust that the enthusiasm of the people may not be allowed to cool, and that funds may be forthcoming to enable the local Officers to do all that they are anxious to do to bring this great work to completion.

* In every village the cry is the same; "keep "us together and drive us to it they say "and we will do all we can for the common "good; but if you expect us to aid ourselves, and depart from the beaten track "without orders, we are all so split into "factions that the thing is simply impossible."

53. The anicut will have two channels, one on either side of the river; that on the north side exists, and that on the south is being cut. The object of the southern channel is to turn water from the river into the great Kadamba tank, the high water mark in which is on a level with the bed of the river. As the river always has water in it the tank will be always full, and the water will stand

throughout the whole length of channel, a distance of five miles, whenever there is more than three feet of water in the river. The tank is three miles long, and the low water level in the river at Strivycuntam is thus carried eight miles nearer the sea; we have thus an immense head of water, capable of irrigating 20,000 Acres, only twelve miles from the sea, but thirty-one feet above it.

54. The country slopes gently down from the Kadamba tank to the sea, and once was more or less irrigated throughout from the Kadamba tank, which was connected with the river by the very line now being cut; but the flood that destroyed the Siviliperi tank and anicut in 1796 breached many of the tanks between the Kadamba tank and the sea, and destroyed the head sluice from the river; at all events the head sluice is in ruins, and the tanks have never held water within the memory of man; the river channel then silted up, and the Kadamba tank reduced to dependence on drainage from higher levels has since continued to irrigate but 2,658 Acres direct, and to throw its surplus into seven tanks which irrigate 1,711 Acres more.

55. The only other irrigation besides this to the east of the talook on the southern side of the river is at Attur, where 2,689 Acres are supplied by a channel taken off from the river some miles below Strivycuntam. The head of this channel will draw little water when an anicut is built above it, but a fresh head can be opened in the channel now being cut between Strivycuntam and the Kadamba tank to carry off water sufficient for 1,300 Acres in addition to the 2,689 Acres now cultivated.

56. One-fifth of the water turned from the river, or enough for 4,000 Acres, will thus be drawn off from the channel before it reaches the Kadamba tank which will have to provide storage for but water sufficient for 16,000 Acres; of this enough for 3,284 Acres in six villages, or for 626 Acres in addition to the 2,658 Acres now irrigated in these villages, will be discharged through the sluices, and enough for 4,015 Acres under the seven subsidiary tanks, or for 2,304 Acres in addition to the 1,711 Acres now irrigated by these tanks, will be discharged through the existing channels that lead to these tanks, leaving water for 8,300 Acres to be passed on to other tanks which have yet to be connected with the Kadamba tank.

Tentiruperi.	Varandivayal Sanbattu.
Angamangalam.	Nalumavadi.
Kurumbur.	Sukandalai.

57. Colonel Horsley's main channel passes on from the Kadamba tank and commands two tanks at Pallipat and Kayampuli; these will irrigate 469 Acres and and 1,254 Acres respectively: four breached tanks under these if restored will irrigate 4,618 Acres, and three others still lower near Trichendur 4,464 Acres more; all these are of very large size and extend across and across the watershed.

58. The total thus accounted for is 782 Acres more than Colonel Horsley's calculation gives water for; but the calculation is no doubt on the safe side, and by careful storage we shall probably be able to irrigate some thousands instead of some hundreds of acres more than Colonel Horsley allowed for.

59. A channel on the north side now exists and irrigates 4,886 Acres: another channel taken off lower down irrigates 1,000 Acres more; in addition to this, there are 2,221 Acres capable of irrigation or a total of 8,107 Acres to be irrigated on the north side of the river in the Tenkarei Talook alone: beyond this, a Zemindary Estate* runs down to the sea on the frontier of the Ottapidaram Talook and contains 1,000 Acres, well capable of irrigation. North of the Zemindary the channel crosses the Madagiri river which is constantly in flood; this will help to refresh the channel which for the last five miles will have had to pass through a dry, sandy soil in Mullakadu; adjoining there are sites for two very large tanks which may irrigate 3,000 Acres.

* Maniachi.

60. The numerous existing tanks in adjacent villages will irrigate 4,000 Acres more; this brings the channel up to the back of Tuticorin with a fall of ten feet to spare. This fall will carry it on to irrigate 2,000 Acres more up to the Arasady river, beyond which lies the Ettiapuram Zemindary; this is a difficult river to cross, the bed being soft and treacherous, and the water so much mixed with soda that it would not be of any great value for irrigation purposes; the Zemindary ryots too have a rich soil and grow very superior dry crops; these they think as valuable as the produce of irrigated land, and they would not care much for the water even should it be carried on to them.

61. So far we have a total of 18,557 Acres to be irrigated on the north bank. My data here are, however, not so accurate as on the south bank, as it is difficult to get reliable information about irrigation from people who hardly know what river-irrigation is. Colonel Horsley, however, has colored the whole of the area mentioned as not already irrigated yellow in his map, which shews that the levels admit of its being irrigated beyond a doubt.

62. The area to be irrigated is thus 40,666 Acres in a tract of country 30 miles long by an average of five in width, perhaps altogether 150 square miles, of which I reckon a little more than one-third to be irrigable.

This is in supersession of all former estimates of area.

63. The returns to be derived from the work are 1,62,664 Rupees at a 4 Rupees water-rate on the entire irrigable area, with an additional 40,000 Rupees at a 2 Rupees water-rate for a second crop on 10,000 Acres on either side of the river. Colonel Horsley, indeed, calculated that he had water sufficient for a double crop on 40,000 Acres, and with our vast facilities of storage, and the constant flow from the river, I have no doubt but that we shall be able to keep very many of the tanks *always* full; add to this 2,02,664 Rupees water-rate, 40,666 Rupees land assessment at 1 Rupee an acre, the total 2,43,300 Rupees represents the revenue to be derived from this area; the present assessment of the land is, however, 1,28,627 Rupees minus an annual remission of 10,000 Rupees; so deducting 1,18,627 Rupees from 2,43,330 Rs., 1,24,703 Rupees represent the actual gain by the work.

This is in supersession of all former estimates of returns.

64. The work is estimated to cost seven and a half lacs of Rupees, but the estimate generally may, I think, be greatly reduced.

Anicut	... ...	2½ lacs.
Bridge	... ...	2 ,,
Channels, &c.,	... ...	3 ,,

65. I have already laid down free of charge all the stone required for the anicut and apron valued at 50,000 Rupees; the channel the ryots are cutting, will further reduce the estimate by 30,000 Rupees. The Attur people have raised 5,000 Rupees and are about to cut a branch channel that will save Government 10,000 Rupees, and the other *branch* channels will all be cut and the tank banks strengthened with a very small Government subsidy.

66. All the firewood wanted for burning bricks and chunam will be given at the cost price of cutting and cartage; cheap labor is procurable by making use of the Pallers who enjoy maniyams for maramut work, and I really think if the Engineer builds the masonry and marks out the lines of channel, that I can get all the earth work performed under his general management better and far more expeditiously than he could unaided, for about a lac of Rupees; half of this sum we could raise, by selling the right of occupancy of 6,874 Acres of immemorial waste land in lots, and the other half would have to be paid by Government.

67. The people are already levelling their fields, and getting all ready for the water that they shortly expect to have; and should I succeed in completing the channel now cutting, and take water to the eastward in June, I think that the Government could perhaps be induced to push on the work at once in a cheap and popular manner by placing 50,000 Rupees to my credit and giving me a *carte blanche* to do all that is needed in the way of earth work under the Engineer's guidance.

68. The correspondence on the subject is noted in the margin.

Civil Engr. to Collr., No. 220, 15th June 1855.
Ex. Procs. of Chief Engr., No. 3,537, 13th. December 1855.
Ex. Procs of Chief Engineer, No. 5,803, 15th August 1856.
Board's Procs., No. 4,903, 25th October 1860.
District Engr to Collr. No. 590, 27th Sept. 1862.
Procs. Madras Govt., No. 218, 11th Sept. 1863.
Procs. Madras Govt., No. 3,696, 6th Dec. 1865.
Procs. Madras Govt, No. 210, 18th Jany 1866.
Offg. Supg. Engr., to Collr., No. 654, 11th August 1866.
Do. do. to do. No. 113, 16th April 1867.
Collr, to Supg. Engr., No. 95, 24th April 1867.
Supg. Engr., to Collr, ,, 282, 9th May ,,
Board's Procs, No. 5,610, 26th August ,,
Procs. Madras Govt., No. 2,143, 11th Sept. ,,
Board's Procs., No. 6 259, 1st October ,,
Procs. Madras Govt., No. 2,987, 25th Sept. ,,
Board's Procs., No. 6 525, 10th October ,,
Procs. Madras Govt., No. 2,366, 8th Oct. ,,
Board's Procs., No. 7,885. 6th December ,,
Procs. Madras Govt., No. 3,016, 18th Dec. ,,
Board's Procs., No. 614, 24th January 1868.

The area to be affected by these works is roughly shown by black lines drawn in the accompanying Sketch Map A.

Returns.	Rs.
III.	11,500
IV.	28,200
V.	24,000
IV.	1,24,703
Total...	1,88,403

Cost.	
III.	65,000
IV.	1,02,000
V.	45,000
VI.	7,32,450
	9,44,450

69. To summarize the foregoing, Nos. 1 and 2 may be constructed at any time, and are not specially needed now. Nos. 3, 4, and 5 are all of pressing importance, and No. 6 of still greater importance, has already been sanctioned; these works will save much of the water that is now allowed to waste, and will add enormously to the wealth and resources of the district. Their aggregate return will be nearly 2 lacs on an outlay of 9½ lacs of Rupees, of which, the Government need not pay more than 7¾ lacs; the outlay on *new Irrigation works* has averaged but 2,190 Rupees

Deduct.		
Value of stone supplied ...	50,000	
Value of earth work done	40,000	
Value of firewood supplied	25,000	
Money yet to be contributed	60,000	
		1,75,000
Net cost ...		7,69,450

yearly during the past ten year's, during which period the net revenue from irrigation has aggregated 171 lacs of Rupees the total outlay on both new works and repairs has amounted to 5¼ lacs of Rupees during the last ten years, while the remission for failure of crop partly caused by defective irrigation has been 11½ lacs of Rupees.

70. 32,450 Rupees have already been paid towards the anicut, and upwards of half a lac of Rupees has been promised for other works now proposed. Setting aside the masonry and the cutting of the main lines of channel, which must be carried out in the usual manner, the other earth-work* may be done very much by village labor if the Government will add two-fold to the amount of subscriptions and allow me to make use of Local Funds in the manner described above. The great drawback is want of labor, the Pallars being the only laborers, and in the Tenkarei Talook they are not accustomed to employ their women on earth work; if we get over this difficulty, and are successful in cutting the trial line now in hand, perhaps Government may consent to render us further assistance by dispensing with the usual routine and allowing the other works to be carried out in the cheapest manner possible.

* For all the projects.

In paragraph 32.

Personally I have no wish to undertake the task, as I have much other work to do; but the people are so earnest in their request that all details of minor works in which they are directly concerned may be carried out by the Revenue Department instead of by the Department of Public Works, that I am willing to do what I can if I do not break down at first starting with the large work we have in hand which requires 2,000 laborers daily to complete, before the freshes come down the river.

The river-irrigated villages will be the first settled, as considerable progress has been made in collecting data for a scheme of Settlement for them; and this I hope to submit very shortly. As I have personally classified the lands of every village in three talooks, I may say that I have seen every irrigation work in them; the other two talooks are now in course of inspection.

71. My reason for pressing the subject now is, that the people expecting much good from the settlement, are eagerly seeking for the means to improve their lands; and as it is my business to go into every village as Settlement Officer and make myself well acquainted with the condition and wants of the people, no other Collector in the country perhaps has the same opportunity of ascertaining what is actually needed, or of carrying out emergent works in the popular way that I can; if only enabled to aid Kudimaramut† by small grants from Local or Imperial Funds, I can put every irrigation work in the district in order during the next five years, while the settlement is in course of completion, some entirely by Kudimaramut, and others by Kudimaramut aided by Local Funds or by Government subsidy; and if all works are put in order and the irrigation is extended to the utmost, I anticipate that the increase of revenue thus acquired will more than make up for the general reduction likely to be effected by settlement.

† Village labor.

72. As an illustration of the course I propose to adopt, I will mention two particular instances :—

I. A road along the course of the Sittar from road No. 2 to the mouth of the river is needed; an Engineer would connect the two points by the shortest possible line, and prepare an estimate for, say, 30,000 Rupees at 2,000 Rupees a mile: when done, there would be a good road, but a road and nothing more; the tanks would remain as they were, and not an acre of land would be benefited; the shortest line is not always the best, particularly for village roads; a village road should connect the villages, and, if possible, should follow the line of tank banks and secure and strengthen these; along the route in question, there are seven tanks and two channel banks, all greatly in need of repair, and along them I propose taking the road; repairing them would cost a large sum, but the road would save the outlay, and by improving the banks would bring under cultivation 850 Acres of waste land assessed at 4,250 Rupees.

At a 4 Rupees Water-rate and 1 Rupee Land tax.

II. A road from Sankaranainarkovil to Vasudevanallur is needed; the Sankaranainarkovil Talook, where I am now making Jummahbundy, has suffered more than any other talook this year, except perhaps Nanguneri, and the remission that has had to be made is far more than sufficient to have put the small works in order that would have saved most of the crops.

73. One of these is a channel to the rain-fed tanks near the Cusbah, a river descends the hills at Vasudevanallur, and two branches from it supply the Talavankottei and Maleiadikurichi tanks. The waste weirs of these tanks are close together, and their surplus waters unite to form a small river which nearly all runs to waste in high freshes, a channel once led off from this river to a chain of tanks near the Cusbah, but it has long been choked up and useless. I now propose restoring this channel and am able to do so at once.

74. A line of road from Sankaranainarkovil to Vasudevanallur is entered in this year's Budget, (1868-69,) and this, instead of following a straight line will be carried along the course of the channel, so that the earth dug out of the channel will form the road; it will also pass along two tank banks now much in need of repair, and will permanently strengthen these. An Estimate for 1,000 Rupees has been framed for repairing a small channel from the southern sluice of the Maleiadikurichi tank, but this may be diverted to the more important work; with this, and the 2,000 Rupees allotment for the road, *plus* 2,000 Rupees that we can easily add to the allotment from the surplus Local Funds elsewhere, we shall make up 5,000 Rupees, and the ryots will give the rest.

Nagaram.
Viridupu.

75. The work can be done this year and will bring under cultivation 800 Acres of dry land assessed at 4,000* Rupees, besides securing the crops from all chance of failure in future; had this channel been in order this year it would have saved us 10,000 Rupees, as the crops under river-fed tanks are flourishing, while those under the rain-fed tanks failed almost entirely this year. By making use of the tank and channel banks for these roads, not a yard of good land will be wasted. The banks will be repaired in the most substantial manner, and will never need repair again. Every Sluice

*At a 4 Rs. Water-rate and a 1 Rupee Land tax.

75 per cent. of the assessment on the rain-fed tanks near the Cusbah had to be remitted.

and Calingulah along the lines will be put into working order, and the outlay will be repaid by a few years revenue, from land which would not be in the least degree benefited if the roads followed the Engineer's lines.

76. There are many places where tanks and channels can be improved by some such schemes as these, and these in the aggregate will repay the cost of the roads, which in their turn will secure the tanks from any chance of again getting out of repair. It would not be too much to say, that 10, 20, or 30 Acres additional can be brought under cultivation by each tank repaired in this manner. We have water sufficient to irrigate half the district; all that we need is storage, and most tanks admit of extension. Increasing the storage capacity of each individual tank will not only irrigate more area, but by saving the water in freshes and letting it trickle down slowly over the face of the country will act as the forest does on the hills, and avert to a great degree those sudden rushes which lose us so much water and prove so destructive to irrigation works.

I have to-day been to a spot where a small outlay on a little anicut and channel would bring under cultivation 200 Acres.

It is proposed to get rid of the very small tanks at Settlement by making them over to the people at dry rates, so that it is only those tanks that irrigate upwards of 20 Acres that need receive any attention—*Vide* Board's Proceedings, No. 8,132, dated 12th November 1866.

77. I feel quite confident that one-half more may be added to the area, and one-fourth more to the revenue, of the irrigated lands of the district generally, by a present outlay on a liberal scale, and that this outlay will be re-paid by an interest of 20 per cent. throughout.

It will naturally be asked why we cannot add 50 per cent. to the revenue if we add 50 per cent. to the area; but I take for granted that the best lands are now cultivated, and my culculations of future revenue are based on what will stand in the Settlement.

78. The information required in paragraph 4 of the Board's Proceedings cannot be given in full, as none of the large projects proposed are single works with a fixed ayacut below them; but the present cultivation is given with the probable extent to which it can be increased; the revenue returns are based on the assumption of a water-rate being charged on a small Land assessment of say 1 Rupee an acre; the existing assessment is high, from 8 to 10 Rupees an acre, and will be considerably reduced by Settlement with or without a water-rate.

4 Rupees for a first crop, and 2 Rupees for a second crop.

79. I have looked through the Public Works reports for the last ten years, but can find little in them worth notice; they are mostly extremely meagre and utterly devoid of interest; they are indeed, merely the covering letters of Annual Financial Statements. The only applicable remarks are those of Messrs. Silver and Wedderburn. Mr. Silver says—

Paragraphs 8, 9, and 11 of letter, No. 11, dated 6th January, 1862.

"As regards the Public Works in general,
"I am decidedly of opinion that the
"transfer of the executive charge of these works from the Revenue to the Profes-
"sional Department, attended as it is with great additional cost to the State, has
"not produced the beneficial results expected from it, at least in this district.
"Repairs to works of Irrigation which are numerous and scattered in Tinne-
"velly, as well as repairs to roads, are not now executed so speedily under the

"present system as they formerly were, and I have never heard but one opinion "expressed by the ryots on this head, generally coupled with the expression of a "wish, that the executive was again in the hands of the Revenue Officers.

"As it is a matter of great importance that works of Irrigation should be "maintained in a state of efficiency to preserve the existing cultivation and "revenue under them, and that repairs should be completed before the commence- "ment of the cultivating season, and as complaints are occasionally made of back- "wardness in letting water to the channels and tanks, on account of the dilatory "execution of repairs, I beg to recommend strongly, that petty earth repairs to "works of Irrigation costing less than 50 Rupees, which are numerous, should be "entrusted to the local Revenue Officers, as recommended in my letters of 4th May "and 19th June 1861, Nos. 203 and 262, respectively, as such an arrangement "would be very acceptable to the ryots. When I spoke to the people on this sub- "ject at the Jummahbundy, they all begged it might be carried out, many adding, "they wished all repairs without reference to this limit might be executed under "the local Revenue Officers as formerly." And Mr. Wedderburn says, that "the "Irrigation works in this district are in need of much improvement."

80. The following Statement exhibits the area and assessment of the irrigated lands of the district during the past ten years, the amount of remissions made, the amount of allotment sought for, and the amount granted for new Irrigation works and repairs :—

Paragraph 4 of letter, No. 327, dated 22nd August 1865.

Year.	Irrigated area in Acres.	Gross revenue in Rupees.	Deduct remission in Rupees.	Net revenue in Rupees.	Amount of allotment sought for in Rupees.	Amount sanctioned for.	
						New works in Rupees.	Repairs in Rupees.
1857-58 ...	1,24,133	20,74,457	1,26,451	19,48,006	...	4,156	43,691
1858-59 ...	1,38,085	22,89,459	56,361	22,33,098	...	939	50,106
1859-60 ...	1,50,270	15,84,525	2,336	15,82,189	..	186	47,078
1860-61 ...	1,54,861	15,54,177	1,86,656	13,67,521	..	409	49,299
1861-62 ...	1,77,913	17,91,774	1,25,278	16,66,496	...	5,473	49,373
1862-63 ...	1,79,729	17,87,537	33,173	17,54,364	...	1,626	45,994
1863-64 ...	1,81,369	18,34,098	76,875	17,57,223	...	3,010	50,969
1864-65 ...	1,81,866	17,97,489	3,41,239	14,56,250	...	1,978	51,783
1865-66 ...	1,75,320	17,55,999	1,57,853	15,98,146	1,84,000	3,548	46,770
1866-67 ...	1,78,188	17,95,951	37,066	17,58,885	1,23,400	5,573	55,050
Total...	.....	1,82,65,466	11,43,288	1,71,22,178	...	26,898	4,90,113

(True Copy.)

(Signed) R. K. PUCKLE,
Collector.

Forwarded, as requested in Memorandum, No. 956, dated 4th Sep. 1868.

ENCLOSURES Nos. 1 to 3.—Maps.

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1. SUBMITTED for the information of Government.

2. The first project on Mr. Puckle's list is a hill reservoir for storage of the head waters of the Tambrapoorni.

3. From the Memorandum of the Superintending Engineer on the subject of the Tambrapoorni river system, communicated with Proceedings of Government, Public Works Department, 28th September 1868, the Board learn that Colonel Wilkieson does not advocate the scheme unless in the remote contingency of the channels being hereafter made navigable.

4. It is, however, well known that at certain seasons the supply is barely sufficient for the existing cultivation, and as Works IV., V., and VI., are for the purpose of extending cultivation to a very large extent, it seems by no means improbable that this project may hereafter recommend itself on considerations of irrigation requirements alone. This and No. II., however, may well be set aside for the present.

5. Nos. III., IV., and V., will naturally be among the first objects to which the attention of the Special Range Officer to be appointed for this river will be directed.

6. No. VI. has already been fully discussed and only awaits the sanction of Government, so that it is not necessary to allude to it further here.

No. 132. Minute by the Honorable A. J. ARBUTHNOT.
(Here enter 3rd December 1868.)

No. 133. Minute by the Right Honorable the President.
(Here enter 17th December 1868.)

No. 134. Minute by the Honorable H. D. PHILLIPS.
(Here enter 4th January 1869.)

No. 135. ORDER THEREON, 4th February 1869, No. 365.

IRRIGATION, No. 4.

1. The Government have perused with much interest Mr. Puckle's report, dated 1st March 1868, No. 108, communicating a project for the development of irrigation from the river Tambrapoorni and its tributaries. The zeal and energy which he has bestowed on the enquiry mark him as a public Officer warmly devoted to the welfare of the people committed to his charge; and the several suggestions he has submitted merit the careful consideration of Government.

2. Mr. Puckle's scheme embraces the construction of reservoirs near the head waters of the Tambrapoorni and one of its branches, the restoration of a weir on the Sittar river, with its main dependant tank, and the general extension of irrigation from the existing channels on both banks of the Tambrapoorni; also the construction of the Strivigoontum weir, which, however, having since been formally approved by Government, may be set aside in the present consideration. Mr. Puckle further brings forward a proposal for the employment of peculiar executive agencies and resources in carrying his projects into effect.

3. While the Government recognize that Mr. Puckle has adduced the strongest *primâ facie* evidence in behalf of all the projects enumerated by him, they think it desirable to subject them to professional scrutiny, and to have the whole of the works proposed for the improvement of the irrigation under the Tambrapoorni treated comprehensively as portions of one general plan. They moreover consider it very desirable that these undertakings should be brought under the category of Loan Works, and without regular plans and estimates, furnished by competent professional authority, funds will not be advanced by the Government of India. Nor is it improbable that there may be errors and short comings in the designs of Mr. Puckle, which would be discovered and amended by an Officer in the Public Works Department, and it is possible that the scheme may admit of still further extension.

4. The various projects submitted by Mr. Puckle will accordingly be referred to the Superintending Engineer of the 8th Division, who will issue instructions to the Officer in charge of the Tambrapoorni Range to prepare a general scheme for the development of the irrigation of that river and its tributaries to the full extent to which it is capable of being carried, keeping the suggestions of the Collector particularly in view. In conducting the investigation the Range Officer should place himself in the most cordial correspondence with the Collector, whose local knowledge cannot fail to be highly beneficial to him. The Strivigoontum project will meanwhile be carried out as a separate work under its special Executive Officer, but it may hereafter be connected with the other works under the Tambrapoorni with a view to facilitate the concession of a single loan for the whole system.

5. With regard to the agencies and means which Mr. Puckle has proposed for carrying the various works into execution, which would involve many innovations in the existing system of executing Public Works, the Government while of opinion that they are all of a legitimate character, and while they are confident that Mr. Puckle's authority would not be exerted in a manner prejudicial to the independence of the monied classes or to the liberty of the lower orders, consider that there would be some difficulty in harmonizing these agencies with the ordinary routine of the Public Works Department, and that a practical solution can only be found in the hearty co-operation of the Collector with the Superintending Engineer and the Executive Officer in charge of the Range. Mr. Puckle would point out the subordinate works which could be executed entirely by means at his disposal, and any contributions in money, labor, or materials which he might collect for other works of a larger class would have to be duly taken into account by the Public Works Officers in their estimates of the total cost.

6. In cases in which district roads may be combined conveniently with the repair or improvement of banks of channels or tanks in the manner proposed by Mr. Puckle, the local Officers will be guided by the following rules:—

(1.) In every case in which it is desired to incorporate a district road with a water dyke and to execute the combined work in whole or in part from Road Funds, the Collector and the Range Officer should submit their conjoint opinion that the road is a necessary work. In this way the interest of the rate-payers and the general public would be protected against the partial and exceptional interest of the cultivators of wet land.

(2.) In every case in which it is proposed to incorporate a district road with a water dyke, and in doing so to deviate in some measure from the natural course of the road or to incur a greater expenditure than the road alone would have involved, a careful estimate should be made of the necessary cost of the road alone in its most direct and natural course, and the amount thus ascertained should be charged to the Road Fund, the excess of expenditure on the combined work being charged to the irrigation funds available from whatever source provided.

7. The Government are of opinion that the manner in which Mr. Puckle's report has been dealt with by the Board of Revenue is not a suitable mode of acknowledging the exertions of an able and zealous Officer, who is evidently actuated by a most sincere desire to promote the welfare of the important district under his charge. Mr. Puckle's letter, after having been detained by the Board of Revenue for eight months, has been submitted to Government with a few very brief remarks containing no allusion to several of the suggestions which the Collector has made with the view of economizing the money of the State and utilizing to the utmost the interest which the people have shown in the speedy prosecution of the works to which he alludes.

8. The Board, in the opinion of His Excellency in Council, has committed an error which ought not to pass unnoticed. The retention of a paper of such importance as the one under consideration for so great a length of time is unjust to Government and unjust to the author. Such delays deprive the Government of that timely information to which it is entitled and are very discouraging to a District Officer who is really interested in his work. They are also most prejudicial to the progress of the country. The Government have moreover a right not only to expect from the Board a reasonable promptitude in the despatch of business, but also such reflections and arguments on the topics submitted as may aid Government in maturing a definitive opinion.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 8th Division.
" Chief Engineer for Irrigation
" Revenue Department.
" Board of Revenue.

Exd. S. T. Augustin.

Govt. of {1869} Madras.

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER,

8TH DIVISION

&c., &c., &c

Dated February, 4th.

Recd. 2nd.

G. O., 4th February 1869, No. 365.

FEBRUARY.

Nos. 131-135

Irrigation.—Passing orders on papers relative to the development of Irrigation of the river Tambrapoorni and its tributaries in the Tinnevelly District.

Superseded 3/11/72

21

Memorandum.

The Registrar, Government Office Public Works Department is requested to return the 3 Enclosures forwarded to Government with Board's Proceedings dated 10th November 1868 No. 7939, as they have been applied for by the Collector of Tinnevelly.

Revenue Board Office,
Madras, 12th November 1872

Hampton
Registrar

To
The Registrar Govt. Office
P. W. Deptt.

Capt. Longfield
W. Weerasawmy.

Remarks by H.E. the President.

Mr. Buckle in his letter of March 6th 1868. No. 108. has ~~submitted~~ communicated a project for the development of the irrigation for the River Sambhapuri and its tributaries of the highest interest and value. The zeal and energy which the Collector of Sambhapuri has displayed in this enquiry marks him as a public officer warmly devoted to the welfare of the people committed to his charge. The suggestions which he has submitted contain several peculiar features originating either in his own independence of character and thought or ~~with~~ in the distinctive condition of the district, which are worthy of the careful consideration of Government. ~~His suggestions~~ The scheme proposed by Mr Buckle has reference;

1/. To the construction of reservoirs and other irrigation works;

2/ To the employment of peculiar executive agencies and resources

in carrying these projects into effect. —

II. The irrigation works contemplated embrace two mountain storage tanks, the reconstruction of a ruined ~~anicut~~ weir on the Sattar river with its main dependent tank, the extension of irrigation on both banks of the Samhapuri below the Bhandara weir, and the construction of the Sheevagunga weir since formally sanctioned by government. Putting the Sheevagunga project aside as one already approved and commenced the remaining projects all comprised themselves to the approval of government. Mr. Purkle has adduced the strongest prima facie evidence on behalf of all. It is the plain duty of government to subject them to professional scrutiny and to obtain plans and estimates with the least possible delay. Mr. Purkle confident in his own powers and in his influence with the population might perhaps desire to commence various portions of these works at once which might subsequently be incompatible with the general plan.

The whole system of distributing works obey the same original impulse, the whole of them stand in mutual dependency, they can all be made subject to one administrative control. Recognizing a peculiar physiography in this river the government have made the basin of the Sambrepoorny a separate irrigation Range and have appointed a special officer to the charge. They should complete the idea by making the development of the irrigation a single loan work, admitting unprofitable features if conducive to the efficiency of the general plan, the better way for the work, ~~Making~~ Setting ~~the~~ encountering the storage reservoirs at the head, which will for ~~Lake~~ a direct return, with the ancient tanks and channels of the middle course and ~~the~~ including the Delta irrigation at the foot which now stands on a separate basis.

I propose therefore that the projects submitted by Mr. Buckle shall be referred to the Superintending Engineer 2nd Division with instructions to employ the officer in charge of the

Tambraparney range in preparing a
general scheme for the development and
security of the irrigation of that river and
its tributaries (with all the specifications and details
required by the Government of India for the
sanction of a loan work. The Range officer
should be directed at the same time to
place himself in the most cordial
correspondence with the Collector of the
District whose local knowledge will
be of the highest benefit to the
Department of Public works.

Pending the adoption of this course, which
project should be meanwhile carried on
as a separate work under the special
executive officers. The union of the
Tambraparney project with the general plan with a
view to facilitate the conception of
a single loan for the whole would
be brought under the consideration of
the Government of India hereafter.

III. The special agencies and resources
indicated by Public as being
available for the execution of irrigation

works is friendly and of a kindred
and rather complicated nature. They
comprise the following suggestions.

(1) The active intervention of the Collector
in the organization and promotion of the
work.

(2) Voluntary contributions or subscriptions in money
or the part of the people.

(3) Voluntary labour and the gratuitous
supply of materials.

(4) The application of customary labour
or village labour under the impulse
& authority of the larger landowners.

(5) The application of local road funds
to the construction of tank and channel
bunds or banks where the course
of a projected district road tank
identified with the course of the
bund or bank without jeopardising
& the road or inconveniencing the
public.--

All the agencies and means above
mentioned are legitimate and might
properly be introduced into the
execution of a loan ~~for~~ work

with the view of accelerating and cheapening
the work and rendering it more profitable
to Government and ~~the Government~~
entertaining the highest confidence in his
Public and Ido I am confident that his authority
would not be exercised in a manner
prejudicial to the independence of the
Married state or the liberty of the
lower orders. Some difficulty would,
however, be undoubtedly experienced in
harmonizing the employment of these
agencies with the ordinary routine
of the Public works Department. It
seems to me that a practical solution
can only be found in the hearty co-operation
of the Public with the executive
Officer in charge of the Range. The
Public would limit all the subordinate
works which could be executed entirely
by means of his Department and he
would indemnify the proportion of
expenditure, in money & labour or
materials, which he could furnish for in
for other works in which the regular
and extraordinary means and resources
must be brought to bear. He
must both

in respect to

contributions thus furnished by Mr Purcell would be carefully estimated and the amount would be deducted from the gross estimate for the ~~whole works~~ general scheme of works which would have to be prepared and submitted by the officer of the Public works Department.

The proposal to employ road funds in aid of irrigation works requires to be dealt with under some description regulation. I assume that these funds could not be employed at all with reference to irrigation works in which a necessary road is not completed. The grant-in-aid should be distinctly bound to apply the road funds to roads alone. Where the course of a road can, however, be identified with the course of a water dike, as is often the case in Holland, it is desirable with a view to the road and the dike. They afford a mutual security and facility. The road helps the dike and the dike helps the road. I think Govt. must be very

---

following rules.

(1) In every case in which it is desired to incorporate a district road with a water dike and to execute the combined work in which a grant for road purposes the Collector and the Range Officer should submit their conjoint opinion that the road is a necessary work. In this way the interest of the ratepayers and the general public would be protected against the hasteful and exceptional interest of the cultivators of wet land.-

(2) In every case in which it is proposed to incorporate a district road with a water dike and in doing so to deviate in some measure from the natural course of the road or to incur greater expenditure than the road alone would have rendered, a careful estimate should be made of the necessary cost of the road alone in its natural direct and natural course and the amount thus ascertained should be charged to the road fund, the excess of expenditure on the combined work being charged to the irrigation funds available from whatever source provided.-

IV. The opportunity which I have embraced
in order to record my impressions in consul-
with Mr. Buckle's letter has been afforded
me by some remarks attached by my
colleague Mr. Arbuthnot to the Draft adver
on this subject prepared by in the
Public works Department, remarks in
which I entirely concur. It is posti
stated, by Mr. Arbuthnot that the
whole, original, and exhaustive scheme of
agricultural improvement contained
in that communication from Mr. the Collector
of Bimerly in her dispatched by
the Board of Revenue after an
unusual delay with little attention
and no recognition. After retaining
the letter of the Collector for a period of
eight months the Board keeped it
on the Government that any comments
on the important suggestions offered
in connection by the collector concerning
the executive agencies to be employed
in the projected works. Nor do they seem
to have considered that the limited
restored by Mr. Buckle on a
prescribed task, which he made a
labour of love, precluded any consideration

The Board has in my humble judgment committed
an error which ought not to pass unnoticed. The
retention of a paper of such importance as the one
under consideration for so great a length of
time is unjust to the Government and unjust
to the author. It deprives Government of that
timely information to which they are entitled
& deprives the author of the satisfaction and
encouragement which are his reward. The
Government has moreover a right not only to
expect from the Board a reasonable promptitude
in the discharge of business but also such
reflection and arguments on the topics submitted
as may aid Government in returning a
definitive opinion. The Board is not simply
a vehicle of transmission. It is the proper
and responsible exponent of the question
having before it, & Government and Council.
The Government will accordingly do well
to mark their sense of the procrastination
and indifference with which the communication
referred to has been treated. The order
drafted in the Public Works Department having
been judged by Mr. Schalch to be inconsistent
with the interests brought under our consideration
I suppose that the order may be laid aside and
that another may be prepared in the same
department on the bases of the remarks now
submitted and of any suggestions which may be
offered by the other members of Council.

Napier

Minute by
H. R.
Prudent.

Jamboree
Irrigation.

D.O.N. 1869 Dept.
Dy 107

Minute by the Right
Honorable the President

Dy 17 Dec 68.
Rec'd 11 Jany 69.

No 365 — 4th Feby 69
133.

Regarding
Mr Purkle's suggestions
for the development of
the irrigation of the
River Cauvery & Coleroon
& its tributaries —

Mr Purkle no doubt deserves the highest commendation for the interesting report he has submitted. Much of what he proposes for the benefit of the districts, is worked for the Government works & in regard of the proposals with. Mr Purkle says the ideas are his own. These projects must, however, of course be last before the Govt of India in the complete form in which Government for decision, & this could be achieved only by testing the practicability of Mr Purkle's plans by professional examination. They cannot consequently be opposed to the Sub: Engineer for report: if the officers favorably views them, they may with much benefit be treated as a single project and act be taught from the imperial loan funds, as suggested by the Honble the President. The operations involved by Mr Purkle will involve many difficulties on the existing system, and alterations may happen, least Mr Purkle, as Collector of Tinnevelly, will not be on the spot to realize the most economical methods by which he proposes that the cost of the works will be materially lessened. Some time for opening that

Regarding
the works;

132 Jany 1869.

such Schemes as the Inspectorate of the Govt may have to frame, should be framed on existing rules & the ordinary data accumulated. Nor will these be the probable cost of the several works treated as a whole, while they will form no authoritative guide, as little has yet been finally taken of the special means which Mr Ruckle or Colleagues may have to bear on the execution of the projects when once they are put in hand. Mr Ruckle's successor may or may not be a position to exercise the local influence &c &c which would conduce - with this modification I have pleasure in concurring in Lordships general proposals

W Allen

4 Sanctg.

Public Works Dept

Proceedings of the Madras Government under date the 2nd December 1868.

Read the following

Proceedings of the Board of Revenue.

(Here enter No 1999 of 10 Sheet 168)

Communicated to

the Chief Engineer for

Irrigation, and to the

Superintending Engineer

of the S. D.

The Officer who may

be appointed to take

charge of the Sambrapoor

Irrigation Agency

will adopt measures for

the thorough and careful

P.W. 1869 Dept.

No 108.

Minute by the Honorable

H. D. Sulivan

Dy 4th Jany 1869.

Read 11 " "

No 365 - 4 " Feby 1869 Dr 134

Regarding

Mr Puckle's suggestions

for the development of

the irrigation for the

River Sambrapoorni &

its tributaries -

No 38

Recd 13th Jany 1869 - Dr 16th

investigation of the several
projects referred to by
the Collector in the order
of their importance.

The project for
an Viaduct across the
Pambrapoorney at Stree-
rigumdum has been sub-
mitted for the sanction
of the Government of India,
and no Gov. of 3395 of
26 Oct 58, authority
has been granted for
the Collection of materials,
and for the construction
of the works during fair
weather with the assign-
ment of funds which

the Board of Revenue
and in which it is
now proposed that
the Govt. should deal
with it in any way
a suitable mode of
acknowledging the
assistance of an able
and zealous Officer
who is evidently
actuated by a most
sincere desire to
promote the welfare
of an important
District under his
charge. The Public
Works, after having been
obtained by the Board
of Revenue for Sanction
have been submitted to
Govt. with a few very
brief remarks, entirely
the absence of which
in my opinion, would render
the practical suggestions
which he has made
with the view of economizing
the means of the State

and destroying to the
utmost the misery
which the people have been made for the
Rains in the Spring, the current years
prosecution of the works in the
and which the abundant Budget.
I ~~think~~ were especially
to the numerous suggestions
contained in the 31st 32nd
34th 35th 36th 39th 40th
64th 65th 66th 67th paras
of the letter. It is now
proposed to pass on the letter
to the Superintending Engineer
without any specific alteration
and without making any
acknowledgment to the Public
Officer, whose valuable investigations
have brought under notice the
existence of which exist for improving
the irrigation of this District. The
Board is aware how, in directing a valuable document
and the order, should be submitted,
to be framed as to show that
the Govt. thoroughly appreciate
the Chief Engr's Letter
Engr's
manner in which the
Public has discharged

his duty and that they are prepared to accord him their cordial support. (15)

I also think that the duty as the head of the Board of Trade is perfectly as the report ought to be retained. There could be no valid reason for this obtaining if for such matters - such duty as most discouraging to British Ships who take any real interest in their work, and are most prejudicial to the prosperity of the Country.

I think the questions addressed to the Surveyors under the Act of 1854 which are published with the report, this report should, I think be withdrawn from the Board for the present year. A circular with the addressed to the Surveyors requesting the duty & calling for the immediate return of the report.

I have &c

[illegible]

2 Nov. 1860

P.W. 1869 Dept.

No. 109.

Minute by the Honorable
A.J. Arbuthnot.

Dy 3rd Decr/68.
Read 11th Jany/69.

Regarding
Mr. Pickle's suggestion
for the development of
the irrigation of the
River Tambraparnis
& tributaries.

From Secy to Govt No 132.

Public Works Department

No 365

Proceedings of the Madras Government
Under date the 4th Febry/69

Read the following
Min. & Board's Report
Despatch order

2	Minute by the Right Honorable the President	H.E. No 3	dated 17th Decr/68.
3	Minute by the Honble H.D. Phillips	H.E. No	dated — 4th January/69
1	Minute by the Honble A.J. Arbuthnot	H.E. No	" — 3rd December/68

The Government have perused with much interest Mr. Pickles report dated 1st March 1868, No 108, Communicating a project for the development of irrigation from the River Tambraparnie and its tributaries. The zeal and energy which he has bestowed on the enquiry mark him as

as a public Officer
warmly devoted to the
welfare of the people
committed to his charge;
and the several sug-
gestions he has submitted
merit the careful con-
sideration of Govern-
ment.

Mr. Puckles scheme
embraces the construc-
tion of reservoirs near
the head waters of the
Tambraparnie and one
of its branches, the
restoration of a weir
on the Sittar river, with
its main dependant
tank, and the general

ex-

tension of irrigation
from the existing chan-
nels on both banks
of the Tambraparnie,
also the construction of
the Shrivaikuntum
weir, which however
having since been formally
approved by Government,
may be set aside in the
present consideration, —
Mr. Puckle further brings
forward a proposal
for the employment of
peculiar Executive a-
gencies and resources
in carrying his projects
into effect.

While

While the Govt. recognize that Mr. Puckle has adduced the strongest prima facie evidence in behalf of all the projects enumerated by him, they desirable to subject them to professional scrutiny, and to have the whole of the works proposed for the improvement of the irrigation under the Tambraparni treated comprehensively, as portions of one General plan - They moreover consider it

it is very desirable that these undertakings should be brought under the category of Canal Work, and without regular plans and estimates, furnished by competent professional authority, funds will not be advanced by the Govt. of India. Nor is it improbable that there may be errors and shortcomings in the designs of Mr. Puckle, which would be discovered and amended by an Officer in the Public Works Department, and it

it is possible that the scheme may admit of still further extension.

The various proposals submitted by Mr. Buckle, will accordingly be referred to the Supt. Engineer 8th Division, who will give instructions to the Officer in charge of the Tambraparni Range to prepare a general scheme for the development of the irrigation of that river and its tributaries to the full extent to which it is capable of being carried, keeping the suggestions of the Collector particularly in view.

In conducting the investigation the Range Officer should place himself in the most cordial correspondence with the Collector, whose local knowledge cannot fail to be highly beneficial to him. The Srivaigoontum project will meanwhile be carried out as a separate work under its Special Executive Officer, but it may hereafter be connected with the other works under the Tambraparni with a view to facilitate the conception of a single loan for the whole system.

Vide

With regard to the Agencies and means which Mr Puckle has proposed for carrying the various works into execution, which would involve many innovations in the existing system of executing Public Works, the Govt. while of opinion that they are all of a legitimate character, and while they are confident that Mr Puckle's authority would not be exerted in a manner prejudicial to the independence of the Married classes or to the liberty of the lower orders, consider that there would be some difficulty in harmonizing these agencies with the ordinary routine of the Public Works department, and that a practical solution can only be found in the hearty co-operation of the Collector with the Superintending Engineer and the Executive Officer in charge of the Range. Mr. Puckle would point out the subordinate works which could be executed entirely by means at his disposal, and any contributions in money labor or materials which he might collect for other works of a larger class would have to be duly

duly taken into account by the Public Works Officers in their estimates of the total cost.

In cases in which district roads may be combined conveniently with the repair or improvement of banks of Channels or Tanks in the manner proposed by Mr. Tuckle, the local Officers will be guided by the following rules:—

1. In every case in which it is desired to incorporate a district road with a water dyke and to execute the combined work in whole or in part from road funds, the Collector and the Range Officer should submit their conjoint opinion that the road is a necessary work. In this way the interests of the rate payers and the general public would be protected against the partial and exceptional interest of the cultivators of wet land.

2. In every case in which it is proposed to incorporate a district road with a water dyke

dyke, and in doing so to deviate in some measure from the natural course of the road or to incur a greater expenditure than the road alone would have involved a careful estimate should be made of the necessary cost of the road alone in its most direct and natural course, and the amount thus ascertained should be charged to the road fund, the excess of expenditure on the combined work being charged to the irrigation funds available from

Whatever course pro-

vided.

The Government are of opinion that the manner in which Mr. Pickles report has been dealt with by the Board of Revenue is not [redacted] a suitable mode of acknowledging the exertions of an able and zealous officer, who is evidently actuated by a most sincere desire to promote the welfare of the important District under his charge. Mr. Pickles letter after having been detained by the

Board

omit N.

Board of Revenue for
eight months, has been
submitted to Govt.
with a few very brief
remarks containing
no allusion to reversal of the
~~comprehensible and~~
~~practical~~ suggestions
which (he) has made with
the view of economizing
the money of the State
and utilizing to the
utmost the interest
which the people have
shown in the speedy
prosecution of the works
to which he alludes.

(omit)

the Collector

The Board, in the
opinion of His Excellency
in Council, has

committed an error
which ought not to have
remained unnoticed. The retention
of a paper of such
importance as the one
under consideration
for so great a length
of time is unjust to
Govt. and unjust to
the author. It deprives
Govt. of that timely in-
formation to which
they are entitled, it
deprives the author of
the satisfaction and
encouragement which
are his reward. The
Govt. have moreover
a right not only to expect
from

I hope this para:
especially this part
of it will cause mis-
givings. If this para:
is to stand, I would
substitute the following
for the part I have
marked.

"such delays deprive
the Govt. of that timely
information to which
it is entitled and

from the Board a reasonable promptitude in the despatch of business but also such reflections and arguments on the topics submitted as may aid [illegible] in maturing a definitive opinion; for the Board is not simply a vehicle of transmission, but the official exponent of the questions passing through its hands to Council.

J.C.

6 Jo
3 The E.B. Board
2 Chairman for Irrigation
1 Revenue Secretary
1 Bd of Revenue

Dispatched 5/2/69.

130 Jan 1869 R. 16

are my discouragement & a distinct illness also is really incurred in this work. They are also much prejudiced & the progress of the country.

Jaque but should substitute the word "attitude"

J.C.

— I would [illegible]

J.C.

of this Board.

I would say

Government.

There is no such body as the "Council in strictly official parlance. It is the "Government in Council" or the "Government."

J.C.

Nos. 102, 107, 108 & 109

Govt. of {1869} Madras.

PUBLIC WORKS.

To The Superintending Engineer
3rd Division

Dated —

Rec'd. 1st

G. O. 6th Feby 1869 No. 365

Nos. 131 to 135

Irrigation Passing orders on letters relative to the development of Irrigation from the Anicuts Lambraspoorum and others Entaries in the Tinnevelly Dt.

7-10-12

MADRAS RECORD OFFICE.

Government Records.

Public Works Department.

G. O. (Printed).

Dated 4: 2- 1869.

No. 365 M

181—135