M.P. G. 1—89,030—16-10-20.

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	47	Press ~~Mis.~~
102-103		
Dated	7th January	1967.

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department,
***9th January* 1869.**

No. 102. Read the following Proceedings of the Madras Government in the Public Works Department:—

Passing orders on the Endorsement of the Chief Engineer for Irrigation submitting, with remarks, letter from the Superintending Engineer of the 2nd Division, soliciting a reconsideration of the demand made upon him for the preparation of the full scheme of Irrigational improvement for the Kistna Delta. } (Here enter 17th December 1868, No. 3,941.)

No. 103. ORDER THEREON, 9th January 1869, No. 49.

Irrigation, No. 2.

Referred to the Board of Revenue for report on the subject referred to in paragraph 11 of the above Proceedings.

(True Extract.)

(Signed) F. BRANDT,
Under Secretary to Government.

To the Board of Revenue, with Proceedings Public Works Department, No. 3,941.
,, the Department Public Works.

Exd. G. A. Turton.

COPY of LETTER, dated 31st JANUARY 1869.

REVENUE.

To

THE BOARD OF REVENUE.

&c., &c., &c.

Dated Fort St. George, the 31st January 1869.

Received, the 1st February 1869.

G. O., the 4th February 1869, No. 59.

JANUARY.

Nos. 102-103.

Land:—Appointment by Kistna Delta.—Board to report on the practical working of the rule which prescribes that rights in land reserved into reds, and water is taken for three consecutive years, the land shall be permanently assessed as irrigated.

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. 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.

1 Appendix A.
1 Do. B.

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.

* 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.

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

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 *bonâ 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.

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

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:—

1*st.*—Soudoo, an effloressence 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.

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

3*rd.*—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.

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

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.

APPENDIX A.

	Fasly 1272 or 1862-63	Fasly 1273 or 1863-64	Fasly 1274 or 1864-65	Fasly 1275 or 1865-66	Fasly 1276 or 1866-67	Fasly 1277 or 1867-68	
Southern or Gunnur Delta.							
Kapully	34,428	44,254	42,303	40,420	41,070	44,183	*Increase* in Southern Delta in five years, 21,010.
Beapetla	17,228	24,855	26,524	25,770	26,983	28,483	
	51,656	69,109	68,827	66,190	68,053	72,666	
Northern or Masulipatam Delta.							
Bunder	13,824	4,104	3,967	3,848	1,434	1,646	*Decrease* in Government lands of Northern Delta, 19,238 acres.
Gudivada	52,542	54,457	59,536	59,789	43,837	43,744	
Bazaarah	3,849	3,964	3,900	4,113	4,826	4,087	
	68,715	62,554	67,453	67,750	49,597	49,477	
Zemindaries*	5,220	17,250	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	64,360	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. 152, 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 Karumchadoo 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.	Kistna. Per garce.
	Rs.	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.	Net produce.
	Rs. A. P.	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 0*a*	20 0 0*b*
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 sist.
b Value of straw not calculated in either case.

† *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.

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

† 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. 5,079, 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 matter is one meriting serious consideration.

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

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.

† 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.

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 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

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

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 bearing 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 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

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

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

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

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).

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.

* 23th October 1868.

10. With regard to the third cause abovementioned, 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 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, and 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 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 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.

† Copy attached.

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.

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 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.

No. 415. ORDER THEREON, 17th December 1868, No. 3,941.

IRRIGATION, No. 17.

1. In their letter of the 25th October 1867, No. 163 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 Bezoarah, 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.

2. In the Orders of this Government, communicating to the Officers concerned the views of the Government of India, the Superintending Engineer of the 2nd Division was called upon to prepare and submit plans and estimates for the whole 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

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

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.

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.)

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

To the Superintending Engineer, 2nd Division.
„ Chief Engineer for Irrigation.
„ Revenue Department.

Exd. S. T. A.-gustin.

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Govt. of 1868: Madras.

PUBLIC WORKS.

THE SUPERINTENDING ENGINEER

2ND DIVISION.

&c., &c., &c.

Dated December, 17th

Read. —"— 3rd "

(G. O., 17th December 1868, No. 3,941.

DECEMBER.

Nos. 414-415

Kistna Delta.—Passing orders on the Endorsement of the Chief Engineer for Irrigation submitting, with remarks, letter from the Superintending Engineer of the 2nd Division, soliciting a reconsideration of the demand made upon him for the preparation of the full scheme of irrigational improvement for the Kistna Delta.

Rec'd Sept.

Rt. No. 19 4 Jany 69

With an order