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MADRAS RECORD OFFICE.

Government of Madras.

Archaeology DEPARTMENT.

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Proceedings of the Madras Government, Public Works Department, 17th December 1868.

No. 414. Read the following Endorsement of the Chief Engineer for Irrigation, dated Fort St. George, 18th November 1868, No. 94 :—

Read the following letter from the Superintending Engineer, 2nd Division, to the Chief Engineer for Irrigation and Joint Secretary to Government, Public Works Department, dated Bazoarah, 9th October 1868, No. 87.

1 Appendix A.
1 Do. B.

1. In G. O., No. 3,684, dated 27th November 1867, I was directed to prepare plans and estimates for the completion of the whole Kistna project, and submit with them a report, showing in a full and comprehensive manner the quantity of water that can be confidently relied on for the supply of the channels, the means by which the delivery of the supply from the river is to be secured, and the area of the lands available for the utilization of that supply.

2. I was also directed to revise the scheme which was submitted with the late District Engineer's letter, dated 6th January 1863, and allow for the construction of any additional works, which further experience may have shown to be necessary, particularly as regards the provision of out-lets for the free discharge of surplus or drainage water, both at ordinary times, and on occasions when, from an extraordinary fall of rain, or from other causes, the channels may have drawn from the river a larger supply than it may be possible to use.

3. The estimates drawn up in 1863 were approximate. The excavations of the channels were calculated on levels taken at long distances, and though they were sufficiently accurate to allow Government to know within a reasonable sum what the Kistna scheme would cost, they were not intended to, in any way, supply the place of the elaborate sections, surveys, and designs, which have since been submitted to Government with the Lower Commamoor channel project,[*] the Lower Poollair project,[†] the Upper Poollair project,[‡] Ryves' Channel project,[§] the east[‖] and west[¶] Side Channels of the Masulipatam Canal, and the various other works enumerated in the Budget of 1868-69.

4. The call made upon me in G. O., No. 3,684, dated 27th November last, virtually amounted to prepare estimates in full and elaborate detail for works that will cost fully twenty lacs of Rupees, and that without a special establishment for the purpose I cannot possibly prepare under a couple of years at least.

5. As a beginning I prepared the estimate for the full enlargement of the Upper Commamoor Channel, and as certain parts of it were works that should be put in hand without delay, forwarded it for sanction with my letter No. 144, dated 8th February 1868.

Estimate Rupees 1,78,800.

6. You returned it with your Memorandum No. 31, of 4th March last, stating that it was necessary that all estimates for works to be constructed from Loan money should be drawn up in such a form as to allow of the Government of India

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[*] Sanctioned in G. O., No. 3,699, dated 15th December 1863, Estimate Rupees 1,85,460.

[†] Do. G. O., No. 3,581, dated 27th November 1865, Estimate Rupees 1,04,050.

[‡] Do. G. O., No. 747, dated 17th March 1865, Estimate Rupees 1,72,830

[§] Do. G. O., No. 3,684, dated 27th November 1867, Estimate Rupees 4,06,110.

[‖] G. O., No. 3,342, dated 19th October 1866, Estimate Rupees 15,610.

[¶] G. O., No. 3,342, dated 19th October 1866, Rupees 49,860.

forming an opinion of their remunerative effect, and stated that you have not the means of showing how far the improvements, which have been carried out within the last few years, have been followed by a gradual increase in the revenue returns.

7. This information, regarding remunerative effect of works and lands available for the utilization of a supply of water, (which it is necessary, of course, that I give for all the estimates I am required to submit,) appears to me at the present time so involved in uncertainty that I feel it absolutely necessary to request your further consideration of the subject.

8. In letter No. 143, dated 6th January 1863, the then District Engineer of the Kistna assumed in submitting the approximate estimates of all future works required, which is before alluded to, that about "one-half of the actual area of the "Delta will be taken up, leaving out of the question a large tract of country, which "is covered by tidal inundation, and also allowing a liberal deduction for tracts "of sandy soil on a high level," and with this premise he calculated that "about "270,000 acres of land may be irrigated in the Masulipatam Delta, and 230,000 "in the Guntoor Delta, in all 500,000 acres."

9. Since that letter was written nearly five years have passed, and in Appendix A. I show the progress of wet cultivation during that period, the total increase being 15,902 acres.

10. In Appendix B. I show, in parallel columns, the state of the works at the end of 1861-62 and at the end of 1867-68.

11. The following has been the expenditure on original works during that interval:—

1862-63	Rs.	2,23,012
1863-64	,,	2,00,471
1864-65	,,	1,58,577
1865-66	,,	81,316
1866-67	,,	95,704
1867-68	,,	2,18,556
	Total Rs.	9,77,636

12. I think it will be admitted that the rate of increase of wet cultivation has not been nearly that which was anticipated, and I believe that the area shown in Fusly 1272 was less than that really cultivated, as the demand on the Zemindary estates had not then been settled, and the difference between the acreage in those estates in 1272 and 1273 is too great to be probably *boná fide* correct. I am, therefore, of opinion that the real increase of irrigation in the five years under review has not much exceeded 10,000 acres.

13. The most notable fallings away of cultivation are in 1863-64, when the Bunder Talook Irrigation decreased from 12,324 to 4,103 acres; in 1867-68, when it further diminished to 1,434 acres, and in the same year when the wet area in Gudivada Talook fell from 59,789 to 43,837 acres.

14. The first decrease is apparent not real, as the Zemindary water cess was in great part unsettled, and written in the Bunder accounts.

15. The two latter diminutions of acreage were caused by the Ryots giving up land on the introduction of the new Revenue Settlement.

16. But other causes have been at work to produce a dislike on the part of the Ryots to irrigation. The following are the chief:—

1st.—Soudoo, an efflorescence of a saline nature, rendering the land on which it appears perfectly sterile, has appeared on a good deal of the very rich soil that is met between Veeranki and Nedamole, and elsewhere in the Northern Delta; and also in some parts of the Southern Delta great fear prevails that it will extend, and that much loss will ensue to those who own lands which are classed as "permanent wet," after three years' irrigation.

2nd.—The price of paddy has not been sufficiently remunerative of late years.

3rd.—The seasonable rains that have fallen for some years past, and the knowledge that the cultivators can on emergency obtain water for their dry crops from the canals, have operated on their naturally indolent temperaments, and taken away the anxiety they felt when famines and drought were not uncommon to cultivate the wet crops, on the culture of which more physical labor and discomfort is necessary than on dry.

17. Certain it is that for land under three of the principal branch channels (viz., Kollur, Kollimara, and Pamurroo,) excavated of late years, not a single application for water has been received. Whilst during the past year, although the eastern side channel of the Bunder canal can from its higher level supply much more land than the Bunder canal was enabled to do, not one additional acre is being cultivated.

18. Probably another cause (though it will be but temporary in its duration) of dislike on the part of the Ryots to commence wet cultivation is the fact that occasional loss has been sustained from an insufficiency of water. They have taken up land, and then found that a full supply could not be secured for the entire season. This defect will disappear as the channels in the upper reaches are enlarged.

19. Things being in this condition, it does not seem, in my very humble judgment, that the time has yet arrived for the formation of estimates of works that shall irrigate half a million of acres. The enlargement of the Masulipatam canal, Ryves' channel, and Seetanagram channels are all in rapid progress, and not till their works are well advanced can any large additional supply of water be given. Work is laid out for some years to come, and any further estimates now framed, excepting those that must from time to time be submitted for branch channels and drainages, would be obsolete as to rates long before they could be perhaps even commenced. The estimates now called for would, in short, whilst in full detail, be little nearer approximations to the true eventual outlay than those forwarded in 1863.

20. It appears to me also very desirable before undertaking this arduous, and, at best, approximate labor, and entertaining an expensive establishment* for the purpose, to pause and see if the slow progress of irrigation is likely to continue, or whether the present check is only temporary.

21. All the widenings of channels now in progress, though sanctioned for the full width to be finally adopted when the half million of acres are taken up, are being at present excavated to only a fractional part of that width, in order that an increased supply of water may be obtained at the very earliest date. Within two or three years after that supply is available, I think a more sound judgment will be formed, as to the advisability of carrying out the full scheme, than is at present possible.

22. Should you agree with me in these views, I would solicit that the matter be submitted for the consideration of Government.

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*The Special Establishment employed in Nellore now costs more than 1,400 Rupees per mensem, inclusive of Mr. Smith's pay.

APPENDIX A.

	Fusly 1272 or 1862-63.	Fusly 1273 or 1863-64.	Fusly 1274 or 1864-65.	Fusly 1275 or 1865-66.	Fusly 1276 or 1866-67.	Fusly 1277 or 1867-68.	
Southern or Guntoor Delta.							
Rapully	34,428	44,254	42,803	40,420	41,070	44,183	*Increase* in Southern Delta in five years, 21,010.
Baupetla	17,228	24,855	26,524	25,770	26,983	28,483	
	51,656	69,109	69,327	66,190	68,053	72,666	
Northern or Masulipatam Delta.							
Bunder	12,324	4,103	3,967	3,848	1,434	1,646	*Decrease* in Government lands of Northern Delta, 19,238 acres.
Gudivada	52,542	54,457	59,586	59,789	43,837	43,744	
Bazoarah	3,849	3,964	3,900	4,113	4,326	4,087	
	68,715	62,524	67,453	67,750	49,597	49,477	
Zemindaries*	5,220	17,230	16,360	22,950	19,371	19,350	Approximate *increase* in Zemindary lands in Northern Delta, 14,130 acres.
Total wet area excluding Mamool wet in Kistna Delta	125,595	148,863	153,140	156,890	137,021	141,493	Total *increase* of cultivation in five years, 15,902 acres.

* The number of acres in the Zemindaries are approximate.

BAZOARAH,
9th October 1868.

(Signed) G. V. WINSCOM, Lieut.-Colonel, R. E.,
Superintending Engineer, 2nd Division.

APPENDIX B.

Name of Work.	Amount of Estimate.	Date of sanction.	State of works in 1862.	State of works in 1868.
Northern Delta.				
Ellore Canal	79,550	G. O., No. 2,109 of 12th November 1856.	Opened in 1861-62, as far as limits of Kistna District.	Opened for seven years.
Ryves' Channel	64,860	G. O., No. 2,197 of 29th November 1861.	Partly opened in 1861-62 ...	Fully opened for more than five years.
Masulipatam Canal	2,59,826	G. O., No. 2,109, 12th July 1856, No. 712 of 4th April 1860, No. 1,407 of 4th July 1860.	Ankumurroo Lock just finished ...	Opened throughout for about five years. Side channel from Pamurroo to Ankumurroo finished. Upper reach from Bazoarah to Cunkipaud partly enlarged.
Poollairoo	1,04,050	G. O., No. 3,581 of 27th November 1865.	No improvement made. New head sluice just commenced.	Much enlarged through greater part of its length.
Polraz Codu			Not commenced	Opened for seventeen miles for the last three years.
Buntumilly Channel			Do.	Opened in 1865.
Southern Delta.				
Nizampatam Canal	2,76,404	G. O., No. 2,358 of 15th December 1856, No. 2,382 of 24th December 1861, No. 1,376 of 17th June 1862, No. 636 of 17th March 1865, No. 2,400 of 13th July 1866.	Enlargement near head commenced. Kuchipudy Lock opened in February 1862 at twenty-three miles from head. Intur Lock commenced.	Greatly enlarged throughout the entire reach between Seetanagram and Duggeralla, and delivering a very greatly increased body of water. Canal opened through-out full length for three years. Side channels about one-third completed.
Western Bank Channel	1,46,179	G. O., No. 1,405 of 12th August 1856, No. 3,232 of 6th November 1863.	Head sluice and lock building. No enlargements made.	Considerably enlarged, four calingulas built, and Kallur and Kollipara Channels dug for past four years (though no irrigation has been taken up under them), Vellatur and Iskapully Channels both greatly enlarged and extended.
Commamoor Channel	1,95,770	G. O., No. 3,699 of 15th December 1863, No. 1,300 of 1st May 1867, No. 1,881 of 24th June 1867.	Extensions not commenced ...	Extended to the Incole road; greatly enlarged and improved. Drainage of Rampairoo finished excepting from Ingole road to the back water which is only partly done. Various new channels excavated, and improved supply to old tanks and irrigation given.

BAZOARAH,
9th October 1868.

(Signed) G. V. WINSCOM, Lieut.-Colonel, R. E.,
Superintending Engineer, 2nd Division.

From the Superintending Engineer, 2nd Division, to the Chief Engineer for Irrigation, dated Bazoarah, 28th October 1868, No. 100.

1 Kistna Collector's letter, No. 186, dated 29th September 1868.*
1 Superintending Engineer's reply thereto, No. 153, dated 28th October 1868, (copy.)
1 Do. letter (copy) No. 152, dated 22nd September 1868.
1 Copy of Revenue Board's Proceedings, No. 5,679, dated 5th August 1868.*

* To be returned.

1. In reply to your Memorandum, No. 73, dated 15th October, I have the honor to state that, in my letter No. 87, dated 9th idem, I in no way wished to infer that the system of channels in the Kistna Delta should not be extended beyond their present limits, but simply desired to show that we have not *at present* due grounds for hoping that half a million of acres will be eventually irrigated, and that it is desirable to delay the formation of estimates for carrying out the works to the extent projected in 1863, until further experience is obtained of the probable action of the ryots.

2. I believe, and am sure, that irrigation *will* be considerably extended, when the enlargement of the channels now in progress is sufficient to enable a good supply of water to be furnished to the poor soils which lie along the sea coast, and extend inland for ten or fifteen miles. This will be the case in the Northern Delta, when the Bunder canal is widened to sixty-six feet bottom width as far as Kunkepaud, the Poollairoo from Kunkepaud to Cowtaram, and Ryves' channel to Murrywada, and in the Southern Delta, when the drainage of the Rampairoo swamp is efficiently completed, and flood banks to protect the newly irrigated land afford security to the ryots against devastation by inundations at the time when the hill streams which cross the Commamoor channel are pouring through the newly excavated Rampairoo drainage. I believe that in the neighbourhood of Kykalur, Culdindy, and Buntumilly several thousands of acres will be turned from waste into irrigated land. I doubt if much will be done at present in the way of extension in the Sullapilly Zemindar's Estate, but on the south, I believe, there will be considerable increase about Rapilly, Buntumilly, and (as I said before) along the Rampairoo.

3. I have requested Mr. McAlpine, the Officer in charge of the 7th Range, to employ Mr. Assistant Engineer Norris almost exclusively on projecting extensions of channels from the Polraz Codu, in the direction of Kykalur and Juggempaud, Culdindy, Toommedy, &c., and the drainage of the various swamps at present existing near the Ooppootair. I hope that a considerably increased supply of water may be given to the Polraz Codu by the season of 1870, and if so, I doubt not but that a large extent of land will be taken up between 1870 and 1873. Lieutenant Smith is employed in investigating the possibility of supplying the sandy poor soils near Perali, and to the east of the Rampairoo swamp with water from the Commamoor channel, and making a navigable canal from Karimchadoo to Wada Ravoo, which from all accounts is the best roadstead for ships in the district.

4. There can be no doubt that the excessive difficulty of access to the port of Masulipatam has a most prejudicial effect on the welfare of this district. The

price of paddy this year at Bunder is very much below that at Madras,* yet there is little or no export of it. At Wada Ravoo, I understand, ships of large burthen may lie off the shore at about the same distance they do at Madras, and I beg to suggest that Government should appoint a Committee to inquire into the capabilities of the place as a port deserving of improvement from Imperial resources.

* August 1868.

	Madras. Per garce. RS.	Kistna. Per garce. RS.
Second sort Rice	457	275
Second sort Paddy	225	122

5. If communications continue to be improved, I believe in 300,000 acres being irrigated from the Kistna anicut before many years are passed, but am dubious concerning more, at any rate for a lengthened period. It is not easy to *entirely* account for the apathy that is manifested by the ryots concerning irrigation, for rice even at its present low rate must be more remunerative than a dry crop;* but the facts remain that wet crops on the black regur soil of the Delta are being given up in large quantities, and that irrigation has not extended in the Kistna as in other districts. I enclose a letter from Mr. McQuhae, the Acting Collector, lately received, from which you will see that there will be a large diminution of wet acreage during the present Fusly. Mr. Wilson, I see, endeavours to account for the "aversion" of the ryots to irrigation in his letter embodied in G. O., No. 3,316, dated 20th instant. But the wonderful benefits which the anicut and its subsidiary works confer on the district can nevertheless scarcely be exaggerated. In one year of famine, such as 1833, it may save a very large proportion of the dry crops of the Delta, giving food and water for man and beast, at a time when (as in that year) 150,000 people might again perish, and cattle to the value of 18 lacs, and revenue to an extent of 77½ lacs† be again lost.

	Expenses. RS. A. P.	Net produce. RS. A. P.
* One acre of second sort Paddy, producing 2,240 lbs., at 122 Rs. per garce, with Rs. 30-8-0	10 8 0a	20 0 0b
One acre of dry crop, producing 900 lbs., at 147½ Rupees per garce, with Rupees 14-13-0	4 8 0	10 5 0

a Including water cist.
b Value of straw not calculated in either case.

No. 186, dated 29th September 1868, to be returned.

† *Vide* Public Work Commissioner's report in 1852.

6. The anicut *secures* the welfare of many thousands of acres of dry cultivation, and indemnifies the owners against loss of their crops, whether an extra rate of rent should not be charged to such holders of land, from this *great* security, is a question that I think may not be unworthy of consideration.

P. S.—With Mr. McQuhae's letter, above alluded to, I beg to forward copy of my letter No. 152, dated 22nd September, and No. 184, dated this day; also copy of the Proceedings† of the Board of Revenue passing orders on the relaxation of the water rules, and the notification which has in consequence appeared in the Gazette.

† To be returned.

From the Superintending Engineer, 2nd Division, to the Acting Collector of Kistna, dated Bezwada, 28th October 1868, No. 184.

1. With reference to your letter, No. 186, dated 29th September 1868, I have the honor to request you will inform me who are the cultivators of dry land, converted into wet, who have the option of refusing irrigation during the ensuing two years.

2. The water rules were *first* published in 1860. The *revised* rules appeared in November 1865. Rule II lays down "that all lands now permanently supplied with the means of irrigation for a single crop, and are now cultivated as nunjah, and have been actually irrigated for two or more years, shall be classed as irrigated." Rule VII, therefore, I presume, only applies to lands newly brought into wet cultivation after *November* 1863. The Board's order* granting the option of refusing irrigation, during the ensuing two years, is because Mr. Wilson states that Rule VII cannot well be applied, because certain lands were not converted in the formal manner prescribed by the rules. As the landholders who, converted from dry into wet in 1863, had the option to refuse till 1865, and those who took up wet in 1866, have been able to refuse this year, I do not exactly understand to whom the new rule applies.

* Proceedings, No. 5,679, dated 5th August 1868.

3. In what way has Rule VII not hitherto been strictly observed? Is it in not allowing the cultivators of 1865 to resign land in 1867, or those of 1854 in 1866, and those of 1863 in 1865?

4. It seems somewhat important that this matter should be clearly understood, as I am under the impression that much land has been relinquished this year on the strength of the late notification, that cannot be justified by the terms or spirits of the said notice. I am no advocate for forcing water on the ryots against their wills, but I would suggest that the rulings, and the meaning of those rulings, should be very clearly stated.

From the Superintending Engineer, 2nd Division, to the Acting Collector of Kistna, dated Bezwada, 22nd September 1868, No. 152.

1. With reference to your notice concerning the conversion of dry land into wet, published in the "District Gazette," I have the honor to request you will inform me whether I am to understand that land which has been cultivated already more than three years as wet may be re-converted into dry, at the option of the ryots during the next two years.

2. Also, when the two years in which the Board allowed the ryots the option of refusing irrigation terminates? It has come to my knowledge that the permission granted to re-convert wet into dry within three years is not likely to work well for the interests of Government. Combinations to give up land the third year, to be resumed some time hence for another two years, whether the irrigation has been satisfactory or not, or to give it up whenever the price of paddy is low (as in the present year), or to cultivate Inam or Zemindary lands, on which a compound rate or no water rate is levied have been reported to me. I find that from these causes there is likely this season to be a very considerable diminution in the watered area, although there has been a better supply of water than in most previous years. The amtter is one meriting serious consideration.

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1. The Government of India in communicating their sanction* to estimates amounting to Rupees 4,06,110 for modifying and enlarging certain channels on the left bank of the Kistna, requested that steps should be taken for the preparation in a full and detailed shape of a complete project for the whole system of Kistna works, based on the most comprehensive view of the irrigation from that river and of the supply of water it affords. The Superintending Engineer was accordingly instructed† to revise the scheme which was submitted with the late District Engineer's letter, dated 6th January 1863, and to allow for any additional works which further experience may have shown to be necessary, particularly as regards the provision of outlets for the free discharge of surplus or drainage water, and of additional bridges for the accommodation of traffic along the thoroughfares intersecting the channels.

* Secretary's letter No. 163 I, 25th October 1867.

† G. O., No. 3,684, dated 27th November 1867.

2. The Superintending Engineer in his letter dated 9th October 1868, solicits a reconsideration of the above order. He explains that he cannot draw up complete designs for all the channels in the Delta without knowing beforehand what area of land is likely to require water from them; and that from various causes, this most important point is involved in great uncertainty. He further represents (paragraph 19) that in any case, work is laid out for some years to come, that the enlargement of three of the principal channels is in rapid progress, and that further estimates now framed, excepting those which must from time to time be submitted for branch channels and drainages, would be obsolete as to rates long before they could be perhaps even commenced.

G. O., No. 430, dated 12th February 1864.

3. As the report dated 6th January 1863 has been referred to, I may explain that it was written by myself when District Engineer, Kistna, and that the project then submitted provided in the main for the simple enlargement of the system of channels which had been designed when the anicut at Bezwada was under execution. It was assumed that about half the total area of the Delta would eventually require the means of irrigation, and that a supply of two cubic yards per hour per acre ought to be taken as the standard allowance. With these data it thus became a simple matter to calculate the approximate cost of completing the whole system of channels, and a margin being allowed for additional bridges and drainage works, the total cost of supplying water to the 500,000 acres, which were reckoned on as the ultimate area to be irrigated, could be arrived at with a sufficient degree of precision to allow of this Government, and the Government of India, forming their opinion on the subject. The calculation which accompanied the report in question, of the probable cost of the various channels, was not altogether a rough estimate. It was based on actual measurements; in minute detail in the case of new branches; and on cross sections at about half a mile intervals, for the enlargement of existing channels; and they represented the substance of extensive surveys. So that on the whole, it might be taken as a reliable outline of what remained to be done in the Delta, and if approved of by Government, it then devolved on the local Officers to take up section by section, in the order best suited for the general advance of irrigation over the Delta, and to work out the estimates for each section n the fullest detail. I would respectfully submit, that the above course is really he best which could be adopted. It is true that projects sent up piecemeal in this way, are not so intelligible as regards their bearing on the whole scheme, to the uthorities who have to pass judgment on them; but they have the very great advantage of preventing mistakes, for the way is felt at every step: whereas, no amount of skill will enable an officer to design an extensive system of works, which

should provide for all contingencies; or prevent the necessity of extensive subs quent rectifications and alterations, to suit peculiarities of soil, as well as peculiariti in the habits of the population; which it would be simply impossible for any o to appreciate fully, until the works should have come into operation.

4. In the Kistna the two sections of the Delta, north and south of the rive may be considered as independent of each other, and in each section of the Delt there are various large channels, which may be considered separately, except th they are connected with the main channels, as a rule, within a short distance c the north or south flank of the anicut.

5. The whole Delta system may thus be divided into eight or nine sections, that is large channels with their branches and distributing channels, and it appears to me that an equal number of projects may be drawn up with advantage and sent up separately for approval, each on its own merits, but complete, as regards provi sion for drainage, bridges, and subsidiary work, within the limits affected by them and with their bearing in relation to the Delta system generally, fully and clearl explained. I would solicit approval for the adoption of this course.

6. The reasons advanced by the Superintending Engineer for postponing the preparation of plans and estimates for the completion of the whole Kistna project, though valid, might lead to erroneous impressions being formed of the prospects of the further extension of irrigation in the Delta; and in fact they would seem to point to the conclusion that the increase of wet cultivation has been proceeding at so slow a rate, for several years past, that it might be questioned whether the system of channels should be extended much beyond their present limits. As I knew that this was not Colonel Winscom's opinion, for he had explained to me verbally, that while irrigation was not on the increase in the upper part of the Delta, there was an extensive area near the coast, which the people were ready to irrigate, as soon as they were supplied with water, I requested him to furnish me with full information on the subject, and his second letter, dated 28th October, is submitted in compliance with this requisition.

7. It appears that the area irrigated during the six years from 1862-63 to 1867-68 has been as follows:—

1862-63...	125,595 Acres.
1863-64...	148,863 "
1864-65...	153,140 "
1865-66...	156,890 "
1866-67...	137,021 "
1867-68...	141,493 "

There has been an increase during that period of 15,902 acres in all, which is made up of an increase of 21,010 acres in the Southern Delta, and of 14,130 acres in Zemindary land in the Northern Delta, *minus* a decrease of 19,238 acres in the Government lands in the same Delta. The most remarkable falling off has been in one talook, and it is attributed chiefly to the introduction of the new Revenue Settlement, which greatly increased the Government demand. Other causes however have been at work to check the progress of irrigation, namely the prevalence of "Soudoo," a saline efflorescence identical, it is supposed, with the "reh" of the North-West Provinces and Punjab; second, the unremunerative price of paddy; third, the preference of the people in certain localities to cultivate dry grains, especially cholum (jowar).

21,010
14,130
35,140
19,238
15,902

8. As regards the first of these drawbacks, namely "Soudoo," I would observe that it is mainly confined to ill-drained low lands, especially to those in the vicinity of the canals where they are carried within embankments, and where the surface of the water in the canals is considerably above the ground level. The hydraulic pressure thus generated must serve to force a certain amount of water to the surface of the ground, and with it the saline matter which may be mixed with the soil. The deterioration of land by this process was very apparent some years ago, along various portions of the canals and especially in that particularized by Colonel Winscom between Veeranky and Needamole, that is from the 24th to the 36th mile of the Masulipatam canal. But it was confined to a strip of land of several hundred yards in width, and the ground was badly drained. A similar result was perceptible in the Godavery, but in neither district has it until lately been considered a matter of much importance. I observe that the Board of Revenue are under the impression that the "Soudoo" will give way to repeated floodings, and my own opinion is to the same effect. Indeed I look upon the appearance of "Soudoo" at all as due to the use of embanked channels combined with the want of proper drainage; and as the canal embankments must become more and more watertight, the source of the evil will be gradually removed. The Superintending Engineer will be instructed to be cautious in the use of highly embanked channels, in future, where they may not be essential for the proper irrigation of the lands. He is already turning his attention to the improvement of the drainage throughout the Delta.

Proceedings, No. 5,679, dated 5th August 1868.

9. The low price of paddy has doubtless a very adverse effect on the spread of irrigation. This is the more remarkable, as there has been scarcity and high prices in other districts, especially in Madras, to which one would suppose that there was every facility for the conveyance of the Delta produce. The same cause is at work in the Godavery Delta at the present time. In reality the profits of the grain dealers and the high charges for freight come to so large an amount, as to oblige the cultivators to sell their grain at a disproportionably low rate. Thus when a ton of rice costs in Madras Rupees 77-10-0, at Masulipatam its price is only Rupees 50-10-0. The freight alone, exclusive of landing and shipping charges, amounts to between eight and nine Rupees a ton. The market inland is limited, as both the portion of Nizam's country bordering on the Kistna and the western portion of the Kistna itself are thinly populated, and moreover having a fair stock of tanks, they can in good years produce nearly if not quite enough rice for the wants of the population. The improvement of the means of communication between the Northern Deltas and Madras deserves, I believe, the earnest attention of Government, as I have already observed in a report* recently submitted on the condition of the traffic on the Delta Canals.

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* 28th October 1868.

10. With regard to the third cause abovementioned, the preference di cultivators to dry cultivation, I would explain that for some distance from banks of the Kistna, the soil is particularly well adapted for garden pro and for the cultivation of cholum (jowar). This is the staple food of certain cla of the population, and will always be grown largely in the district. The crop i precarious one, being liable to destruction by either an excess or deficiency moisture, but the channels which pervade the greater part of the Delta remove portion of the risk, and in certain lands the people prefer it to paddy. There ca be no doubt that the cholum crop is immensely benefited by the Delta channe for not only can the people obtain water for it in times of drought, by payment a moderate water rate, but must get a good deal without payment. But the Del system should evidently be credited with the improvement of the revenue deriv from the dry crops, as well as from the wet.

11. The Superintending Engineers of both the 1st and 2nd Divisions are opinion that the extension of irrigation is likely to be retarded by a clause in o of the Rules† for the assessment of wa rate, which came into operation at t end of the year 1865. Rule 7 provides for the conversion of dry land into wet, an the clause in question is to the effect that when the means of irrigating the lan already exist, the Collector was to make the Ryots understand that if water wer taken for three years in succession, the land was to be permanently classed a "irrigated," and charged with a water rate of 4 Rupees per acre per annum in addition to the fixed land assessment. The Superintending Engineers believe that the Ryots will evade the obligation to the above rule, by cultivating paddy for two years, then dry crops, then paddy again for two years, and so on. This point may require attention, as the Superintending Engineer observes it is not desirable that the people should be forced to take water against their wills ; but the above procedure would give them the means of improving the land by repeated floodings of the muddy water from the channels, and then deriving the benefit of an improved dry crop at the lower rate of assessment. This, in my opinion, is as likely as the "Soudoo" to be the cause of the conversion of wet crops into dry.

12. The above correspondence shows that it will be necessary for the Superintending Engineer to estimate the probable returns for new irrigation works in the Kistna Delta, more carefully than has been customary up to this time. It has been the practice heretofore to assume that every increase of expenditure would be followed by a corresponding increase of revenue. The past results have been looked upon as a guarantee for future results. But now that it appears that various causes are at work to check the progress of irrigation in the Delta, and that the increase of revenue is not at all commensurate with the improvement of the supply of water, it is very necessary that the project submitted by the Superintending Engineer should be accompanied by carefully compiled estimates of the probable returns, prepared by the Revenue authorities ; and that the Superintending Engineer should take the precaution of obtaining agreements from the cultivators, as provided by the last clause of Rule 7, for the payment of the water rate on the area they are prepared to irrigate.

(Signed) J. C. ANDERSON, Colonel, R. E.,
Chief Engineer for Irrigation.

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† Copy attached.

Rules for the Assessment of the Water Rate in the Godavery and Kistna Deltas.

1. The new Revenue Settlement will be made in the Godavery and Kistna Deltas on the principle of an assessment of the land according to its natural capabilities without irrigation, and a separate water assessment to be levied as follows :—

2. All lands now permanently supplied with the means of irrigation for a single wet crop, and which are now cultivated as Nunjah, and have actually been irrigated for two or more seasons, shall be classed as "irrigated," and charged Rupees 4 per acre per annum for water, in addition to their fixed land assessment. Such land shall not be transferred to Punjah unless the means of irrigation fail permanently.

3. Where water is supplied for a second crop of any description on Nunjah land, a water rate of Rupees 4 per acre shall be charged for the same ; but it shall be competent to any landholder to compound for irrigation for two crops, either for a term of years or in perpetuity, at the rate of Rupees 6-8-0 per acre payable annually (in addition to the land assessment) except on the occurrence of a total failure of water.

Such composition shall not be for a less period than five years, and if it be made without limit as to time, one clear year's notice of its discontinuance must be given.

4. Sugar-cane, Betel, Plantains, and other such garden produce remaining on the ground for the time of two crops, shall pay Rupees 8 per annum per acre for water all the year round ; but the owner of lands so cultivated may compound under Rule 3.

5. Temporary irrigation for a Nunjah crop on dry land shall be charged for at the rate of Rupees 4 per acre for each crop, besides the regular land assessment.

6. Temporary irrigation for Punjah crops on dry land shall be charged at the rate of Rupees 2 per acre, either for first or second crop, beside the regular land assessment.

7. When Ryots desire to convert dry land into wet, application is to be made to the Collector, either directly or through the Tahsildar, on or before the 31st March, and the Collector will arrange with the Public Works Department for the supply of water.

Where the means of irrigation for such land already exist, the Collector will cause the Ryot distinctly to understand that if water be taken for three years in succession, the land will be permanently classed as irrigated under Rule 2, above.

The Collector shall, however, be at liberty to require the Ryot in exceptional cases to enter into an agreement for continuing to take the water for such period as he may deem necessary and equitable in the interests of Government, or of other individual Ryots, before arranging for the supply.

Where it may be necessary to execute new works at Government cost in order to provide the required supply, such preliminary agreements for the continuance of the water rate as may in each case appear necessary shall be taken from the landholders for whose benefit the work is designed, but the fulfilment of the agreement will depend on Government sanctioning the proposed outlay for the works.

8. Where water is temporarily required for Punjah crops and dry land, application may be similarly made at any time, and the Collector will arrange with the Department of Public Works for the supply, if other exigencies will admit of it.

9. Where water is surreptitiously taken by Ryots, double the water rate, which would be chargeable according to these rules, shall be rigidly exacted, and the parties thus taking water will be further liable to a criminal prosecution.

10. These rules shall apply to Zemindary and Inam lands, except where, in the case of Zemindaries, a composition shall have been made either for fixed yearly payment or according to the quantity of water supplied. Provided always that no charge whatever shall be made under thes

rules for a single crop in Zemindary or Inam land where such lands are proved to have been pri marily cultivated with wet crops under old tanks, channels, or by any other means of irrig whatever, prior to the construction of the anicuts, or to have been charged in the account such a rate of assessment as indisputably indicates the title of such land to water, or by the terms of the grant to have been given as Nunjah Inam.

11. The arrangement whereby in a part of the Kistna Delta, in the old Guntoor divisi consolidated water rate of Rupees 4 per acre has been introduced, will be superseded by the pre rules. But in other parts of the Delta in that division, where the system of Nunjah rates prev that system will remain undisturbed till the new Revenue Settlement is introduced.

12. The water rate payable under these rules shall be paid at the stated times along wi land assessment, or in the usual instalments where there is no such land assessment payab Government.

No. 415. Order thereon, 17th December 1868, No. 3,941.

IRRIGATION, No. 17.

1. In their letter of the 25th O ber 1867, No. 163 I, the Government India, when according sanction to pl and estimates for the improvement and enlargement of certain channels on t eastern bank of the Kistna as a portion of the general scheme of irrigation fr that river under the Anicut at Bezoarah, drew attention to the imperfect manne in which those plans and estimates had been sent up, and desired that steps migh be taken for the preparation of a complete project for the whole system of work for the Kistna Delta, based on a comprehensive view of the available water supply and of the lands that can be irrigated by that water.

2. In the Orders of this Government, communicating to the Officers concerned the views of the Government of India, the Superintending Engineer of the 2n Division was called upon to prepare and submit plans and estimates for the whol of the Kistna project in the thoroughly complete form prescribed by that Government, taking so far as was necessary for his guidance the scheme prepared in 1863 by Colonel Anderson when he was District Engineer of the Kistna, and allowing for such additions as further experience may have shown to be necessary, particularly as regards ample provision for the disposal of drainage.

3. As it was clear from the tenor of those instructions that the Government would not receive any proposals for the extension of the Kistna works if sent up again in a fragmentary form, the Chief Engineer for Irrigation very properly returned certain plans and estimates which were submitted through him for the enlargement of the upper portion of the Commamoor channel, and, reminding the Superintending Engineer of the orders of both this Government and the Government of India, informed him that it was now necessary that all estimates for works to be constructed, like those in the Kistna Delta, from loan funds, should not only be drawn up in such a way as to show the full scope of the undertaking as a whole, but also the extent to which it was likely to be remunerative.

4. In reply the Superintending Engineer reports in his letter of the 9th October 1868, No. 87, his inability to comply with those requisitions, inasmuch as, owing to the several causes he mentions, it is at present impossible for him to say to what extent lands to which water may be supplied will be taken up by the Ryots for wet cultivation in preference to allowing them to remain under dry tillage. As moreover the grounds on which Colonel Winscom recommended delay seemed to discredit all further endeavours being made to enlarge the area of irrigation in the Kistna, and to throw a doubt upon the advantages of irrigation generally, he was called upon for explanation, and has given it in his letter of the 28th October 1868, No. 100, which Colonel Anderson submits for the consideration of Government with his own remarks.

5. From these papers the Government perceive that irrigation in the Delta of the Kistna has not of late years made much progress. The causes of this, in the opinion of the Superintending Engineer, are—

(1.) The fear which the Ryots have begun to entertain that the deterioration of the land by the production on its surface of a saline efflorescence which they have seen to occur at certain spots under the influence of the channels, is likely generally to follow the use of water for irrigation in all the richer black soils.

(2.) The price of paddy having greatly fallen of late years owing to the want of a remunerative market for it.

(3.) The preference which is felt for the cultivation of dry crops, such as Jowary, on the rich alluvial lands of the Upper Delta, where heavy crops of that grain can be raised in all ordinary years with little expenditure of capital or labor, and where, since the channels have been made, irrigation can always be fallen back upon should the rains fail.

(4.) Dissatisfaction with the new Revenue Settlement rules, and,

(5.) The occasional loss that has been sustained by Ryots, who, having taken up irrigation, have been disappointed of a full supply of water.

6. All these causes, in the opinion of the Superintending Engineer, have combined to check the extension of wet cultivation so as to have limited its increase during the five last years to something less than 16,000 acres, while in the same time an expenditure on original works of about 7½ lacs of Rupees has been incurred, and he argues that he is consequently so situated that, in devising any general scheme for the development to completion of the system of channels by which the whole area of the Delta may be watered and fully drained, he is unable to calculate, with any degree of certainty, what extent of land will be benefited, or to give any reliable estimate of returns.

	RS.
1863-64...	2,00,471
1864-65...	1,58,577
1865-66...	81,316
1866-67...	95,704
1867-68...	2,18,556
	7,54,624

7. He therefore solicits a reconsideration of the demand made upon him for the preparation of the full scheme of irrigational improvement for the Delta, and recommends that, as sufficient work has been sanctioned and laid out to occupy the attention of the Department, and to utilize all available labor for some years to come, the arduous duty of preparing a complete project for the irrigation of the whole half million of acres in the Delta may be deferred till, the works in hand being finished, a full supply of water will be at command, and the results of future extensions may be accurately predicted.

Proceedings of the Madras Government, Public Works Department,
17th December 1868.

8. His Excellency in Council is willing to admit that there is some force in Colonel Winscom's arguments to excuse the postponement of investigations, (which can only be taken up at some expense) for collecting the data on which such a scheme as the Government of India require, can be prepared, but he is nevertheless of opinion, that the Government should have the project before them in a complete and reliable form, with as accurate returns as can be procured of the increase of wet cultivation which is likely to follow the extension of irrigational improvements, and with information as to the sufficiency of the supply of water, a fair allowance being made for the disturbing causes which are represented to be at work to prevent the development of irrigation on a more extended and remunerative scale. Information of this character is now more than ever necessary to satisfy the Government of India that the assignments to this Presidency from Loan funds are being utilized to the best advantage.

9. It was not to be expected that irrigation would extend throughout the Delta in the same rapid manner in which it was taken up at first when large areas of land only waited for water to be supplied, and the floods of the river to be excluded, to be applied to the cultivation of rice. The causes enumerated by the Superintending Engineer have doubtless tended to discourage irrigation, and may fully account for the falling off that has so notably been taking place in the demand for water; but it would be contrary to experience to believe that these hindrances to improved culture, which the use of water always produces, will be permanent, or affect the ultimate extension of irrigation to the greater part of the Delta, if, by boldly extending the means of supplying water wherever it can be made use of, the fear of the Ryot that he may be left with an insufficient supply be removed.

10. The Superintending Engineer will accordingly proceed at once with the requisite survey and levelling operations, and with the other investigations which may be necessary for the preparation of the complete project, and he will report what additional establishment he will require to prosecute this special duty. The attention of the Superintending Engineer will be particularly drawn to the question of remedying the present defective system of drainage, which the Government have reason to believe has, in no small measure, led to the relinquishment of some portion of the wet cultivation which has been given up.

11. These papers will be communicated to the Revenue Department with a view to the Board of Revenue being called upon to consider the practical working of the rule which prescribes that when dry land is converted into wet, and water is taken for three consecutive years, the land shall be permanently classed as irrigated. It may perhaps be desirable to revoke that rule experimentally.

(True Extract.)

Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 2nd Division.
,, Chief Engineer for Irrigation.
,, Revenue Department.
Exd. S. T. Augustin.

Appendix A.

	Fusly 1272 or 1862-63	Fusly 1273 or 1863-64	Fusly 1274 or 1864-65	Fusly 1275 or 1865-66	Fusly 1276 or 1866-67	Fusly 1277 or 1867-68	
Southern or Guntur Delta							
Repally	34428	44254	42803	40420	41070	44183	Increase in Southern Delta in 5 years
Bapatla	17228	24855	26524	25770	26983	28483	
	51656	69109	69327	66190	68053	72666	21010 -
Northern or Masulipatam Delta							
Bunder	12324	4103	3967	3848	1434	1646	Decrease in Government lands of Northern Delta.
Gudivada	52542	54457	59586	59789	43837	43744	
Bezwarah	3849	3964	3900	4113	4326	4087	
	68715	62524	67453	67750	49597	49477	19238 Acres.
* Zemindaries	5220	17230	16360	22950	19371	19350	Approximate increase in Zemindary lands in Northern Delta. 14130 Acres.
Total wet area excluding Inam wet in Kistna Delta	125595	148863	153140	156890	137021	141493	Total increase of cultivation in 5 years. 15902 Acres.

* The numbers of acres in the Zemindaries are approximate.

Supdg Engrs Office Dd 29: Octr 1868
Bezwara

Geo Winscom Lt Col
Supdg Engineer 2d D.

Enclosure in letter
from the Supdg
Engineer 2d Divn
to the Chief Engineer
for Irrigation &c
Madras No 87
7th October 1868.

P.W. 4516/68

[illegible] 17 Octr 68 [illegible]

Appendix A

Appendix B

Name of Works	Amount of Estimate	Date of Sanction	State of Works in 1862	State of Works in 1868
Eastern Delta				
Ellore Canal	79550	G. O. No 2109 of 12th November 1856	Opened in 1861-62 as far as limits of Kistna District.	Opened for 7 years.
Ryves Channel	64860	G. O. No 2197 29th May 1861	Partly opened in 1861-62	Fully opened for more than 5 years.
Masulipatam Canal	259826	G. O. No 2109 12th July 1856 No 712 of 4th April 1860 No 1107 of 4th July 1860	Ankummoor Lock just finished.	Opened throughout for about 5 years. Side Channel from Pamurroo to Ankummoo finished. Upper reach from Bezorah to Cunkipaud partly enlarged.
Poolairoo	101050	G. O. No 3581 of 27th November 1865.	No improvement made. New Head Sluice just Commenced.	Much enlarged through greater part of its length.
Polraj Canal			Not Commenced	Opened for 17 miles for the last 3 years.
Buntumilly Channel			Not Commenced	Opened in 1865.
Western Delta				
[illegible] patam Canal	276404	G. O. No 2358 15th Decr 1856. No 2382 of 24th Decr 1861. No 1376 of 17th June 1862. No 636 17th March /65 No 2400 of 13 July 1866.	Enlargement near Head Continued. Kuchipudy Lock opened in February 1862 at 23 miles from Head. Inter Lock Commenced.	Greatly enlarged throughout the entire reach between Tsetanagram and Dooggerolla and delivering a very greatly increased body of water. Canal opened throughout full length for 3 years. Tide Channels about ⅓ Completed.
Western Bank Channel	146179	G. O. No 1405 12th Aug 1856 No 3232 of 6th November 1863.	Head Sluice & Lock building. No Enlargement made.	Considerably enlarged, 4 Calingulas built & Kallur & Kollipara Channels [illegible] for past 4 years / this irrigation has been taken up under them / Pelloor & Tokapally Channels both greatly enlarged & Extended.
Commamoor Channel	195770	G. O. No 3699 15 Decr 1863 No 1300 of 14th May 1867 No 1881 of 24th June /67	Extension not Commenced.	Extended to the Ongole Road & greatly enlarged and improved. Drainage of Kompairoo finished except from Ongole Road to the Backwater which is only partly done. Various new Channels excavated & improved supply to old tanks and irrigation given.

Supg. Engrs. Office
Bezorah
9th Decr 1868.

Lieut. R.E.
Supt. Engineer 2nd Dn.

Enclosure in letter
from the Sub Engr
2nd Divn to the
Chief Engineer
for Irrigation &c
Madras No 1081
of 9 Octr 1868

P.W.P. 4416/168

Progs 17 Decr /68 No 114

Appendix B

Rules for the Aſseſsment of the Water-rate in the Godavery and Kistna Deltas

1 . The new Revenue Settlement will be made in the Godavery and Kistna Deltas on the principle of an assessment of the land according to its natural capabilities without irrigation, and a separate water aſseſsment to be levied as follows:

2 . All lands now permanently supplied with the means of irrigation for a single wet crop, and which are now cultivated as Nunjah, and have actually been irrigated for two or more seasons, shall be claſsed as "irrigated", and charged Rupees 4 per acre per annum for water, in addition to their fixed land aſseſsment. Such land shall not be transferred to Punjah unless the means of irrigation fail permanently.

3 Where water is supplied for a second crops of any description on Nunjahland, a water-rate of Rupees 4 per acre shall be charged for the same; but it shall be competent to any land-holder to compound for irrigation for two crops either for a term of years or in perpetuity, at the

rate of Rupees 6-8-„ per acre payable annually (in addition to the land aſseſsment) except on the occurrence of a total failure of water.

. Such composition shall not be for a less period than five years; and if it be made without limit as to time, one clear year's notice of its discontinuance must be given.

4 Sugar-cane, betel, plantains, and other such garden produce, remaining on the ground for the time of two crops, shall pay Rupees 8 per annum per acre for water all the year round; but the owner of lands so cultivated may compound under Rule 3

5 . Temporary irrigation for a Nunjah crop on dry land shall be charged for at the rate of Rupees 4 per acre for each crop besides the regular land aſseſsment.

6 . Temporary irrigation for Punjah crops on dry land shall be charged at the rate of Rupees 2 per acre, either for first or second crop, beside the regular land aſseſsment

7 When Ryots desire to convert dry land into wet, application is to be made to the Collector either directly or through the Tahsildar on or before

before the 31st March, and the Collector will arrange with the Public Works Department for the supply of water.

Where the means of irrigation for such land already exist, the Collector will cause the Ryot distinctly to understand that if water be taken for three years in ſucceſsion, the land will be permanently classed as irrigated under Rule 2 above.

. The Collector shall, however, be at liberty to require the Ryot in exceptional cases to enter into an agreement for continuing to take the water for such period as he may deem neceſsary and equitable in the interests of Government, or of other individual Ryots, before arranging for the supply.

Where it may be neceſsary to execute new works at Government cost in order to provide the required supply, such preliminary agreements for the continuance of the water-rate as may in each case appear neceſsary shall be taken from the landholders for whose benefit the work is designed, but the fulfilment of the agreement will depend on Government sanctioning the proposed outlay for the works

8 Where water is temporarily required

for Punjah crops and dry land. Application may be similarly made at any time, and the Collector will arrange with the Department of Public Works for the supply, if other exigencies will admit of it.

9 Where water is surreptitiously taken by Ryots double the water-rate which would be chargeable according to these rules, shall be rigidly exacted, and the parties thus taking water will be further liable to a criminal prosecution.

10 These rules shall apply to Zemindary and Inam lands, except where, in the case of Zemindaries, a composition shall have been made either for fixed yearly payment or according to the quantity of water supplied. Provided always that no charge whatever shall be made under these rules for a single crop on Zemindary or Inam land where such lands are proved to have been customarily cultivated with wet crops under old tanks, channels, or by any other means of irrigation whatever, prior to the construction of the Anicuts, or to have been charged in the accounts with such a rate of assessment as indubitably indicates the title of such land to water, or by the terms of the grant to have been given as Nunjah, Inam

11 The arrangement, whereby in a part of the Kistna Delta in the old Guntoor division a consolidated water-rate of Rupees 4 per acre has been introduced, will be superseded by the present rules. But in other parts of the Delta in that division where the system of Nunjah rates prevails, that system will remain undisturbed till the new Revenue Settlement is introduced.

12 The water-rate payable under these rules shall be paid at the stated time along with the land assessment, or in the usual instalments where there is no such land assessment payable to Government.

~~True Copy~~

~~Colonel R.E.~~

~~Chief Engineer for Irrigation~~

No 151/68

Rules for the Assessment of the Water-rate in the Godavery and Kistna Deltas.

No. 100.

Supdg Engrs Office 2nd Dn
Bezwarah
28th October 1868

From
Lieutenant Colonel G. V. Winscom R.E.
Superintending Engineer 2nd Dn
To
Colonel J. C. Anderson R.E.
Chief Engineer for Irrigation
Madras.

Enclosures
x 1 Kistna Collr's letter No 1868 of 29 Septr 1868
1 Supg Engrs reply thereto No 152 of 28th Octr 1868
1 Do letter (copy) No 152 of 22nd Septr /68
x 1 Copy of R. B. of Rev. No 5679 of 5 Aug /68 –
4
x To be returned –

Sir

In reply to your Memorandum No 73 dated 15th October, I have the honor to state that in my letter No 87 dated 9th idem, I in no way wished to infer that the System of Channels in the Kistna Delta should not be extended beyond their present limits, but simply desired to show that we have not at present any grounds for opining that half a millions of acres will be eventually irrigated – and that it is desirable to delay the formation of Estimates for carrying out the works to the extent projected in 1863, until further experience is obtained of the probable action of the Ryots.

2 I believe & am sure that irrigation will be considerably extended, when the enlargement of the Channels now in progress is sufficient to enable a good supply of water to be

furnished to the poor soils which lie
along the Sea Coast, and extend inland
for 10 or 15 miles. This will be the case
in the Northern Delta when the Bunder
Canal is widened to 66 ft. bottom width
as far as Kunkepaud, the Poolairoo
from Kunkipaud to Cowtaram, and
Ryves Channel to Munnywada, and
in the Southern Delta where the drainage
of the Nompairoo Swamp is efficiently
completed, and flood banks to protect
the newly irrigated land afford security
to the Ryots against devastation by
inundations at the time when the Hill
streams which cross the Commamoor
Channel are flowing through the newly
excavated Nompairoo Drainage. I
believe that in the neighbourhood of the
Kykalur, Calldindy, and Buntumilly
several thousands of acres will be
turned from waste into irrigated land.
I doubt if much will be done at present,
in the way of extension in the Jullapilly
Zemindar's Estate, but on the South
I believe there will be considerable
increase about Napilly, Buntumilly
& (as I said before) along the Nompairoo.

3 I have requested Mr. McAlpine
the Officer in Charge of the 7th Range to employ

August 1868

	Madras	Kistna
	Rs. per garce	Rs. per garce
Best Rice	457	275
Dry Paddy	225	122

Mr. Assistant Engineer Norris almost
exclusively in projecting extensions of
Channels from the Polraz Coddu in the direction
of Kykalur & Juggempaud, Calldindy, Toom-
mery &c and the drainage of the various
swamps at present existing near the
Oopootair. I hope that a considerably
increased supply of water may be given
to the Polraz Coddu by the season of 1870, &
if so, I doubt not but that a large extent
of land will be taken up between 1870 & 1873.
Lieut. Smith is employed in investigating
the possibility of supplying the sandy
poor soils near Perali and to the East of the
Nompairoo swamp with water from the Commamoor
Channel & making a navigable Canal from Karim-
chadoo to Vada Navoo, which from all accounts
is the best Roadstead for ships in the District.

4 There can be no doubt that the excessive
difficulty of access to the Port of Masulipatam
has a most prejudicial effect on the welfare
of this District. The price of paddy this
year at Bunder is very much below that at
Madras, yet there is little or no export of it.
At Vada Navoo I understand ships of
large burthen may lie off the shore at about
the same distance they do at Madras & I
beg to suggest that Government should appoint
a Committee to enquire into the capabilities
of the place as a Port deserving of improvement

form

from Imperial resources.

5. If Communications continue to be improved I believe in 300,000 acres being irrigated from the Kistna Anicut before many years are passed, but am dubious concerning more at any rate for a lengthened period. It is not easy to entirely account for the apathy that is manifested by the Ryots concerning irrigation. For Rice even at its present low rate must be more remunerative than a Dry Crop*; but the facts remain that wet crops on the black regur soil of the Delta are being given up in large quantities, and that irrigation has not extended in the Kistna as in other Districts. I enclose a letter from Mr. McQuhae the Acting Collector lately received, from which you will see that there will be a large diminution of wet acreage owing to present feeling. Mr Wilson, I see, endeavours to account for the "aversion" of the Ryots to irrigation in his letter embodied in P. O. No 3316 dated 20 instant. But the wonderful benefits which the Anicut and its subsidiary works confer on the District can neverthe less scarcely be exaggerated. In one year of famine such as 1833, it may save a very large proportion of the dry crops of the Delta, giving food and water for man and beast, at a time when, as in that year, 150000 people might again perish, and Cattle to the value of 18 lacs and Revenue to an extent of 77½ lacs* be again lost.

No 1868
29th Sept 1868
to be returned

*	Expenses	Net produce
One acre of 2nd Sort paddy producing 2240 lbs at 122 Rs. per garce on the Rs 30–8–"	10. 8. 0.*	20. " "
One acre of dry Crop producing – 900 lbs @ 147½ Rs. per garce Rs. 14. 13. "	4. 8. 0.	10 – 5. 0.

* including water rate –
† value of Straw not calculated in either case

* Vide Public Works Commissioners Report in 1852

The Anicut secures the welfare of many thousands of acres of dry cultivation, and indemnifies the owners against loss of their Crops. Whether an extra rate of Rent should not be charged to such holders of land, from this great security, is a question that I think, may not be unworthy of consideration.

I have the honor to be
Sir
Your most Obdt Servt
Geo. T. Mniscome Lt Col RE
Supg Engineer 2nd Divn

P.S. With Mr. McQuhae's letter, above alluded to, I beg to forward copy of my letter 152. d. 22nd Sept. & No. 184 dated this day. – also copy of the Proceedings† of the Board of Revenue passing orders on the relaxation of the Water Rules, & the notification which has in consequence appeared in the Gazette

G.W

† to be returned

From
The Supt Engr
2d Divn
To The Chief Engineer
for Irrigation &c
Madras
Dated 28 Octr/68
Recd 3 Nov

No 100
Enclosures 4
P.W. 4516/68.
Submits further explanation regarding the eventual extension of Irrigation under Kistna Anicut Channels, as requested by the Chief Engineer

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No 184

Superintending Engineer's
Office 2nd Division
Bezwara 28 October 1868

From
Lieut Colonel G. V. Winscom R.E.
Superintending Engineer
2nd Division

To
The Acting Collector
Kistna.

Sir,

With reference to your letter No 186 dated 29th September 1868, I have the honor to request you will inform me who are the cultivators of dry land, converted into wet, who have the option of refusing irrigation during the ensuing two years.

2 The water rules were first published in 1860. The revised rules appeared in November 1863. Rule 2, lays down "that all lands now permanently supplied with the means of irrigation for a single crop and are now cultivated as Nunjah and have been actually irrigated for 2 or more years, shall be classed as irrigated". Rule 7 therefore I presume only applies to lands newly brought in to wet cultivation after November 1863. The Boards' order granting the option of refusing irrigation during the ensuing two years is because Mr Wilson states that Rule VII cannot well be applied because certain lands were not converted in the formal manner prescribed by the Rules. As the land holders who converted from dry into wet in 1863 had the option

Bd. Pro: No 567 d/15 August 1868.

to refuse till 1865, and those who took up wet in 1866, have been able to refuse this year. I do not exactly understand to whom the new rule applies.

3. In what way has Rule VII not hitherto been strictly observed? is it meant allowing the cultivators of 1865 to resign land in 1867? or those of 1864, in 1866? and those of 1863 in 1865?

4. It seems somewhat important that this matter should be clearly understood, as I am under the impression that much land has been relinquished this year on the strength of the late notification, that cannot be justified by the terms or spirit of the said notice. I am no advocate for forcing water on the Ryots against their wills, but I would suggest that the rulings and the reading of those rulings should be very clearly stated.

I have the honor to be
Sir,
Your most Obedient Servant
(Sd/) G. V. Winscom Lieut. Col. R.E.
Superintending Engineer
2d Division

(True Copy)

Geo. Winscom Lieut. Col. R.E.
Supg Engr 2nd Division

Enclosure in letter
to the Chief Engr
for Irrigation
No 1008 of 28 Octr/68

MC 4516/68

No 152

Supg Engrs Office 2d D
Bezwarah
22d September 1868

To William McQuhae Esq
Acting Collector Kistna

Sir

With reference to your notice concerning the Conversion of Dry land into wet, published in the District Gazette, I have the honor to request you will inform me whether I am to understand, that land which has been cultivated already more than 3 years as wet may be reconverted into dry at the option of the Ryots during the next two years.

2 Also when the two years in which the Board allowed the Ryots the option of refusing irrigation terminates? It has come to my knowledge that the permission granted to reconvert wet into dry within 3 years is not likely to work well for the interests of Government. Combinations to give up land the 3d year to be resumed some time hence for another two years, whether the irrigation has been

satisfactory or not; or to give it up whenever the price of paddy is low (as in the present year) or to cultivate Inam or zemindary lands, on which a compound rate, or no water rate is levied, have been reported to me. I find that from these causes there is likely this season to be a very considerable diminution in the watered area. Altho' there has been a better supply of water than in most previous years. The matter is one meriting serious consideration.

I have &c

(Sd) G. T. Winscom Lt Col RE
Supdg Engineer 2d Dn

(True Copy)

G. T. Winscom Lt Col RE
Supdg Engineer 2d Dn

Enclosure in letter to Chief Engineer for Irrigation No 100 of 25 Octr /68

PW 4516/68

2287/68

Supdg Engrs Office 2nd Dn
Bezwarah
9th October 1868.

From
Lieutenant Colonel G. V. Winscom R.E.
Superintending Engineer 2nd Dn

To
Colonel J. C. Anderson R.E.
Chief Engineer of Irrigation
&
Joint Secretary to Government
Department Public Works.
Fort St George

Enclo –
1 Appendix A
1 do — B

Sir

In G. O. No 3684 dated 27th November 1867. I was directed to prepare plans and Estimates for the completion of the whole Kistna project, and submit with them a report showing in a full and comprehensive manner the quantity of water that can be confidently relied on for the supply of the Channels, the means by which the delivery of the supply from the River is to be secured, and the area of the lands available for the utilization of that supply.

2 I was also directed to revise the scheme which was submitted with the late District Engineer's letter dated 6th January 1863, and allow for the construction of any additional works which further experience may have shown to be necessary, particularly

as

regard the provision of outlets for the free discharge of surplus or drainage water both at ordinary times, and on occasions when from an extraordinary fall of rain or from other causes the Channels may have drawn from the river a larger supply than it may be possible to use.

3 The Estimates drawn up in 1863, were approximate. The excavations of the Channels were calculated on levels taken at long distances, and tho' they were sufficiently accurate to allow Government to know within a reasonable sum what the Kistna scheme would cost, they were not intended to in any way supply the place of the elaborate sections, surveys and designs which have since been submitted to Government with the lower Commamoor Channel project+, the lower Poollairoo project*, the upper Poollairoo Project°, Ryves Channel Project°, the East and West# side Channels of the Masulipatam Canal and the various other works enumerated in the Budget of 1868-69.

4 The call now made upon me in G.O. No 3684 dated 29th November last, virtually amounted to preparing Estimates in full and elaborate detail for works that will cost fully 20 lacs of Rupees, and that

+ Sanctioned in G.O. No 8698 of 1st December 1868 Estimate Rs 185460.
* do G.O. No 3581 of 7th Aug/67 Est Rs 104050.
° do G.O. No 747 of 17 March/68 Est Rs 172830
° do G.O. No 3684 of 7th Aug/67 Est Rs 406110
° G.O. No 3342 of 19 October 1866, Est Rs 13610.
G.O. No 3342 of 19th October 1866. Rs 49360.

without a special Establishment for the purpose I cannot possibly prepare under a couple of years at least.

5 As a beginning I prepared the Estimate for the full enlargement of the upper Commamoor Channel and as certain parts of it were works that should be put in hand without delay, forwarded it for sanction with my letter No 144 dated 8th February 1868.

Estimate Rs 28800

6 You returned it with your Memo No 31 of 1st March last, stating that it was necessary that all Estimates for works to be constructed from Loan money should be drawn up in such a form as to allow of the Government of India forming an opinion of their remunerative effect, and stated that you have not the means of showing how far the improvements which have been carried out within the last few years have been followed by a gradual increase in the Revenue returns.

7 This information regarding remunerative effect of works and lands available for the utilization of a supply of water (which it is necessary of course that I give for all the estimates I am required to submit) appears to me at the present time so involved in uncertainty that I feel it absolutely necessary to request your

further Consideration of the Subject.

8 In letter No 1403 of 6 January 1863 the then District Engineer of the Kistna assumed in submitting the approximate Estimates of all future works required which is before alluded to, that about "one half of the actual area of the Delta "will be taken up, leaving out of the question "a large tract of Country which is covered "by Tidal Inundation, and also allowing "a liberal deduction for tracts of sandy "Soil on a high level" and with these premises he calculated that "about 270,000 acres of "land may be irrigated in the Masulipatam "Delta, and 230000 in the Guntoor Delta; "in all 500,000 acres".

9 Since that letter was written nearly 5 years have passed and in appendix A I show the progress of wet Cultivation during that period the total increase being 15,902 acres.

10 In Appendix B I show in parallel Columns the state of the works at the end of 1861.62 and at the end of 1867-68.

11 The following has been the expenditure on original works during that interval.

1862.63	Rs	223012
1863-64		200471
1864-65		158577
1865-66		81316
1866-67		95704
1867-68		218556
	Total Rs	977636

7,54,624 in last 5 yrs

12 I think it will be admitted that the rate of increase of wet Cultivation has not been nearly that which was anticipated, and I believe that the area shown in Fusli 1272 was less than that really cultivated, as the demand on the Zemindary estates had not then been settled, and the difference between the acreage in those Estates in 1272 and 1273 is too great to be probably bona fide correct. I am therefore of opinion that the real increase of irrigation in the 5 years under review has not much exceeded 10000 acres.

13 The most notable fallings away of Cultivation are in 1863-64, when the Bunder Taluq Irrigation decreased from 12924 to 4103 acres; in 1867-68, when it further diminished to 1434 acres, and in the same year when the wet area in Gudivada Taluq fell from 59789 to 43837 acres.

14 The first decrease is apparent not real, as the Zemindary water cess was in great part unsettled and written in the Bunder accounts.

15 The two latter diminutions of acreage were caused by the Ryots giving up land on the introduction of the New Revenue Settlement.

16. But other causes have been at work

to produce a dislike on the part of the Ryots to irrigation. The following are the Chief:

1st Soudoo, An efflorescence of a saline nature, rendering the land on which, it appears perfectly sterile has appeared on a good deal of the very rich soil that is ~~found~~ met between Veeranki and Nedamole, and elsewhere in the Northern Delta, and also in some parts of the Southern Delta. Great fear prevails that it will extend, and that much loss will ensue to those who own lands which are classed as "permanent wet" after 3 years irrigation.

2nd the price of paddy has not been sufficiently remunerative of late years.

3rd The seasonable rains that have fallen for some years past, and the knowledge that the Cultivators can on emergency obtain water for their dry crops from the Canals have operated on their naturally indolent temperaments and taken away the anxiety they felt when famines and drought were not uncommon, to cultivate the wet crops, on the culture of which more physical labour and discomfort is necessary, than on dry.

17 Certain it is, that for land under 3 of the principal branch Channels (Vizt Kollair, Kollimara, and Pamarroo) irrigated of late years, not a single application for water has been received.- whilst during the past year, although the Eastern side Channel of the Bunder Canal, can from its higher level supply much more land, than the Bunder Canal was enabled to do, not one additional acre is being cultivated.

18 Probably another Cause (tho' it will be but temporary in its duration) of dislike of dislike on the part of the Ryots to Commence wet Cultivation is the fact that occasional loss has been sustained from an insufficiency of water. They have taken up land, and then found that a full supply could not be secured for the entire season. This defect will disappear, as the Channels in the upper reaches are enlarged.

19 Things being in this Condition, it does not seem in my very humble judgment that the time has yet arrived for the formation of Estimates of works that shall irrigate half a million of acres. The enlargement of the Masulipatam Canal, Rynes Channel & Seetanagram Channels are all in rapid progress & not till their works are well advanced can any large additional supply of water be given. Work is laid out for some years to come and any further

Estimates now framed excepting those that must from time to time be submitted for branch Channels and drainage — would be obsolete as to Rates long before they could be perhaps even Commenced. The Estimates now called for would in short, whilst in full detail, be ~~[illegible]~~ little nearer approximations to the true eventual outlay than those forwarded in 1863 –

20 It appears to me also very desirable before undertaking this arduous and at best approximate labour, and entertaining an expensive Establishment+ for the purpose ~~to pause~~ to see if the slow progress of irrigation is likely to continue, or whether the present check is only temporary –

21 All the widenings of Channels now in progress tho' Sanctioned for the full width to be finally adopted when the 1/2 million of acres are taken up – are being at present excavated to only a fractional part of that width in order that an increased supply of water may be obtained at the very earliest ~~date~~ – Within two or three years after that supply is available, I think a more sound judgment will be formed as to the advisability of carrying out the full scheme, than is at present possible –

22 Should you agree with me in these views I would solicit that the matter be submitted for the Consideration of Government –

I have the honor to be
Sir
Your most Obed Servant

Lieut Col R.E.
Chief Engineer I. D.

+ The special Establishment employed in the Circle now costs more than 1400 Rs per mensem inclusive of Mr Smith's pay.

P.W.D.
1868

From
The Supdg. Engineer
2nd Division

To
The Chief Engineer
for Irrigation

Dated 9th Octr 1868
Recd 13th Inst 6 - 2
Reports on the impracticability
of the preparation of Plans
and Estimates for the Completion
of Kistna Anicut Project
and offering certain observations
on the Subject.

No. 4511/1868

Pro. 17th Decr /68 No. 414

No 94.

The Government of India in communicating their sanction[x] to estimates amounting to Rupees 4,06,110 for modifying and enlarging certain channels on the left bank of the Kistna, requested that steps should be taken for the preparation in a full and detailed shape of a complete project for the whole system of Kistna works, based on the most comprehensive view of the irrigation from that river, and of the supply of water it affords. The Superintending Engineer was accordingly instructed[x] to revise the scheme which was submitted with the late District Engineer's letter dated 6th January 1863, and to allow for any additional works which further experience may have shown to be necessary, particularly as regards the provision of outlets for the free discharge of surplus or drainage water, and of additional bridges for the accommodation of traffic along the thoroughfares intersecting the channels.

2. The Superintending Engineer in his letter dated 9th October /68 solicits a reconsideration of the above order. He explains that he cannot

draw

[x] Secy's letter No. 163 I - 25th Octr /67

[x] G.O. No 3684 dated 27th Novr /67

draw up complete designs for all the channels in the Delta without knowing beforehand what area of land is likely to require water from them; and that from various causes, this most important point is involved in great uncertainty. He further represents (para 19) that in any case, work is laid out for some years to come; that the enlargement of three of the principal channels is in rapid progress and that further estimates now framed, excepting those which must from time to time be submitted for branch channels and drainages, would be obsolete as to rates long before they could be perhaps even commenced.

G.O. No 430 dated 13th Feb 1864

3 As the report dated 6th January 1863 has been referred to I may explain that it was written by myself when District Engineer Kistna, and that the project then submitted provided in the main for the simple enlargement of the system of channels which had been designed when the anicut at Bezwada was under execution. It was assumed that about half the total area of the Delta would eventually require the means of irrigation, and that a supply of 2 cubic yards per hour per acre ought to be taken as the standard allowance. With these data it thus became a simple matter to calculate the approximate cost of completing the whole system of channels, and a margin being allowed

for

for additional Bridges and drainage works, the total cost of supplying water to the 500,000 acres, which were reckoned on as the ultimate area to be irrigated, could be arrived at with a sufficient degree of precision to allow of this Government, and the Government of India, forming their opinion on the subject. The calculation which accompanied the report in question, of the probable cost of the various channels, was not altogether a rough estimate. It was based on actual measurements—in minute detail in the case of new branches—and on cross sections at about half-mile intervals, for the enlargement of existing channels; and they represented the substance of extensive surveys. So that on the whole, it might be taken as a reliable outline of what remained to be done in the Delta, and if approved of by Government, it then devolved on the local officers to take up section by section, in the order best suited for the general advance of irrigation over the Delta, and to work out the estimates for each section in the fullest detail—I would respectfully submit, that the above course is really the best which could be adopted. It is true that projects sent up piecemeal in this way, are not so intelligible as regards their bearing on the whole scheme, to the authorities who have to pass judgment on them; but they have the very great advantage of preventing mistakes, for the way is felt at every step: whereas, no amount of skill will enable an officer to design an extensive system of works, which should provide for all contingencies; or prevent the necessity of extensive subsequent rectifications and alterations, to suit peculiarities of soil, as well as peculiarities in the habits of the population, which it would be simply impossible for any one to appreciate fully, until the works should have come into operation

4 In the Kistna the two sections of the Delta north and south of the river may be considered as independent of each other_ and in each section of the Delta, there are various large channels, which may be considered separately, except that they are connected with the main channels_ as a rule, within a short distance of the north or south flank of the anicut.

5. The whole Delta system may thus be divided into eight or nine sections_ that is large channels with their branches and distributing channels_ and it appears to me that an equal number of projects may be drawn up with advantage and sent up separately for approval, each on its own merits_ but complete, as regards provision for drainage, bridges, and subsidiary work, within the limits affected by them, and with their bearings in relation to the Delta system generally, fully and clearly explained_ I would solicit approval for the adoption of this course.

6 The reasons advanced by the Superintending Engineer for postponing the preparation of plans and estimates for the completion of the whole Kistna project, though valid, might lead to erroneous impressions being formed of the prospects of the further extension of irrigation in the Delta; and in fact they would seem to point to the conclusion that the increase of wet cultivation has been proceeding at so slow a rate for several years past, that it might be questioned whether the system of channels should be extended much beyond their present limits_ As I knew that this was not Colonel Winscom's opinion, for he had explained to me verbally, that while irrigation was not on the increase in the upper part of the Delta, there was an extensive area near the coast, which the people were ready to irrigate, as soon as they were supplied with water, I requested him to furnish me with full information on the subject, and his second letter dated 28th October is submitted in compliance with this requisition.

7. It appears that the area irrigated during the six years from 1862-63 to 1867-68 has been as follows

1862-63	125,595	acres
1863-64	148,863	″
1864-65	153,140	″
1865-66	156,890	″
1866-67	137,021	″
1867-68	141,493	″

There has been an increase during that period of 15,902 acres in all, which is made up of an increase of 21,010 acres in the Southern Delta, and of 14130 acres in Zemindary land in the Northern Delta, minus a decrease of 19238 acres in the Government lands in the same Delta. The most remarkable falling off has been in one taluq, and it is attributed chiefly to the introduction of the new Revenue Settlement, which greatly increased the Government demand. Other causes however have been at work to check the progress of irrigation, namely 1st the prevalence of "Soudoo" a saline efflorescence identical, it is supposed, with the "reh" of the North West Provinces and Punjab — 2nd The unremunerative price of paddy, 3rd the preference of the people in certain localities to cultivate dry grains, especially cholum (jowar) —

21010
14130
35140
19238
15902

8. As regards the first of these drawbacks namely "Soudoo" — I would observe that it is mainly confined to ill drained low lands, especially to those in the vicinity of the Canals where they are carried within embankments & where the surface of the water in the Canals is considerably above the ground level. The hydraulic pressure thus generated must serve to force a certain amount of water to the surface of the ground and with it, the saline matter which may be mixed with the soil — The deterioration of land by this process was very apparent some years ago, along various portions of the Canals and especially in that particularized by Colonel Winscom between Veeranky and Nedamole that is from the 24th to the 36th mile of the Masulipatam Canal — But it was confined to a strip of land of several hundred yards in width and the ground was badly drained. A similar result was perceptible in the Godavery, but in neither District has it until lately been considered a matter of much importance —

Dings. No. 5679 5th Augst. 68.

I observe that the Board of Revenue are under the impression that the "Soudoo" will give way to repeated floodings, and my own opinion is to the same effect. Indeed I

have

looks upon the appearance of "Loudoo" at als as due, to the use of embanked channels combined with the want of proper drainage: and as the Canal embankments must become more and more watertight, the source of the evil will be gradually removed. The Superintending Engineer will be instructed to be cautious in the use of highly embanked channels, in future, where they may not be essential to the proper irrigation of the lands. He is already turning his attention to the improvement of the drainage throughout the Delta.

9. The low price of paddy has doubtless a very adverse effect on the spread of irrigation. This is the more remarkable, as there has been scarcity and high prices in other Districts especially in Madras, to which one would suppose that there was every facility for the conveyance of the Delta produce. The same cause is at work in the Godavery Delta at the present time. In reality the profits of the grain dealers & the high charges for freight come to so large an amount, as to oblige the cultivators to sell their grain at a disproportionably low rate. Thus when a ton of rice costs in Madras $\overset{Rs}{77}.\overset{a}{10}.\overset{p}{0}$; at Masulipatam its price is only $\overset{Rs}{50}.\overset{a}{10}.\overset{p}{0}$. The freight alone exclusive of landing and shipping charges amounts to between 8 and 9 Rupees a ton. The market inland is limited, as both the portion of Nizam's country bordering on the Kistna and the western portion of the Kistna itself are thinly populated, and moreover having a fair stock of tanks, they can in good years produce nearly if not quite enough rice for the wants of the population. The improvement of the means of communication between the Northern Deltas and Madras deserves I believe the earnest attention of Government, as I have already observed in a report* recently submitted on the condition of the traffic on the Delta Canals.

10 With regard to the third cause above mentioned, the preference of the cultivators to dry cultivation. I would explain that for some distance from the banks of the Kistna, the soil is particularly well adapted for garden produce and for the cultivation of cholum (jowar). This is the staple food of certain classes of the population and will

* 20th Octr /68.

will always be grown largely in the District, the crop is a precarious one, being liable to destruction by either an excess or deficiency of moisture, but the channels which pervade the greater part of the Delta remove one portion of the risk, & in certain lands, the people prefer it to paddy. There can be no doubt that the cholum crop is immensely benefited by the Delta channels, for not only can the people obtain water for it in times of drought, by payment of a moderate water rate, but must get a good deal without payment. But the Delta system should evidently be credited with the improvement of the revenue derived from the dry crops, as well as from the wet.

11. The Superintending Engineers of both the 1st and 2nd Divisions are of opinion that the extension of irrigation is likely to be retarded by a clause in one of the Rules× for the assessment of water rate, which came into operation at the end of the year 1865. Rule 7 provides for the conversion of dry land into wet, and the clause in question is to the effect that when the means of irrigating the lands already exist, the Collector was to make the

×Copy attached.

Ryots

Ryots understand that if water were taken for three years in succession, the land was to be permanently classed as "irrigated" and charged with a water rate of 4 Rupees per acre per annum in addition to the fixed land assessment. The Superintending Engineer believes that the Ryots will evade the obligation to the above rate, by cultivating paddy for two years, then dry crops, then paddy again for two years and so on. This point may require attention, as the Superintending Engineer observes it is not desirable that the people should be forced to take water against their wills; but the above procedure would give them the means of improving the land by repeated floodings of the muddy water from the channels, and their deriving the benefit of an improved dry crop at the lower rate of assessment. This, in my opinion, is as likely as the "Sondoo" to be the cause of the conversion of wet crops into dry

12. The above correspondence shows that it will be necessary for the Superintending Engineer to estimate the probable returns for

in the Kistnah Delta, more careful

tomarily up to this time. It has been the practice heretofore to assume that every increase of expenditure would be followed by a corresponding increase of revenue. The past results have been looked upon as a guarantee for future results. But now that it appears that various causes are at work to check the progress of irrigation in the Delta, and that the increase of revenue is not at all commensurate with the improvement of the supply of water, it is very necessary that the project submitted by the Superintending Engineer should be accompanied by carefully compiled estimates of the probable returns prepared by the Revenue authorities, and that the Superintending Engineer should take the precaution of obtaining agreements from the cultivators, as provided by the last clause of rule 7, for the payment of the water-rate on the area they are prepared to irrigate

Fort St George
18th November 1860

J. Anderson Col. R.E.
Chief Engineer for Irrigation

To
The Secretary
to Government P.W.D.

P.W. Dept.
Procdg. 17 December
No. 4516

From
The Chief Engineer
for Irrigation
To
The Secretary
to Govt. P.W.D.
Dated 18th
Recd. 19 } Novr./68

No. 94

Enclosures 2

On Irrigation
works of the Kistna
Delta.

Lo 3941 - 17th Decr/68

259 Novr 1868 Pr. 305

For Orders.

The question raised here is one on which I however myself with the very great hesitation. I think however that it is necessary with a view to the [illegible] of the Govt. of India and the application of the [illegible] that we should have a general comprehensive view of the whole scheme of irrigation in the Kistna Delta, an estimate of land susceptible of cultivation the water that can be applied to it and of the returns that may be expected making a liberal allowance for the disturbing causes which are almost without an adequate [illegible] this comprehensive. The work may afterwards be sanctioned for execution gradually N taking one or more of the subdivisions indicated by Col. Anderson at a time. The preparation of a comprehensive plan would not appear to me to exclude subordinate changes or ameliorations during the progress of the

In their letter of the 25th October 1867, No. 15 I, the Government of India, when according sanction to plans and estimates for the improvement and enlargement of certain channels on the eastern bank of the Kistna as a portion of the general scheme of irrigation from that river under the Anicut at Bezwarah, drew attention to the imperfect manner in which those plans and estimates had been sent up, and desired that steps might be taken for the preparation of a complete project for the whole system of works for the Kistna delta, based on a comprehensive view of the available water supply, and of the lands that can be irrigated by that water.

In the orders of this Govt. communicating to the Officers concerned the views of the Govt. of India, the Supg. Engineer of the 2nd Division was called upon to prepare and submit plans and estimates for

works.

I would therefore direct the Superintending Engineer to persevere in the preparation of the general scheme and I would furnish him with an establishment on the most liberal scale for the prosecution of this special duty.

The attention of the Sup. Engineer should also be particularly called to the question of drainage the defects of which I am emphatically informed by competent authority are the chief cause of the relinquishment of wet cultivation. The water lies on the land and rots the crop. A plan for rectifying this evil should be prepared without delay and if necessary I would detail a special officer for the purpose. The diminution of wet cultivation in the Delta in consequence of any error in the system of this sort, would be a most serious source of future discredit to irrigation and its extension in general.

The attention of the Board of Revenue should be drawn to the effects

ascribed to the rule under which land used as wet for three consecutive years is permanently classed as wet. It might be desirable to revoke this order experimentally to see what effect ~~the~~ change has on the extension of the irrigated area.

N

I agree with Mr. [illegible] that the [illegible] in retaining the general scheme to be prepared. We can scarcely go back after doing so [illegible] the Delta & laying before the Supr. Govt. a general plan of such vast importance. The unpopularity of the Delta new irrigation [illegible] from the [illegible] [illegible] of superintendence [illegible] with a [illegible] of water [illegible] regulating the supply of water [illegible] their hands are [illegible] [illegible] of [illegible] [illegible] to obtain [illegible] 5 Aug. '68 [illegible] provide a remedy for some of the evils [illegible] unpopular Delta irrigation unpopular.

WD

I agree in the remarks

for the whole of the Kistna project in the thoroughly complete form prescribed by that Govt., taking, so far as was necessary for his guidance, the scheme prepared by Col. Anderson when he was District Engineer of the Kistna, and allowing for such additions as further experience may have shown to be necessary, particularly as regards ample provision for the disposal of drainage.

As it was clear from the tenor of those instructions that the Govt. would not receive any proposals for the extension of the Kistna works if sent up again in a fragmentary form, the Chief Engr.

Engineer for Irrigation having properly returned certain plans and estimates which were submitted through him for the enlargement of the upper portion of the Commamore Channel, and, reminding the Supg: Engineer of the orders of both this Govt. and the Govt. of India, informed him that it was now necessary that all estimates for works to be constructed, like those in the Kistna Delta, from loan funds, should not only be drawn up in such a way as to show the full scope of the undertaking as a whole, but

Apd. also

of His Excellency the Governor — I believe that an effective system of drainage is an urgent want both in the Kistna & in the Godavery Delta and that no time should be lost in rectifying the evil — The facts stated in these papers appear to me to throw great doubt on the ~~[illegible]~~ [illegible] policy of the rule which requires that all land which has received water from an irrigation channel for 3 years should be permanently assessed as wet land — They also as Col. Anderson observes point to the great importance of improving the means of communication between the Northern Deltas & Madras

also the extent to which it was likely to be remunerative.

In reply the Supg: Engineer reports in the first of the letters now circulated, his inability to comply with those requisitions, inasmuch as, owing to the several causes he mentions, it is at present impossible for him to say to what extent lands to which water may be supplied will be taken up by the Ryots for wet cultivation in preference to allowing them to remain under dry tillage. As the grounds on which Col. Winscom recommended delay seemed to discredit all further endeavours being made to enlarge the area of irrigation in the Kistna, and to throw a doubt upon the advantages of irrigation generally, he was called upon for explanation, and has given it in the second letter which Col: Anderson submits for the consideration of Govt. with his own remarks.

From these papers the Govt. will perceive that irrigation in the Delta of the Kistna has not of late years made much progress. The causes of this, in the opinion of the Supt. Engr., are

1. The fear which the Ryots have begun to entertain that the

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deterioration of the land by the production on its surface of a saline efflorescence which they have seen to occur at certain spots under the influence of the Channels, is likely generally to follow the use of water for irrigation in all the richer black soils.

2. The price of paddy having greatly fallen of late years owing to the want of a remunerative market for it.

3. The preference which is felt for the cultivation of dry crops such as Jowarry, on the rich alluvial lands of the Upper Delta, where heavy crops of that grain can be raised

in all ordinary years with little expenditure of Capital or labor, and where since the channels have been made, irrigation can always be fallen back upon should the rains fail.

4. Dissatisfaction with the new Revenue Settlement rules, and

5. The occasional loss that has been sustained by Ryots, who, having taken up irrigation, have been disappointed of a full supply of water.

All these causes, in the opinion of the Supdg Engr. have combined to check

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the extension of wet cultivation so as to have limited its increase during the five last years to something less than 16,000 acres, while in the same time an expenditure on original works of about 7½ lacs of Rupees has been incurred, and he argues that he is consequently so situated that, in devising any general scheme for the development to completion of the system of Channels by which the whole area of the Delta may be watered and fully drained, he is unable to calculate, with any degree of certainty, what extent of land will be benefited or to give any reliable estimate of returns.

He therefore solicits a reconsideration of the demand made upon him for the preparation of the full scheme of irrigational improvement for the Delta, and recommends that, as sufficient work has been sanctioned and laid out to occupy the attention of the Department and to utilize all available labor for some years to come, the arduous duty of preparing a complete project for the irrigation of the whole half million of acres in the Delta may be deferred till the works in hand being finished, a full supply of water will be at command, and the results of future extensions may be accurately predicted.

Though there would seem to be some force in Col: Wniscom's arguments to excuse the postponement of investigations, which can only be taken up at some expense for collecting the data on which such a complete scheme as the Govt: of India require can be formed, and the Chief Engineer is of opinion that this course had better be followed so far as to allow of the project being designed and estimated for in sections, the undersigned does not agree with either Officer. It was not to be expected that irrigation would extend throughout the Delta in the same rapid manner as it was taken up at first when large areas of land only waited for water to be supplied and the floods of the river to be excluded, to be applied to the cultivation of rice. No doubt the creation of "Sowdas," the enhancement of the rate of assessment for water, with the clause binding the Ryot who may take it for three consecutive years ever after to pay for it whether he returns to dry cultivation or not, and the low price of paddy,

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are sufficient discouragements to irrigation, and may fully account for the falling off that has so notably been taking place in the demand for water. But it would be contrary to experience to believe that these hindrances to improved culture, which the use of water always produces, will be permanent, or affect the ultimate extension of irrigation to the greater part of the Delta, if by boldly extending the means of supplying water wherever it can be made use of, the fear of the Ryot that he may be left with an insufficient supply be removed

The undersigned believes with Col: Anderson that "Sowdos" appears only in the neighbourhood of embanked channels, where the drainage not being perfected, the upward pressure of the water, with which the soil adjacent is saturated by percolation from the channel, forces the salts that may be contained in the earth to the surface. This evil occurs in the upper and higher situated portions of the Delta where black "Regur" soil prevails, and where dry grains being cultivable in the greatest perfection, the field for extension

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of irrigation is limited compared with that in the lower parts of the Delta, where light soils, of little value for the cultivation of dry crops, and capable of bearing heavy crops of rice if supplied with water, abound, and to which it is the very object of the extension of the channels to convey the necessary water. It is only natural that an increased stringency of the terms on which water can be taken should have the effect, for a time at least, of diminishing the demand for it where its use has not been established in the habits of the people: but this is probably only a temporary result of the new rules, and it will be sure to give way under the pressure of a single year's failure of the regular rains.

Under even the exceptionally unfavorable circumstances of the last five years, the increase of the area of wet cultivation, taken at 15,912 acres, has been sufficient to yield a return of about 8½ per cent on the + outlay on new works during the same period. This is not what might have been expected, but there is nothing so discouraging as Col: Winscom

Sup-

+ Rs 7,50,000

supposes in it, and there is certainly no reason why, in the long run, irrigation should not be as greatly and as profitably extended in the Kistna as it has been in the Godavery Delta, and, seeing that, as stated by Col: Winscom, the preparation of the project in its complete shape, will occupy two years, at the end of which time the Govt. will probably be in a position to come to a better conclusion regarding the advantages of the Kistna works than now, and to determine whether to proceed with them or not, the undersigned

is of opinion that no delay
should be allowed to take
place in the preparation of
the complete project, and
that the Supg Engr. should
receive explicit orders to
proceed at once with the
requisite survey and
levelling operations, and
with the other investigations
that may be neceſsary,
applying for such tem-
porary establishments
as he may require-

Public Works Department

No 3941

Proceedings of the Madras Government

Under date the 17th Decr /68

Read the following

From The Chief Engineer for Irrigation. | H.c. No 94 dated 18th Novr /68 |

In their letter of the 25th October 1867, No 153, the Govt. of India, when according sanction to plans and estimates for the improvement and enlargement of certain channels on the eastern bank of the Kistna as a portion of the general scheme of irrigation from that river under the Anicut at Bezwarah, drew attention to the imperfect manner in which those

plans

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plans and estimates had been sent up, and desired that steps might be taken for the preparation of a complete project for the whole system of works for the Kistna Delta, based on a comprehensive view of the available water supply, and of the lands that can be irrigated by that water.

In the orders of this Govt. communicating to the Officers concerned the views of the Govt. of India, the Supg. Engineer of the 2d. Division was called upon to prepare and submit

plans

plans and estimates for the whole of the Kistna project in the thoroughly complete form prescribed by that Govt., taking so far as was necessary for his guidance, the scheme prepared in 1865 by Col. Anderson when he was District Engineer of the Kistna, and allowing for such additions as further experience may have shown to be necessary, particularly as regards ample provision for the disposal of drainage.

As it was clear from the tenor of those instructions that the Govt. would not receive any proposals for the extension of the Kistna works if sent up again in a fragmentary form, the Chief Engineer for Irrigation very properly returned certain plans and estimates which were submitted through him for the enlargement of the upper portions of the Commamoor Channel, and, reminding the Supdg. Engr. of the orders of both this Govt. and the Govt. of India, informed him that it was now necessary that all estimates for works to be constructed, like those in the Kistna Delta, from loan funds, should not

only

only be drawn up in such a way as to show the full scope of the undertaking as a whole, but also the extent to which it was likely to be remunerative.

In reply the Supdg: Engineer reports in his letter of the 9th October 1868, No 87, his inability to comply with those requisitions, inasmuch as, owing to the several causes he mentions, it is at present impossible for him to say to what extent lands to which water may be supplied will be taken up by the Ryots for wet cultivation in preference to allowing them to remain under dry tillage. As the grounds on which Col. Winscom recommended delay seemed to discredit all further endeavours being made to enlarge the area of irrigation in the Kistna, and to throw a doubt upon the advantages of irrigation generally, he was called upon for explanation, and has given it in his letter of the 20th October 1858, No. 100 which Colonel Anderson submits for the consideration of Govt. with his own remarks.

From these papers the Govt. perceive that irrigation in the Delta of the Kistna has not of late years made much progress. The causes of this in the opinion of the Supt. Engineer, are,

1. The fear which the Ryots have begun to entertain that the deterioration of the land by the production on its surface of a saline efflorescence which they have seen to occur at certain spots under the influence of the channels, is likely generally to follow the use of water for irrigation in all the richer black soils.

The

2. The price of paddy having greatly fallen of late years owing to the want of a remunerative market for it.

3. The preference which is felt for the cultivation of dry crops such as Jowary, on the rich alluvial lands of the Upper Delta, where heavy crops of that grain can be raised in all ordinary years with little expenditure of capital or labor, and where since the channels have been made, irrigation can always be fallen back upon should the rains fail.

4. Dissatisfaction with the new Revenue Settlement rules, and

5. The occasional loss that has been sustained by Ryots, who, having taken up irrigation, have been disappointed of a full supply of water.

All these causes, in the opinion of the Supdg Engr., have combined to check the extension of wet cultivation so as to have limited its increase during the five last years to something less than three acres, while in the same time an expenditure on original works of about 7½ lacs of Rupees has been incurred, and he argues that

	Rs
1863-64	2,00,471
1864-65	1,58,577
1865-66	81,316
1866-67	95,704
1867-68	2,18,556
	7,54,624

that he is consequently so situated that, in devising any general scheme for the development to completion of the system of channels by which the whole area of the Delta may be watered and fully drained, he is unable to calculate, with any degree of certainty, what extent of land will be benefited, or to give any reliable estimate of returns.

He therefore solicits a reconsideration of the demand made upon him for the preparation of the full scheme of irrigational improvement for the Delta and recommends that, as sufficient work has been sanctioned and laid out to occupy the attention of the Department, and to utilize all available labor for some years to come, the arduous duty of preparing a complete project for the irrigation of the whole half million of acres in the Delta may be deferred till, the works in hand being finished, a full supply of water will be at command and the results of future extensions may be accurately predicted.

His Excellency in Council is willing to admit that there is some force in Col. Whiscom's arguments to excuse the postponement of investigations, (which can only be taken up at some expense) for collecting the data on which such a scheme as the Govt. of India require, can be prepared, but he is nevertheless of opinion, that the Govt. should have the project before them in a complete and reliable form, with as accurate returns as can be procured of the increase of net cultivation which is likely to follow the extension of irrigational improvements, and with information as to the sufficiency of the supply of water, a fair allowance being made for the disturbing causes which are represented to be at work to prevent the development of irrigation on a more extended and remunerative scale. Information of this character is now more than ever necessary to satisfy the Govt. of India that the assignments to this Presidency from Loan Funds are being utilized to the best advantage.

It was not to be expected that irrigation would extend throughout the Delta in the same rapid manner in which it was taken up at first when large areas of land only waited for water to be supplied, and the floods of the river to be excluded to be applied to the cultivation of rice. The causes enumerated by the Supg Engineer have doubtless tended to discourage irrigation, and may fully account for the falling off that has so notably been taking place in the demand for water, but it would be contrary to experience to believe that

these

these hindrances to improved culture which the use of water always produces, will be permanent or affect the ultimate extension of irrigation to the greater part of the Delta, if by boldly extending the means of supplying water wherever it can be made use of the fear of the Ryot that he may be left with an insufficient supply be removed.

The Supg Engr. will accordingly proceed at once with the requisite survey and levelling operations, and with the other investigations which may be necessary for the preparation of the complete project, and he will report what additional Es-

establishment he will require to prosecute this special duty. The attention of the Supg. Engr. will be particularly drawn to the question of remedying the present defective system of drainage, which the Govt. have reason to believe has in no small measure led to the relinquishment of some portion of the wet cultivation which has been given up.

These papers will be communicated to the Revenue Dept. with a view to the Board of Revenue being called upon to consider the practical working of the rule which prescribes that when dry land is converted into wet, and water is taken for three consecutive years, the land shall be permanently classed as irrigated. It may perhaps be desirable to revoke that rule experimentally.

To
The Supg. Engr. 2nd D[illegible]
" Chief Engr. for Irrigation with all enclosures
" Revenue Dept.

Ex. Pr. Bd of Revl. No 519
25 Apl [illegible]

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