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MADRAS RECORD OFFICE

Government of Madras

Public works DEPARTMENT

G.O. No. / ~~B.P. No.~~ 118-119-120.	413		Press / Mis.
Dated	5	3	1843.

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Proceedings of the Madras Government, Public Works Department, 5th March 1873.

Read the following papers :—

No. 118. Read the following Proceedings of the Madras Government in the Revenue Department :—

Irrigation works in Kistna District — Mr. C. G. Master's report on this subject, reviewed. } (Here enter No. 1,239, dated 21st August 1872.)

No. 6.

No. 119. *Note by the Chief Engineer for Irrigation.*

In paragraph 23 of the Order of Government, Revenue Department, dated 21st August 1872, No. 1,239, the consideration in the Public Works Department of the question "whether the transfer in the deltas of the charge of village and field channels to the ryots themselves, and the distribution of the water among the ryots to the Revenue Department, is expedient" is directed.

2. I have read paragraph 290 of Mr. C. G. Master's report on the Kistna Delta, the opinion expressed in the late Mr. Boswell's letter, paragraph 9, forming Appendix X of the report, and paragraph 34 of the Proceedings of the Board of Revenue reviewing the report, and I do not feel certain whether the practice in the Kistna Delta differs from that in the Godavery, or whether rather it may not be a want of information on the part of the ryots as to what the Public Works Department undertakes to do which may have led to the idea that a change of arrangements is desirable.

3. Exactly what the present practice is is nowhere stated, but I am under the impression that nowhere have Range Officers attempted to keep field channels in repair, while village channels can but seldom have been dealt with. Circumstances differ in the Northern Deltas, in Nellore, Tanjore, and the south, and a precisely similar rule is not, therefore, applicable to each. In the Kistna the inadequacy of the labour supply must have rendered it impracticable generally to attend to village channels, even if such a duty has in any degree been recognized in principle, and here and in most other districts Agricultural repairs funds could not at any time have sufficed for such work.

4. It appears to me that the duty of the Public Works Officers is, or should be, confined really to regulation, which includes, of course, distribution in bulk, if I may so term it, but not distribution in detail. The regulation of the water-supply in the Kistna, the Godavery, and in all systems of irrigation in which any such regulation at all is practicable, should, down to the sluices which supply the lands of one village only, be vested in the Public Works Officers. It appears to be essential that such should be the case so far, because an independent authority is required to manage the supply until it passes into the hands of the village community. If a channel supply two villages, it would not do to let each village manage the sluice at the head of its channel otherwise the other village might, and probably would, suffer. And as I do not suppose that any Revenue Officers have contemplated, or would desire the transfer of the entire regulation to that department, it follows that the Range Officers should retain the management. Moreover,

one authority must manage all such regulation from the head of the main channel downwards, otherwise the necessary connection would be broken and no one could be held fully responsible for results. Below, however, the village sluice, the management should be in the hands of the village community, and the duty of the Public Works Department should be confined to keeping a sufficient depth of water on the sill of every head-sluice or in maintaining a depth approximating as closely to this requirement as the quantity of water in the superior channels will allow.

5. Neither in the Kistna nor in any other district is there, as yet, anything like a perfect system of regulation; but the completion estimates sanctioned for the Godavery and those under preparation, or just prepared for the Kistna, aim at, among other things, such completeness as will enable a Range Officer to carry enough water in his main canals, whenever the level of the feeding river is suitable for a certain maximum area of cultivation, and to sub-divide the supply according to the area of each section, sub-section, and finally village. When these improvements have been carried out it will be practicable for the Range Officers to give to every village sluice the full supply, or the proportionate supply, to which it may be entitled. The duty and authority could not, I think, be better placed, if indeed they could be otherwise located. No one else can deal with all the circumstances to be taken account of; and an officer possessing the requisite experience and local knowledge, however far he may fall short of giving full satisfaction to all the villages concerned, has, in my opinion, the power to do more for them than can be done under any other arrangement, and he will, moreover, always be able to show clearly what he has done or may be doing, and why nothing more is, for the moment at any rate, practicable.

6. In connection with the subject of the improper use of influence which subordinate establishments of this, in common with all, departments will exercise, so long as the opportunity is afforded them, I would invite attention to the remarks contained in the letter* from a late Superintending Engineer of the 1st Division, printed in G. O., 13th May 1868, No. 1,525. Properly speaking, the delta establishments should simply carry out the definite orders of the Range Officer, and there should be no room for the exertion of improper influence by them. As the delta works approach nearer and nearer to completion, the supersession of discretionary power by systematic orders should be steadily carried out. The degree of success attained will depend much upon the character of individual officers, but it is, of course, essential that each Range Officer should have a sufficient number of assistants to ensure, with due diligence and attention on their part, the proper execution of his orders. At present the staff of the delta is unequal to its duties, and it will be my duty, at the earliest possible moment, to lay before

* Para. 4.—At present we have three Delta Superintendents on 70 Rupees and eight Navigation Superintendents on 50, besides the fifty-eight Channel Superintendents and their peons. I propose twenty-seven Delta Superintendents on pay varying from 70 to 30 Rupees per mensem, (the term Navigation Superintendent should be discontinued) with forty-nine lascars on 5 Rupees.

Their principal duties to be, to watch the river banks, the canals and principal branches, and all masonry works. To prevent damage by weather or water action, to see that the canals, banks, and sluices, etc, are not tampered with or injured by ryots or others, to see that the Range Officer's orders regarding the proper depths to be maintained at the several locks and regulating calingulahs are accurately carried out, to keep the Range Officer informed of the condition of crops under irrigation, and the state of the water supply; to see that the navigation bye-laws are not infringed by dhonies and radary boats; to prepare estimates for, and superintend execution of clearances and bank repairs.

5. It will *not* be their duty to distribute water; on the contrary they will be prohibited from interfering with the distribution, beyond seeing that the several distributive and regulating sluices and dams are being worked according to the Range Officer's orders (these will generally be standing orders, only in some few cases or instances will special orders be required).

Government, the particulars of the additional assistance required in this and other districts, in which the irrigation works are of great importance and the work under execution, or to be done, heavy.

7. The free option now given to the ryots in the Kistna and Godavery Deltas to take water for irrigation, or cultivate their lands with dry crops, will not, I think, after the lapse of a few years entail much extra work, but it will be necessary for the Collector to keep the District Engineer informed of the area in each village, or under each village channel, to be irrigated in each year, so that the Range Officers may know for what areas they have to provide. Later applications for water would need to be communicated direct to the Range Officer from the taluq.

8. The free option given to the ryots to relinquish irrigation on giving due notice will, I should suppose, secure to the Government concurrently the option of ceasing temporarily or permanently, to irrigate, on similar conditions. It might be very inconvenient and expensive to continue to irrigate a few hundred acres from a channel designed for several thousands; and again it might be advantageous to close a channel for a season during the carrying out of extensive improvemen No doubt rules will be issued in connection with this important decision, and perhaps it will be considered advisable to specify the terms on which, after irrigation for any year may have been relinquished, a supply may subsequently be obtained if available.

9. Referring to paragraph 25 of the order quoted at the beginning of this note, I may remark that in G. O. of the 17th June last, No. 1,489, the subject of the extension of the East Coast Canal to meet the Kistna Delta canals and through that the Godavery Delta and river navigation was ordered to lie over. It may be well not to lose sight of the particulars of the cost of transporting delta rice to Madras by coasting vessels, as given in the late Colonel Anderson's memorandum dated 1st October 1868, printed in G. O., 21st November 1868, No. 3,652. I observe that with the exception of a short length of about 6 miles the surveys for the extension which were made in 1855 are all forthcoming, and they would probably afford sufficient information for the preparation of an approximate estimate if none was prepared by Lieutenant-Colonel Chambers. I would, therefore, suggest that the general dimensions of the Canal bed level, etc, should be fixed, and that the papers should then be transferred to the District Engineer of Nellore, who with the aid of one or two Surveyors would probably be able without much difficulty to make out an estimate based on current rates of the cost of supplying this important link in the chain of navigable communication.

FORT ST. GEORGE,
6th January 1873.

(Signed) C. J. SMITH, Captain, R.E.,
for Chief Engineer for Irrigation.

No. 120. ORDER THEREON, 5th March 1873, No. 713.

IRRIGATION, No. 8.

THE suggestion in paragraph 290 of Mr. Master's report on irrigation in the Kistna District, that village and field channels be left to the ryot themselves to repair and manage, is quite in consonance with the opinion of all experienced Public Works officers, with whom it appears

to be matter of surprise and doubt that a contrary practice should anywhere have obtained. Instructions will accordingly be issued in the Revenue and Public Works Departments absolutely restricting the functions of the subordinate officers of the latter Department to the regulation of the water-supply in channels which supply the lands of more than one village, and vesting in the village officers the charge of the water supplied to single villages from the moment it quits the regulating sluice, over which however they will have no control. The Board will report, after consulting the Collectors, from what date this arrangement shall take effect, and whether any increase in the number of Neergunties or any other measure is requisite.

2. The subject of the extension of the East Coast Canal northwards has not been lost sight of. In the *Gazette* of the 9th August 1872, it was arranged that Mr. Walch should relieve Mr. Harington of the East Coast Canal Range, on account of the latter gentleman's state of health; and be employed in executing the extension from Doogoorazpatam to Kistnapatam, and planning for completing communication with Nizampatam. It has not been possible to work out the programme then laid down, but the extension south of Kistnapatam was sanctioned in G. O., No. 274 of 28th January 1873, and will be provided for in the Budget of 1873-74. And the Nellore District Engineer will apply for such extra establishment as he may need for planning and estimating the extension north of Kistnapatam on the same scale as laid down for the southern portion.

Paragraph XXII. of Lord Napier's Minute, recorded with G. O., 2,396, dated 20th September 1871.

3. The Government will be prepared to receive with favour any propositions that may be laid before them by the Local Fund Boards for perfecting the communication by road between Bezwada and Hyderabad. The more so, as it would appear that communication by rail between Hyderabad and the Eastern Coast, can better be made in conjunction with a line opening the new coal fields south of the Godavery River. It has been projected to run to Chandah, round by Warangul; a short branch from which latter place to the third or lowest Barrier on the Godavery would not only traverse a promising coal field, but join that river at a place from which cheap water communication would be available to Cocanada, a much more desirable port than Masulipatam.

4. The subjects mooted in paragraphs 7 and 8 of Lieutenant-Colonel Mullins' note will doubtless commend themselves to the attention of the Revenue Board, who will issue such instructions and regulations regarding them as may be found necessary.

(True Extract.)

(Signed) C. W. WALKER, Colonel, R.E.,

Secretary to Government.

To the District Engineers, Nellore and Kistna.
,, District Engineer, Godavery.
,, Chief Engineer for Irrigation.
,, Revenue Department.
,, Financial ,,

Exd. S. T. Austin.

Ro 13 Bmy Sp 68 No 354 - 355
" 21 Sept — 150 - 152
" 20 Sept 71 — 329 - 330
" 1 June 72 — 258 - 259.
" 28 Jany 73 — 660 - 562

P W. 1873 Depart
Pro: of Govt for March
No 597.

From
The Chief Engr
for Irrigation
To
The Secretary to Govt
P W D.

No 6.

Dated 6.
Recd 29 January 73.

Note regarding the transfer in the delta of the 2nd Class of the charge of village Field channels to the ryots themselves & the distribution of the waters among the ryots by the Revenue Dept.

No 713.5 dated 1873.

No 119
Rec. 17 Feby 1873
Ans 12 Feby 1873 2.11.d

Proceedings of the Madras Government, Revenue Department, 6th December 1869.

No. 71. Read the following Report from C. G. MASTER, Esq., on Special Duty, to the Acting Secretary to Government, Revenue Department, Fort Saint George, dated Madras, 4th November 1869, No. 50:—

THE Report herewith submitted has its origin immediately in a discussion which took place in the Public Works Department relative to the causes which, in the opinion of the then Superintending Engineer of the 2nd Division, made it undesirable to prepare certain plans and estimates required to enable the Government of Madras to transmit, for the sanction of the Government of India, a complete project for the system of works in the Kistna Delta.

2. Colonel Winscom contended that he was not in a position to furnish the information regarding the remunerative effects likely to follow such additions to the irrigation works, nor could he state what lands would be available for the utilization of such supply of water as that intended to be obtained. In illustration of his proposition, he showed that, while it had been estimated that 500,000* acres in the Kistna Delta were capable of irrigation, only Acres 141,493 were paying water-rate in Fusly 1277 (1867-68); the total increase over the area under irrigation in Fusly 1272 (1862-63) 275(1865-66) the cultivation had reached Acres 156,890. This, it is to be noted, was exclusive of usual wet cultivation.

	Acres.
* Masulipatam side	270,000
Guntoor side	230,000
	500,000

being under 16,000 acres, though in Fusly 1

3. The increase of 16,000 acres above alluded to was made up of an increase in the Southern part of the Delta of Acres 21,010, and a decrease in the Northern Delta (inclusive of the water-cess in Zemindary tracts) of Acres 5,088.

4. The reasons assigned by Colonel Winscom for the diminution were—

(1.) The giving up of land by the ryots on the introduction of the new Revenue Settlement: this referred to the Bandur and Gudivada Talooks in the Eastern Delta.

(2.) The prevalence of "chavudu" an efflorescence of a saline nature.

(3.) Fall in prices.

(4.) The indolence of the cultivators who, with seasonable rain and the knowledge that they have the Kistna water to fall back upon in case of need, prefer dry-cropping their lands to the greater physical labour and discomfort of wet cultivation.

(5.) Occasional loss from an insufficient supply of water.

(6.) Difficulty of access to Masulipatam and other parts.

5. Colonel Anderson, the Chief Engineer for Irrigation, in his Endorsement dated 10th November 1868, No. 94, after enlarging on the second, third, and fourth obstacles alluded to above, mentioned that the Superintending Engineers of the 1st and 2nd Divisions were of opinion, that the second clause of the seventh of the rules for the assessment of the water-rate in the Godavery and Kistna Deltas, sanctioned

by Government Order, 31st October 186

" When 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 irri-
" gated."

Anderson considered that this option wa
of the preference for dry crops over wet;
" of improving their land by repeated
" channels, and then deriving the benefi
" rate of assessment."

6. In passing orders on these

* G. O. 17th Dec. 1868, No. 3,941, P.W.D.

" which prescribes that, when dry land
" for three consecutive years, the land s
adding that it might perhaps be desirable

7. In their Proceedings, dated 3
Revenue fully reviewed the whole questi
objected to, showing that it originated
State, who directed that complete option
decline water as he pleased, with a pr
made it desirable, that Government sho
years for certain. They pointed out th
been allowed in so thorough a manner a
Despatch of the 24th November 1863.
of the Rule VII.: (1), because the simple
from discontinuing irrigation; (2), bec
would, at the present moment, be impo
away with the option altogether would b
rities, and be very unacceptable to t
circumstances under which, in their Proc
had directed that the option of re-co
now be allowed, and that so long as lan
no water-rate should be levied.

8. The Board then proceeded to
which must have influenced the sprea
peculiar circumstances of the Kistna Di
which required to be settled before a
the best course to pursue, they conclu
inquiry should be made, for the purpos
involved.

9. This recapitulation of past co
Order in the Revenue Department, d

ernment, Revenue Department,
ber 1869.

, No. 2,665, Revenue Department, (*vide* margin,) had a prejudicial effect, as it enabled ryots to avoid having their temporarily-converted dry lands classed as permanent wet by cultivating paddy for two years, then dry crop, then paddy again for two years, and so on. Colonel as likely as "chavudu" to be the cause because the ryots had thus "the means floodings of the muddy water from the of an improved dry crop at the lower

papers, the Government resolved* to call upon the Board of Revenue "to consider the practical working of the rule is converted into wet, and water is taken hall be permanently classed as irrigated," to revoke that rule experimentally.

oint, No. 2,069, the Board of in an express ed the history of the rule should be permitte to the Secretary of oviso, in cases where the outlay re take or ld insist on an engagement for a term o site at, in fact, this option had not in the end s was indicated in the Secretary of State's Still they deprecated any present alteration revocation of it would not prevent the ryots ause to insist on agreements in all cases litic and inopportune; (3), because to do e opposed to the orders of the Home autho- e people. They then recapitulated the edings of 5th August 1868, No. 5,679, they nverting "wet" lands into "dry" should ds continued "chavudu" and unculturable

oint out other reasons, not hitherto named, l of irrigation, and, after dwelling on the strict, and the many questions of importance definite decision could be arrived at as to led by recommending that a special local e of setting at rest the many doubtful points

respondence brings me to the Government ated 21st May 1869, No. 1,432, in which

the Right Honourable the Governor in Council was pleased to depute to me the task of investigating and reporting upon the whole subject, with an expression of his opinion, that it would be good policy to give the ryots still greater option as to taking and refusing water.

G. O., 4th June 1869, No. 1,584, R. D., Criminal charges against an Overseer, D.P.W.
Board's Pros., 15th June 1869, No. 4,292, with G. O., 16th July 1869, No. 2,070, on Mr. Thornhill's Memorandum.
Board's Pros., 10th July 1869, No. 4,950, on Petition No. 3,244 of 1868.
Board's Pros., 29th July 1869, on "Gulakarai."
Board's Pros., 30th July 1869, No. 5,588, on the precise scope of their Proceedings, dated 5th August 1868, No. 5,679.
Board's Pros., 31st August 1869, No. 6,510, on Kistna Collector's report on Public Works for 1868-69.

10. In accordance with the instructions furnished me, I arrived at Masulipatam on the 19th June last, and have since been engaged in the various Delta talooks in prosecuting the necessary inquiries.

11. The marginally noted papers have been communicated to me from time to time, and will be noticed in their proper places in the report.

12. The Kistna Delta consists of the whole or portions of the five talooks noted in the margin*. The first three are on the east or Masulipatam side of the river, but only the lower portion of Bezwada can be considered to be in the Delta proper. The remaining two are on the Guntoor or west bank of the Kistna. The four Zemindary estates which come within the range of irrigation are all on the Masulipatam side. Of these Davarakotta and Gudur are completely within the Delta; the others are not.

* 1. Bandur.
2. Gudivada.
3. Bezwada.
4. Repallee.
5. Bapatla.

13. The total number of villages in each talook, distinguishing those under the command of the anicut-channels, is shown in the following statement:—

Talooks.	Number of Villages.			Number of Villages under different sources of irrigation.								
				Kistna Anicut.			Rain-fed Tanks.					
	Government villages.	Mokassa and Agraharams.	Total.	Government villages.	Mokassa and Agraharams.	Total.	Government villages.	Mokassa and Agraharams.	Total.	Sanalu or natural springs.	Kolor lake.	Dry villages.
1	2	3	4	5	6	7	8	9	10	11	12	13
1. Bandur	72	...	72	13	...	13	32	...	32	...	...	27
2. Gudivada	198	44	242	138	41	179	3	...	3	...	45	15
3. Bezwada	73	10	83	11	...	11	24	7	31	...	...	41
4. Repallee	149	23	172	112	11	123	...	...	...	10	...	49
5. Bapatla	92	12	104	35	7	42	...	...	...			52
Total...	584	89	673	309	59	368	59	7	66	10	45	184
Zemindaries.												
1. Davarakotta	...	...	67	..	...	18	...	...	...	...	...	...
2. Gudur and Vullur... ...	...	...	31	..	...	29	...	...	...	...	...	...
3. Nuzid	...	...	256	..	...	28	...	...	...	...	...	...
4. Chavendra	...	...	6	..	...	4	...	...	...	...	...	...
Total...	...	...	360	..	...	79	...	...	...	...	...	...
Grand Total...	584	89	1,033	309	59	447	59	7	66	10	45	184

14. It will be seen from the above, that of the total number of villages, 447 are under the command of the anicut, and 121, (exclusive of Zemindary,) under that of other sources of irrigation: of the latter, sixteen villages form the Divi Estate in Bandur Talook. They are dependent solely on tanks fed by Kistna freshes, which are always precarious. In ten "sandy-tract" villages of Bapatla Talook wet cultivation is carried on with water derived from "sonalu" (సొనలు.) or springs cleared out every year by the ryots at their own expense. The ayacut of this is 3,790 acres. In the Kaikalur division of the Gudivada Talook forty-five villages, commonly called "lunkalu"or లంకలు (islands), are irrigated by the Koler Lake; the water of which is raised by means of pakottas. The remaining 184 in Government Talook are dry villages.

15. The total area of the villages in the Delta talooks is Acres 1,442,430, of which Acres 963,367, or 67 per cent., are arable, and the remainder non-arable:—

Talooks.	Total area according to new survey.	Arable Land.			Inams.	Poramboke and other lands unfit for cultivation.
		Dry.	Wet.	Total.		
	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
1. Bandur	252,311	77,804	20,032	97,836	6,349	148,126
2. Gudivada... ...	301,676	98,074	90,299	188,373	31,185	82,118
3. Bezwada	120,944	65,675	9,237	74,912	19,191	26,841
4. Repallee	367,714	245,573	40,394	285,967	43,817	37,930
5. Bapatla	399,785	289,923	26,356	316,279	41,573	41,933
Total...	1,442,430	777,049	186,318	963,367	142,115	336,948

of the arable area Acres 578,709, or 60 per cent., are in occupation of the ryots according to the returns of Fusly 1278, as detailed in the following statement:—

Talooks.	Dry.		Usual Wet Land.		Dry Land converted into Wet.		Total.	
	Land.	Assessment	Land.	Assessment	Land.	Assessment	Land.	Assessment.
	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
1. Bandur ...	36,948	62,234	10,245	47,972	4	16	47,197	1,10,222
2. Gudivada...	41,163	61,011	18,770	1,05,337	14,603	86,253	74,536	2,52,601
3. Bezwada ...	59,656	69,861	4,925	21,807	4,078	22,828	68,659	1,14,496
4. Repallee ..	156,296	2,78,630	12,156	69,190	28,647	1,61,352	197,099	5,09,172
5. Bapatla ...	164,995	3,19,275	14,614	80,922	11,609	67,632	191,218	4,77,829
Total...	459,058	7,91,011	60,710	3,55,228	58,941	3,38,081	578,709	14,64,320

16. In the following statement is given the extent of dry converted into wet in the fourteen years, since the construction of the anicut.

Appendix No. 1.

Fuslies.	Bandur Talook.		Gudivada Talook.		Bezwada Talook.		Repallee Talook.		Bapatla Talook.		Total.	
	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
1	2	3	4	5	6	7	8	9	10	11	12	13
	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
1265	...	...	2,131	2,339	...	603	...	...	318	1,896	2,449	4,235
1266	...	...	4,851	6,814	257	2,999	305	3,959	4,737	28,326	10,150	39,702
1267	43	74	5,086	7,367	1,191	14,652	3,494	19,972	7,257	42,154	17,076	72,566
1268	27	50	5,833	10,071	3,127	10,918	9,139	52,039	7,444	44,652	25,570	1,21,464
1269	20	40	6,180	17,512	2,679	9,501	18,120	1,03,742	8,505	50,614	35,504	1,82,826
1270	19	36	5,559	15,989	2,372	12,305	18,242	1,03,754	7,451	44,474	33,643	1,73,754
1271	19	51	6,957	21,142	2,832	14,951	21,534	1,21,071	7,197	43,021	38,539	1,97,590
1272	41	101	8,827	28,929	3,270	17,100	24,771	1,35,690	9,062	48,163	45,971	2,27,834
1273	42	139	11,834	33,763	3,756	17,488	34,755	1,79,683	10,652	63,059	61,039	2,93,744
1274	43	164	14,337	53,051	3,829	22,554	33,337	1,74,096	12,567	73,421	64,113	3,18,220
1275	41	178	16,038	68,279	4,016	23,937	32,563	1,79,410	12,888	74,754	65,546	3,45,175
1276	1	5	14,101	83,419	4,272	23,937	31,775	1,79,213	12,762	73,973	62,911	3,60,547
1277	3	16	15,418	91,655	4,630	22,711	31,450	1,94,133	15,002	80,311	68,963	3,94,226
1278	4	16	14,603	86,253	4,078	22,828	28,647	1,61,352	11,609	67,632	58,941	3,38,081
Total...	308	870	131,755	5,25,983	39,709	1,92,547	291,132	16,08,114	127,511	7,42,450	590,415	30,69,964
Average...	26	73	9,411	37,570	3,055	14,811	22,395	1,23,701	9,108	53,032	42,172	2,19,283

17. It will be seen from the above that Gudivada and Bapatla Talooks in the Delta first came under the influence of the anicut-channels, and the others subsequently. The cultivation of dry land converted into wet was highest during Fusly 1277, namely, Acres 68,963, bearing an assessment of Rupees 3,94,226, of which the water-rate amounted to Rupees 2,75,852.

18. The usual wet cultivation also increased to a large extent under channel-irrigation, as detailed in the following summary compared with the extent during five years previous to the construction of the anicut. Since Fusly 1276, however, in the talooks of Bandur and Gudivada, there has been a great decrease in land, and a large increase in assessment. This is due to the introduction of the new settlement and water-rate.

Before and subsequent to the construction of anicut.	Fuslies.	Bandur.		Gudivada.		Bezwada.		Repallee.		Bapatla.		Total.	
		Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment	Extent.	Assessment.	Extent.	Assessment.	Extent.	Assessment.
Before the construction of the anicut.	1260 ...	ACS. 3,800	RS. 4,579	ACS. 10,581	RS. 43,664	ACS.	RS.	ACS. 6,537	RS. 38,616	ACS. 7,299	RS. 45,414	ACS. 28,217	RS. 1,32,273
	1261 ...	3,800	4,579	21,903	70,491	.....	.....	6,674	39,126	8,714	53,357	41,091	1,67,553
	1262 ...	3,595	5,274	25,304	77,930	.....	.....	7,789	35,351	8,488	52,266	45,176	1,70,821
	1263 ...	3,548	5,396	24,616	77,279	.....	.....	7,072	40,571	9,237	55,821	44,503	1,79,067
	1264 ...	3,547	5,405	35,898	82,759	.....	.....	9,284	46,976	10,110	60,492	58,839	1,95,632
Total...	.....	18,290	25,233	118,332	3,52,123	.....	.....	37,356	2,00,640	43,848	2,67,350	217,826	8,45,346
Average...	.....	3,658	5,046	23,666	70,425	.....	.....	7,471	40,128	8,770	53,470	43,565	1,69,069
After the construction of the anicut.	1265 ...	3,552	5,356	37,735	70,876	.....	.....	4,977	29,095	12,155	73,349	58,419	1,78,676
	1266 ...	3,710	5,477	39,482	85,366	.....	.....	9,605	52,587	13,637	80,414	66,434	2,23,844
	1267 ...	3,750	5,900	39,683	85,349	.....	.....	10,113	57,937	13,846	80,471	67,392	2,29,657
	1268 ...	3,735	5,912	41,552	1,01,913	.....	.....	11,938	68,646	13,210	79,387	70,435	2,55,858
	1269 ...	3,796	6,113	40,950	1,13,475	.....	.....	9,307	53,247	11,167	67,814	65,220	2,40,649
	1270 ...	3,731	6,045	39,866	1,14,880	.....	.....	9,133	51,903	10,642	64,597	63,372	2,37,425
	1271 ...	3,733	5,990	41,454	1,15,484	.....	.....	9,326	53,412	10,916	65,938	65,429	2,40,824
	1272 ...	3,703	6,129	42,887	1,19,416	.....	.....	9,493	54,271	10,882	66,376	66,965	2,46,192
	1273 ...	3,772	6,158	45,683	1,21,545	.....	.....	9,495	54,279	13,995	83,057	72,945	2,65,039
	1274 ...	3,674	6,084	48,177	1,24,184	.....	.....	9,466	54,133	13,738	81,338	75,055	2,65,739
	1275 ...	3,593	5,954	48,857	1,25,465	.....	.....	9,409	53,809	13,010	77,508	74,869	2,62,736
	1276 ...	1,436	7,399	22,890	1,26,996	.....	.....	9,459	53,952	13,007	76,866	46,792	2,65,213
	1277 ...	1,640	8,424	26,232	1,49,685	.....	.....	9,459	53,952	13,177	77,332	50,508	2,89,393
	1278 ...	1,189	6,117	17,475	1,01,303	.....	.....	12,156	69,150	12,416	73,393	43,236	2,49,963
Total...	.....	45,014	87,058	532,923	15,55,937	.....	.....	133,336	7,60,373	175,798	10,47,840	887,071	34,51,208
Average...	.....	3,215	6,218	38,066	1,11,138	.....	.....	9,524	54,312	12,557	74,846	63,362	2,46,515
Deduct the average of the past 5 years before the anicut.	.....	5,046	23,666	70,425	.....	.....	7,471	40,128	8,770	53,470	43,565	1,69,069	
Net Increase...	.....	1,172	14,400	40,713	.....	.....	2,053	14,184	3,787	21,376	19,797	77,446	

19. The net increase of revenue on usual wet lands due to the anicut is Rupees 77,446 a year four Fusly 1265 to 1278, or 46 per cent. on the average amount of the previous five years.

20. In addition to the above, a large income has been derived since the construction of the anicut from dry crops watered both in Government, Zemindary, and Inam lands, and from dry lands converted into wet both in Zemindary and Inam, inclusive of water-rate collected in Repallee and Bapatla Talooks on usual wet Inams, at one rupee per acre in lieu of ghuttutumulu,* commuted into money-rents as detailed in the following statement :—

* ఘుటుతూములు paid in grain at one toom per candy of produce for the repairs of irrigation-tanks.

Fuslies,	Dry Crops watered.					Dry Lands converted into Wet.				Water-cess collected on usual wet Inams in lieu of ghuttutumulu formerly paid for the repair of tanks.	Grand Total.
	Government land.	Inam lands included in Government villages.	Zemindary.		Total.	Zemindary.		Inam lands, etc., in Government villages.	Total.		
			Zemindars' Sairi lands.	Inams included in Zemindary villages.		Zemindars' Sairi villages.	Inams, etc., included in Zemindary villages.				
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1265	...	...	...	...	...	...	...	...	...	...	...
1266	454	227	...	...	681	...	...	84	84	2,279	2,363
1267	1,276	2,506	...	...	3,782	...	...	803	803	1,349	2,833
1268	3,769	2,184	...	...	5,953	...	...	615	615	1,272	5,669
1269	12,146	2,038	...	...	14,184	...	...	2,940	2,940	2,073	10,966
1270	2,644	1,005	...	...	3,649	...	...	3,730	3,730	3,152	21,066
1271	15,719	1,636	...	...	17,355	...	...	12,576	12,576	3,730	19,955
1272	1,902	561	...	...	2,463	...	...	14,470	14,470	3,176	35,001
1273	17,066	1,490	13,208	3,637	35,401	10,298	6,133	14,797	14,797	3,000	20,260
1274	4,023	412	3,906	1,202	9,543	16,597	6,630	27,518	43,949	4,130	83,480
1275	10,403	707	8,918	1,491	21,519	33,580	6,380	31,882	55,109	4,021	68,673
1276	5,434	179	2,519	750	8,882	42,049	7,908	31,464	71,424	3,194	96,137
1277	5,207	1,242	2,226	265	8,940	43,948	8,788	48,357	98,314	3,439	1,10,635
1278	16,548	2,935	361	280	20,124	59,677	11,580	48,206	1,00,942	3,874	1,13,756
Total ...	96,591	17,122	31,138	7,625	1,52,476	2,00,149	47,419	46,349	1,11,606	3,921	1,35,651
Average ...	7,430	1,317	5,189	1,271	11,721	33,358	7,903	2,83,791	5,31,359	42,610	7,26,445
								20,271	37,954	3,044	51,889

Notes.—For water-rate collected (from 1265 to 1272) from Zemindars no accounts are forthcoming in the Collector's office. They were destroyed during the cyclone of 1864.

21. The following statement shows in one view the income derived from the anicut irrigation from Fusly 1265 to 1278.

Talooks.	TOTAL INCOME FROM THE ANICUT-IRRIGATION FROM FUSLY 1265 TO 1278.														ADD WATER-RATE COLLECTED FROM ZEMINDARS, ETC., FOR ANICUT-IRRIGATION.						Grand total profit.
	From conversion of dry land into wet.		From increase in cultivation of usual wet.		From dry crops irrigated.		Total.		Average.		Deduct average assessment for 5 years on usual wet lands before the anicut.		Remainder per year.		Total profit for 14 years.		On lands converted from dry into wet.		For dry crops watered		Total.		
	Government.	Inam.	Government.	Inam.	Government.	Inam.	Government.	Inam.	Government.	Inam.	Government.	Inam.	Government.	Inam.	Government.	Inam.	Zemindary.	Inams in Zemindary.	Zemindary	Inams in Zemindary.	Zemindary.	Inams in Zemindary.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Bandur ...	870	.....	87,058	.....	265	.....	88,193	.....	6,300	.....	5,046	.....	1,254	.....	17,550	.....	.....	.....	.....	.....	.....	.....	.....
2. Gudivada...	5,25,983	84,194	15,55,937	.....	14,275	1,266	20,96,195	85,460	1,49,728	6,104	70,425	.....	79,303	6,104	11 10,242	85,460	.....	.....	.....	.....	.....	.....	.....
3. Bezwada ...	1,92,547	25,185	.....	.....	3,787	399	1,96,334	25,584	15,103	1,968	.....	.....	15,103	1,968	1,96,331	25,584	.....	.....	.....	.....	.....	.....	.....
4. Repallee ..	16,08,114	1,13,497	7,60,373	24,093	60,163	12,458	24,28,650	1,50,048	1,73,475	10,718	40,128	479	1,33,347	10,239	18,66,858	1,43,346	.....	.....	.....	.....	.....	.....	.....
5. Bapatla ...	7,42,450	60,915	10,47,840	18,517	18,101	2,999	18,08,391	82,431	1,29,171	5,888	53,470	529	75,701	5,359	10,59,814	75,026	.....	.....	.....	.....	.....	.....	.....
Total...	30,69,964	2,83,791	34,51,208	42,610	96,591	17,122	66,17,763	3,43,523	4,72,697	24,537	1,69,069	1,008	3,03,628	23,529	42,50,804	3,29,416	2,00,149	47,419	31,138	7,625	2,31,287	55,044	48,66,751

22. It will be seen from the above that the total income for water supplied, during the past fourteen years, to ryots and Inamdars in Government villages, as well as to Zemindars and their Inamdars, amounts to Rupees 48,66,751

23. Appendix No. II. shows the extent of dry land that could be converted into wet under existing irrigation-channels, and if new channels are excavated. It will be seen therefrom that about 122,000 acres of dry land could be converted, yielding an additional revenue of six lacs of rupees. The land entered in column 6 of the statement is almost all swamp now lying waste. An abstract is given below for easy reference:—

Talooks.	Extent of dry land that could be converted into wet under existing channels.		Extent of dry land that could be converted into wet if new channels are excavated.		Total.	
	Land.	Assessment *plus* water-rate.	Land.	Assessment *plus* water-rate.	Land.	Assessment *plus* water-rate.
1	2	3	4	5	6	7
	Acs.	Rs.	Acs.	Rs.	Acs.	Rs.
1. Bandur ...	69	320	6,735	31,740	6,804	32,060
2. Gudivada ...	1,332	7,549	77,634	3,88,354	78,966	3,95,903
3. Bezwada ...	174	926	6	34	180	960
4. Repallee ...	5,332	36,397	12,830	66,207	18,162	1,02,604
5. Bapatla ...	1,530	9,554	16,183	73,527	17,713	83,081
Total ...	8,437	54,746	113,388	5,59,862	121,825	6,14,608

24. I will now briefly describe the system of wet cultivation both before and after the construction of the anicut, and the mode in which the water-rate rules have been observed.

25. In the Masulipatam portion of the Delta the usual wet lands in Gudivada and Bandur were formerly cultivated under the Budamair and Pullair, which were streams supplied by the Kistna freshes and also under rain-fed tanks. The Bezwada Talook had no wet cultivation in the villages which fall within the Delta. In Repallee and Bapatla Talooks on the Guntoor side wet cultivation was carried on under rain-fed tanks, and tanks supplied by channels leading from the Kistna and Nullamado. In all talooks the mode of cultivation was never on a large scale; the supply of water being precarious.

26. So long as the sharing system existed the whole extent of the arable wet land, which the ryots occupied according to their respective shares in each talook, was seldom fully cultivated: the portion left waste was not charged. The extent of waste in every village enabled the ryots to change about from block to block, leaving the relinquished portions fallow for three or four years; and as the revenue was dependent on the quantity of produce yielded, not on the extent of land in occupation, no objection was made to this method.

27. After the introduction of money-rents into Guntoor in 1847, this practice was abolished. Each ryot took up so much land as he felt able to pay for, it being optional with him to leave a portion waste for his own convenience. In Masulipatam the sharing and unchana nivada, etc., systems were superseded by village joint rents in 1850, as the option of appor-

ಅಂದಾಜಿನಮೇಲೆ, *i. e.*, average of estimates.

tioning the total rent on individual holdings was given to the villagers, they distributed it according to their own convenience, and with reference to the capabilities and nature of the soil. The rents, too, being very light it did not prove hard on any individual to pay for the land which he left waste.

28. The Kistna anicut was constructed in the year 1852, and the subsidiary works partially completed by the end of the year 1855.

29. As soon as anicut-water was made available in Guntoor, the Collector, to encourage the ryots to undertake wet cultivation in those talooks* where it was previously unknown, proposed the introduction of a water-rate to be added to the existing dry rates, and imposed gradually. It was eventually decided† that dry lands converted into wet in these talooks should pay a water-rate of 4 rupees an acre, to be collected according to the taragati‡ specified in the margin; the full rate being enforced from the fifth year. This rate was inclusive of charge for a second crop, should such be grown. With respect to the Repallee, Ponnur, and Bapatla Talooks, § where there was already wet cultivation under tank-irrigation, it was settled that all dry lands, which might be converted into wet with anicut-water, should pay the usual wet assessment of the neighbourhood without any taragati being allowed, unless in exceptional cases. The allowance was to be made for all Inam lands converted from dry into wet.

* Tenali and Mungalgeri. These villages are now included in the present Repallee Talook.

† E. M. C., 25th August 1856, No. 883.

‡ తరగతి (gradually increasing rate.)"

1st	year	... ...	nil.
2nd	do.	... ...	1 rupee.
3rd	do.	... ...	2 ,,
4th	do.	... ...	3 ,,
5th	do.	... ...	4 ,,

§ Now included in Repallee and Bapatla.

30. In the Gudivada and Bandur Talooks taragati was not allowed, as the joint-rent system was in force. The rents were increased with reference to the extent of land irrigated yearly and the estimated amount of produce. In Bezwada Talook the conversion of dry into wet was introduced in Kunkipad village without any progressive rates of assessment. The water was charged for at different rates.

Rates charged.....	Rupees	1-0-0
	,,	2-0-0
	,,	3-0-0
	,,	3-8-0

31. In this manner the ryots in the Delta gradually increased the usual wet cultivation, and converted into wet a good deal of dry land, both waste and cultivated, as water became available, without much consideration as to whether the existing channels could continue to supply water for such an extent of nunjah cultivation, or whether the converted dry lands, some of which had been under dry cultivation for years, were well suited for wet crops. This went on for some years, or until about 1864-65, during which period much profit was made on most lands thus cultivated.

32. At the commencement of this cultivation the ryots of the Tenali and Zampani kandams or divisions, yielding to a little "moral persuasion," gave agreements to the Tahsildars to convert a given extent of dry land into wet. As

they found it profitable they increased their cultivation with or without permission. In Bapatla Talook applications were formally made to the Tahsildars in cases in which taragati was required. In Gudivada and Bandur the ryots converted their lands into wet as water became available, without any formal application; because under the joint-rent system the whole extent of land of the village was at their disposal. In Bezwada Talook the same system was pursued to some extent.

33. As regards the Zemindars the channels, which benefited their estates, were first excavated in communication with them, and on their formal applications. All land that was yearly converted from dry into wet was in the proper season measured for the purpose of assessing the water-rate. The same course was followed as regards Inams.

34. All the dry land converted into wet under anicut-irrigation since Fusly 1265 has been yearly entered under the head of permanent nunjah up to the present time in the Bapatla Talook, and up to Fusly 1276 in Repallee Talook. In Bezwada it has been all along entered in the accounts as "dry converted into wet;" the dry assessment and water-rate being shown separately in the accounts. In Bandur Talook the same course was followed up to Fusly 1273; and in Fusly 1274 the dry converted into wet was transferred to permanent nunjah. In Gudivada Talook all dry land converted into wet from Fusly 1265 to 1272 was entered in the accounts under "temporary nunjah," and transferred to permanent nunjah in Fusly 1273. Portions of dry converted into wet subsequently were transferred to the same head during the settlement of Fuslies 1273 and 1274.

35. From Fusly 1265 up to 1273 great eagerness for water was shown everywhere: subsequently the demand for it declined under the following circumstance.

36. In the Tenali and Zampani khandams of Repallee Talook the taragati expired with Fuslies 1271 and 1272, and from Fuslies 1272 and 1273 the ryots had to pay full water-rate. They then commenced to ask for permission to re-convert into dry such of the lands as were found unsuited for wet cultivation, either from "inaccessibility to irrigation," "chavudu," or from being "pulludu." In other portions of this talook, and in Bapatla also, similar complaints became frequent. In the latter talook some lands were relinquished on account of being over-grown with "vellatunga," a kind of coarse salt-grass. In Gudivada Talook complaints were made of "chavudu" (poorness of soil) and inaccessibility to irrigation from Fusly 1275. In Bezwada some lands became gradually inaccessible to channel-irrigation.

37. Under the Water-rate Rules first introduced in 1861* or Fusly 1272, the Revenue authorities being unable to permit the re-conversion of such lands into dry, they were in many cases cultivated with dry crops, the assessment *plus* water-rate being paid. A statement of such land will be given hereafter. In some Fuslies water-rate was remitted during the Jummahbundy.

* G. O., 26th October 1861, No. 2,054.

38. For some years past the ryots have applied in person and through the Revenue authorities to the Department of Public Works for certificates to re-convert into dry lands of the nature mentioned above. Certificates have been

granted for 2,700 acres of land both Government and Inam (an abstract of this is given below), and it has accordingly been transferred to punjah :—

From Fusly 1273 *to* 1278.

Talooks.	Sairi or Inam.	Extent of dry land converted into wet for which applications were made for certificates for re-conversion into dry.		Extent of land for which certificates were granted by Department Public Works.	
		Land.	Assessment.	Land.	Assessment.
1	2	3	4	5	6
1. Bandur	Govt....	ACRES. 1	RS. 4	ACRES. 1	RS. 4
	Inam....	.....	.....	.....	.....
Total	.....	1	4	1	4
2. Gudivada	Govt....	395	2,301	34	165
	Inam...	649	2,597	58	232
Total	.....	1,044	4,898	92	397
3. Bezwada	Govt....	310	2,165	310	2,165
	Inam.	.....	.....	.....	.....
Total	.....	310	2,165	310	2,165
4. Repallee	Govt....	782	3,291	774	3,272
	Inam....	354	1,408	354	1,408
Total	.....	1,136	4,699	1,128	4,680
5. Bapatla	Govt....	766	4,624	766	4,624
	Inam....	408	1,631	403	1,613
Total	.....	1,174	6,255	1,169	6,237
Total	Govt....	2,254	12,385	1,885	10,230
	Inam....	1,411	5,636	815	3,253
	.....	3,665	18,021	2,700	13,483

39. The first Water-assessment Rules, dated 26th October 1861 came into operation from Fusly 1272. Clause 2nd† of these Rules was acted upon as regards the Government lands in the eleven villages of the Bezwada Talook, and in the Tenali and Zampani khandams of the Repallee Talook where the consolidated water-rate of Rupees 4 an acre was superseded by Rule VIII. It was not made applicable to the talooks of Gudivada and Bandur where joint-rents then existed, nor to Bapatla, nor

† "All lands now permanently supplied with irrigation for a single wet crop shall be classed as irrigated, and charged 3 rupees per acre for water in addition to their fixed land-assessment. Lands newly brought under irrigation, and classed as irrigated shall be assessed at one-half of the above rate of 3 rupees for the first year, and at the full rate in the subsequent years; provided that if the land is thrown up at the end of the first year, the full rate will be charged for it, though one ryot may transfer his land to another without forfeiting the favourable rate for the first year."

to the remaining portion of Repallee where the consolidated nunjah rates were in force. All Inam and Zemindary lands converted from dry into wet came under the operation of this clause.

40. Rule VIII.* was not regularly acted upon : application was not made, as a rule, to the Collector or Tahsildar by the Government ryots when they converted dry into wet under existing irrigation. The reason alleged is, that the supply from the channels being precarious and often inadequate, the ryot would wait till the season promised well, and then, hoping to get a fair crop with the united assistance of channel-water and rain, he converted his land into wet. Such lands were measured before the close of the fusly for the purpose of being assessed, and were thenceforward entered under the head of nunjah or irrigated. When large tracts of lands, not irrigable from existing sources, were proposed to be taken up, the custom generally observed by the ryots was to apply to the Department of Public Works for new branch channels : seldom to the Collector.

*"When ryots desire to irrigate dry land, and to convert it permanently into the class of nunjah cultivation, application is to be made to the Collector, either direct or through the Tahsildar, on or before the 31st March. The Collector will then arrange with the Public Works Department for the supply of water, and will direct the entry of the land under nunjah or irrigated. The arrangements for the supply of water to lands to be newly irrigated will be regulated by tracts, and not by detached fields."

41. When large projects of irrigation were proposed by the Engineer Department, the estimates prepared by them were forwarded for opinion and counter-signature to the Collector, who referred them to the Tahsildar for inquiry and report as to the extent of land which could be irrigated. The Tahsildar then sent for the Village Curnums, and ascertained from them the area which might be converted into wet, and the probable increase to the revenue. The ryots were not, as a rule, consulted as to whether the lands are suited for wet cultivation, or whether they are willing to take water. On the receipt of the Tahsildar's report the estimates were returned to the Department of Public Works with the Collector's opinion on the projects.

42. Rule IX.† has not been observed at all by the ryots. In years of drought the practice was to ask the Overseers and Delta Goomastahs for permission to water their dry crop; the application being postponed to the last moment in hopes of a fall of rain; or they would surreptitiously take water by making breaches in the bunds. Statements for irrigated dry crop are prepared by the Village Curnums and by the Department Public Works. These two accounts come before the Collector at the time of settlement. These often vary one from the other : on the one hand the ryots assert that they did not use the channel water, but that their lands were flooded by the channel having overflowed its banks; on the other hand the officers of the Department Public Works say that the water was surreptitiously taken. The settlement officer has to decide the case on its merits; but in most cases where any difference of opinion exists, the Department Public Works' Register is acted upon.

†"Where water is temporarily required for dry crops on dry land, application may be made in a similar manner (*i.e.*, to the Collector either direct or through the Tahsildar) at any time, and the Collector will arrange with the Public Works Department for the supply, if other exigencies will admit of it."

49. It is true, however, that, under revised Rule II.,* land converted in 1274, the extent of which was Acres 10,107, was not to be considered permanent nunjah till another year had elapsed.

50. In May 1867 an order was issued to the Tahsildars of the Delta talooks, directing them to enter in the accounts under "*nunjah head*" all dry lands newly converted into wet if they had been irrigated in three successive seasons, and that, till such period, lands of this description should be retained under the head of dry, the dry assessment and water-rate being shown separately in the accounts. The Tahsildar of Repallee Talook reported in reply that all the dry lands converted into wet up to the end of Fusly 1276 had been entered yearly under the nunjah head in all accounts kept in the villages and talook; and that it would be very difficult to separate them. He therefore requested permission to enforce the order from Fusly 1277 only. Accordingly the Collector directed that as the lands had already been entered as nunjah, they should not be separated, but that all lands forming part of the above which the ryots had sought permission, during the settlement of Fusly 1276, to re-convert into dry, on the ground that they were inaccessible to irrigation, should be excluded from *nunjah* head and transferred to *punjah*. The latter part of this order does not seem to have been acted upon. The lands converted from dry into wet from Fusly 1277 have been entered in the accounts as temporary *nunjah*, and the ryot allowed the option of refusing irrigation during the three years' limit.

51. This order was acted upon in the talooks of Bezwada and Bandur. It was not noticed at all in Bapatla Talook, and there dry lands converted into wet are still entered under nunjah head. In Gudivada Talook it was carried out.

52. It seems clear then that Clause 2 of the revised Rule VII. has not been observed strictly, nor is it generally known to the ryots. During the present inquiry some have stated that they became aware of its provisions in Fusly 1277. I have found that the greatest possible ignorance exists on the subject of the rules even among the Curnums, who might be expected to know better. They have every facility for becoming acquainted with them if they choose.

53. No exceptional cases have hitherto occurred, such as are alluded to in the 3rd Clause of Rule VII.†

54. Before this Rule‡ was passed, the custom existed of taking an account from the Curnums of the extent in each village which might be cultivated under any new channel, and orders were thereon issued to cause cultivation to be made. The course pursued since the rule was passed has not been very different. A remark has been entered in some cases in the accounts to the effect, that the ryots were willing to cultivate wet

* Rule II.—"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 Rs. 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."

† "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."

‡ Clause 4.—"When 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 water-rate as may in each case appear necessary shall be taken from the land-holders, for whose benefit the work is designed, but the fulfilment of the agreement will depend on Government sanctioning the proposed outlay for the work."

crops; but no formal agreement seems ever to have been taken. In other cases a remark on the estimate forwarded from the Public Works Department that the ryot had promised to cultivate so and so was accepted as sufficient.

55. It was owing to repeated applications from the ryots of the Repallee Talook for permission to re-convert land into dry on account of efflorescence, inaccessibility to irrigation and deficiency of water-supply, that Mr. Thornhill was obliged to recommend* the modification of Water-rate Rules, which has been since allowed as a temporary measure.

* 30th March 1867, No. 87.

56. In their Proceedings, dated 5th August 1868, the Board of Revenue gave to the cultivators of dry land converted into wet the option of refusing irrigation during the ensuing two years, because Rule VII. of the Teerwajasti Rules, which prescribed three years' limitation for the ryot to decide whether he wished to retain his land under permanent *nunjah*, had not been properly enforced.

57. This order was duly notified in the *District Gazette* of 5th September 1868, with Rule VII. appended thereto.

58. On a reference from the Superintending Engineer, Mr. McQuhae subsequently issued orders to the Tahsildars of the Delta talooks, stating that as the revised Teerwajasti Rules were published in Fusly 1275 (1865-66), the option given by the Board was applicable only to lands converted into wet from that year. A short time afterwards Mr. Wilson made a reference to the Board, asking whether their Order of the 5th August was not also applicable to lands converted into wet from the time the anicut-channels came into play. The Board replied† in the affirmative; and on 21st June 1869 the Officiating Collector issued orders in the *District Gazette*, notifying to all ryots, Zemindars, and Inamdars, that they are at liberty to refuse irrigation up to the end of Fusly 1279 for all dry lands converted into wet under Kistna channels, without the necessity of obtaining certificates from the Department Public Works.

† Proceedings, 4th June 1869, No. 3,979.

59. From the date of Mr. McQuhae's first order up to June 1869, applications were received for the re-conversion into dry of 134 acres of land in the Delta talooks; and during the settlement of Fusly 1278, this land was transferred to *punjah*. Since the promulgation of the Notification issued by the Officiating Collector numerous applications have been received from the ryots. The extent of land thus applied for up to 30th September 1869 is Acres 10,119. A statement of the same is given below. It includes not only land that was under dispute before Fusly 1278, but also some that had been under wet cultivation from the commencement without complaint. From this it may fairly be presumed that the ryots, whose lands are not unsuited for wet cultivation, have applied for permission to re-convert them to punjah thinking that if this opportunity is lost they may not have another; knowing

also that they can re-convert them into wet when they like, and then refuse irrigation at any time within the limited period of three years. It will be observed that the total extent re-converted up to date amounts to Acres 12,819,* or 22 per cent.† on the extent already converted into wet:—

* As per certificates granted by Department Public Works... 2,700
As per new Order 10,119
12,819

† On the cultivation of Fusly 1278.

Talooks.	Extent of Chavudu and Nalaik lands.	Extent of land applied for from the date of Mr. McQuhae's Order, dated 6th November 1868, up to 20th June 1869.	Extent of land applied for from 21st June 1869, agreeably to the Collector's Notification in the District Gazette of 26th idem, up to 30th September 1869.	Total of columns 3 and 4.	Per-centage of columns 2 and 5.	Remarks.
1	2	3	4	5	6	7
1. Bandur...	Acs. 3,012	Acs. ...	Acs. ...	Acs. ...	Acs. ...	The extent of land for which irrigation has been refused is Acres 10,119, both Government and Inam. The probable amount of water-rate thereon is Rupees 40,476. This loss is estimated up to 30th Sept. 1869. As option is allowed till the close of Fusly 1279, or till 30th June 1870, many further applications may yet be received.
2. Gudivada	12,532	2	1,623	1,625	13	
3. Bezwada.	232	48	216	258	111	
4. Repallee.	7,508	40	6,341	6,381	85	
5. Bapatla..	2,929	50	1,805	1,855	63	
Total...	26,213	134	9,985	10,119	39	

60. It has been brought to notice that in several villages of the Delta talooks, ryots who had applied for permission to re-convert their lands into dry, have, owing to a sufficient water-supply, cultivated them with wet crops during the current fusly. It may fairly be presumed from this that so long as water is not deficient, the ryot does not prefer dry to wet, except in cases where lands have become really unsuited for wet crops. This leads me to think that the re-conversion of any large extent will not be permanent, but the action of the ryots tends to show what the popular feeling on the subject is.

61. In paragraph 8 of their Proceedings, dated 5th August 1868, the Board remarked that if Rule VII., which "prescribes that when dry land is converted into "wet, and water is taken for three years in succession, the land should be permanently classed as irrigated," whereby an option is given to the ryots "to decide, "after trying irrigation for two years, whether they will continue to use Government water or not," had been properly enforced, the wide-spread dissatisfaction which now exists would not have arisen. They forgot, however, that this option was accorded only in the Water-rate Rules of 1865, and not in those of 1861.

62. In fact, Rule VII. only applies to land converted into wet from Fusly 1275, shown in paragraph 48 supra to be 6,009 acres. The Board, it is true, have, in Proceedings, 4th June 1869, No. 3,979, given retrospective effect to their indulgence; but they will observe that the general dissatisfaction related to rules which contained no option which could have mitigated the burden imposed on the bulk of the ryots.

63. The Amarakam or extent occupied for Fusly 1278 (1868-69) is short of that for Fusly 1277 (1867-68). The net decrease is Acres 19,415, or 3 per cent. on the Amarakam of Fusly 1277, as detailed in the following Statement :—

Talooks.		Land occupied in 1277.		Land relinquished in 1278.		Remainder.		Land newly taken up in 1278.		Total Amarakam for 1278.		Comparison between columns 4 and 5 and 8 and 9.			
												Increase.		Decrease.	
		Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15
		ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
1. Bandur ...	Dry ...	37,907	63,935	2,500	3,514	35,407	60,421	1,541	1,813	36,948	62,234	.....	.....	959	1,701
	Wet ...	10,977	51,277	1,525	6,754	9,452	44,523	797	3,465	10,249	47,988	.....	.....	728	3,289
	Total...	48,884	1,15,212	4,025	10,268	44,859	1,04,944	2,338	5,278	47,197	1,10,222	.....	.....	1,687	4,990
2. Gudivada...	Dry ...	42,238	61,652	3,225	3,480	39,013	58,172	2,150	2,839	41,163	61,011	.....	.....	1,075	641
	Wet ...	42,554	2,42,504	17,661	98,056	24,893	1,44,448	7,268	40,248	32,161	1,84,696	.....	.....	10,393	57,808
	Total...	84,792	3,04,156	20,886	1,01,536	63,906	2,02,620	9,418	43,087	73,324	2,45,707	.....	.....	11,468	58,449
3. Bezwada ...	Dry ...	59,531	69,784	1,363	1,322	58,168	68,462	1,488	1,399	59,656	69,861	125	77	.....	.....
	Wet ...	8,822	43,817	181	886	8,641	42,931	362	1,704	9,003	44,635	181	818	.....	.....
	Total...	68,353	1,13,601	1,544	2,208	66,809	1,11,393	1,850	3,103	68,659	1,14,496	306	895	.....	.....
4. Repallee ...	Dry ...	154,711	2,74,693	2,857	4,258	151,854	2,70,435	4,442	8,195	156,296	2,78,630	1,585	3,937	4,153	23,688
	Wet ...	43,908	2,48,085	5,490	30,848	38,418	2,17,237	1,337	7,160	39,755	2,24,397	.....	.....	4,153	23,688
	Total...	198,619	5,22,778	8,347	35,106	190,272	4,87,672	5,779	15,355	196,051	5,03,027	1,585	3,937	.....	.....
5. Bapatla ...	Dry ...	164,783	3,19,098	1,987	2,661	162,796	3,16,437	2,199	2,838	164,995	3,19,275	212	177	4,210	22,575
	Wet ...	30,433	1,81,130	6,638	36,106	23,795	1,45,024	2,428	13,531	26,223	1,58,554	.....	.....	4,210	22,575
	Total...	195,216	5,00,228	8,625	38,767	186,591	4,61,461	4,627	16,369	191,218	4,77,829	212	177	2,034	2,342
Total ...	Dry ...	459,170	7,89,162	11,932	15,235	447,238	7,73,927	11,820	17,084	459,058	7,91,011	1,922	4,191	19,484	1,07,360
	Wet ...	136,694	7,66,813	31,495	1,72,650	105,199	5,94,163	12,192	66,108	117,391	6,60,271	181	818	21,518	1,09,702
	Total...	5,95,864	15,55,975	43,427	1,87,885	552,437	13,68,090	24,012	83,192	576,449	14,51,282	2,103	5,009	2,103	5,009
Deduct Increase...		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19,415	1,04,693
Net Decrease...		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Curnums and make them furnish statements which are embodied in a form by some talook official, and receive the Tahsildar's signature, though no real check can be made as to the correctness of the figures. Such documents go up to the next higher authority, and so in time to the Board and Government; and are generally accepted as *bonâ fide* returns, though in reality they have no title to be considered so.

71. In the present instance there were causes at work which made it necessary to observe more than usual caution in accepting the Curnum's entries. In Gudivada Talook, which was the first visited, a notion had gained ground that the more "chavudu" land entered in the accounts, the greater probability of some reduction in the rates or other boon. The ryots put pressure on the Curnums to enter their respective fields as "chavudu," on the plea that they would thus get "justice." The consequence was that when an examination of this so-called "chavudu" came to be made, it was found that whole tracts had been so entered which had no pretention to the title. In one very flagrant case the Officiating Collector, at my request, made an example of the Curnums; and this had a considerable effect, for many other Curnums then took advantage of the opportunity afforded them to amend their statements. Still it was clear, as the examination of lands went on, that far more land had been entered as "chavudu" than really existed; and this was evidenced not only by the direct admission of the villagers on the ground, but by the marked absence, in several cases, of the village officials who had, though duly warned to attend, evaded the order, fearing that they would be reported to the Collector for having rendered false accounts.

72. In the other talooks somewhat more caution was I believe taken. The Collector's action has been notified in the *District Gazette*, and the village officials were more on their guard. If, however, as I have been informed was the case, this led to their transferring bodily to another head, what had been intended for "chavudu," it has not, I fear, made the ultimate result any more trustworthy.

73. Premising, therefore, that the statement is not perfect, I proceed to offer a few remarks upon it.

74. It will be observed that out of Acres 217,201 (contained in 368 villages) which represent the arable land in the Delta talooks at present under the command of the Kistna Anicut, Acres 26,213 (contained in 226 villages), or 12 per cent., are said to be unfit for wet cultivation from various causes. Of these "chavudu" is estimated at 3 per cent. of the total area, and the remaining causes at 9 per cent. Classing the different disqualifications with reference (1) to the quality of the soil, and (2) to the deficiency or excess of water, we have Acres* 11,067, or 5 per cent. of the whole, unfit as to *soil*; and Acres† 15,146, or 7 per cent., unsuitable with reference to *water*.

*		Acs.
	Chavudu	6,714
	Pulludu	3,237
	Gulakarai	319
	Vellatunga	797
		11,067

†		Acs.
	Inaccessible to irrigation	7,881
	Flooding	2,197
	Leakage	128
	Inundated by sea	4,940
		15,146

NOTE.—In this Report "dry into wet" means land converted from the commencement of the anicut-irrigation.

75. Again the proportion of "chavudu" in "usual wet" and "dry into wet" is as 4 to 2, whether in Government land or in that and Inam combined.

(4.) *Chakala chavudu* (చాకలిచవుడు) or Washermen's chavudu.

84. The two first named species are most general.

85. Three, four, and five years have been mentioned as the periods after which, in the case of dry lands converted into wet, the efflorescence has appeared.

86. In hot weather it is said to be always palpable to the sight and taste. Lieutenant Smith, R.E., states that "the salt is so deliquescent that a sea breeze "renders the surface of the ground sticky and uncomfortable to walk upon." In the rainy season it is of course not so apparent. It is alleged also that it can be smelt.

87. Opinions differ as to whether "chavudu" (చవుడు) was wont to occur under tank irrigation in former times: at all events it was comparatively unknown. Lieutenant Smith, R.E., mentions it as found under tanks in the upper western talooks, and in waste lands it has existed to a small extent from time immemorial. Out of forty villages in the Delta Talooks in which the question was put, twenty could offer no opinion, fifteen answered it in the negative, and five only in the affirmative.

88. The complaint, in the opinion of most of the officers asked, is not as a rule a *bonâ fide* one. It is often put forward as a pretext for remission. The crop may be a poor one from deficiency of water or from want of manure, and so the ryot says the land has turned "chavudu" (చవుడు.) I quite concur in this view. It has become the fashionable complaint of the district, with "gulakarai" (కులకరై) of which more further on. The cry is caught up and carried from village to village because it is believed that it will be efficacious in easing the shist.

89. Lieutenant Smith, R.E., has furnished me with the following opinion on the cause of "chavudu." "The water soaks into the soil, and at a certain depth "finds the salt. There is then a mild solution of 'chavudu' on the upper "stratum; the sun acts on this and evaporates the water which by capillary attrac- "tion mounts up to the surface to keep up the supply, bringing with it the salt, "and so the process is repeated until the soil is rendered in some cases worthless, "and in other cases more or less so. This worthlessness, together with the time of "its first appearance depends, I think, on the depth of the salt below the surface; "both vary constantly and, I imagine, equally. Thus scarcity of water will tend "to produce chavudu sooner, because it is kept stagnant on the land until it dries "up altogether before a fresh supply is received. At the same time in large hold- "ings I have no doubt that "chavudu" appears on portions where an excess of "water can be supplied, simply because the owner takes no trouble to regulate "that supply, and through apathy and meanness allows the bunds of small field "channels leading to his higher lands to get out of repair."

* Mr. Norris, Assistant Engineer.
† Mr. McAlpine, Executive Engineer.

90. Defective drainage,* and continuous cultivation† which deprives the soil of some of its most fertilizing elements, are mentioned by two other Range officers as prominent causes of the evil.

91. The causes noted in the margin represent the feelings of native Revenue officers and of the ryots generally on the subject. The popular notion is that when water is not speedily re-placed by a fresh supply it gets so hot from the action of the sun upon it as to destroy the crop, and then the fresh water is of no use. It is also said that, as the Kistna water comes over a long distance, and is composed of the drainage of many different countries, it contains ingredients which do not "agree with" the black regada soils of the Delta though they do not affect the mixed regada or sandy soils. Again it is asserted, that if, when the surface of the soil is cracked with the heat, there is a copious supply of rain which thoroughly penetrates the ground, there would be no "chavudu."

1 Insufficient and irregular supply of water and rains.
2 Inherent badness of soil.
3 Leakage and percolation.
4 Bad drainage.
5 Want of manure.

92. The first reason, viz., insufficiency of water is that favoured mostly by the ryots of the *Gudivada Talook*. The *Repallee* cultivators lay particular stress on the second (badness of soil), while in *Bapatla* the third reason (leakage) is generally alleged as the chief cause. Inundation by the sea has, in some villages in Bandur, Gudivada, and Bapatla Talooks, been assigned as the cause of "chavudu."

93. In *Bezwada* Talook there is no chavudu (worth mentioning,) and this the Tahsildar considers a proof that the mere application of Kistna water cannot be alleged to produce "chavudu," since the eleven villages under irrigation have been watered since 1856. It occurs to me that the nature of the soil may have a great deal to say to this exemption. I observe that Mr. F. W. Morris, when submitting proposals* for the settlement of the Masulipatam portion of the district, speaks of the dark regada of Gudivada as the best for *dry* crops, while the best kind for *wet* crops "is of a lighter colour and consistency, and is mostly to be found in "the lower parts of Bezwada and Ellore."

* 23rd February 1861, No. 46, paragraph 112.

94. "Chavudu" has appeared in some instances on usual wet land formerly under tank irrigation, but which is now supplied from the Kistna channels. One reason assigned is that the water under the old system settled in the tanks, and was only supplied to the lands in a pure state, while now it comes impregnated with silt.

95. Colonel Anderson, I observe, attributes "chavudu" to the hydraulic pressure generated, where the surface of the water in canals is considerably above the ground-level, and which forces a certain amount of water to the surface of the adjacent ill-drained low lands, and with it the saline matter which may be mixed with the soil. Such embanked channels combined with the want of proper drainage are, he thinks, the main causes of the evil, and as the former became more water-tight, and the latter is improved, it will disappear.

† Endorsement, dated 18th November 1868, No. 94, paragraph 8, recorded in G. O., 17th December 1868, No. 3,941, Public Works Department.

96. The Board have asked whether any attempts have been made to prevent this result of irrigation by improving the drainage, preventing leakage from the channels, or otherwise, and how far such attempts have been successful.

‡ Proceedings, 31st March 1869, No. 2,069, paragraph 29.

97. Mr. McAlpine, Executive Engineer, has given me the following particulars of experiments made, before his arrival, in his range.

"A small piece of affected land was selected and divided into four equal "parts; one was manured with silt, another with cattle-dung, the third with "wood-ashes, and the fourth part had the 'chavudu' scraped off the surface of the "land. The Talook Overseer reported the first three experiments quite successful; "but the experiment of removing the chavudu by scraping he considered only "partially so.

"The ryots of Duggumilli, a village in the Kaikalur Division, were advised "by the Delta Superintendent to try *flooding* the chavudu land, and they experi-"mented on a piece of about 20 acres in extent; at their own expense they "enclosed the land, and divided it in the usual manner into small patches, by "bunds. For two irrigation seasons the land was kept constantly flooded with "water repeatedly changed; the third season it was cultivated, and produced half "a crop, and the last two seasons it has produced full crops, and it is expected "that it will continue to be equally productive for two or three seasons more, and "if occasionally it is moderately manured 'chavudu' may not appear again."

98. In four villages details were given me by the ryots of attempts which they had made with the same object. In the first, 8 acres were flooded with water for two years without cultivation, and in the third year manured, ploughed, and planted out. The result was that the land was improved and a small crop raised. A similar experiment proved successful in Kurada. In the third village, Tenali, two or three small plots of ground which had been relinquished as "chavudu" and had been left waste a couple of years, were taken in hand by some poor ryots who could get no other land, and being drained, manured, scraped, and properly looked after, a fair crop was reaped, and the land was being cultivated again this year. The attempt in Chinnaravur was not so successful. The ryots here advocated leaving the land waste for ten years or so, as a better method.

Villages.	*Talooks.*
1 Vinakota.	Gudivada.
2 Kurada.	
3 Tenali.	
4 Chinnaravur.	Repallee.

99. I think the experiments described above indicate the best course to be pursued, but this pre-supposes a sufficient supply of water, which is the general and great difficulty. It is also unlikely that this would suffice without manure; but this is not so plentiful as could be desired. In many villages, owing to all the lands being taken up for cultivation, the cattle are obliged to be sent to distant jungles for several months during the hot season, and their manure is consequently lost. Patimannu (పాటిమన్ను) or village site earth is available but for a few. Some of the Tahsildars recommend hemp, milk-hedge, refuse indigo leaves, and the plants named in the margin as substitutes for manure. Wood-ashes are spoken of by Mr. McAlpine. Where "chavudu" arises from percolation drainage channels are specially necessary.

Kasinda (కసిండ) *Cassia.*
Vempali (వెంపలి) *Purple Galega.* (a small wild shrub with leaf resembling that of the tamarind.)
Tangedu (తంగేడు) *Cassia Auriculata.*
Aragu (ఆరుగు).

100. Mr. Thornhill, in paragraph 2 of his letter, dated 30 March 1867, No. 87, stated that such lands might require tilling without irrigation for a time, to distribute the salt more widely through the soil, and thus to neutralize its ill effects. I have made this a particular point of inquiry, but the almost universal opinion has been that dry-cropping the ground would be of no avail at all for the removal of "chavudu." This remark applies to the alternation of wet and dry crops suggested in paragraph 35 of the same officer's memorandum dated 26th May 1869. The idea met with no favour whatever.

Recorded in Board's Proceedings, 15th May 1867, No. 2,990.

101. The Board considered it desirable to ascertain whether a public assurance that neither land assessment nor water-rate would be levied on land which became "chavudu" so long as it remains unproductive, and that, if desired, water would be supplied gratuitously, would remove the apprehensions of the people and be advisable.

102. The Delta Tahsildars generally are in favour of such an arrangement, provided some limit be placed on the concession, *i.e.* it should only be made in cases where there can be no doubt that chavudu exists in its worst form, and where the whole number is affected or where the land is already waste from this cause.

103. Lieutenant Smith, R.E., is satisfied that a measure like the one proposed would at once increase the complaints of "chavudu." If on the other hand the sist is invariably levied for chavudu lands (provided of course water can be supplied) the ryots would do their utmost to get rid of it; as it is now, the ryots take all the good out of the land during the first year or two, and take no trouble to re-enrich it. If chavudu exists it then shows itself.

104. The ryots consulted had generally nothing to say against so favourable a proposition; in one or two instances, however, they declined to have anything to do with any attempt even at curing "chavudu."

105. Considering the comparatively small extent affected, and the malpractices and confusion which such a course would probably bring about, I am not disposed to recommend any considerable addition to the liberal permission already accorded by the Board, by which if a ryot chooses to retain chavudu land, the land assessment only is to be charged as long as the land continues *unculturable* from "chavudu" (చవుడు).

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

106. The only alteration I would suggest is that for the word "unculturable," should be read "unfit for irrigation," as suggested by Mr. Boswell in his letter recorded in Board's Proceedings 10th July 1869, No. 4,950.

107 Mr. McAlpine, Executive Engineer, is of opinion that the advice of some eminent agricultural Chemist would be most desirable on the question of the cause of "chavudu" and the best method of treating it. This is not the first time that such a proposal has been made.

108. Mr. T. J. Knox, while Acting Collector of Masulipatam, addressed the Professor of Chemistry, Madras, in the following terms:—"Since the construc-"tion of the anicut across the Godavery, and the consequent spread of water over

22nd January 1858, No. 30.

"lands hitherto only moistened by rain, there has appeared in very many places "a salt in the soil which, by the third year renders the ground perfectly nude of all "vegetation, and it is supposed that in a few years the land will recover its power "of production. I use the word salt in its popular sense, the soil becomes saltish, "and there is at times a white efflorescence visible on the surface.

"The evil has now become so extensive, that it is desirable to know its cause; "though on a very small scale it is well known to the ryots."

* 28th January 1858.

109. Doctor Mayer in reply*asked for samples of the salt alluded to, at the "same time remarking "I have little doubt that your opinion is correct, and that the "solubility of some portions of the soil having been increased greatly by the standing "water, operates detrimentally when the water evaporates, in other words strong "saline solutions are formed and left to evaporate on the land; the result of such "action will be the death of all former kinds of vegetation, while after a time a "new series of plants will appear."

110. Whatever the cause might be, however, Doctor Mayer thought it would be difficult to put a stop to an evil of such magnitude, as to render sterile hundreds of acres of land.

111. Mr. Knox reported the matter to the Board of Revenue on the 9th February 1858, and from the subsequent correspondence noted in the margin, it appears that, though samples of soil were sent on three occasions for analysis, nothing came of it. The locality referred to originally was in the talook of Pentapad eventually transferred to the Godavery. The first specimens received were, it appears, destroyed by white-ants, and the Chemical Examiner who received the further samples retired without doing any thing in the matter. The Board asked the Collector of the Godavery to inform them of the present condition of the lands in question, and whether he considered it necessary to pursue the matter further. On his replying that the lands were in exactly the same condition, and that he did not consider it necessary to take further steps, the subject dropped.

From Board to Collector, 15th December 1859, No. 5201.
From Collector to Board, 26th June 1861, No. 162.
Board's Proceedings, 10th July 1861, No. 3,623.
Do., 11th Sep. 1863, ,, 5,832.

Boards Proceedings, 10th Oct. 1863, No. 6,511.
Do., 5th Dec. ,, ,, 7,656.

112. Mr. Wilson, when Acting Collector of the Kistna District, made a similar proposal for a scientific investigation of "chavudu," but the Board did not notice the proposition in their Proceedings of 5th August 1868, No. 5,679.

113. I do not, for my own part, think that the evil is of such a magnitude as to make it absolutely necessary to seek such an opinion. The inquiries which have taken place on the subject of "Reh" as found in the Punjab (with which Colonel Anderson considers "chavudu" identical) resulted in the practical conclusion that the best remedy was "irrigation accompanied by efficient drainage" and this will probably be found as true for Madras.

Vide Supplement to the *Gazette of India* May 8, 1869, No. 19.

114. Should any chemical investigation be still considered desirable, the specimens of soil should be collected during the hot season when the presence of "chavudu" is most easily determined; and the inquiry might be extended to the silt and water of the Kistna.

115. *Zemindaries.*—The particulars, so far as known, relative to lands in Zemindaries rendered unproductive from "chavudu" and other causes, are entered in the following statement:—

Names of Zemindary Estates.	Number of villages under the command of anicut.	Number of villages under the command of anicut in which there are complaints.	Chavudu.		Unfit from other causes.		Total.		Dry crops cultivated in lands in column 4.	Dry crops cultivated in lands in column 6.	Remarks.
			Extent.	Water-rate.	Extent.	Water-rate.	Extent.	Water-rate.			
1	2	3	4	5	6	7	8	9	10	11	12
1. Gudur... ...	29	20	Acres. 116	Rs. 464	Acres. 3,102	Rs. 12,408	Acres. 3,218	Rs. 12,872	Acres. 49	Acres. ...	From the remark in the statement rendered by the Zemindar, it appears that these villages were inundated by the sea, and that the whole extent of land in column 6 was left waste from inaccessibility to irrigation and from infertility of soil.
2. Devarakotta...	18	7	4,445	17,780	...	...	4,445	17,780	2,250	...	It appears from the remark in the Zemindar's account that these villages were visited by the sea on 1st November 1864; that most part of this land turned saline while the rest became unprofitable from inaccessibility to irrigation, infertility of soil and bad drainage; and that application for re-converting it into dry was made during 3 years, viz.:— A. C. In Fusly 1277 ... 1,936 56 ,, 1278 ... 744 89 ,, 1279 ... 1,763 63 Total... 4,445 8
3. Nuzid	28	4	183	733	...	...	183	733	1	...	It appears that this land was converted into wet in Fuslies 1273, 1274, and 1275, and that it gradually turned saline and was left waste by the ryots.
Total...	75	81	4,744	18,977	3,102	12,408	7,846	31,385	2,300	...	

Much of the land in the Devarakotta estate lies along the Masulipatam canal, and is that referred to by Colonels Winscom and Anderson in their letters recorded in

G. O., 17th December 1868, No. 3,941, Public Works Department, as visibly deteriorated, especially between Veranki and Nidamole.

116. *Pulludu* (పుల్లుడు) *and Gulakarai* (గులకరాయి). The two entries in the statement of lands rendered unfit, etc., which relate to gulakarai and pulludu,* may be taken together. The term "gulakarai" refers to gravel, which, it is said, renders land unfit for wet cultivation. The term "pulludu" to a loose state of soil which has the same effect. The former term has, especially on the west of the Kistna, become a popular cry owing, I believe, to an accidental inquiry by the Board regarding its alleged hurtful influence on wet cultivation.

	Acres.	
Pulludu.....	3,239 in 39 villages in 3 talooks.	
Gulakarai...	319 in 7 do.	,, 2 ,,
Total...	3,556	

* NOTE.—In Gudivada Talook the term *Pulludu* (పుల్లుడు) is not generally used. They generally say బిదగిలిన్నజబ్బు పాలూలు or lands poor and feeble. In Repallee Talook the ryots call the same lands *Pulludu* (పుల్లుడు) or బలహీనమై, లళళళాడెలి, *i.e.*, poor and loose. Both these kinds of land are entered under the head *Pulludu*.

117. It appears, from the correspondence noted marginally, that the Board authorized the re-classification as dry of a portion of an Inam in Gudavalli village, Repallee Talook, on a report from the district that the land had become unfit for wet cultivation from its being black regada mixed with "gulakarai," and as it was the first time that such liability to deterioration from such a cause had been brought to their notice, they asked how the change takes place, and whether it affects any considerable portion of the land commanded by the new irrigation works.

Board's Proceedings, 19th Oct. 1868, No. 7,498.
Do., 1st Feb. 1869, ,, 645.

118. In reply the Acting Collector reported that "no change apparently takes place either by natural or artificial causes. Such lands are always unsuited for wet cultivation for the following reason—when the land is irrigated, the earth becomes loose, so much so that men and cattle can hardly walk through it. Their legs sink in the mud, and they cannot withdraw them without difficulty at every step. Ploughing and preparing the field for transplantation are therefore extremely difficult operations. After all the crop is said to be inferior to crops raised in soils of other descriptions in the neighbourhood under the same circumstances." Mr. Boswell goes on to say that at the last Jummabundi he made particular inquiries on this point, and inspected some of the lands (in the village of Burripallem) so affected which had been cultivated with wet crops. The stubble showed that the plants had been set out at greater distances apart from each other than in other lands in the vicinity. "The ryots say that in such gravelly soil, as stone contributes no strength to the plant, they are obliged to plant out the paddy at greater distances, as if closely planted the plants would not get sufficient nourishment from the stony soil. As wet cultivation in these lands is thus attended with great trouble and expense, without any proportionate advantage, the ryot naturally desires to revert to his dry cultivation after having tried irrigation for some years."

Proceedings of the Madras Government, Revenue Department, 6th December 1869.

119. A statement was appended showing that an extent of 606 acres were thus affected with "gulakarai" in five villages in the Repallee Talook.

Names of Villages.	Extent. Ac.	G.
1. Iayaveram	25	33
2. Chundur	33	...
3. China Ravar	10	...
4. Gudavalle	57	38
5. Burripallem	480	...
Total...	606	31

Board's Proceedings, 29th July 1869, No.

120. This letter having been communicated to me, I have made particular inquiries on the subject, and I have been led to believe that "gulakarai" has in itself no special prejudicial effect, but that the unfitness of such soil arises from its being "pulludu."

121. I give in the margin a comparison between the extent said to be "gulakarai" when the Collector asked the question, and when at a later date I did the same. It is an illustration of the utter uselessness of such returns. It would be difficult to say which is the furthest from the truth.

Villages.	Extent as per Collector's Report. Ac.	Extent as per accounts prepared with reference to this inquiry. Ac.
1. Jayaveram	25	6
2. Chundur	33	...
3. China Ravur... ...	10	4
4. Gudavalle	57	19
5. Burripallem	480	...

122. Three of these villages I inspected and in the case of Gudavalle sent for and examined the villagers. The following is the result.

Chundur.—The ryots said there was no gulakarai, neither did they show any.

Chundur.
Chinna Ravur.
Burripallem.

Chinna Ravur.—I examined the four acres alleged to be gulakarai. The entry in my note-book is as follows:—

"Partially ploughed—a few stones scattered about—could not be considered "any impediment to cultivation. The difficulty in cultivating with wet crops, if "difficulty there is, would probably arise from its pulludu texture. Surrounding "lands under dry crops had precisely the same kind of soil with a few pebbles "intermixed."

123. I was informed that, before conversion into wet, this land had been usually cultivated with dry crops; that paddy plants cannot take root, because the stones and earth combine together and become very hard; that there is no more difficulty in ploughing and preparing this land than other wet land, though it is true the legs sink a little more; that they have not been accustomed to plant out at greater distances than usual in other lands, nor see any necessity for doing so; that "gulakarai" and "pulludu" always go together; that the latter may exist without the former, but not the former without the latter.

124. *Burripallem.*—This is the village more especially alluded to by the Collector. Though they had entered none of their land as "gulakarai" in the account furnished to me, they said, in reply to my question, that the whole of the village was slightly affected by it, but so slightly that they did not consider it rendered any land unfit for wet cultivation, and that their wet cultivation had not been in any way prejudiced thereby. The Curnum allowed that he had entered in the

statement called for by the Collector 480 acres, or the whole then wet ayacut of the village as affected by "gulakarai," that the different pieces of ground examined by the Collector formed portions of 30 acres which were included in the present account as "pulludu" (the whole extent of pulludu being 145 acres); and that there was no more "gulakarai" in the "pulludu" than in the other lands.

125. The ryots pretended that in the Collector's examination of the soil they had alleged "pulludu" as the sole cause of their distaste for wet cultivation, which distaste they have further shown by applying for the re-conversion into dry of nearly the whole of their present wet lands, though there is no lack of water.

126. From what I could see of the "gulakarai" I thought it nothing extraordinary. *Gudavalle.*—This is the village referred to in the Board's Proceedings, dated 19th October 1868, No. 7,498. The Curnums present expressed ignorance of what "gulakarai" account had been sent in formerly. The extent of 19 acres which they have now entered is, they say, identical with the Inam originally reported upon. About 80 acres altogether are thus affected, but very slightly. In the Inam even it is not much. It is not the "gulakarai" which is originally to the wet cultivation; but the original nature of the soil which is a hindrance much from those previously given in these statements made to me should differ so seen of these "gulakarai" lands I am decidedly of opinion that the original representations were not made *bonâ fide*, whatever the present assertions may be worth.

127. I can give no reason why the soil of the "gulakarai" or gravel is common enough in much of the ordinary dry soil of the country, and I put no faith in the assertion of its deleterious influence.

128. In reality a sprinkling of "gulakarai" or gravel is common enough in soil, and the difficultyof cultivating it with wet crops is, to my thinking, applicable to "pulludu," which is a state of soil I have observed in many parts of the Delta. The black regada, either from constant dry cultivation, or natural causes, or both, becomes so loose in texture that even in a dry state a stick may, without exertion, be inserted a yard or more into the ground. Such land, if left uncultivated, soon becomes full of holes. A free application of water would, as represented by Mr. Boswell, make it almost impracticable for man or beast, and it can easily be understood how difficult the transplantation of paddy plants would be and what small prospect of their taking firm root in such a semi-liquid mass. At the same time, this soil is good enough for ordinary dry crops or cotton. It is not surprising then that the ryots demur to continuing wet cultivation in such land.

130. I am informed that where former waste land, or that which had been some time fallow, was converted into wet, this hindrance had not occurred. Indeed the finest wet crops had been raised on such lands.

131. The ryots assert that "pulludu" land cannot be made fit for wet cultivation either by manure or by being left fallow.

132. *Vellatunga* ‡ ‡ soil.—This coarse grass is reported to exist on dry lands converted into wet in eight villages in the Bapatla Talook to the extent of 797 acres. It comes up along with the young paddy which it gradually outgrows and destroys. It is difficult of removal at the time, and can only be effectually eradicated with some trouble during the dry season.

133. The causes, which relate to the insufficiency or excess of water, may most conveniently be considered, when we come to speak of the Department Public Works.

134. (2) CYCLONE, *vide Appendix IV.*—The Board have mentioned the cyclone of 1864 as having possibly influenced the extension of irrigation, even though it might be found that cultivation had resumed its former extent.

135. The inundation of the sea, which took place at that time, affected nearly the whole of the Bandur Talook and many villages in Gudivada, both to the east of the Kistna.

136. The following statement contains the particulars of cultivation in dry and wet for four years before and four years after the cyclone in twenty villages in Gudivada and thirteen villages in Bandur. These have been selected, because they are the only villages affected, which are at present under the influence of the anicut:—

Talooks.	Villages.	Total dry cultivation during four years before the cyclone.		Average per year.		Total dry cultivation during four years after the cyclone.		Average per year.		Total wet cultivation during four years before the cyclone.		Average per year.		Total wet cultivation during four years after the cyclone.		Average per year.	
		Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
		ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Gudivada...	20	6,748	7,178	1,687	1,794	9,628	8,157	2,407	2,039	63,844	1,15,006	15,961	28,751	31,204	1,02,869	7,801	25,717
Bandur ...	13	10,912	9,696	2,728	2,424	13,961	9,261	3,490	2,315	15,026	24,816	3,756	6,204	7,907	28,109	1,977	7,027
Total...	33	17,660	16,874	4,415	4,219	23,589	17,418	5,897	4,354	78,870	1,39,822	19,717	34,955	39,111	1,30,978	9,778	32,744

137. It will be observed that the average dry cultivation in these twenty-three villages is greater since the cyclone, than it was before it, though the assessment receives no proportionate addition. The average assessment paid in Bandur is, indeed, less than it was; that in Gudivada a little more. In the wet cultivation, however, the area occupied since the cyclone is 50 per cent. less than the average extent of wet cropped before that event; but the assessment is only slightly reduced. On looking into the particulars, it will be observed that Bandur pays more for the diminished extent cultivated subsequent to the cyclone, than it did for the former larger area; and that Gudivada pays a little less than it used to do.

138. Causes other than the cyclone have combined with it to produce this result; and it is not difficult to assign the exact influence of each.

139. The cyclone was closely followed by the Revenue Settlement, and the enhanced water-rate of 1865: the former was introduced in 1866, being in force from 1276 (1866-67); the latter came into operation in portions of the district at the end of 1865, *i.e.*, in Fusly 1275, and, as far as Inams were concerned, in the talooks of Gudivada and Bandur; but, as a rule, the Revenue Settlement and the 4-rupee water-rate were simultaneous.

Talooks.	Villages.	Cultivation of 1274. Dry. Land.	Dry. Assessment.	Wet. Land.	Wet. Assessment	Cultivation of 1275. Dry. Land.	Dry. Assessment	Wet. Land.	Wet. Assessment
		ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Gudivada ...	20	2,033	2,227	18,605	31,536	2,079	2,076	18,066	29,535
Bandur ...	13	2,762	2,443	3,717	6,248	2,699	2,286	3,634	6,132
Total ...	33	4,795	4,670	22,322	37,784	4,778	4,362	21,700	35,667

140. There is not much difference in the extent taken up for cultivation in Fuslies 1274 (1864-65) and 1275 (1865-66); the former being the cyclone year: both are above the average cultivation of the four years preceding the cyclone.

NOTE.—It has been already explained, (paragraph 46 above,) that until 1276 no regular water-rate had been imposed at all in this part of the district.

This would indicate that the cyclone had not had much effect.

141. The difference, however, on the introduction of the new settlement, and the 4-rupee water-rate from Fusly 1276 (1866-67), was most striking. The average of the three following fuslies shows that the twenty villages in Gudivada only cultivated 4,379 acres as against 15,961, the average before the cyclone and the thirteen in Bandur Acres 1,424 as against 3,756, or, respectively,* 27 and 38 per cent. below the former average.

* Gudivada ... ... ACS. 27
Bundar 38

Fuslies.	Gudivada Talook. Wet land.	Gudivada Talook. Assessment.	Bandur Talook. Wet land.	Bandur Talook. Assessment.
	ACS.	RS.	ACS.	RS.
1276	4,662	24,447	1,437	7,404
1277	5,801	33,043	1,643	8,440
1278	2,675	15,844	1,193	6,133
Total...	13,138	73,334	4,273	21,977
Average...	4,379	24,445	1,424	7,326

142. It is manifest, therefore, that these two causes have had the greatest influence in the falling off of irrigation in this particular locality.

143. I am of opinion, however, that the cyclone has not been without effect: I find on comparing the average cultivation (before and after the cyclone) in 118 villages in the Gudivada Talook, not affected by the inundation, with that of the twenty villages already mentioned, that the decrease in area is only 8 per cent. in the former, while it is 51 per cent. in the latter. The assessment shows an increase of 45 per cent. in the villages not inundated, and a decrease of 11 per cent. in those submerged. In the thirteen villages in Bandur also the decrease in area is 47 per cent. below the former cultivation, the revenue being enhanced by 13 per cent.

144. The 118 villages in Gudivada must have been affected by the new settlement, and water-rate precisely as the inundated villages were; and I can only account for the difference on the three grounds: that the lands in the latter, (and this holds good for the thirteen villages in Bandur also,) were poorer; had been made still more unproductive by the cyclone; and were much worse off for Kistna water than the others.

Talooks.	Items.	Number of villages under the command of anicut.	Average wet cultivation of four years before the cyclone of 1st November 1864. Land.	Average wet cultivation of four years before the cyclone of 1st November 1864. Assessment.	Average wet cultivation of four years subsequent to cyclone. Land.	Average wet cultivation of four years subsequent to cyclone. Assessment.	Increase. Land.	Increase. Assessment.	Decrease. Land.	Decrease. Assessment.	Per-centage. Increase. Land.	Per-centage. Increase. Assessment.	Per-centage. Decrease. Land.	Per-centage. Decrease. Assessment.
			ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Gudivada.	Villages not inundated by Sea ...	118	39,078	1,25,627	36,102	1,82,396	...	56,769	2,976	.....	...	45	8	...
	Do. inundated by sea ...	20	15,961	28,751	7,801	25,717	...	.....	8,160	3,034	...	...	57	11
Bandur	Villages inundated...	13	3,756	6,204	1,977	7,027	...	823	1,779	.....	...	13	47	...

145. I am confirmed in this opinion by the inspection which I made of many of the inundated villages.

146. The extent,* entered in Appendix III. as rendered unfit for wet cultivation from this cause, may be taken as generally correct, with the proviso that, if plenty of water be supplied, it will in time recover.

	Acs.
* Gudivada...	2,843
Bandur	2,047
Total ...	4,940

147. In seven of the inundated villages, situated in the Kaldindi Purguna, and at some distance from the sea, the cyclone is said to have done no permanent harm. It is in this locality that 10,000 acres are ready for conversion, the moment water can be brought to them.

148. In the Gudur Purguna, ten villages were inundated by the sea during the cyclone of 1st November 1864, as appears by the Statement furnished to me by the Vullur Zemindar to whom the Purguna belongs. An abstract of the same is given below. It will be seen therefrom that in the wet there is an increase of Rupees 2,858 in assessment, and a decrease of Acres 539 in land; and also a decrease, both in dry and assessment, after the cyclone. The increase in wet assessment is probably due to the new water-rate of 4 rupees, and the decrease in the cultivation of both dry and wet may be the effect of the cyclone. I cannot say how far this account is accurate :—

Number of villages inundated.	Average cultivation of four years before the cyclone from 1271 to 1274.		Average cultivation of four years after the cyclone from 1275 to 1278.		Increase.		Decrease.	
	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
	Acs.	Rs.	Acs.	Rs.	Acs.	Rs.	Acs.	Rs.
Dry ...	1,030	1,022	956	852	.....	.....	74	170
10 Wet ...	2,698	8,216	2,159	11,074	.....	2,858	539	.....
Total...	3,728	9,238	3,115	11,926	.....	2,858	613	170

149. (3) RAIN-FALL.—The late Superintending Engineer of the 2nd Division has observed* that the *seasonable* rains, which have fallen for some years past, have contributed to make the ryots careless about wet cultivation.

* 9th October 1868, No. 87, paragraph 16 (3.)

150. I believe this is an erroneous opinion. The following Statement shows what the average rain-fall has been for the past seventeen years in the district; and I append extracts from the Jummahbundy Reports from 1262 (1852-53) to 1278 (1868-69), which, I think, clearly show that, on the whole, the seasons have been unfavourable, and the rain deficient for the last fifteen years or more :—

Fuslies.	Rain-fall.	
	Inches.	Cents.
1262	36	10
1263	19	38
1264	40	12
1265	29	7
1266	29	52
1267	31	5
1268	27	58
1269	28	1
1270	18	4
1271	27	10
1272	29	69
1273	19	75
1274	24	77
1275	26	22
1276	22	28
1277	29	21
1278	26	70
Total ...	464	12
Average ...	27	30

151. I am given to understand that, for some years past, the rains have been heavy or scanty, either at the beginning or during the latter part of the cultivating season : thus the wet crop suffered either from deficiency or excess at one or other two periods. A Statement, showing the remissions granted for loss of crop during the past, four years is given below :—

Fuslies.	Bandur Talook.	Gudivada Talook.	Bezwada Talook.	Repallee Talook.	Bapatla Talook.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1275	2,616	3,001	.....	970	.....	6,587
1276	156	7,638	.....	2,573	61	10,428
1277	516	1,069	409	11,437	11,674	25,105
1278	2,385	2,450	781	6,382	4,075	16,073
Total ...	5,673	14,158	1,190	21,362	15,810	58,193

1262 (1852-53).—Rain-gauge introduced. Season generally favourable.

1263 (1853-54).—Commissioner, northern Circars, says: the "fall of rain was "only about one-half of that of the previous fusly, or of an average year."

1264 (1854-55).—Rain was copious throughout the five Circars. The total fall in all the districts was double that of the preceding year; but that year, in consequence of very great deficiency, was one of peculiar trial. The actual fall of rain during the year under report may be said to be a fair average quantity.

1265 (1855-56).—Season was favourable to dry; disastrous to wet cultivation. Gudivada saved by the anicut.

1266 (1856-57).—Rains seasonable.

1267 (1857-58).—Season in Masulipatam described as a peculiarly unfavourable one. In Guntoor also it was generally unfavourable: an average quantity of rain fell; but it was either partial, excessive, or far between.

1268 (1858-59).—In Masulipatam, season cannot be called favourable. In Guntoor it was, on the whole, more favourable.

1269 (1859-60).—Season tolerably favourable in the Kistna District. The Board say that, on the whole, it was not a very favourable year for the Presidency.

1270 (1860-61).—The rain-fall was scanty. Season certainly unfavourable. The Board say the same for the whole country.

1271 (1861-62).—Favourable season on the whole; wet crops, however, suffered from want of rain in August and September.

1272 (1861-62).—Season favourable.

1273 (1863-64).—Season unfavourable for wet crops: 19 inches rain to 29 in previous year.

1274 (1864-65).—Rain good at first, but failed later on in the season. Cyclone year.

1275 (1865-66).—Rain very deficient in most important season, viz., June and July.

1276 (1866-67).—Unfavourable rain-fall, 22 inches and 28 cents.

1277 (1867-68).—Season, though an improvement on that which immediately preceded it, was not on the whole favourable. The early rains were neither seasonable nor sufficient; and the late rains, from August to October, which were very heavy, proved injurious in some localities. Average rain-fall 29 inches and 21 cents.

1278 (1868-69).—Rain-fall 27 inches. Copious during June and July; and the season appeared extremely promising, so much so that people thought that it was the first good year after a score of bad season; but they were somewhat disappointed. The rain-fall in August and September was partial and scanty, and in October, when it was most wanted, it almost failed.

In answer to question to Circular from the Public Works Commissioners, the Collector said: "The rain-fall from Fusly 1261 (1850-51) was deficient during the "last fifteen years in comparison with the same period prior to that fusly."

152. The following remarks occur in a letter from the Officiating Collector, Kistna, dated 10th March 1869, No. 56, recorded in Board's Proceedings, dated 22nd March 1869, No 1,979, on the state of the season:—

"The wet paddy in the Delta gave a good outturn under the influence of the "anicut-channels; but with some more showers in October and November would

"have done better. The anicut-channels are utilized as far as they go; but, in "seasons of drought, their supply is inadequate for the irrigation of the large area "of land cultivated with wet crops in the Delta; only with the help of seasonable "rains, they supply the necessary water."

Paragraph supra.

153. (4) *Prices.*—The price of paddy has, it is said, not been remunerative of late years.

154. A general Statement* of prices from 1222 (1812-13) to 1278 (1868-69) is forwarded. In the margin I give the prices of paddy in this district for the last ten years. During this period, they have been generally on the rise, especially after 1272 (1862-63); the large exportation being the alleged reason. Prior to the extension of irrigation under the Kistna channels, rice was largely imported from Arracan and elsewhere. This has now ceased. In 1276 (1866-67), nearly sixteen lacs of rupees worth of food-products were exported. In 1277 (1867-68), however, prices fell considerably, owing to the abundance of grain for sale in the local markets. There was a great diminution also in the quantity exported both by land and sea.

* Appendix V.

Fuslies.	Per Madras Garce.	Per Candy.
	RS.	RS.
1269...	116	23
1270...	122	24
1271...	143	29
1272...	163	33
1273...	189	38
1274...	197	39
1275...	179	36
1276...	216	43
1277...	154	31
1278...	156	31

155. This fall had no doubt some influence on the relinquishment of wet cultivation which characterised* the following year. Ryots are chiefly affected by the market-prices in March, April, and May, when, from the necessity of paying their rent, they are compelled to raise money; and these influence their future cultivation. From the annexed Statement it will be seen that the average prices in these months were much below that of the year 1277.

* *Vide* paragraph, 63 Supra.

Per Candy.

Months.	Bandur Talook.		Repallee Talook.		Bapatla Talook.		Gudivada Talook.		Bezwada Talook.		Total.		Average.	
	1277, (A. D. 1867-68.)	1278, (A. D. 1868-69.)	1277, (A. D. 1867-68.)	1278, (A. D. 1868-69.)	1277, (A. D. 1867-68.)	1278, (A. D. 1868-69.)	1277, (A. D. 1867-68.)	1278, (A. D. 1868-69.)	1277, (A. D. 1867-68.)	1278, (A. D. 1868-69.)	1277, (A. D. 1867-68.)	1278, (A. D. 1868-69.)	1277, (A. D. 1867-68.)	1278, (A. D. 1868-69.)
	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.	Rs. As.
July	34 0	20 8	49 0	36 0	43 0	27 0	31 0	16 0	40 8	22 15	197 8	122 7	40 0	24 0
August	32 8	21 8	48 0	36 0	44 0	27 0	31 0	16 0	35 8	24 0	191 0	124 8	38 0	25 0
September	28 0	21 8	48 0	30 0	44 0	27 0	31 0	16 0	33 0	25 0	184 0	119 8	37 0	24 0
October	23 8	22 4	33 0	30 0	44 0	27 0	27 0	17 0	27 12	25 0	155 4	121 4	31 0	24 0
November	22 0	29 4	32 0	36 0	44 0	36 0	24 0	26 0	27 12	31 4	149 12	158 8	30 0	32 0
December	20 8	31 0	45 0	40 0	42 0	36 0	20 0	32 0	27 8	33 0	140 0	172 0	28 0	34 0
January	23 0	29 8	46 0	40 0	40 0	34 0	21 0	27 0	28 8	32 12	141 8	163 4	28 0	33 0
February	22 0	30 0	31 0	40 0	40 0	34 0	18 0	24 0	25 0	33 4	137 0	152 4	27 0	31 0
March...	19 8	30 0	41 0	33 0	35 0	35 0	18 0	23 0	26 8	35 0	129 0	164 0	26 0	33 0
April...	19 8	30 0	42 0	32 0	38 0	38 0	18 0	25 0	25 6	32 0	125 14	167 0	25 0	33 0
May...	19 8	30 8	45 0	29 0	36 0	36 0	18 0	26 0	22 8	32 4	121 0	169 12	24 0	34 0
June...	20 0	30 0	46 0	30 0	41 0	41 0	26 0	26 0	23 11	33 0	126 11	176 0	25 0	35 0
Total...	284 0	326 0	453 0	465 0	308 0	1,798 9	274 0	274 0	343 9	359 7	1,798 9	1,810 7	359 0	362 0
Average	23 11	27 3	38 0	39 0	33 0	150 0	22 13	22 13	28 10	29 15	150 0	151 0	30 0	30 0

156. In 1278 (1868-69) prices were low at the beginning of the season, when the rain-fall was abundant, but rose gradually afterwards; the average being about the same as the preceding year.

II. As relating to the people.—*Objection to wet cultivation per se* or from apathy; dread of physical labour or discomfort.

157. One of the causes for dislike to wet cultivation, mentioned by Colonel Winscom in his letter of 9th October 1868, No. 87, paragraph 16, was, that owing to seasonable rains, and the knowledge that they could get canal-water for their dry crops in case of emergency: the ryots thus freed from anxiety about famine, give way to their naturally indolent temperament, and avoid that mode of culture which involves more physical labour and discomfort, than is necessary in the case of dry cultivation.

158. Mr. Thornhill* ridiculed the notion, and, I think, justly. He pointed to the rapidity with which so much of the district had been converted from dry into wet as a sufficient refutation of the charge. The opinion of most of the officers whom I have consulted is to the same effect: granted water in abundance, a suitable soil, and good prices; and there is not a single ryot who, having once tried the system of wet cultivation, would desire to revert to dry. It has been the universal reply to my inquiry from the people themselves in all parts of the Delta, that they had no objection whatever to wet cultivation, but rather prefer it to dry. It has also been pointed out to me that the *labour* and *discomfort* is, in fact, *less* in wet than in dry cultivation: dry lands require more ploughings than wet; dry crops require weeding; constant watching from earing to harvest, to guard against birds and thieves; and they are liable to attacks from insects and divers diseases. The converse is true of wet crops: from the time of transplanting from the seed-beds to the time of harvest, all that the ryot has to do is to attend to the watering of his land; moreover, his outlay need not be so extensive, for a cheap buffalo will do the work which, in dry land, is performed by the more costly bullock.

* Memorandum of 26th May 1869, paragraph 27.

159. The Repallee Talook is the one more particularly referred to by Colonel Winscom in his remarks on this land. Mr. Thornhill, however, asserts† that there is no aversion to wet cultivation here, as water is eagerly sought for wherever irrigation has been found really profitable, whether nearer the sea, where there is an admixture of sand in the soil, or where large tracts of salt-land are lying waste.

† 30th March 1867, No. 87, paragraph 7.

160. I fully agree in this. As an instance in point, I may mention that while at Repallee a durkhast was presented to me by two influential ryots of that place, offering to take up 6,100 acres of the salt swamp in the neighbourhood, if irrigation was provided; and I have since heard of further instances. The Overseer in charge of this part of the talook informed me that there were 11,000 acres of such swamp available for conversion.

161. (2.) *Natural preference for dry cultivation.*—The fact that no aversion exists to wet cultivation is quite consistent with a natural preference for dry under different conditions of soil. Such preference most certainly exists in many villages of the Repallee Talook more especially, which could have water for the asking. Colonel Winscom adverts* particularly to those under the Kollur and Kollepara channels in this talook; and Mr. Thornhill gives†, I think, valid reasons enough for the persistent refusal of the ryots here to give up their magnificent dry crops. Colonel Anderson supposes‡ that the knowledge of water being available, should they want it, has much to say to this preference. He thinks, too, that they get a good deal of water without payment. I do not think, from what I have seen of the locality, that there is much danger of this in the villages under the two channels named; but in other parts of the talook I have seen tracts of land cropped with black paddy, which were deriving much benefit from water which *apparently* the owners could not have prevented overflowing their lands, even had they wished to do so.

* 9th October 1868, No. 87, paragraph 17.
NOTE.—The Panmaru channel in Gudivada is also mentioned; but I think this must have been from oversight. It is true that no cultivation has been made, though the channel has been dug some years; but that is because no calingulah existed. The ryots have always been ready to use the water directly they can get it.
† Memorandum, 26th May 1869, paragraphs 24 and 25.
‡ 18th November 1868, No. 94, paragraph 10.

162. Having been directed to visit those parts of the district where the greatest distaste had been shown to irrigation, I went through all the villages which could be watered by the Kollur and Kollepara channels, and also those which could be reached, did they so wish of it, from the Vellatur calingulah on the western bank main canal. The following Statement gives the particulars of these villages, fourteen in number, and the extent, as estimated by the Tahsildar, which could be irrigated in each. I believe that this, however, is hardly a sufficient estimate, as in most cases nearly the whole area of the village is accessible to the water. The people themselves allowed that nearly 11,000 acres could be irrigated.

Proceedings of the Madras Government, Revenue Department, 6th December 1869.

STATEMENT showing the probable extent of dry land that could be converted into wet under the Kollepara and Kollur Channels.

Names of Channels	Names of villages.	Ayacut according to Survey.	Extent of dry land that could be converted into wet.	Present dry assessment.	Water-rate.	Total wet assessment.	Present average dry rate per area.	Remarks.
		ACS. CTS.	ACS. CTS.	RS. A. P.	ES. A. P.	RS. A. P.	RS. A. P.	
Kollepara Branch Channel.	1. Kollepara 4,340	6,222 ...	200 ...	300 0 0	800 0 0	1,100 0 0	1 8 0	This being a large village has been sub-divided.
	Bommavanepalem... ... 1,882	3,206 ...	100 ...	150 0 0	400 0 0	550 0 0	1 8 0	
	2. Devalur	1,441 ...	....	....	....	... .	.....	Clubbed together.
	3. Tummulur...	1,414 ...	100 ...	150 0 0	400 0 0	550 0 0	1 8 0	
	4. Chemudupad	5,078 ...	100 ...	187 8 0	400 0 0	587 8 0	1 14 0	
	5. Zampani and		60 ...	104 0 0	240 0 0	344 0 0	1 12 0	
	6. Buntumilli...		100 ...	150 0 0	400 0 0	550 0 0	1 8 0	Do. do.
	7. Chadalavada and Kakurlamudi ...	1,783 ...						
	Total...	19,144 ...	660 ...	1,041 8 0	2,640 0 0	3,681 8 0	.....	.....
Kollur Branch Channel.	1. Kollur 4,612	10,239 ...	200 ...	612 8 0	800 0 0	1,412 8 0	3 2 0	This village has been divided into three
	Ravikumpad 3,693	2,131 ...	300 ...	900 0 0	1,200 0 0	2,100 0 0	3 0 0	
	Peddalunka 1,934	1,614 ...	212 ...	858 10 0	848 0 0	1,706 10 0	4 1 0	
	2. Donapudi	5,086 ...	940 ...	4,228 1 0	3,760 0 0	7,988 1 0	4 8 0	Sub-divided.
	3. Vellalur	1,239 ...	633 ...	2,154 0 0	2,532 0 0	4,686 0 0	3 6 0	
	4. Peddapulivarru 3,949	1,079 ...	107 ...	397 2 0	428 14 0	826 0 0	3 8 0	Clubbed together.
	Pasaralunka 1,137	2,851 ...	997 ...	3,162 0 0	3,988 0 0	7,150 0 0	4 0 0	
	5. Goregapudi	20,290 ...	3,389 22	12,312 5 0	13,556 14 0	25,869 3 0	.....	.....
	6. Ravi Anantavairam and Panamudi.	1,079 ...	107 22	397 2 0	1,239 0 0	1,636 2 0	3 0 0	
	7. Voleru	2,851 ...	997 ...	3,162 0 0	3,988 0 0	7,150 0 0	4 0 0	
	Total...	39,434 ...	4,049 22	13,353 13 0	16,196 14 0	29,550 11 0	.....	.....
	Grand Total...							

163. There was no doubt, however, about the general wish of the ryots to adhere to their dry crops, though they did not always, or at once, give their real reason, but proffered a dozen excuses; such as, land unsuitable, gulakarai, and so forth. My impression is, that however much confidence they might have as to a plentiful supply of water, they would not convert their lands. In several instances, I was told as much. These remarks apply more especially to those villages lying close to the bank of the Kistna. In one or two, more inland, a small extent of dry has been converted into wet.

164. I think that in many villages, which *have* taken up wet cultivation, there is a desire either to re-convert or to retain a certain extent as dry, on account of fodder for the cattle, which are, in this talook, remarkably fine.

165. Among other reasons for preferring dry grains may be mentioned the following:—Food for immediate consumption is more quickly obtained; wages in kind are more easily available for the cultivation-servant. Should one dry crop fail, another can be planted; and out of the several, which are on the ground at one and the same time, they are tolerably sure of one or more. In wet cultivation, on the other hand, if the crop fails from insufficiency of water, it is too late to turn the land to any other use. The expense of transplanting the paddy-plants would, in such a case, be entirely thrown away; while a failure in a dry crop is not attended with a similar result, because all the work is done by regular farm-servants, who are paid by the year.

166. At the risk of unduly lengthening my report, I am tempted to enter here extract from a letter written to the Board in January 1868, by Mr. Wilson, upon the irrigation wants of the Kistna District. His testimony is as follows:—

Recorded in Board's Proceedings, dated 8th September 1868, No. 6,390.

"Judged by the absence of means of irrigation, there is no question that the "district's chief wants lie here; but there arises to oppose our willingness to sup- "ply present defects by schemes of a large and comprehensive nature—the unwil- "lingness of the people to have anything to do with wet cultivation. They don't "want it. This is not a fanciful but a real difficulty, especially throughout the "Guntoor side. I have travelled much over it, and have asked much, and have "seldom found those, who were accustomed to dry cultivation, at all anxious on "the subject of irrigation. The popular feeling on the subject will be understood "when I mention the fact that it is a common thing in the Guntoor portion for "the ryots holding the wet ayacut, to pay wet assessment year after year, and "cultivate dry crops, whether the tanks get supply or not. The reasons for this "aversion I have reduced to the following:

"(1) *The nature of the Soil.*—This is almost uniformly black regar soil, and its "varieties which often turn saline when irrigated, and is thus rendered worthless. "This the ryots know well.

"(2) *The nature of the crops.*—The great staple is jonna or cholum, which, "*when grown on black regar, requires but little moisture, and is apt to spoil with the "slightest excess.* This suits a country where the rain-fall is uncertain, and very "often scant."

"(3) *The number and variety of crops that can be raised during the year on dry "lands.*—The cholum is no sooner cut than up spring the green gram, minu- "mulu, etc. As the ryots say, a cholum field has, throughout the year, something "for the curry-pot, while the rice-field gives its one crop of paddy, and nothing "else in the year."

(4.) "*The productive power of the lands as they are.*—This is very great in the "Tenali Division of the Repallee Talook, in the alluvial villages of Guntoor, and in "the rich deep loams of Pruttepad and the old Martur Divisions. Hundreds of "acres in the Tenali Division, for whose supposed benefit costly works have been "executed in connexion with the anicut scheme, are dry to this day because the "ryots won't expose their beautiful lands to the risk of the terrible "chavudu," "and because, on the whole, they prefer dry cultivation to wet."

* * * *

(6.) "*The unaccustomed nature of the operations of wet cultivation*, that invin- "cible వాడకలేదు (we are not used to it,) which is the answer so often given by the "ryots of those parts to proposals of irrigation. His father never raised a seer "of paddy, why should he? He knows nothing about it, and has no wish to "learn: he prefers his bullock and dry cultivation to buffaloes and wet."

167. (3.) *More profit in cultivating dry crops* on re-converted lands on account of the fertilizing matter deposited. I have already (paragraph 5 above) noticed Colonel Anderson's idea on this point. In his opinion it is as likely a reason as "chavudu" for the preference for dry crops.

168. I have consulted the officers in both the Public Works and Revenue Departments on this subject as well as the ryots. The opinion of the latter must, of course, be taken *cum grano*.

169. The officials were asked whether they thought irrigation was often declined the third year because the land was so improved by irrigation that the growth of a dry crop would be more than ordinarily profitable. The ryots were simply asked whether, under similar circumstances, the deposit of silt would give a more than ordinary dry crop in the third year.

170. Two of the Range Officers held that the doubtful advantage of a better dry crop would not in itself be a sufficient inducement to give up wet cultivation. Two others held the opposite view.

171. The Revenue view of the matter was almost universally against the idea that wet cultivation would be declined for this reason solely—silt seldom, it is averred, reaches the land in sufficient quantities to do more than benefit the crop on the ground.

172. The ryots in the Eastern Delta, as a rule, did *not* think that a dry crop so grown in the third year would be more than ordinarily profitable, while in the Western Delta the opinion was, on the whole, that, provided plenty of silt was deposited, a better crop might be expected.

173. III.—As relating to the Revenue Department. (1.) *Revenue Settlement and 4-rupee water-rate.*—Colonels Winscom and Anderson have mentioned the Revenue settlement as having been one great reason why the ryots, in Gudivada especially, relinquished wet cultivation. The Board, in paragraph 22 of their Proceedings of 31st March 1869, adverted to the enhancement of the water-rate from 3 to 4 rupees as having possibly a bearing on the subject.

174. The new Revenue settlement in the Masulipatam part of the district, and the 4-rupee water-rate in fact, as I have already mentioned,* came into force at one and the same time, viz., from the commencement of 1276 or July 1866. It must also be borne in mind that up to that time, though a 3-rupee water-rate had been in operation in some parts of the district, the rules of October 1861, under which it was leviable, had practically had no effect in Gudivada and Bandar Talooks where the joint-renting system was in force. It is true that some addition had been made to the rents on this account; but it was done on estimate merely and with reference to the circumstances of each village, and could not be said to represent a clear 3 rupees per acre in addition to the land assessment. Besides, the ryots had all the waste lands at their disposal, and could apportion the excess demand as was most convenient to themselves.

*Paragraph 46, supra.

175. Under the settlement it became obligatory to pay permanently the taram sist and water-rate, and the old custom of receiving remission on parts of fields left waste was done away, full bunjer fields only being recognized as suitable for exceptional treatment.

176. I would advert for a moment to the circumstances under which the settlement was made. The first revision was undertaken in 1859-60, and the Director's report submitted in 1861. The district had not then been surveyed. When this was done it was discovered that the cultivated area was in excess of that entered in the old Revenue accounts by 32 per cent., while there was a decrease in the waste lands of 18 per cent. The application to the real areas of the rates proposed by Mr. Newill resulted in what the Government called a "startling" increase of 52 per cent., or Rupees 2,80,000 above the joint rents of Fusly 1269 (1859-60.)

Government Order, 30th September 1864, No. 1,812, Revenue Department.

177. The scheme finally sanctioned by Government fixed the assessment on the area then under cultivation at Rupees 7,15,846, or Rupees 1,75,339 above the joint rent already alluded to. This included a 3-rupee water-rate.

178. But before the settlement was carried out they raised the water-rate to 4 rupees an acre. The wet cultivation in the Delta talooks had been estimated by the Settlement Department at 78,732 acres. The new Order at once then added about 70,000 rupees to the demand, which became 7,85,846, or 2,45,339 above the joint rent of 1269.

Government Order, 12th May 1865, No. 1,006.

Note.—8,247 acres in Divi being still under tank irrigation, pay two-thirds of the full rate, or Rupees 2-11-0 per acre. The rate for the cultivation under the Colair Lake is 3 rupees, and about 33,713 acres are involved.

179. From the Jummahbundy Report of 1276 it appears that the financial result of the introduction of the settlement was an increase of Rupees 2,86,801 on the joint rent of the previous fusly.

180. It is not possible to compare accurately the whole extent cultivated at the time the settlement computations were made with the area now occupied, because in the interim the Gudur Pargana has been handed over to the Vallur Zemindar; but, comparing the wet area cultivated in 1277 (1867-68) and 1278 (1868-69) with that occupied in the same villages in 1275 (1865-66), it appears that there has been a total decrease in the cultivation of nearly 25,000 acres made up of a decrease in Gudivada and Bandar, and a slight increase in Bezwada.

		A.	A.	F.
198 Gudivada.	1275	65,220	43,794	1277
13 Bandar.	1275	4,694	1,193	1278
11 Bezwada.	1275	3,869	4,077	1278
Note.—These are all survey areas.		73,783	49,064	
		49,064		
		24,719 decrease.		

181. The following remarks on the subject occur in the Jummahbundy Reports:—

1276 (1866-67.)

"The increased assessment which the new settlement imposed, especially in "the Gudivada Talook, which had been "theretofore much under-assessed in "many cases, led to the relinquishment of acres 65,374, bearing an assessment of "Rupees 2,72,406. Acres 40,201, assessed at Rupees 1,08,428, were subsequently "taken up, and the actual financial result of the introduction of the settlement was, "at the commencement of the fusly on occupation, acres 4,00,888 assessed at "Rupees 8,93,014, against a reputed amarakam of acres 3,79,330 assessed at Rupees "6,06,213, or an increase of Rupees 2,86,801 on the joint rents of the previous fusly.

"The wet shows a decrease in area of acres 12,296 but an increase in assessment of Rupees 80,860. The decrease is owing to the extensive relinquishments consequent on the new settlement, to which is due the increase in the assessment of the area now occupied. Under joint rents many hundreds of acres were assessed at consolidated wet-rates, very much below the present water-rate of Rupees 4 an acre. The introduction of the settlement and the imposition of a water-rate of Rupees 4 in addition to a land assessment had the effect of at once increasing the rates as much as one, two, and three hundred per cent., and, in some cases, in a still greater ratio. Extensive relinquishment, as a first result, might naturally be looked for, and they occurred as anticipated. In the course of a few years all that has been relinquished will probably be taken up again; if not, it may be fairly inferred that the rates are, in these particular instances, too high."

1277 (1867-68.)

"The wet shows a decrease in area of 11,160 acres, and of Rupees 37,711 in "assessment. The decrease is due partly "to relinquishments consequent on the "introduction of the new settlement rates. Under the joint-rent system a considerable extent of irrigated land was assessed at consolidated rates much below "the present water-rate of 4 rupees an acre, and it was anticipated that the imposition

" of a water-rate of 4 rupees in addition to land assessment would have the effect " at first of causing extensive relinquishments."

" Acres 81,729 paying Rupees 2,51,414 were relinquished, and acres 65,323 " paying Rupees 1,39,311 were taken " up during 1278, the net decrease being " acres 16,406 paying Rupees 1,12,103* " in wet lands, chiefly in the talooks " named below.

1278 (1868-69.)		
* Decrease in wet...	1,19,620	
Increase in dry...	7,516	
	1,12,103	

" The largest is in Gudivada Talook, and is ascribed partly to the deterio- " ration of soil by chavudu and to the " insufficient supply of water in the " channels, but chiefly to the enhance- " ment of wet rates by the introduction " of the new settlement. The present " water-rate alone is greater than the " whole consolidated wet assessment under the joint rents. So large an enhance- " ment of their sists suddenly in Fusly 1276 has led to an enormous relinquishment " of land last year," &c., &c.

Relinquishment.		RS.
Gudivada...	...	57,807
Repallee ...	...	23,688
Bapatla ...	...	22,576
Vissannapett	...	22,956
Bandar ...	...	3,289

182. I think it may fairly be inferred from the above remarks that, owing to a combination of circumstances, a settlement which in itself was much in advance of former rents and had been discussed with considerable anxiety as to its results, was suddenly enhanced by a change in the water-rate and so brought to an amount not much under that which had seemed to Government themselves a " startling" increase over former assessments. It is true that this portion of the district had been under-assessed, and, whether or not it be a fact that the 4-rupee water-rate is too high, the sudden imposition of a fair assessment coupled with this water-rate naturally made a very considerable difference to the people. The short period during which the settlement has been in force has not been sufficient to reconcile the cultivators to the change. This could hardly be expected even had there not been other and most material adverse influences at work. When these are taken into consideration it cannot be a matter of surprise that large areas of land should be relinquished. I do not think it true that all who have thrown up land really suffer from the settlement. It is not pleasant for them doubtless to surrender all at once so much larger a portion of the profits they have been enjoying, and I am not without suspicion that in some cases the well-to-do ryots, who can afford to try the game, are holding back at present loss to themselves in hopes that a show of resistance may obtain for them more favourable terms.

No doubt the ryots generally would like to revert to joint rents though probably the poorer classes came off but badly even then. The new settlement is said not to be quite even in its incidence, some villages being classed more favourably than others. Such may be the case, but inequalities† of the kind are hardly avoidable in an undertaking of such magnitude.

† NOTE.—This inequality is adverted to in paragraph 8 of Mr. Thornhill's letter, recorded in Board's Proceedings, 30th July 1867, No. 4,887.

183. I now turn to the inquiry put by the Board as to whether the present charge for water is too high, and whether a lower charge at first would be advisable.

184. When the first proposal was made for assessing the irrigated lands in the Godavery and Kistna Deltas on the principle of a fixed water-rate and a distinct tax on the land, Mr. Newill reported that, from experiments made in Rajahmundry, it appeared that the improved value of land under irrigation might be, in good and medium soils, about 10 and 8 rupees an acre, and, in inferior soils, $3\frac{1}{2}$ rupees. The conclusion arrived at was that land generally will bear a rate of about 3 rupees an acre for water-supply for a paddy crop in addition to a land-tax assessed irrespective of irrigation, leaving a large profit to the cultivators for the better soils with perhaps only a trifling gain on the worst. " Considering all circumstances I am of opinion that 3 rupees " may be adopted as a standard for a universal rate, although the best land will " bear much more than this. I could not advocate a higher rate as it would press " heavily upon the poor soils, and it is still to be seen whether the very worst will " bear this in addition to the land-tax." In order to meet the case of the last-named, where the 3-rupee water-rate would absorb almost the whole profits, it would be necessary to assess than at an almost nominal rate.

Letter from Director of Revenue Settlement, dated 13th September 1859, No. 833.

185. Assuming that Mr. Newill was right in estimating the difference in favour of land when irrigated to be Rupees $10\frac{1}{2}$, 8, and $3\frac{1}{2}$ respectively for the three descriptions of soil, (best, medium, and superior,) the Board* did not concur in his conclusion that 3 rupees an acre might be taken as a water-rate for the following reasons:—

* Proceedings 27th October 1859, No. 4,395, paragraph 4.

(1.) It creates a great inequality in the land-tax, and involves an unnecessary sacrifice of revenue in the case of the superior soils.

(2.) The entire profit in the inferior soils is absorbed by the Government tax, which is not only unfair to the owner of the land but acts as a prohibition to the investment of capital in this class of soils.

186. The Board were further of opinion, for reasons stated, that Mr. Newill's estimates of produce were too high, " and " that the difference in value between " unirrigated and irrigated land as exhibited by him must consequently be propor- " tionately affected. This consideration gives strength to the view already " expressed as to the inapplicability of an uniform rate of 3 rupees per acre in the " case of inferior soils."

Paragraph 17.

187. Again the Board observe, "apart from the considerations that revenue " will be unnecessarily relinquished and " taxation rendered very unequal, their " objection has reference chiefly to those soils on which the profit arising from " the application of water will be for the most part, or entirely so, absorbed by the " Government water-tax. Indeed, as Mr. Newill admits, it may be found, when " the subject is looked into more closely, that the proposed rate is in excess of the " profit. A lower rate seems necessary to meet the circumstances of those lands

Paragraph 32.

"which fall within the designation of 'inferior.' Should such an arrangement on "the further and full consideration of the subject seem advisable, it will naturally "follow that the intermediate or medium class of lands should be represented by "a rate of its own, thus making three separate water-rates, which will probably be "found sufficient to meet the varying powers of the soil. It may be urged that, to "charge separately for water but to make the charge vary with the description of "land as here recommended, is in reality to continue the principle of the present "nunjah assessment. One advantage would, however, be gained from keeping the "two elements of taxation distinct, the value of the water furnished by the State "would be clearly known in the accounts."

Paragraph 34.

"Should it be finally resolved to have more than one water-rate, the importance of having the same rate for an "entire tract should not be lost sight of. "Where the soils of a tract do not exhibit any material departure from uniformity "it is obviously desirable that they should all be represented by a common rate."

Proceedings, 16th November 1859, No. 4,694, paragraph 12.

"Mr. Ballard advocates a graduated scale of water-rates, viz., Rupees "4, 3-8-0, 3, and 2-8-0. The greater "part of the land falls under the 3-rupee "rate. The Board do not receive this "fact as establishing the propriety of an universal rate of Rupees 3 per acre. "Supposing the calculations to be correct and the classification of the land trust-"worthy, the result shows that the same rate may be applied to tracts of land "with little variety of soil but not to a whole district indiscriminately."

188. I have made these extracts not with the view of reviving any discussion on the merits of an uniform water-rate, but to show that if it was true in 1859 that a 3-rupee rate bore hard on the inferior soils, it is not unlikely that a 4-rupee rate should in 1869 be equally oppressive, the rise in prices notwithstanding.

189. The reasons which chiefly actuated the Government in raising the water-rate from 3 to 4 rupees an acre were—(1), that prices had risen; (2), that the assessment of land had been revised and fixed on an extremely moderate scale; and (3), that the extension and improvement of the channels had given the ryots cheap means of conveying their produce to market.

G. O., 12th May 1865, No. 1,006, Revenue Department.

190. I am of opinion that, however true these reasons may be as applicable to the Godavery District, the first only affects the Kistna. I do not think that the revision of assessment eased the ryots' burdens nor that the canals are any material assistance in cheapening carriage.

191. The danger is in regarding the two districts as possessing equal advantages. Mr. Newill, in speaking of Masulipatam, says, "In this district the "soils do not, I think, on the whole, come up to those of Rajahmundry, there being "probably a larger proportion of medium on inferior soils," and Colonel Moberly writes, "It is scarcely reasonable to "expect the same improvement in this "district as in the Godavery, where the water-communications and means of sup-"plying are so much nearer every man's door."

13th September 1859, No. 833.

8th July 1869, No. 81.

192. It is not necessary, for the purpose of this report, to re-open the question of water-rate *versus* consolidated nunjah asessment, which was fully discussed in 1859. The present Collector of the district I know holds strongly the opinion that it would generally be far preferable to have two distinct series of rates of assessment, one for nunjah the other for punjah; but, as a water-rate has been finally decided upon under orders from the Secretary of State, it seems useless to enter on the *pros* and *cons* again. A reference, however, to some of the correspondence of that period is desirable on other grounds.

193. It was assumed at that time that, in introducing the system of land assessment with a separate charge for water, a scale of classification might be drawn up, taking into accounts for all lands, whether yet irrigated or not, their irrigable qualities. Sir Charles Trevelyan,* in finally supporting the proposal to levy an uniform water-rate, alluded to this as removing one of the objections to the scheme. He says, "Although the "productiveness of the different kinds of soil varies considerably under dry culti-"vation, the effect of irrigation upon every kind of soil is nearly equal; and, so "far as there is a difference, it is partly allowed for in Mr. Newill's classification "of different qualities of soil for the *land* assessment, inasmuch as he includes "among those qualities what he calls irrigable properties, or, in other words, the "relative capacity of different kinds of soil to profit by the application of water."

From Director of Revenue Settlement, 13th September 1859, No. 833.

* Minute, 20th November 1859.

The Secretary of State also, (Despatch of 6th July 1860, No. 6,043,) in expressing a decided opinion that the rate for water should be uniform and not graduated according to the supposed profits of the recipient, adverts to this particular point as one of the reasons in favour of his decision.

194. This distinction has been entirely put on one side in the settlements which have since been made. Mr. Morris, in his report of the Masulipatam portion of the

23rd February 1861, No. 46, page 155.

Kistna District, distinctly says that, both in calculating the grain-values and the money-rates, he had omitted to take this point into consideration. He refers to an opinion expressed by Mr. Newill on the preliminary reports of the Godavery District, where it had been brought to notice that the effect of water in increasing the productiveness of certain classes of soils cannot in all cases be calculated upon with certainty, and that, in some cases, certain classes which were supposed to benefit out of proportion to others do not really do so. He then goes on to say "it seems clear to me that "the irrigable properties of land belong wholly to the subject of the water-tax," and, "therefore, to be wrong in principle to attempt to qualify the effect of the universal water-rate by making a modification in the land-rates. If the normal condition of the cultivation of a talook was wet, we then might with fairness consider "the irrigable properties of land in the land-tax; but the land-tax would not then "be a *bonâ fide* tax on dry cultivation, but merely rates to be added to a universal "water-rate, to form a wet assessment on the land. But the dry rates we are now "discussing are, to a very great extent, *bonâ fide* rates on dry cultivation, and I am "firmly of opinion that it is unfair to charge dry cultivation for properties which "are dormant without the application of water."

195. If this principle has been acted upon it shows that Mr. Newill's idea of making a special allowance, where the profit on poor soils under irrigation would be almost entirely absorbed by the water-rate, has fallen through.

196. I observe that, when the rules submitted with Board's Proceedings, G. O., 22nd September 1860, No. 1,690. dated 26th May 1860, No. 2,529, were sanctioned, Rule I. stood as follows:—

"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 *(taking into account its irrigable properties)* and a "separate water assessment to be levied."

Eventually, however, when the rules were finally passed* and published, the * G. O., 26th October 1861, No. 2,054. words italicised above were omitted, and, from the Board's letter of 1st June 1861 No. 2,843, on which the Government Order was passed, it would appear that this alteration was made at the suggestion of the Director of Revenue Settlement, though the precise reasons are not stated.

197. From the answers received from the Public Works and Revenue officials to my inquiries on this point I gather that the former do not think the present rate too high, though one considers that, in justice to the cultivators, the rates should be variable, as all lands under wet cultivation are by no means equally productive. Some of the Tahsildars consulted recommend a return to the 3-rupee rate on the ground

that water is insufficient at most seasons of cultivation. Others think there is no hardship in the present rate so long as prices are high, but that, when these fall as they did in 1277 (1867-68), some allowance should be made.

198. An uniform water-rate can never be quite fair, and this is well-known to the ryots. Even where a man gets a good-enough profit from his land after paying his assessment he can never but think himself ill-used when he sees his neighbour with better land and a finer crop only paying the same water-rate, for the small difference in the land assessment, even if any exists, does not, in his opinion, or in reality, place the two on an equality.

199. An uniform water-rate is *prima facie* unfair because the highest-taxed dry rate does not make the best land for nunjah or *vice versa.*

200. A sandy soil pays (say) 8 annas an acre; it produces a poor dry crop: convert it into wet, and you have a first-rate crop for which the ryot pays Rupees 4. On the other hand, take a good loamy soil assessed at 3 rupees and very productive under dry cultivation, and the wet crop will not be as good as on the sandy soil, though the combined rate will be Rupees 7.

For good or evil, however, the system of an uniform rate has been established, and I merely notice the subject here because it has been pointedly referred to in the course of my inquiry.

201. On the Guntoor side of the Kistna, where the ryotwary system has been in force for twenty years and where the present rates of assessment are as high, if not higher than Gudivada, I have met with no complaint of the water-rate being too heavy. It must be remembered, however, that its imposition has not made so great a change as east of the river. In a portion only of one talook has a separate water-rate been introduced. Here the rate originally fixed in 1856 was a graduated one, the maximum being 4 rupees. So the present rate is nothing new. In the remaining land converted into wet, the nunja rates of neighbouring lands have, pending the new settlement* shortly expected, been and no change was made when the fixed, enhancement in the water-rate was ordered. In reality, however, they are paying its equivalent.

Average rates.

	Rs.	A.	P.
Repallee, per acre	5	5	1
Bapatla, do. including Sonalu land.	7	0	0

The Zampany and Tenali Divisions of Repallee.

* New settlement rate per acre plus water-rate.

	Average dry rate per acre.	Water-rate.	Total.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Repallee	1 14 0	4 0 0	5 14 0
Bapatla	1 10 0	4 0 0	5 10 0

Even on the Masulipatam side, where there are in Bezwada a few villages favourably circumstanced as to soil and water-rate, and where the 3-rupee water-

rate was in force from 1861, there has been no falling off in the wet cultivation since the settlement was made, but, on the contrary, an increase.

202. Looking to the opinions which have been expressed by the officials in the district; to the absence of complaint in the Guntoor portion of it; to the readiness in all parts to take up land where it is suitable and water available; and to the present prices, I am not prepared to say that the 4-rupee rate is too high unless for exceptionally poor lands; but I think that the peculiar circumstances under which it has been brought into operation in the joint-rent villages render a partial and temporary modification of it desirable.

203. (2.) WATER-RATE RULES.—*Option.* The Board have asked* whether free option for taking or declining water at any period can be safely conceded. They say in another place that they prefer perfect freedom and do not think the risk material so long as the water-rate is moderate, and the Government are also of opinion that it would be good policy to give the ryots still greater option (than at present exists) as to taking or refusing water.

* Proceedings, 31st March 1869, No. 2,069, paragraph 31.

Paragraph 17.

Government Order, 21st May 1869, No. 1,432, paragraph 2.

204. It is to be remarked that, in the discussion upon the practicability of assessing wet cultivation on the principle of a land-tax supplemented by a water-rate, Sir Charles Trevelyan gave it as one reason in favour of the plan "that "the water will be an article which men may take or not as they like, so that, if "any complain, we may be able to say, 'Well, don't take it if you think it won't "do you good."

Minute, 20th November 1859.

205. Mr. Walter Elliot objected to an uniform water-rate if it interfered "with perfect freedom of action on the "part of the cultivators. We are now "recognizing more and more the fact that the land is the ryot's private property, "held only by the tenure of paying the land-tax. That tax has been defined to "be a fixed sum per acre in its dry state; so long as that is paid, the occupant "should be left at perfect liberty to use it according to his discretion as pasture, "or in growing dry grain or in taking a single crop or a double crop, or in "growing rice or tobacco or sugarcane at his pleasure."

Minute, 15th November 1859.

206. The late Mr. Morehead differed. He said, "When land has been brought "under the influence of the water-rate, such land ought to be transferred to the "head of wet lands, the only freedom of action that should be left to the cultivator being the power of giving up the lands if he sees fit so to do. The land has "been improved at a heavy outlay to Government, and the Government have "clearly a right to fix the terms on which they mean to rent their lands. I do "not, therefore, agree with Mr. Elliot in the last paragraph of his Minute. If his "views were acted up to, the improvements of land by Government would be "effectually checked. In England, if a landlord drains and improves a farm, he "raises the rent; so in India, if the Government bring water to the lands of a "village, the water-rate must be paid. The land in all Ryotwary districts belongs "to Government: the right conferred on the ryot is that of permanent occupancy,

"subject to payment of a fixed sum as rent and to the liability of being charged a "water-rate when the Government finds water."

207. In determining to adopt an uniform water-rate the Government directed that, in order to guard against fraud and evasion, rules should be prescribed "with respect to the time and the "manner for ryots to signify their desire to take water *or to discontinue taking it.*"

G. O., 7th December 1859, No. 1,656, Revenue Department, paragraph 4.

208. The first draft of these water-rate rules was prepared by the Director of Revenue Settlement, and Rule VI. stood as follows:—

Forwarded with letter, 5th May 1860, No. 433.

"When ryots desire to discontinue the irrigation of land classed as nunjah "and chargeable with the 3-rupee or 4-rupee water-rate, notice of the same must "be given to the Collector in writing on or before 31st March, who will, after "inquiry from the Engineer-Officers as to the nature and sufficiency of the supply "of water and investigation of other causes which may have given rise to the "application, arrange for the discontinuance of the water and order the transfer "of the land in the accounts from nunjah to punjah if such a course is required. "This transfer will not be allowed for isolated fields which are necessarily benefitted by the surrounding irrigations although not ostensibly supplied directly "with water, and the cases will be considered with reference to the general wishes "and interests of the community rather than the caprice of a few individuals."

209. On this the Board remarked that "if it is intended to give the ryots "the option of taking or refusing water "as they may judge most consistent with "their own interests, all that should be required is that the ryot should make "known his wish before a fixed date. The rule as it stands, however, seems to make "compliance with the ryots' application contingent on the opinion of the Collector "and Engineer as well as the wishes of the other ryots. The Board think that "either the option should be allowed with only the condition they have stated, or "that it should be ruled that nunjah land cannot be re-converted into punjah unless "the means of irrigation fail. The Board prefer the latter."

Proceedings, 16th May 1860, No. 2,372.

210. Mr. Newill in reply said, "I fully concur with the Board in thinking it "better that it should be laid down *as a* "*rule* that nunjah cannot be re-converted "into punjah unless the means of irrigation fail. Rule VI. was drawn up with "reference to the provision for discontinuance of the use of water contemplated "in the Order of Government. If it were cancelled *in toto*, as I would now "recommend, it would leave matters in exact accordance with the general "practice in the Northern Circars, viz., that lands once brought under regular "irrigation and entered in the nunjah class are not re-converted into punjah unless "from failure of the service of irrigation or other uncontrollable causes.

19th May 1860, No. 503, paragraphs 3 and 4.

"It is perhaps unnecessary to add that, if option is allowed in all cases to the "ryots to take or discontinue the use of water, the principle of dealing with land

"by tracts must be abandoned and all the evils of an annual examination of each "field hazarded, as noticed in paragraph 4 of my Memorandum, dated 25th November "1859, to which I beg specially to refer as showing that such option, involving a "transfer from nunjah to punjah, is not in accordance with the usages of the "country and not in itself necessary or expedient; but that raising the question of "it would only tend to unsettle things, to foster fraud, vexation, and evasion of "the tax."

211. The Board agreed in this view, adding that "the ryots cannot reasonably expect such a privilege after Government had incurred all the labour and expense of providing regular and permanent irrigation." The rule they proposed, therefore, was that "Land classed as nunjah and chargeable with the "3-rupee or 4-rupee water-rate cannot be transferred to punjah unless the means "of irrigation permanently fail."

Proceedings, 26th May 1860, No. 2,529.

212. The Government approved of the Rule slightly modified as follows, "Land once classed as nunjah cannot be "transferred to punjah unless the means "of irrigation fail permanently." This rule appears as No. VI. in the rule finally sanctioned by Government on the 26th October 1861, No. 2,054, and continued in force until the passing of the revised rules sanctioned by Government on the 31st October 1865, No. 2,665.

G. O., 22nd September 1860, No. 1,690, Revenue Department.

213. The reasons which led to the alteration then made and the nature of that alteration are fully epitomized in the Board's Proceedings, dated 31st March 1869, No. 2,069, paragraphs 5—10.

214. It is to be noted that the *quasi* option then permitted referred only to lands newly taken up. All land previously converted into wet remained as it was, viz., untransferrable to punjah unless the means of irrigation failed permanently.

215. The dilemma appears to be this. The order of the Secretary of State directing option to be allowed being intended primarily to meet the case of a district where no wet cultivation had been carried on was ruled not to apply to the Godavery and Kistna, where a very large extent of land had already been converted. In cases of new wet cultivation, however, a compromise was ordered. If a ryot converted land and took water for three successive years, then his land was classed as irrigated; if, however, he declined water the third year, the land remained dry, and he might thereafter vary his cultivation as he pleased, always provided that he never took water for more than two years at a time. Some ryots, as appears from Mr. Fraser's letter, recorded in Board's Proceedings, 14th April 1869, No. 2,539, have in the Godavery District taken advantage of this rule in the manner above described, and, no doubt if the rules had been better known in the Kistna District, the same would have been the case there. At all events, the practice is likely to increase, particularly where a large extent has recently been re-converted into dry under special circumstances.

Proceedings of the Madras Government, Revenue Department, 6th December 1869.

216. The following statement shows how far the ryots have availed themselves of the privilege in the Kistna District:—

Items.	Extent of land re-converted into dry.				Fusly in which the dry land was converted into wet.	Fusly in which the wet land was re-converted into dry.	Remarks.
	Land.	Assessment.	Water-rate.	Total.			
	Acres.	Rs.	Rs.	Rs.			
Bandar	...	...	...	...	...	...	
Gudivada... ...	168	139	672	811	1275	1276	Infertility of soils and deficiency of water-supply.
Bezwada... ...	12	21	47	68	1275	1277-1278	Inaccessibility to irrigation.
Repallee... ...	110	147	442	589	1275	1277	Do. do. do.
Bapatla	36	71	144	215	1276-1277	1278	Poorness of soils, having been under cultivation from a long time.
Total...	326	378	1,305	1,683	.....	.....	

217. The state of things induced thereby will give opportunities for much of the fraud, evasion of tax, and annual examination of each field, which Mr. Newill named as the consequence of an entire option. Those who do not possess this liberty of action over their land will naturally envy those who have it.

218. Experience has shown that some modifications are necessary in the rules. Allowance must be made for possible deterioration of soil and other uncontrollable causes which were recognized in the Northern Circars in past time, besides simple failure of irrigation, as affording ground for a change in the classification. Such changes must be in favour of the ryot, and so far they will give openings for fraud, cheating, and other malpractices.

219. The question then arises, Would it not be better to merge all these modifications in a complete option?

220. *Theoretically*, few can deny that such option is *fair*; but is it *practicable?* Would it result in greater confusion than is likely to occur under the present or any other modified system?

221. The objections may be summed up as follow:—

In the Revenue Department.—Constant interference of petty Revenue Officers, who would have to be always on inspection to see what fields had taken water.

Board's Proceedings, 15th July 1857, No. 2,400, paragraph 6.

Additional work thrown upon the Talook Authorities and subordinates of every grade, such as keeping registers of reports made by the ryots; annual examination of land; inquiries into complaints of fraud made by, and against, the village officers and ryots; confusion in accounts; and fraudulent use of water by ryots and Inamdars.

Vide Godavery Collector's opinion, Board's Proceedings, 11th October 1865, No. 6,422.

In the Public Works Department.—Irregularity of distribution, which would entail much extra labour on Delta Goomastahs.

222. I may add that the feeling of the Public Works Officers in the district is entirely opposed to such a relaxation. They would permit no re-conversion of

wet into dry, and new land should be watered only on agreement to cultivate wet perpetually. Neither are the Tahsildars in favour of any more freedom.

223. When writing on the subject of a general survey and settlements in 1855, the Government expressed themselves in the following terms, "When annual "settlements shall be in use, the terms of them will simply vary with the lands "held by the ryot and *his use or non-use of water* from a Government source. No "inquiry will be necessary as to the mode in which he may have cultivated his "land or any of it, or whether he has cultivated it at all. There will be entire "freedom to ryots to take or give up land; but whatever they take they will be "required to pay for till they formally relinquish it, and there will be a set time in "each year for such relinquishment."

224. This picture of what an annual settlement should be is not borne out by the reality.

225. The course as to the examination of fields prescribed by the present rules is as follows:—

Under paragraph 15 of the Village Manual the Curnum is to open account No. 4 ("Adungal Account,") with reference to which the other accounts necessary for the settlement are prepared. As soon as the cultivation season commences he is to examine and enter in this account the lands cultivated, the nature of the crop, with other particulars as to the state of the irrigation, deficiency, or excess of water, or waste. Every field is to be thus examined, and the date of examination noted. The account completed, a report is to be made to the Tahsildar, who will depute an "Ajamayashedar" (Examiner), whose duty is to take the Adungal account and examine the cultivated and waste fields, entering in column 19 the result of his examination, noting any excess if found. All cultivation which takes place from the time of the "Adungal" examination up to the Jummahbundy is to be entered in the accounts. This "Adungal account" should correspond with the Jummahbundy account No. 5 in the Village Manual.

226. The system actually pursued is somewhat different. The Curnum prepares the Adungal account more or less accurately, but does not report its completion to the Tahsildar. The Revenue Inspector, in his tour through the villages of his division, examines some fields in every village, say 10 per cent. In some cases where it may be impracticable for him to examine, Talook Goomastahs are sent for the purpose. The fact is that there is no thorough overhauling of the Curnum's account. In spite of rules and manuals the work is "scamped."

227. The Revenue Inspectors have this to be said in their behalf, viz., that their charges are now so large (fifty or sixty villages) that it is physically impossible for them to make the necessary examination as it ought to be made. Before the revision of talooks and establishments, the "Samutdars," as they were then called, had the oversight of twelve or fourteen villages.

228. If, with such a system in force, free option of taking and declining irrigation is given to the ryots, the Curnums will be certainly still more masters of the situation.

229. Even supposing them to be actuated by the most honourable motives, their own labour will be very much increased, as they would have to be constantly

on the watch, lest land which had been re-converted into dry should again be watered surreptitiously. In Zemindary tracts where the Curnums are not responsible to the Collector's authority still more opportunities of fraud would occur.

230. I have not yet* heard what the sentiments of the present Collector of this district on this subject are. Those of the Collector of Godavery are, I gather from past correspondence, entirely opposed to such option. A former Sub-Collector and Collector of that district held that water assessment should be charged for water actually received.

* See conclusion of the report.

Vide Board's Proceedings, 11th March 1864, No. 1,515.

231. It is to be noted that, in according his assent to Madras Act VII. of 1865, *(to enable the Government to levy a separate cess for the use of water supplied for irrigation purposes in certain cases,)* the Governor-General did so on the understanding that "no water-rates will be levied under the Act for water which has not "been used."

Vide Proceedings, Legislative Department, recorded in Government Order, 10th October 1865, No. 2,445, Revenue Department.

232. Notwithstanding this, water-rate has been levied in the Kistna District on hundreds of acres which have for years been dry-cropped from various causes.

See paragraph 37, supra.

233. The question of option as it affects Inamdars is, I think, important. Under the present rules much of this species of property, so recently confirmed by sunnud, has been, by a side-wind as it were, virtually destroyed. The holder of Government land if refused permission to re-convert his wet into dry has, at all events, the last resource of relinquishing it altogether. But if an Inamdar has converted his dry inam into wet and then finds it does not answer, he must still go on paying the water-rate if he wishes to retain his freehold property.

234. Some years ago the then Collector of the Godavery District asked, in the event of an inam classed as irrigated being left waste, whether the water-tax was to be demanded. He said, "It would be so in the case of land held from "Government, want of water being the only ground under which a remission of "the water-rate can be claimed; but I question whether it will be fair to call on an "Inamdar to pay water-tax for land *left waste*, notwithstanding that the inam has, "from being permanently supplied with irrigation, been classed as irrigated."

Board's Proceedings, 26th March 1863, No. 1,778.

No immediate answer seems to have been given to this query.

235. In 1861, when the discussion about a separate water-rate was going on, Mr. Taylor, the Inam Commissioner, gave it as his opinion that the option of refusing irrigation was a necessary safeguard to Inamdars, because the water-rate ought in their case to fall solely and entirely on the additional profits derivable from anicut irrigation and ought not to trench on the original income or return from the land, and he recommended that they should be allowed to raise wet crops with the option of converting their dry lands into wet at any time they may find it to their advantage to do so.

Board's Proceedings, 31st October 1861, No. 5,959.

236. Mr. Boswell, the Acting Collector of the Kistna District, refers to the hardship of the present rule in paragraph 3 of his letter, recorded in Board's Proceedings, 10th July 1869, No. 4,950.

237. It is not known how much of the land re-converted under the Board's Order of 5th August 1868 is inam, because the return has been based simply on the cultivators' petitions, and no inquiries have yet been instituted into the particulars of each case.

Vide paragraph 59, supra.

238. I observe that, when the first draft of an Act for the realization of water-rate was prepared, it was proposed to give much more opportunity than has since been permitted to both ryots and Inamdars to decide whether they would take water, and, in case an enhanced water-rate was determined upon, those who had given written agreements were to have the opportunity of refusing assent to such enhancement.

Board's letter, 20th September 1862, No. 6,305.

239. The tendency of the age is towards liberality in dealing with the natives of India. The Government of to-day would hardly say as that of 1858 did, that "individuals cannot be suffered to "obstruct great measures of general improvement by refusing to take advantage "of them. The ryot only holds his land on the tenure of paying the public demand, "which the Government can enhance or reduce at pleasure, according to the as "circumstances of the land. Individuals who refuse to pay the full amount of tax "regulated must give place to those who will pay."

Government Order, 22nd September 1858, No. 1,289, Revenue Department, paragraph 17.

240. A few years hence it will probably be a matter of astonishment that any hesitation was felt in giving effect to what will then seem an act of simple justice.

241. Mr. Thornhill's proposition is that the ryots should have perfect freedom for five years, and that then the rule should be so modified that any ryot showing due cause should be at liberty to revert to dry cultivation.

Memorandum, dated 26th May 1869, paragraph 34.

242. I am inclined to think that under a complete option there would be less probability of ryots throwing up wet cultivation than under Mr. Thornhill's scheme. In the latter case they might be anxious to obtain that option which they could not acquire after the five years had elapsed, and would take steps to get it even though they had no intention of reverting permanently to dry cultivation.

243. On the whole, I see great difficulties in the way of granting complete option; but at the same time it is a question whether they are so great as to be insurmountable, considering also that the requisite modification of the rules will, and must, result in greater discretion to the Revenue Authorities to act according to circumstances instead of being bound down tightly to a rigid formula.

244. If the option of taking or declining water *is* granted, it is essential that the laxity of procedure hitherto observed should cease and the rules be strictly enforced.

245. Every ryot wishing to convert his dry into wet should send an application to the Tahsildar through the Curnum stating the number and extent of the field

which he wishes to wet crop under channel irrigation, and undertaking to pay the land assessment and water-rate for the year whether he cultivates the land or not, water being available. The Tahsildar should on receipt register the same in a given form and return it to the Curnum with a simple endorsement showing that it is admitted. The Curnum, after registering it in a book, should return it to the ryot. Such applications should be received and admitted by the Tahsildar till the end of June. He should then close the account and send one copy to the Range Officer and another to the Revenue Inspector of the division, who should examine now and then whether any other dry lands have been converted into wet besides those sanctioned.

246. Lands converted in any other manner should be treated as surreptitiously irrigated, and dealt with accordingly.

247. Lands once converted should be considered liable to water-rate until formal notice to the contrary.

248. A system similar to that described above should be followed where a ryot wishes to decline water.

249. Printed forms should be supplied to every Curnum, to be used in applications of both kinds.

250. The rules should be proclaimed by beat of tom-tom in every village, and a printed copy thereof posted up.

251. A statement of lands applied for for conversion or re-conversion should be published periodically in every village.

252. It might tend to the advantage of the State if the Revenue Inspector was allowed a per-centage on all concealed cultivation which he might be instrumental in bringing to light.

253. Regular examinations of all wet lands should be made before the end of December and an occasionl transfer of Inspectors for this purpose would be desirable.

254. With respect to Zemindary tracts a similar course should be followed through the agency of the Deputy Tahsildars.

255. If the system was carried out in its integrity it might work satisfactorily. There are often local jealousies which keep the Curnums straight, and there is the check exercised by the Department Public Works.

256. No doubt it will throw additional work on the Talook establishment.

257. Where agreements are taken when new channels are dug, I think the provisions should be on a standard plan and should hold good for a term of years for certain.

258. The only other case that occurs to me when complete option could not be given is when land from its position cannot help receiving water.

259. *Other alterations in water-rate rules.*—If option be not accorded there are one or two alterations which it seems well to provide for in the rules.

Rule II.—To the concluding words "such land shall not be transferred to "punjah unless the means of irrigation fail permanently" should be added "or "unless, from deterioration of soil or other uncontrollable cause it becomes unsuited "wet cultivation."

Rule VII.—Unless, in the case of the required execution of a new irrigation work, there is no necessity for retaining the 31st March as the date on or before which application is to be made to convert land. In reality it has never been observed.

If it was enforced it would bear hardly on many who dare not venture to take up fresh land till they see what the prospects of the season are. This cannot be till June or July, and the date might be 30th June or 31st July. The Tahsildar should have authority to receive and dispose of such applications where means of irrigation already exist.

260. Another suggested alteration refers to the second clause of Rule VII. It has been said that the interval of two years which it permits is not sufficient to test the capabilities of the soil for wet cultivation. The evidence on the subject is conflicting. The limit as it stands is not looked on with favour by the Public Works Department. It is considered sufficient by some, insufficient by others of Revenue experience, and the ryots are not unanimous in asking for an increase. On the whole, it seems best to leave it unaltered.

261. *Rule VIII.*—The roundabout system here directed has never been followed. As already stated in paragraph 42 of this report the ryots have been accustomed to go straight to the Delta Goomastah or Overseer. I think that the Tahsildar should have more knowledge of what is done in the matter, and that the Revenue Inspector should receive the applications and send lists of them to the talook. The existing custom tends to throw too much authority into the hands of the Department Public Works subordinate.

262. I think it would be better to make the rules correspond with what should be the practice and then enforce them properly. Where the liability of the ryot is concerned they have generally been observed rigidly enough except in regard to Rule IX., which directs double water-rate for water surreptitiously taken. This could not be observed when it was impossible to distinguish what was and what was not surreptitious irrigation. If applications for permission to cultivate are rendered indispensable there will be no more difficulty about it, and the proper enforcement of Rule IX. will make the ryots more careful in complying with the provisions of Rule VII.

263. (3.) *Separate cess.*—The Board* ask if a separate cess is practically so unpopular and unacceptable to the people as to be in any material degree an influencing cause in the rejection of the water.

* Proceedings, 31st March 1869, No. 2,069, paragraph 30.

264. None of the ryots whom I questioned on the subject made the smallest objection to a separate cess. It was a matter of profound indifference to them whether they paid their sist in this way or in a consolidated form. In fact, it is consolidated so far as they are concerned, and the separation of the items is a mere matter of account for the Curnum to attend to.

265. As RELATES TO THE PUBLIC WORKS DEPARTMENT.—(1.) *Drainage.*—The irrigation of the Delta is conducted (except in the Divi division of the Bandar Talook) by canals leading from the anicut at Bezwada, fifty miles from the mouth of the Kistna. On the east bank there are two main lines, leading respectively south to Masulipatam and east towards Ellore. On the west bank the main line from Sitanagaram to Nizampatam on the coast has two branches, one leading from Duggirala to the borders of the Nellore District and known as the "Kummamur Channel," the other following the course of the west bank of the Kistna from which it takes its name.

Proceedings of the Madras Government, Revenue Department, 6th December 1869.

266. Gudivada Talook is supplied by channels leading from both the Ellore and Masulipatam main canals: Bandar and Bezwada are solely dependent on the latter. On the Guntoor side the Repallee Talook is watered from the Nizampatam and western bank canals, while the Kummamur channel feeds the Bapatla Talook.

267. It seems hardly necessary to say much on the subject of drainage, as the Government themselves have admitted that it is defective, and that to this cause, in no small measure, the relinquishment of some portion of the wet cultivation is due. From my own observations in Bapatla since the recent heavy rain has fallen, as well as previously in the other Delta talooks, I am able to add my testimony to the fact. I am informed by the Range Officers that plans are under preparation for the improvement of the drainage generally, involving, in some instances, a re-distribution of the water-supply for irrigation, and that it will depend on the grants made by Government as well as on the facility of procuring labour, which is diminishing yearly, how soon these can be carried out; in any case, several years will elapse before they are complete.

G. O., 17th December 1868, No. 3,941, Public Works Department.

268. (2.) *Insufficiency of water-supply.*—The chief cause of the difficulty which has arisen in this district is, I believe, an insufficient supply of water. It is this which has principally influenced the ryots in their unwillingness to convert their dry land into wet, and is at the bottom of all complaints about, "chavudu;" and I think it sufficiently explains how the eagerness for water, which characterized the first days of the anicut as described by Mr. Thornhill in his Memorandum of the 26th May last, has changed into an apparent aversion to its use.

269. The following extracts from the Jummahbundy Reports of past years show that the difficulty is not a new one:—

1268 (1858-59.)—*Guntoor.*—"Wet crop in Delta talooks suffered under "Kistna channels from want of water this year."

"On the 16th November last the Department Public Works wrote that the "supply of water in the Kistna was quite inadequate to the cultivation, and that, "in consequence, all sluices must be closed for two days in each week. It was "probably not that the supply of water was inadequate but that the present "arrangements for securing that supply were inadequate."

1269 (1859-60.)—*Kistna.*—"As ryots appeared to be taking up land without due discrimination, the Collector issued orders to warn Tahsildars against "encouraging them to occupy more than they could properly manage. Subsequently the District Engineer having intimated that the supply of water would "not be sufficient for any further increase of cultivation, orders were issued to "prohibit ryots from preparing more land for cultivation. That this was a wise "precaution was shown by the subsequent complaints of want of water in many "villages. The practice of the District Engineer was to allow full flow of water "to each talook for one day in seven. It was found, however, that by this arrangement the more distant lands of the talook received none at all; and at Mr. Knox's "suggestion, therefore, water was allowed for two days in every fifteen instead of "one in seven."

1270 (1860-61.)—"In the Delta the crops promised well, but just as the "paddy was coming into ear the supply from the channels fell off."

"Decrease in wet cultivation was very great, attributable partly to failure "of rain, also to failure of freshes in the Kistna."

1271 (1861-62.)—"Nor was the supply of water from the anicut at that "time (August and September) by any means equal to the demand upon it."

1273 (1863-64.)—"In Repallee and other Delta talooks a great deal of "wet land was newly cultivated under the influence of anicut water: owing to "failure of rain the supply from the anicut was not sufficient to bring all the crops "to perfection, hence the necessity for remissions."

1275 (1865-66.)—"Supply from the anicut channels inadequate" in June and July.

1278 (1868-69.)—"The wet crop suffered from drought in October and "November."

270. The large relinquishments this year were ascribed partially to insufficient supply of water in the channels. "The branch channels have been extended too "far, and more land has been taken up than it has been found possible to irrigate "properly. Efforts are now being made to increase the width of the main channels "as fast as possible."

271. The enormous amount of silt in solution in the Kistna water, the excessive deposit in the channels, the precariousness of the supply of water, and the incomplete state of the anicut works, were dwelt upon by the Collector in 1861.* He showed in 1867† that the works were still far from complete, and the same may be said now, while the other evils have not diminished. Paragraph 15 of Mr. Thornhill's Memorandum shows how serious an evil the silt is.

272. Speaking of the Eastern Delta, Colonel Moberly, Superintending Engineer, 2nd Division, informs me that "the main canal is notoriously not large enough "to convey the quantity required‡ and "that works lately sanctioned under an estimate for Rupees 4,08,090 are now "in progress to supplement the small existing head." Again, in reference to the Kummamur channel on the Guntoor side, he writes, "the irrigation is exceedingly "troublesome. The local officers are obliged to put up and open temporary dams "to regulate an insufficient supply of water (the head like that of the Masulipatam "canal not being large enough) passing down a channel with seven feet a mile-fall."

273. Colonel Winscom referred to this question in the following terms, 9th October 1868, No. 87.

"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."

274. During the cultivation season, which may be said to be generally from July to December, (though seed-beds are prepared in June if water is available,) water is most required at the beginning and the end, *i. e.*, for the transplanting the

* *Vide* Board's Proceedings, 21st November 1861, No. 6,447.

† Board's Proceedings, 30th July 1867, No. 4,887.

‡ For Gudivada.

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young paddy and for bringing the crop to maturity. At both these seasons, but especially the latter, the deficiency is mainly felt. It sometimes happens that, owing to incompletion of repairs, (as was the case this year,) the water cannot be admitted as soon as the first freshes come down, and the lack at the close of the season is generally from the low state of the river at that period.

275. The ryots on both sides of the river are unanimous in their complaints on this score, and they are corroborated by the Revenue Officers of the Delta. The records of the collectorate and of the different talooks show how constantly the sufferings of the people on this account have been brought to notice. The greatest sufferers are those whose lands lie furthest away from the channel heads: the villages in the Bandar Talook and in the eastern part of Gudivada may be mentioned especially, and here also the irrigation channels are defective. The Bantumilly canal has had, it is said, the effect of rendering the irrigation of the villages in its neighbourhood far more difficult than it was before, when they received water from the old Pullair, which has now been intercepted by the new canal. The supply may not only be insufficient but may be untimely. Owing to the period elapsing before a fresh supply comes down the crop may in the interval have perished.

276. During October and November water is admitted by "turn" into the principal channels as the only way of giving a sufficient watering, the river being generally low at this period.

277. I think it not at all improbable that in one sense the ryots have often themselves only to blame for the failure. I believe that they have in past years taken up a great deal more land than the channels could supply, and that they have not only suffered themselves but have lessened the supply, which would have otherwise sufficed for their neighbours.

278. In some cases the insufficiency of water has arisen simply from the irrigation channels being out of repair. In one instance which was brought to my notice a complaint of eight years, standing, was removed by the expenditure of a few rupees. In other cases additional cultivation-channels are asked for to make the supply adequate.

279. I think the complaint of inaccessibility to irrigation may be partially explained in this way: also it is to be remembered that, in the earlier stages of the water-works, cross bunds had been permitted here and there to raise the water to the level of the land which the ryot was then eager to irrigate. In course of time, as the scheme of irrigation was more developed, these cross bunds were found inconvenient in many ways, both as retaining silt and as interfering with the proper supply of water to villages lower down; they were, therefore, forbidden, but the ryot whose land was thus rendered inaccessible did not always get a certificate to that effect, and so he went on growing dry crops and paying water-rate. I dare say that this does not hold good of the whole extent entered under this head in the statement, viz., acres 7,881, but I am convinced that in many cases great hardship has been incurred. I can easily conceive that a ryot seeing his neighbour in such a predicament would be very chary of making himself liable to a similar accident.

280. The following statement shows the extent of land originally converted from dry into wet, which, having become unsuitable for wet crops from various causes, was cultivated with dry in 1278 (1868-69):—

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Statement showing the dry crops cultivated in Fusly 1278 *on lands alleged*

Talooks.	Government or Inam.	CHAVUDU.				NALAYEK OR LANDS NOT
		Usual wet.		Dry land converted into wet.		Inaccessibility to irrigation.
		Land.	Assessment.	Land.	Assessment.	Usual wet.
						Land.
		AC.	RS.	AC.	RS.	AC.
1. Bandar ...	Govt....	...	...	...	...	...
	Inam...	...	...	...	...	...
Total...	.....	...	...	...	...	...
2. Gudivada.	Govt. ...	8	43	...	...	92
	Inam...	...	...	...	...	...
Total...	.....	8	43	...	...	92
3. Bezwada.	Govt....	...	...	...	...	...
	Inam...	...	...	...	...	...
Total...	.....	...	...	...	...	...
4. Repallee.	Govt....	...	...	2	13	237
	Inam...	...	...	...	...	4
Total...	.....	...	...	2	13	241
5. Bapatla...	Govt....	...	...	...	...	...
	Inam...	...	...	2	8	...
Total...	.....	...	...	2	8	...
Total...	Govt....	8	43	2	13	329
	Inam...	...	...	2	8	4
Total...	.....	8	43	4	21	333

Talooks.	Inaccessibility to irrigation.		Flooding.		Gulacarai or Gravel.	
	Dry converted into wet.		Usual wet.		Dry converted into wet.	
	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
	AC.	RS.	AC.	RS.	AC.	RS.
1. Bandar ... Govt....	...	...	...	...	...	...
Inam...	...	...	...	...	...	...
Total...	...	...	...	...	...	...
2. Gudivada. Govt. ...	277	1,640	...	...	...	...
Inam...	176	705	...	...	...	...
Total...	453	2,345	...	...	5	26
3. Bezwada. Govt....	102	601	...	...	...	...
Inam...	17	80	...	...	...	...
Total...	119	681	...	...	...	...
4. Repallee. Govt....	1,305	7,272	...	...	38	227
Inam...	278	1,116	...	...	...	...
Total...	1,583	8,388	...	...	38	227
5. Bapatla... Govt....	59	356	...	...	24	144
Inam...	1	4	...	...	1	4
Total...	60	360	...	...	25	148
Total... Govt....	1,743	10,049	...	...	67	397
Inam...	472	1,905	...	...	1	4
Total...	2,215	11,954	...	...	68	401

Talooks.	Gulacarai or Gravel.		
	Usual wet.	Dry converted into wet.	
	Land	Assessment.	Land.
	AC.	RS.	AC.
1. Bandar ... Govt....	...	...	...
Inam...	...	...	...
Total...	...	...	...
2. Gudivada. Govt. ...	...	...	...
Inam...	...	...	...
Total...	...	...	...
3. Bezwada. Govt....	...	...	...
Inam...	...	...	...
Total...	...	...	...
4. Repallee. Govt....	...	...	11
Inam...	...	...	19
Total...	...	...	30
5. Bapatla... Govt....	...	...	...
Inam...	...	...	...
Total...	...	...	...
Total... Govt....	...	...	...
Inam...	...	...	11
Total...	...	...	30

Talooks.	Dry converted into wet.	
	Land.	Assessment.
	AC.	RS.
1. Bandar ... Govt....	...	...
Inam...	...	...
Total...	...	...
2. Gudivada. Govt. ...	...	...
Inam...	...	...
Total...	...	...
3. Bezwada. Govt....	...	...
Inam...	...	...
Total...	...	...
4. Repallee. Govt....	...	...
Inam...	...	...
Total...	11	66
5. Bapatla... Govt....	...	...
Inam...	30	142
Total...	...	...
Total... Govt....	...	...
Inam...	...	...
Total...	11	66
	30	142

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to be unsuitable for wet crops on account of Chavudu, etc.

SUITED FOR WET CROP FROM												Grand Total.			
Pulludu.				Vellalunga.				Total.							
Usual wet.		Dry converted into wet.		Usual wet.		Dry converted into wet.		Usual wet.		Dry converted into wet.		Usual wet.		Dry converted into wet.	
Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
AC.	RS.	AC.	RS.	AC.	RS.	AC.	RS.	AC.	RS.	AC.	RS.	AC.	RS.	AC.	RS.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	92	408	282	1,666	100	451	282	1,666
...	...	...	...	...	...	...	...	...	...	176	705	...	...	176	705
...	...	...	...	...	...	...	...	92	408	458	2,371	100	451	458	2,371
...	...	...	...	...	...	...	...	...	...	102	601	...	...	102	601
...	...	...	...	...	...	...	...	...	...	17	80	...	...	17	80
...	...	...	...	...	...	...	...	...	...	119	681	...	...	119	681
...	...	502	3,260	...	...	...	...	237	1,444	1,856	10,825	237	1,444	1,858	10,838
...	...	129	525	...	...	...	....	4	4	426	1,717	4	4	426	1,717
...	...	631	3,785	...	...	...	...	241	1,448	2,282	12,542	241	1,448	2,284	12,555
...	...	2	12	...	...	...	...	...	...	85	512	...	...	85	512
...	...	...	...	...	...	2	8	...	...	4	16	...	...	6	24
...	...	2	12	...	...	2	8	...	...	89	528	...	...	91	536
...	...	504	3,272	...	...	...	...	329	1,852	2,325	13,604	337	1,895	2,327	13,617
...	...	129	525	...	...	2	8	4	4	623	2,518	4	4	625	2,526
...	...	633	3,797	...	...	2	8	333	1,856	2,948	16,122	341	1,899	2,952	16,143

* Usual wet	AC. 341	Out of a total of 3,293* acres, 2,548 acres had been so cultivated from alleged inaccessibility to irrigation, the wet assessment still continuing to be paid.
Dry into wet	2,952	
Total...	3,293	

281. It is said that there is often waste of water both from the tail-ends of channels being without regulators and also because the ryots leave open heads to their minor channels instead of putting palmyra or other sluices. Water thus lost might, it is suggested, be stored, but the difficulty is in finding the room. Several of the Tahsildars recommend that the old tanks should be utilized instead of their beds being cultivated, also that new ones should be formed for the purpose. So far as I can learn, however, the silt which is brought down in such quantities by the river would soon render them useless as reservoirs.

282. It has been found that many of the levels in existing tanks and in the former channels from the Kistna, which have been utilized under the present irrigation, are unsuited to the cultivation, and, in consequence, though water was given abundantly, much of it ran to waste.

283. When the main channels are widened there will doubtless be much less cause for complaint during the greater part of the season. The low state of the river, however, in October and November, is a difficulty not so easily surmounted. Colonel Moberly tells me that it has been thought dangerous to raise the crown of the anicut, though it is done, I believe, roughly and temporarily at this season.

284. No means other than large reservoirs would probably suffice to supply the deficiency. It has struck me whether the bed of the river itself above Chintapalli, where Mr. Wilson has recommended the erection of an anicut, might not be utilized for this purpose. The river here runs for many miles from the boundary of Kurnool to Chintapalli through a narrow but deep rocky bed, and perhaps the erection of barriers at intervals would afford a means of retaining a large additional supply. I make the suggestion with much diffidence, feeling that, if the project was a feasible one, it would have been entertained long ago.

NOTE.—Since this was written I have seen an extract from a report made by Captain Buckle in 1839 on the subject of an anicut at Chintapalli or higher up the river. This will be found in Appendix VIII. Though conclusive against the formation of a dam from which an irrigation channel could be led, it does not seem altogether impracticable, unless on the ground of expense, that a reservoir should be formed; indeed, the lie of the country would seem rather favourable.

285. (3.) *Administrative defects.*—I now approach a branch of inquiry the subjects of which are indicated in paragraph 32 of the Board's Proceedings of 31st March 1869. I feel here that I am entering a region of surmise and general report, and that I cannot produce much evidence of defects in the Public Works administration. I have asked the ryots generally whether they suffer from the undue closing of the channels or from the withdrawal of the water at critical times. As a rule they reply, "No, except when the water is sent down the channels by turns," neither do the majority complain that their convenience and needs are not generally consulted. But there have been exceptions, and, without wishing to make too much of them, I cannot but be persuaded that the subordinates, such as

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Delta Goomastahs, have an amount of authority and influence which is not unfrequently abused for their private advantage. There is nothing surprising in this. Officials on small salaries who have the power of giving or withholding what is all-essential to the prosperity of the people at large have a temptation put in their way which it is not easy to resist. The fear of offending them is quite enough to shut the mouths of the ryots, who know well enough that the small modicum of good which they *might* obtain by complaining would be more than counterbalanced by the ill-will they would thus draw upon themselves, and which they would feel every day. I have been told by some of a system of contributions which I can well believe possible, and which, while it bears lightly enough on the individual ryot, is sufficient to enrich the recipient. Besides, the ryot is often willing to pay for advantage to which he has no right, and which he would be sorry to see interfered with.

286. The officers of the department themselves acknowledge that the evil does exist, and one reason assigned is the lack of adequate supervision. Indeed, it is obvious that no one officer can thoroughly oversee the extent of country comprised in one of the present ranges however constantly he may be on the move.

287. The papers recorded in G. O., 4th June last, No. 1,584, Revenue Department, sufficiently prove that sometimes the burden becomes past endurance.

288. The present incompleteness of the works must render the regular supply of water at all times a matter of difficulty. The sooner this is remedied the more difficult will it be for the subordinates, provided the supervision is adequate, to abuse the trust confided in them.

289. A not unnatural jealousy exists between the lower branches of the Revenue and Public Works administration. The former look back with regret on the days when they had every thing in their own hands. The latter stand on their dignity, and are inclined to treat as interference with their proper duties any references connected with irrigation which they may receive from the Revenue side. Between the two the ryot cannot but sometimes suffer. To a certain extent such differences are useful, as they prevent collusion and the departments mutually act as checks on each other. Beyond that the interests of Government as well as of the people are injured.

290. Whether from more intimate association with the people or from regret that the anicut and its subordinary works should not be more largely utilized, there is, I cannot but notice, a feeling among the members of the Public Works Department that the ryots should be treated more strictly than has hitherto been customary, and should be bound down by such rules as may prevent their exercising any freedom whatever. The knowledge of the existence of such sentiments must have a bad effect. It is shown in the difficulty experienced in getting labour. The ryots will not put themselves out of the way to assist in this respect. They say, "Let the Sircar do it; we have to pay water-rate, that is quite enough." The increasing wealth of the people makes them more independent, and, even though well paid for it, they object to doing more than they are obliged. I do not know what alterations in the present system may be in contemplation with reference to the recent Public Works Commission; but I am strongly of opinion that the plan of leaving the village and field channels to the ryots themselves to repair and

Vide Board's Proceedings, 30th July 1867, No. 4,887.

look after, as contemplated by Colonel Winscom and Mr. Thornhill, would be most advisable.

291. (4.) *Means of Export.*—The Board, in paragraphs 26 to 28 of their Proceedings, 31st March last, No. 2,069, lay stress on this important point and suggest that perhaps the speediest way of obtaining large returns is to devote part of the available funds to opening up the district.

292. Mr. Thornhill, in paragraphs 38 to 47 of his Memorandum, recorded in Government Order, 16th July 1869, No. 2,070, gives a short account of the ports of the district, and suggests two lines of rail towards Hyderabad and Cuddapah.

293. In the Board's letter, dated 22nd January 1869, recorded in Government Order, 11th March 1869, No. 656, Revenue Department, occurs the following remark, "The Government are aware that want of communications has lately "been assigned by the Superintending Engineer of the Kistna District and the "Chief Engineer for Irrigation as one of the reasons why nunjah cultivation has "not increased so largely as was expected."

294. The subject naturally divides itself into three branches, viz. :—

(1.) Roads.
(2.) Navigable canals.
(3.) Ports.

295. *Roads.*—In this respect the district is sadly deficient. There are two main Imperial lines, viz., from Masulipatam, in a north-westerly direction, to the Hyderabad frontier; and the other from Perikeed, on the eastern boundary of the district, *viâ* Bezwada and Guntoor to Inkole, otherwise known as the Calcutta High Road.

296. The Hyderabad Road is, for the first thirty-eight miles from Masulipatam or to within six miles of Bezwada, little more than an earthen bank half a yard high, which serves to convey the traffic in dry weather. It is furnished with the requisite masonry works except in one instance. The traffic on it is always large, for, though during three parts of the year the trade between Masulipatam and Bezwada is carried on very largely by boats plying along the canals, yet, to avoid costly transfers, goods bound to places beyond the latter station are carried by carts. During the wet weather, however, when the road is utterly impassable, goods for places beyond Bezwada are conveyed so far by boat, and, there being no choice, in some cases the empty bandy is taken along the road to receive its load again at Bezwada. The soil over which the road passes is particularly bad: if a heavy fall of rain occurs it is most difficult for even men to get over it, and such an obstruction may frequently happen, as it did this year, between the 15th and 24th June.

297. Near Bezwada the road is metalled and in fair order. Beyond that, or for 72½ miles to the Nizam's frontier, it is metalled in parts only, and its condition in some places is such that bandies occasionally stick in the mud for days. Most of the drainage is bridged over; but two considerable rivers, the Muniyeru and Pulleru, remain unbridged. Estimates are yearly sent in for the improvement of this part of the road. If I understand rightly it is not thought necessary to

attempt much on the other portion between Bezwada and Masulipatam, the canal being considered sufficient for the traffic.

298. The average monthly traffic between Bezwada and Masulipatam and *vice versâ* from June 1868 to February 1869 inclusive is shown in the following statement. These figures are from returns kept in the Public Works Department:—

	Loaded.	Empty.	Total.
Bandies	4,034	2,508	6,542
Bullocks	214	956	1,170
Men with loads	317	945	1,262

I have not been able to obtain the traffic for the same period on the rest of the line towards Hyderabad; but the average of April, May, and March 1869, three months, shows as follows:—

Bandies loaded and empty...	11,792
Bullocks do. do.	1,747
Men with loads	1,639

299. The Superintending Engineer is of opinion that the road between Masulipatam and Bezwada should be no longer neglected, and I fully agree with him. It must be remembered that it is the only means of communication when the canal is closed, or from March to June of every year, and that the country to the eastward, comprising the greater part of the Gudivada Talook, is almost entirely dependent upon it for access to the Masulipatam market.

300. Through some mistake I have not received information about the Calcutta High Road; but I believe I am correct in stating that the only part in any thing like good order is between Guntoor and Sitanagaram, on the west bank of the Kistna, opposite Bezwada, a distance of twenty miles.

NOTE.—On passing over it I find that it is in a very poor condition though under extensive repairs.

301. The following statement shows the traffic one either side of Bezwada during a period of nine months from June 1868:—

	Bandies.		Bullocks.		Men with loads.	
	Loaded.	Empty.	Loaded.	Empty.	Cavadies.	Head bundles.
Bezwada to Ellore and *vice versâ* ...	12,681	10,387	1,528	4,985	3,230	8,266
Bezwada to Guntoor and do. ...	33,196	13,550	1,978	2,021	1,784	18,276
Total...	45,877	23,937	3,506	7,006	5,014	26,542
Monthly average...	5,097	2,646	389	778	557	2,949

302. As to minor roads Colonel Moberly tells me that every year the means of communication are being improved from the road cess, and that in a few years

more the district will be provided with good metalled roads; "at present, the "misfortune is that there is no thorough communication any where." I cannot but think Colonel Moberly over-sanguine: in the Delta, where metal is not to be had except occasionally, there seems small prospect of the present mud banks being much improved.

303. On the Bandar side, the principal minor road (and, I believe, it is Imperial not local) is the Lambadi Road from Perikeed to Buntumelli *viâ* Gudivada. It is destitute of metals; but is useful for the purpose for which it was made, viz., for affording the Lumbadis access to the salt-pans on the coast. There are one or two local roads which connect this with the Masulipatam High Road.

304. On the western side there are roads either in progress or anticipation radiating from Guntoor, some of which will form cotton-feeders from the western talooks. Those which are most advanced lead from Guntoor towards the coast and the Kistna.

305. The communications on this side are clearly described in Chapter V. of Mr. Wilson's Report* on the Settlement of the Guntoor portion of the Kistna District.

* Dated 10th September 1867.

306. The chief means of approach from the interior to the ports of the district are the Masulipatam High Road and its feeders, already alluded to in the eastern part of the Delta, where there is the single port of Masulipatam; and on the Guntoor side, where there are three† ports, access from Guntoor is obtained by a very fair local fund road as far as Ponnur, 17 miles, with inferior continuations to Chandole, 6 miles, and Bapatla, 14 miles, between which and Nizampatam and Vadarevupalem or Ipurpalem port respectively there is a sand-ridge which presents no serious hindrance to the traffic at any time of the year. Motupalli, further south, is reached from the western talooks by a short road from Inkole (8 miles) where the Calcutta High Road enters the Nellore District, but there is no connecting link with the interior.

† Nizampatam.
Vadarevupalem.
Motupalli.

307. An estimate for embanking and gravelling a line 15 miles in length from Parchur to Vadarevupalem has been sent in. This is to be connected further inland with Chilakalurpad and Narasaraopet, and will open up a large extent of country. Other minor roads have been proposed to cross the Romperu swamp.

308. It is only during the wet weather that there is serious difficulty in transporting produce. In dry weather the ordinary village paths are sufficient for the purpose, and present no particular obstacle. It is during these months that the markets and ports are chiefly supplied.

309. *Canals.*—The navigable canals in the Delta consist, on the Bandar side, of the Masulipatam canal, 47 miles in length, connecting Bezwadá with tidal water, with one branch of 8 miles long to the present head of the Polrazkodu and Buntumelli channel, neither of which are fit for navigation, and the Ellore canal, of which a length of 27 miles belongs to the Kistna District. On the Guntoor side there is the Nizampatam canal from the anicut to the sea, 42 miles, and one branch,

S3

the western bank channel, navigable as far as Kollur, 29 miles from Sitanagaram. The Kummamur channel, which lakes off the Nizampatam canal, thirteen miles from its head and runs to the south-west limits of the district near Chinna Ganjam, will eventually be a navigation canal. It is already practicable with a little difficulty as far as Chebrole, twenty-six miles from Bezwada. The improvements contemplated to make it efficient for both navigation and irrigation are estimated to cost between four and five lacs of Rupees. It will convey the traffic to the creek near Chinna Ganjam, whence the east cost canal to Madras must continue the communication. The great fall in the bed of this channel, six or seven feet per mile, is the chief obstacle to be overcome.

NOTE.—The estimate for a canal between Karemchedu and Vadarevupalem amounts to Rupees 45,000. The Superintending Engineer believes that it would cost a great deal more, and that its maintenance would be extremely expensive. A road would be even more costly, as the country is a swamp the first four miles and heavy sand the remaining four.

310. Surveys are being made to ascertain the practicability and approximate cost of taking a branch from the Kummamur channel towards the seaports of Motupalli and Vadarevupalem, and it is in contemplation to connect the latter port and Nizampatam by canal.

311. The Masulipatam canal renders it easy to carry grain to that market and port. The junction with the Ellore canal at Bezwada gives access to Ellore, and, through the Godavery system of canals, with Cocanada, to which place much produce-cotton especially finds its way from Guntoor and the western talooks. The Nizampatam canal is comparatively less used. A good deal of salt, however, finds its way back by the dhonies which bring down grain for shipment.

312. The following statement shows the traffic on the Masulipatam and Ellore canals during 1868:—

From	To	Number of boats.	Number of passengers.	Number of tons of goods carried.	Number of tons of boats as per license measurements.	Remarks.
Bezwada... ...	Bandur	2,979	15,368	4,778	9,043	This return is for 1868; but during March, April, May, and part of June, the canals were closed to traffic
Bandur	Bezwada ...	3,888	15,729	2,073	8,079	
Bezwada... ...	Ellore	5,360	21,444	4,509	28,115	
Ellore	Bezwada ...	4,851	17,795	10,443	28,442	

313. On the Nizampatam canal there is no regular passenger traffic. The following is an abstract of the transactions at one of the locks (Jutur) during August last:—

Traffic at Jutur Lock in August 1869.

	Number of Boats			Tonnage.	Value of cargo.	Remarks.
	Full.	Empty.	Total.			
					Rs.	
Up	67	67	134	2,434	28,827	Two-thirds salt.
Down	80	20	100	1,941	37,837	Do. paddy.
Total...	147	87	234	4,375	66,664	

314. It must not be forgotten that, while the canals are most convenient for the trade of the country inwards and outwards, they are often great obstacles to locomotion between talook and talook. Sometimes indeed they divide a village into two, to the daily discomfort of its inhabitants.

315. From the following statement it will be seen that there are not a dozen bridges at present existing along a distance of 186 miles of canal. These moreover have not, as a rule, been made to accommodate the traffic but because it was necessary to establish locks at certain intervals. Therefore, for the convenience of the inhabitants, they are not so well placed as they might have been. Again, little or nothing is done in the way of ferries. So far as I can learn, Government ferries are established only where there is a post road. For the rest the people have to pay the ferryman and often provide the boat too. The least, I think, that should be done pending more permanent means of crossing is to provide a strong balakat capable of conveying bandies. Lieutenant Edgcome mentions this kind of boat as in use on the Ellore and Masulipatam canals, but I have seen nothing of the kind on the Guntoor side of the river:—

Name of Canal.	From	To	Distance.	Number of bridges.	Number of ferries.	Remarks.
			Miles.			
Masulipatam...	Masulipatam.	Bezwada.....	47	5	...	One at Masulipatam; four at different locks, viz., Kankipad, Viranki, Nedumole, and Dodlapalem.
					12	This is an estimate. There are six between Viranki and Bezwada, a distance of 25 miles. None of these are Government ferries.
Ellore	Bezwada.....	Perikeed.....	27	1	...	This is at Bezwada; a second is sanctioned for Perikeed.
					5	One only of these is a Government ferry.
Nizampatam...	Sitanagaram.	Nizampatam.	42	3	...	At the Duggirala, Kuchipudi, and Jutur locks.
						A bridge will be constructed for the new road from Guntoor to Iyalur.
Western Bank Channel.	Revendrapad.	Kollur.....	20	...	...	No Government ferries. The villagers keep up sangadis or palmyra pantoons at their own expense.
Kummamur...	Duggirala ...	Inkolla.....	49½	2	...	The last two remarks apply here.
						A third under construction, viz., at Kolakalur. This and the two at Jagarlamudi and Chebrole are within 15 miles of Duggirala. When this becomes a navigation canal there will be bridges at every lock.
					4	Not stated whether Government or not.
			186	11	21	

316. The minor irrigation channels also which are numbered by hundreds have a considerable effect in cutting up the country. Some of them approach in size to the navigation canals. It cannot be a matter of surprise that in a net work of this kind the communications should be somewhat defective or that the ryots should feel a difficulty in getting to market. Provided the main canals are sufficiently bridged, the remainder must wait the course of events.

317. *Ports.*—In the appendix I give the average annual exports and imports of the ports of the district for a number of years, but only in the case of Masulipatam for a longer period than twenty years. The following is an abstract of this:—

Appendix VI.

Ports.	Years.	Export.	Import.	Total.
		RS.	RS.	RS.
Masulipatam	44	5,61,808	6,29,202	11,91,010
Nizampatam	19	2,31,176	85,918	3,12,572
Kottapalem	15	30,884	39,572	70,456
Ipurpalem or Vadarevupalem	16	2,62,827	3,82,222	6,45,069
Motupalli	16	30,217	52,199	82,416
Total...	.....	11,16,912	11,89,113	23,01,523

318. At all there has been much additional traffic during the past few years.

319. Tables illustrating the trade at the four ports on the Guntoor side will be found in Mr. Wilson's Report* at paragraph 53 and Appendix H.

* Dated 10th September 1867.

320. *Masulipatam.*—Notwithstanding the defects of this port, which are beyond probable remedy, both exports and imports have largely increased since 1860. A project has been sanctioned for conveying a large quantity of drainage into the sea by the creek which runs under the fort, which will give an additional scour; but it remains to be seen what effect this may have on the bar at the mouth of the river, and, as Colonel Moberly says, in any case it is impossible to bring the ships nearer.

321. *Nizampatam.*—I have found among the Collector's records a report made by Captain Maiden, the Master Attendant at Masulipatam, in January 1863, on this and the adjacent port of Kottapalem. This I give at length in the appendix.* Since it was written the cyclone of November 1864 occurred, and this has considerably improved the communication between the town and the mouth of the backwater. The distance when Captain Maiden wrote was three miles; it is now not more than a mile in a different direction, the former circuitous passage being now partially choked by sand-banks. There does not seem to be any material change in the position of the entrance itself, but it is shallower now than it then was. There are twenty or more cargo boats belonging to the port, and one-third of these are employed in trading direct with other places on the coast. The rest are used in lading ships, and occasionally take trips on their own account.

* Appendix VII.

322. Nizámpatam has great natural advantages, being connected by backwater on the east with Kottapalem and the Kistna, as well as having direct communication with the anicut on the north. Westward the backwater extends eight or ten miles, and opposite Perali there is another mouth, but there is very little water on the bar here.

323. Considering the great difficulties to be encountered in making the Kummamur channel into a navigation canal, I question whether it would not be better to continue the east coast canal straight up from Nellore to this backwater and so round by the Nizampatam canal.

324. The communication by backwater with the Kistna is used for the purpose of bringing grain from Divi and other parts of the district bordering on the Kistna. Formerly a good deal of salt returned in the same direction, but since the opening of the fresh water canal for traffic the bulk of this finds its way to the upper portion of the river beyond the anicut. The following statement shows the exports in both directions during the last eight years :—

Statement showing amount of Salt exported from Nizampatam from Fusly 1271 *to* 1278.

Fuslies.	Export by Salt Creek.			Export by Kistna Canal.			Total.		
	Number of Dhonies.	Amount of Salt.	Value.	Number of Dhonies.	Amount of Salt.	Value.	Number of Dhonies.	Amount of Salt.	Value.
		I. M.	Rs. A. P.		I. M.	Rs. A. P.		I. M.	Rs. A. P.
1271	34	871	1,306 8 0	.....	.....	.....	34	871	1,306 8 0
1272	133	18,986	27,399 0 0	.....	.....	.....	133	18,986	27,399 0 0
1273	69	4,844	7,266 0 0	.....	.....	.....	69	4,844	7,266 0 0
1274	86	5,022	7,533 0 0	.....	.....	.....	86	5,022	7,533 0 0
1275	83	7,751	11,626 8 0	28	3,258	4,887 0 0	111	11,009	16,513 8 0
1276	3	97	163 11 0	393	69,714	1,13,187 6 0	396	69,811	1,13,351 1 0
1277	21	558	941 10 0	148	28,665	46,853 7 0	169	29,223	47,795 1 0
1278	13	551	929 13 0	211	42,752	72,144 0 0	224	43,303	73,073 13 0
Total...	442	38,680	57,166 2 0	780	1,44,389	2,37,071 13 0	1,222	1,83,069	2,94,237 15 0
Average...	.....	4,835	7,146 0 0	.....	36,097	59,267 15 0	.....	22,884	36,779 12 0

325. From what I learnt at Nizampatam this creek has in parts silted up a good deal and has deteriorated since Captain Maiden saw it.

326. The following statement shows the duties levied at Nizampatam and Kottapalem during the past ten years :—

Proceedings of the Madras Government, Revenue Department, 6th December 1869.

Names of Ports.	Items.	Fusly 1269.	Fusly 1270.	Fusly 1271.	Fusly 1272.	Fusly 1273.	Fusly 1274.	Fusly 1275	Fusly 1276.	Fusly 1277.	Fusly 1278.	Total.
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Nizampatam...	Exports	895 7 9	637 13 6	75 12 0	219 13 6	247 6 4	2 14 0	.....	229 6 3	253 10 6	206 4 8	2,763 8 6
	Imports	.....	9 8 0	.....	237 4 7	41 5 10	.....	.....	.....	46 9 2	15 14 9	350 10 4
	Tonnage duty ...	90 15 9	.....	.....	.....	.....	.....	.....	.....	.....	.....	90 15 9
	Sale proceeds of drift wood.	51 9 6	95 15 9	31 14 6	67 2 6	140 13 0	.....	24 2 0	438 14 0	49 15 0	26 5 10	940 2 7
	General Fund	.....	.....	.....	.....	.....	.....	.....	.....	6 6 6	.....	6 6 6
	Fines	.....	.....	.....	.....	.....	.....	.....	.....	5 0 0	.....	5 0 0
	Other items ...	.....	.....	.....	12 7 0	5 0 0	.....	2 4 6	.....	0 8 6	6 15 1	29 5 5
	Seigniorage on Firewood Dhonies	.....	.....	46 0 0	142 0 0	109 0 0	0 8 0	4 0 0	4 0 0	7 8 0	116 0 0	429 0 0
	Duty on firewood taken by land	.....	.....	0 14 0	.....	1 10 9	0 8 0	26 6 3	32 0 9	28 3 0	50 7 3	151 0 9
	Total...	1,038 1 0	743 5 3	154 8 6	678 11 7	545 3 11	30 5 7	56 12 9	704 5 0	397 12 8	421 15 7	4,771 1 10
Cottapalem ...	Tonnage	107 14 0	.....	.....	.....	.....	... .	.....	.....	.....	.....	107 14 0
	Sale proceeds of drift wood	42 10 0	57 6 6	.....	20 5 0	182 11 2	61 5 6	33 13 6	8 2 3	42 1 0	4 11 0	453 1 11
	Other items	.....	.....	.....	7 6 3	.....	8 10 3	0 8 0	0 4 0	3 4 0	.....	20 0 6
	Seigniorage on Firewood Dhonies	.....	.....	70 15 6	557 0 0	759 8 0	674 8 0	767 8 0	953 8 0	923 8 0	1,338 8 0	6,044 15 6
	Duty collected on firewood taken by land	.....	.....	3 7 0	.....	1 14 6	23 5 3	27 14 3	99 13 0	392 8 3	700 8 6	1,254 6 9
	Total...	150 8 0	57 6 6	74 6 6	584 11 3	944 1 8	772 13 0	829 11 9	1,061 11 3	1,361 5 3	2,043 11 6	7,830 6 8
	Grand Total...	1,188 9 0	800 11 9	228 15 0	1,263 6 10	1,489 5 7	803 2 7	886 8 6	1,766 0 3	1,759 1 11	2,465 11 1	12,661 8 6

327. Native vessels anchor three quarters of a mile from shore in three fathoms water. English vessels would anchor in five or five-and-a-half fathoms, one mile and three quarters out.

328. *Ipurpalem or Vadaravu.*—This, while it has none of the advantages of Nizampatam in the way of approaches, carries on a larger trade. The only way of approaching it is along the sand-ridge, at the edge of which it is situated. It is an open roadstead, and vessels of from 100 to 400 tons can anchor within three quarters of a mile from shore. The surfs are never very high. Masulah boats are used for shipping and landing cargo. There are several large pucka-built godowns and sites, for such fetch a large price at auction. The chief point here is to make the approaches better, and, as observed above,* estimates have been prepared both for roads and canals.

* Paragraph 285.

329. *Motupalli*, a few miles further down the coast and four miles north-east of Chinna Ganjam, is, as Mr. Thornhill observes, similar to Ipurpalem, and requires the same treatment. The sand near it is very heavy and drifts up into large banks which would necessitate a large establishment to keep a made-road clear, and such road, though only four miles long (to Kadavakuduru, the present terminus of the Inkole road) would cost a large sum.

330. At none of the ports on the Guntoor side of the river are there any signals or lights, nor does the coast present any specific land-marks to guide vessels in approaching the shore.

331. The foregoing sketch of the communications and ports of the district, imperfect as it is, may give the Government some idea of the course to be pursued in order to make both more efficient. The first thing is to make the roads leading to the ports more worthy of the name; the next, to complete the connexion by means of Local Fund roads from the principal towns in the district. As to the canals there is no immediate prospect of any addition to their navigable length; but, as I said above, if there is a hope of the east coast canal being taken up in earnest, it seems doubtful whether it would not be better to adhere to the coast line as far as Nizampatam rather than attempt the more costly and difficult Kummamur route. If access is thus made available to the southern districts it will be an inestimable boon to the Kistna.

332. If it is intended to attract a larger class of vessel to the minor ports, it seems necessary that an examination of the coast should be made and proper soundings taken. There may be information on these points in the office of the Superintendent of Marine, Madras. Then, facilities in the way of flagstaffs, lights, etc., must be afforded to guide vessels in. There seems no reason why exportation should not go on at Vadarevupalem or Nizampatam to a larger extent than at Masulipatam, for vessels could approach nearer the shore than at the last-named place if they only knew how to get there.

333. *Railways.*—In regard to Mr. Thornhill's proposed rail or tramways, Colonel Moberly tells me that there appears no material difficulty in making one to Hyderabad from Bezwada. It would cost Rupees 50,000 per mile at least. As to the other route, Colonel Moberly is of opinion that a line *viâ* Cumbum with a

branch from Innukonda to Ongole would serve the purposes of the coast districts far better than a continuous line from Calcutta to Madras. Nellore could be connected with Tirapati or that neighbourhood on the railway from Madras.

334. Though probably already on record in Government Office, I append* for ready reference extracts from a letter which Mr. Thornhill wrote to the Board on the 8th April 1868 fully explaining the advantages of both the lines which he advocates.

* Appendix IX.

335. I have now gone through the main causes which are said to have led to the disinclination for wet cultivation in the Kistna District. Of the four divisions above mentioned I cannot but think that the most influence must be ascribed to the present position of the Public Works Department. Whether as regards drainage, water-supply, administration, or communications, there are serious defects. The incomplete state of the Kistna works and the consequent insufficient supply of water are, I believe, the most prominent reasons for the aversion. It should be the first object to remove the existing distrust by every possible means. All available funds and energy should be devoted to enlarging the main canals. As Colonel Moberly says, "generally there is plenty of water, at any rate for existing cultivation, *if* there were sufficient means of *passing it down*." Until this is done extension of cultivation should not be permitted without careful inquiry. There is work for years to come in accommodating the present supply-channels to the area under cultivation, improving drainage, and preventing waste. Though much water even now runs to waste from various causes, there are times when the supply is quite insufficient for existing cultivation. Speaking generally, it is necessary for a fair crop that there should be plentiful rain, and of this in late years the supply has been deficient. As to administrative defects it is not easy to suggest a remedy for those which have been referred to in this report. The ryots as a body desire the transfer of the distribution of water to the Revenue Department. They say that those who have the collection of the sist will naturally take more interest in their being well treated in the matter of water than a separate department can or will. I think this not at all improbable. A transfer, if it could be made, would in a great measure stop any system of subscriptions or fees to the persons in charge of sluices, for, though the same class of persons must be employed, there would be more check upon them, and they would be more likely to be convicted and punished if guilty of such practices than at present. It is not easy, however, to separate the work of distribution from the guardianship of the main supply. If it were possible I think it would be very desirable to make the change. Supposing things remain as they are, the powers of supervision in the different ranges need to be increased. No one officer can possibly look after his scattered subordinates as he would wish.

336. Next in order comes, I think, the Revenue Department. In this case, however, the Revenue settlement and enhanced water-rate have had only a partial effect confined to a particular portion of the district. Where this has been aggravated by the cyclone of November 1864 I think some allowance is desirable,

especially as in this part of the country the supply of water is particularly deficient. I, therefore, recommend that the water-rate in the thirty-three villages named in Appendix IV. and all other villages on the Masulipatam side which were inundated at the time of the cyclone should be for five years assessed at 3 instead of 4 rupees an acre. The remainder of the Gudivada Talook needs no special consideration. I have already suggested some changes in the water-rate rules if complete option is not given. I would add that in such case the existing orders of the Board in regard to chavudu should remain permanently in force, modified as proposed in paragraph 106 supra. I have already pointed out some defects in the Revenue administration, and in the laxity in some respects in carrying out the water-rate rules. These should be enforced strictly as the only fair course for both ryots and Government. I think that the Tahsildars who are so much tied to their head-quarters, and whose talooks are so much larger than formely, require more efficient aid in supervising the Curnums and the cultivation. The charges of the Revenue Inspectors seem to me over-large.

337. As to the remaining causes which are said to have affected the progress of wet cultivation, some are temporary merely and will be removed as irrigation and drainage are improved: such are "chavudu" and other alleged causes of infertility. Others which relate to the inclinations of the people have not much reality: if any hindrance does exist from this cause it will be removed as confidence is restored, though I am quite of opinion that, in preferring dry crops in certain circumstances, the ryots have exercised a wise discretion.

338. Since this report was drafted I have received from Mr. Boswell, the Officiating Collector of the district, the accompanying* opinion on the chief points of this inquiry. It will be seen that in paragraph 3 he suggests that a reduced water-rate of 3 rupees should be made applicable to all villages on sandy tracts, on the ground that they are arenacious and require more manure than other soils. I have in a measure anticipated this recommendation. In paragraph 8 he corroborates my opinion that the Revenue Inspectors have more than they can do, and this is one of his reasons for deprecating the grant of free option. At the conclusion of his letter he advocates the transfer of the distribution of water from minor channels to the Revenue Department.

* Appendix X.

339. It only remains for me now to apologize for the length to which my remarks have run and also for the delay in submitting them, and finally to mention the valuable assistance which I have received during the course of my inquiry from Turaga Narsingam, the Head Clerk in the Collector's office, whom Mr. Boswell was good enough to attach to me on my arrival in the district. He has been indefatigable in his work and in checking and revising the returns received from the various Tahsildars. He has on more than one occasion acted as Sheristadar of the district, and his local knowledge was consequently of much use to me.

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. 1.

TABULAR STATEMENT showing the progress of wet cultivation before and subsequent to the construction of the Kistna Anicut in the villages of the Talooks within the Delta.

BANDUR TALOOK.

Items.	Fuslies.	Government. Usual wet. Land.	Government. Usual wet. Assessment.	Government. Dry into wet. Land.	Government. Dry into wet. Assessment.	Government. Dry crops watered.	Inams. Dry into wet. Land.	Inams. Dry into wet. Water-rate.	Inams. Dry crops watered.	Inams. Total. Land.	Inams. Total. Water-rate.
Cultivation of wet lands before the construction of the anicut.	1260	ACS. 3,800	Rs. 4,579	.....	.....	.....	.....	.....	.....	.....	.....
	1261	3,800	4,579	.....	.....	.....	.....	.....	.....	.....	.....
	1262	3,595	5,274	.....	.....	.....	.....	.....	.....	.....	.....
	1263	3,548	5,396	.....	.....	.....	.....	.....	.....	.....	.....
	1264	3,547	5,405	.....	.....	.....	.....	.....	.....	.....	.....
	Total...	18,290	25,233	.....	.....	.....	.....	.....	.....	.....	.....
	Average...	3,658	5,046	.....	.....	.....	.....	.....	.....	.....	.....
Cultivation of wet lands after the construction of the anicut.	1265	3,552	5,356	.....	.....	.....	.....	.....	.....	.....	.....
	1266	3,710	5,477	.....	.....	.....	.....	.....	.....	.....	.....
	1267	3,750	5,900	48	74	.....	.....	.....	.....	.....	.....
	1268	3,735	5,912	27	50	.....	.....	.....	.....	.....	.....
	1269	3,796	6,113	20	40	.....	.....	.....	.....	.....	.....
	1270	3,731	6,045	19	36	.....	.....	.....	.....	.....	.....
	1271	3,733	5,990	19	51	.....	.....	.....	.....	.....	.....
	1272	3,703	6,129	41	101	.....	.....	.....	.....	.....	.....
	1273	3,772	6,158	42	139	10	.....	.....	.....	.....	.....
	1274	3,674	6,084	43	164	.....	.....	.....	.....	.....	.....
	1275	3,593	5,954	41	178	77	.....	.....	.....	.....	.....
	1276	1,436	7,399	1	5	62	.....	.....	.....	.....	.....
	1277	1,640	8,424	3	16	50	.....	.....	.....	.....	.....
	1278	1,189	6,117	4	16	66	.....	.....	.....	.....	.....
	Total...	45,014	87,058	308	870	265	.....	.....	.....	.....	.....
	Average...	3,215	6,218	26	73	53	.....	.....	.....	.....	.....

APPENDIX No. 1.—(*Continued.*)

TABULAR STATEMENT showing the progress of wet cultivation before and subsequent to the construction of the Kistna Anicut, &c.—(*Continued.*)

GUDIVADA TALOOK.

Items.	Fuslies.	Government.							Inams.*				
		Usual wet.		Dry into wet.		Dry crops watered.	Total.		Dry into wet.		Dry crops watered.	Total.	
		Land.	Assessment	Land.	Assessment		Land.	Assessment	Land.	Water-rate.		Land.	Water-rate.
Cultivation of wet lands before the construction of the anicut.		ACS.	RS.	ACS.	RS.	RS.	ACS.	RS.	ACS.	RS.	RS.	ACS.	RS.
	1260	10,581	43,664	.....	.....	.....	10,581	43,664	.....	.....	.....	.....	.....
	1261	21,903	70,491	.....	.....	.....	21,903	70,491	.....	.....	.....	.....	.....
	1262	25,304	77,930	.....	.....	.....	25,304	77,930	.....	.....	.....	.....	.....
	1263	24,646	77,279	.....	.....	.....	24,646	77,279	.....	.....	.....	.....	.....
	1264	35,898	82,759	.....	.....	.....	35,898	82,759	.....	.....	.....	.....	.....
	Total...	1,18,332	3,52,123	.....	.....	.....	1,18,332	3,52,123	.....	.....	.....	.....	.....
	Average...	23,666	70,425	.....	.....	.....	23,666	70,425	.....	.....	.....	.....	.....
Cultivation of wet lands after the construction of the anicut.	1265	37,735	70,876	2,131	2,339	.....	39,866	73,215	82	80	.....	82	80
	1266	39,482	85,366	4,851	6,814	.....	44,333	92,180	497	229	.....	497	229
	1267	39,683	85,349	5,086	7,367	3	44,769	92,719	315	165	.....	315	165
	1268	41,552	1,01,913	5,833	10,071	3	47,385	1,11,987	351	440	.....	351	440
	1269	40,950	1,13,475	6,180	17,512	1,689	47,130	1,32,676	674	867	98	574	965
	1270	39,866	1,14,880	5,559	15,989	403	45,425	1,31,272	979	1,590	14	979	1,604
	1271	41,454	1,15,484	6,957	21,142	895	48,411	1,37,521	1,319	2,130	124	1,319	2,254
	1272	42,887	1,19,416	8,827	28,929	313	51,714	1,48,658	2,056	3,595	241	2,056	3,836
	1273	45,683	1,21,545	11,834	33,763	4,372	57,517	1,59,680	3,557	7,289	628	3,557	7,917
	1274	48,177	1,24,184	14,337	53,051	524	62,514	1,77,759	4,629	9,704	24	4,629	9,728
	1275	48,857	1,25,465	16,038	68,279	1,315	64,895	1,95,059	5,084	6,712	66	5,084	6,778
	1276	22,890	1,26,996	14,101	83,419	1,114	36,991	2,11,529	5,116	16,402	10	5,116	16,412
	1277	26,232	1,49,685	15,418	91,055	426	41,650	2,41,166	5,386	17,684	11	5,386	17,695
	1278	17,475	1,01,303	14,603	86,253	3,218	32,078	1,90,774	5,476	17,307	50	5,476	17,357
	Total...	5,32,923	15,55,937	1,31,755	5,25,983	14,275	6,64,678	20,96,195	35,521	84,194	1,266	35,521	85,460
	Average...	38,066	1,11,138	9,411	37,570	1,190	47,477	1,49,728	2,537	6,014	127	2,537	6,104

APPENDIX No. I.—(*Continued.*)

TABULAR STATEMENT showing the progress of wet cultivation before and subsequent to the construction of the Kistna Anicut, &c.—(*Continued.*)

BEZWADA TALOOK.

Items.	Fuslies.	Government.							Inams.				
		Usual wet.		Dry into wet.		Dry crops watered	Total.		Dry into wet.		Dry crops watered.	Total.	
		Land.	Assessment	Land.	Assessment		Land.	Assessment	Land.	Water-rate.		Land.	Water-rate.
Cultivation of wet lands before the construction of the anicut.		ACS.	RS.	ACS.	RS.	RS.	ACS.	RS.	ACS.	RS.	RS.	ACS.	RS.
	1260	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1261	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1262	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1263	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1264	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Total...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Average...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cultivation of wet lands after the construction of the anicut.	1265	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1266	.....	.....	257	603	.....	257	603	15	15	.....	15	15
	1267	.....	.....	1,191	2,999	.....	1,191	2,999	121	140	.....	121	140
	1268	.....	.....	3,127	14,652	2	3,127	14,654	490	1,712	.....	490	1,712
	1269	.....	.....	2,679	10,918	93	2,679	11,011	410	1,224	11	410	1,235
	1270	.....	.....	2,372	9,501	64	2,372	9,565	339	1,014	9	339	1,023
	1271	.....	.....	2,832	12,305	743	2,832	13,048	530	1,436	86	530	1,522
	1272	.....	.....	3,270	14,951	339	3,270	15,290	627	1,750	30	627	1,780
	1273	.....	.....	3,756	17,100	1,339	3,756	18,439	806	2,222	128	806	2,350
	1274	.....	.....	3,829	17,488	291	3,829	17,779	826	2,435	17	826	2,452
	1275	.....	.....	4,016	22,554	344	4,016	22,898	857	3,416	51	857	3,467
	1276	.....	.....	4,272	23,937	197	4,272	24,134	831	3,325	31	831	3,356
	1277	.....	.....	4,030	22,711	184	4,030	22,895	805	3,216	8	8(5	3,224
	1278	.....	.....	4,078	22,828	191	4,078	23,019	820	3,280	28	820	3,308
	Total...	.....	.....	39,709	1,92,547	3,787	39,709	1,96,334	7,477	25,185	399	7,477	25,584
	Average...	.....	.....	3,055	14,811	344	3,055	15,103	575	1,937	40	575	1,968

APPENDIX No. I.—(*Continued.*)

TABULAR STATEMENT showing the progress of wet cultivation before and subsequent to the construction of the Kistna Anicut, &c.—(*Continued.*)

REPALEE TALOOK.

Items.	Fuslies.	Government. Usual wet. Land.	Usual wet. Assessment	Dry into wet. Land.	Dry into wet. Assessment	Dry crops watered.	Total. Land.	Total. Assessment	Inams. Water-rate collected on usual wet Inams in lieu of Ghattu-tumulu.	Inams. Dry into wet. Land.	Inams. Dry into wet. Water-rate.	Inams. Dry crops watered.	Inams. Total. Land.	Inams. Total. Water-rate.
		ACS.	RS.	RS.	ACS.	RS.	ACS.	RS.	RS.	ACS.	RS.	RS.	ACS.	RS.
Cultivation of wet lands before the construction of the anicut.	1260	6,537	38,616	.....	.....	.....	6,537	38,616	439	.....	.....	.....	.....	439
	1261	6,674	39,126	.....	.....	.....	6,674	39,126	500	.....	.....	.....	.....	500
	1262	7,789	35,351	.....	.....	.....	7,789	35,351	340	.....	.....	.....	.....	340
	1263	7,072	40,571	.....	.....	.....	7,072	40,571	540	.....	.....	.....	.....	540
	1264	9,284	46,976	.....	.....	.....	9,284	46,976	579	.....	.....	.....	.....	579
	Total...	37,356	2,00,640	.....	.....	.....	37,356	2,00,640	2,398	.....	.....	.....	.....	2,398
	Average...	7,471	40,128	.....	.....	.....	7,471	40,128	479	.....	.....	.....	.....	479
Cultivation of wet lands after the construction of the anicut.	1265	4,977	29,095	.....	.....	.....	4,977	29,095	1,000	.....	.....	.....	.....	1,000
	1266	9,605	52,587	305	3,959	.....	9,910	56,546	458	.....	.....	215	.....	673
	1267	10,113	57,937	3,494	19,972	.....	13,607	77,909	203	.....	.....	2,419	.....	2,622
	1268	11,938	68,646	9,139	52,039	3,288	21,077	1,23,973	1,005	.....	199	2,142	.....	3,346
	1269	9,307	53,247	18,120	103,742	8,835	27,427	1,65,824	2,070	.....	890	1,844	.....	4,804
	1270	9,133	51,903	18,242	103,754	2,067	27,375	1,57,724	2,370	.....	8,637	930	.....	11,937
	1271	9,326	53,412	21,534	121,071	11,118	30,860	1,85,601	1,830	.....	8,637	937	.....	11,404
	1272	9,493	54,271	24,771	135,690	1,226	34,264	1,91,187	1,749	.....	7,167	101	.....	9,017
	1273	9,495	54,279	34,755	179,683	8,879	44,250	2,42,841	2,050	.....	12,030	201	.....	14,281
	1274	9,466	54,133	33,337	174,096	2,242	42,803	2,30,471	2,105	4,393	12,843	270	4,393	15,218
	1275	9,409	53,809	32,563	179,410	6,286	41,972	2,39,505	2,213	4,286	12,438	282	4,286	14,933
	1276	9,459	53,952	31,775	179,213	3,034	41,234	2,36,199	2,319	4,236	16,909	110	4,236	19,338
	1277	9,459	53,952	34,450	194,133	3,531	43,909	2,51,616	2,347	4,337	17,349	816	4,337	20,512
	1278	12,156	69,150	28,647	161,352	9,657	40,803	2,40,159	2,374	4,099	16,398	2,191	4,099	20,963
	Total...	133,336	7,60,373	291,132	16,08,114	60,163	4,24,468	24,28,650	24,093	21,351	1,13,497	12,458	21,351	1,50,048
	Average...	9,524	54,312	22,395	123,701	5,469	30,319	1,73,475	1,721	4,270	10,318	958	4,270	10,718

APPENDIX No. I.—(*Continued.*)

TABULAR STATEMENT showing the progress of wet cultivation before and subsequent to the construction of the Kistna Anicut, &c.—(*Continued.*)

BAPATLA TALOOK.

Items.	Fuslies.	Government. Usual wet. Land.	Usual wet. Assessment	Dry into wet. Land.	Dry into wet. Assessment	Dry crops watered.	Total. Land.	Total. Assessment	Inams. Water-rate collected on usual wet Inams in lieu of Ghattu-tumulu.	Inams. Dry into wet. Land.	Inams. Dry into wet. Water-rate.	Inams. Dry crops watered.	Inams. Total. Land.	Inams. Total. Water-rate.
		ACS.	RS.	ACS.	RS.	RS.	ACS.	RS.	RS.	ACS.	RS.	RS.	ACS.	RS.
Cultivation of wet lands before the construction of the anicut.	1260	7,299	45,414	.....	.....	.....	7,299	45,414	163	.....	.....	.....	.....	163
	1261	8,714	53,357	.....	.....	.....	8,714	53,357	296	.....	.....	.....	.....	296
	1262	8,488	52,266	.....	.....	.....	8,488	52,266	425	.....	.....	.....	.....	425
	1263	9,237	55,821	.....	.....	.....	9,237	55,821	872	.....	.....	.....	.....	872
	1264	10,110	60,492	.....	.....	.....	10,110	60,492	888	.....	.....	.....	.....	888
	Total...	43,848	2,67,350	.....	.....	.....	43,848	2,67,350	2,644	.....	.....	.....	.....	2,644
	Average...	8,770	53,470	.....	.....	.....	8,770	53,470	529	.....	.....	.....	.....	529
Cultivation of wet lands after the construction of the anicut.	1265	12,155	73,349	318	1,896	.....	12,473	75,245	1,279	11	4	.....	11	1,283
	1266	13,637	80,414	4,737	28,326	454	18,374	1,09,194	891	514	559	12	514	1,462
	1267	13,846	80,471	7,257	42,154	1,273	21,103	1,23,898	1,069	267	310	87	267	1,466
	1268	13,210	79,387	7,444	44,652	476	20,654	1,24,515	1,068	512	589	42	512	1,699
	1269	11,167	67,814	8,505	50,614	1,529	19,672	1,19,957	1,082	579	749	85	579	1,916
	1270	10,642	64,597	7,451	44,474	110	18,093	1,09,181	1,360	667	1,335	52	667	2,747
	1271	10,916	65,938	7,197	43,021	2,963	18,113	1,11,922	1,346	769	2,267	489	769	4,102
	1272	10,882	66,376	9,062	48,163	24	19,944	1,14,563	1,251	826	2,285	189	826	3,725
	1273	13,995	83,057	10,652	63,059	2,466	24,647	1,48,582	2,080	2,308	5,977	533	2,308	8,590
	1274	13,738	81,338	12,567	73,421	966	26,305	1,55,725	1,916	2,438	6,900	101	2,438	8,917
	1275	13,010	77,508	12,888	74,754	2,381	25,898	1,54,643	981	2,224	8,898	308	2,224	10,187
	1276	13,007	76,866	12,762	73,973	1,027	25,769	1,51,867	1,120	2,930	11,721	28	2,930	12,869
	1277	13,177	77,332	15,062	86,311	1,016	28,239	1,64,659	1,527	2,489	9,957	407	2,489	11,891
	1278	12,416	73,393	11,609	67,632	3,416	24,025	1,44,440	1,547	2,341	9,364	666	2,341	11,577
	Total...	1,75,798	10,47,840	1,27,511	7,42,450	18,101	3,03,309	18,08,391	18,517	18,875	60,915	2,999	18,875	82,431
	Average...	12,557	74,846	9,108	53,032	1,392	21,665	1,29,171	1,323	1,348	4,351	231	1,348	5,888

APPENDIX No. I.—(*Concluded.*)

TABULAR STATEMENT showing the progress of wet cultivation before and subsequent to the construction of the Kistna Anicut, &c.—(*Concluded.*)

Items.	Fuslies.	TOTAL OF DELTA.												
		GOVERNMENT.						INAMS.						
		Usual wet.		Dry into wet.		Dry crops watered.	Total.		Water-rate collected on usual wet Inams in lieu of Ghattu-tumulu.	Dry into wet.		Dry crops watered.	Total.	
		Land.	Assessment	Land.	Assessment		Land.	Assessment		Land.	Water-rate.		Land.	Water-rate.
		ACS.	RS.	ACS.	RS.	RS.	ACS.	RS.	RS.	ACS.	RS.	RS.	ACS.	RS.
Cultivation of wet lands before the construction of the anicut.	1260	28,217	1,32,273	.....	.....	.....	28,217	1,32,273	602	.....	.....	.....	.....	602
	1261	41,091	1,67,553	.....	.....	.....	41,091	1,67,553	796	.....	.....	.....	.....	796
	1262	45,176	1,70,821	.....	.....	.....	45,176	1,70,821	765	.....	.....	.....	.....	765
	1263	44,503	1,79,067	.....	.....	.....	44,503	1,79,067	1,412	.....	.....	.....	.....	1,412
	1264	58,839	1,95,632	.....	.....	.....	58,839	1,95,632	1,467	.....	.....	.....	.....	1,467
	Total...	2,17,826	8,45,346	.....	.....	.....	217,826	8,45,346	5,042	.....	.....	.....	.....	5,042
	Average...	43,565	1,69,069	.....	.....	.....	43,565	1,69,069	1,008	.....	.....	.....	.....	1,008
Cultivation of wet lands after the construction of the anicut.	1265	58,419	1,78,676	2,449	4,235	.....	60,868	1,82,911	2,279	93	84	.....	93	2,363
	1266	66,434	2,23,844	10,150	39,702	454	76,584	2,64,000	1,349	1,026	803	227	1,026	2,379
	1267	67,392	2,29,657	17,076	72,566	1,276	84,468	3,03,499	1,272	703	615	2,506	703	4,393
	1268	70,435	2,55,858	25,570	1,21,464	3,769	96,005	3,81,091	2,073	1,353	2,940	2,184	1,353	7,197
	1269	65,220	2,40,649	35,504	1,82,826	12,146	1,00,724	4,35,621	3,152	1,663	3,730	2,038	1,663	8,920
	1270	63,372	2,37,425	33,643	1,73,754	2,644	97,015	4,13,823	3,730	1,985	12,576	1,005	1,985	17,311
	1271	65,429	2,40,824	38,539	1,97,590	15,719	103,968	4,54,133	3,176	2,618	14,470	1,636	2,618	19,282
	1272	66,965	2,46,192	45,971	2,27,834	1,902	112,936	4,75,928	3,000	3,509	14,797	561	3,509	18,358
	1273	72,945	2,65,039	61,039	2,93,744	17,066	133,984	5,75,849	4,130	6,671	27,518	1,490	6,671	33,138
	1274	75,055	2,65,739	64,113	3,18,220	4,023	139,168	5,87,982	4,021	12,286	31,882	412	12,286	36,315
	1275	74,869	2,62,736	65,546	3,45,175	10,403	140,415	6,18,314	3,194	12,451	31,464	707	12,451	35,365
	1276	46,792	2,65,213	62,911	3,60,547	5,434	109,703	6,31,194	3,439	13,113	48,357	179	13,113	51,975
	1277	50,508	2,89,393	68,963	3,94,226	5,207	119,471	6,88,826	3,874	13,017	48,206	1,242	13,017	53,322
	1278	43,236	2,49,963	58,941	3,38,081	16,548	102,177	6,04,592	3,921	12,736	46,349	2,935	12,736	53,205
	Total...	8,87,071	34,51,208	5,90,415	30,69,964	96,591	14,77,486	66,17,763	42,610	83,224	2,83,791	17,122	83,224	3,43,523
	Average...	63,362	2,46,515	42,172	2,19,283	7,430	105,535	4,72,697	3,044	5,945	20,271	1,317	5,945	24,537

ENCLOSURE IN No. I.

STATEMENT showing the ayacut of the talooks in the Kistna Delta.

Talooks.	Number of villages under Anicut Irrigation.	Government or Inam.	Ayacut including Poremboke.	Deduct Poremboke not assessed.	REMAINING ASSESSED LAND.							
					DRY.		DRY INTO WET.		USUAL WET.		TOTAL.	
					Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
			ACS.	ACS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Bandur ...	13	Government.	17,463	6,333	6,440	4,315	30	153	4,660	23,831	11,130	28,299
		Inam ...	1,203	.....	228	.....	.....	.....	975	.....	1,203	.....
Gudivada ...	179	Government.	1,91,607	50,752	55,914	75,181	17,782	1,04,025	67,159	3,60,669	1,40,855	5,39,875
		Inam ...	40,758	.....	20,356	.....	5,476	21,904	14,926	.....	40,758	21,904
Bezwada ...	11	Government.	14,881	1,765	8,968	12,004	4,148	23,173	.....	.....	13,116	35,177
		Inam ...	3,620	.....	2,800	.....	820	3,280	.....	.....	3,620	3,280
Repallee ...	123	Government.	2,22,988	52,295	1,20,393	1,97,660	33,349	1,88,151	16,951	92,234	1,70,693	4,78,045
		Inam ...	37,506	437	30,075	.....	4,178	16,671	2,816	2,363	37,069	19,034
Bapatla ...	42	Government.	1,92,472	80,999	72,442	1,12,722	18,629	1,07,003	20,402	1,18,515	1,11,473	3,38,240
		Inam ...	15,633	.....	10,733	.....	2,341	9,364	2,559	1,547	15,633	10,911
Total...	368	Government.	6,39,411	1,92,144	2,64,157	4,01,882	73,938	4,22,505	1,09,172	5,95,249	4,47,267	14,19,636
		Inam ...	98,720	437	64,192	.....	12,815	51,219	21,276	3,910	98,283	55,129
		Total...	7,38,131	1,92,581	3,28,349	4,01,882	86,753	4,73,724	1,30,448	5,99,159	5,45,550	14,74,765

MADRAS,
4th November 1869.

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. II.

Statement showing the extent of dry land already converted into wet up to Fusly 1278, the extent which could be converted under the irrigation of existing channels and the extent available if irrigation works are increased.

Talooks.	Extent of dry land under wet cultivation by the irrigation of existing channels.		Extent of dry land which could be converted into wet under existing channels.		Extent of dry land which could be converted into wet if new channels are excavated.		Total extent of land to be converted from dry into wet, vide columns 4, 5, 6, and 7.		Remarks.
	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	
1	2	3	4	5	6	7	8	9	10
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	
Bandur	30	153	69	320	6,735	31,740	6,804	32,060	The bulk of the land that could be converted into wet in Gudivada Talook appertains to Kykalur Division. The villages of Kalidindi Purguna form part of this.
Gudivada	24,113	1,30,095	1,332	7,549	77,634	3,88,354	78,966	3,95,903	
Bezwada	5,887	31,624	174	926	6	34	180	960	
Repallee	14,699	71,051	5,332	36,397	12,830	66,207	18,162	1,02,604	In Repallee Talook the bulk appertains to Adavaladiri, Kunchenapadu, and other villages. Applications have been received already for 6,000 acres. A branch irrigation channel is required from the western bank
Bapatla	3,499	20,607	1,530	9,554	16,183	73,527	17,713	83,081	
Total ...	48,228	2,53,530	8,437	54,746	1,13,388	5,59,862	1.21,825	6,14,608	

channel. It is said that the cost for this would amount to 10,000 rupees which would be repaid the first and second years.
In Bapatla Talook most of the land belongs to "*Vada*" (Swamp) only drainage and supply channels are required for its conversion.
The extent in column 2 refers only to villages which have available dry lands suitable for conversion. It does not include villages where there is no such available land.

(Signed) C. G. MASTER,
On Special Duty.

MADRAS,
4th November 1869.

APPENDIX No. III.

Statement showing the alleged Chavudu and Nalayak lands in the Delta Talooks of the Kistna District.

	Talooks.	Number of Villages under Anicut Irrigation, with the extent of Ayacut thereof		Number of Tukkarar villages.	Chavudu.		Nalayak or lands become unprofitable for wet cultivation from the following causes.												Total Nalayak.		Grand Total.		Per-centage.		
							Inaccessibility to Irrigation.		Flooding.		Gulakarai or Gravel.		Pulludu and Poor lands.		Leakage.		Vellatunga or Salt grass.		Inundated by sea in 1864.							
		Number of Villages.	Extent of land.		Land.	Assessment.	Land.	Assessment	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Between Columns 2 and 4.	Between Columns 2 and 20.	Between Columns 2 and 22.
	1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
					ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	CAS.	ACS.
1	Bandur.....	13	5,665	13	400	1,681	433	1,818	132	673	...	...	...	...	...	...	...	...	2,047	7,847	2,612	10,338	3,012	12,019	7	46	53
2	Gudivada.....	179	1,05,343	67	4,971	25,793	2,255	11,770	1,254	6,048	135	727	896	5,396	128	693	...	...	2,893	14,895	7,561	39,529	12,532	65,322	5	7	12
3	Bezwada...	11	4,968	11	5	24	201	1,086	26	122	...	...	...	...	...	...	...	...	...	...	227	1,208	232	1,232	...	5	5
4	Repallee.....	123	57,294	106	1,010	5,388	3,703	19,772	340	1,515	184	1,019	2,271	12,591	...	...	...	...	...	...	6,498	34,897	7,508	40,285	2	11	13
5	Bapatla.....	42	43,931	29	328	1,909	1,289	7,102	445	2,443	...	...	70	398	...	...	797	4,081	...	...	2,601	14,024	2,929	15,933	1	6	7
	Total...	368	2,17,201	226	6,714	34,795	7,881	41,548	2,197	10,801	319	1,746	3,237	18,385	128	693	797	4,081	4,940	22,742	19,499	99,996	26,213	1,34,791	3	9	12
Under occupancy Ryots.	*Particulars of Government land.*																										
	Usual wet.....	43,236	.....	360	1,994		367	2,168	154	838	...	...	...	...	...	...	61	326	622	3,177	1,204	6,509	1,564	8,503	1	3	4
	Dry converted into wet.....	58,941	.....	412	2,247		1,832	10,397	234	1,379	17	101	635	3,680	72	390	50	300	8	11	2,843	16,258	3,255	18,505	1	5	6
	Total...	1,02,177	.....	772	4,241		2,199	12,565	388	2,217	17	101	635	3,680	72	390	111	626	625	3,188	4,047	22,767	4,819	27,008	1	4	5
Relinquished.	Usual wet.....	65,936	.....	3,902	21,570		2,157	11,544	569	2,805	135	727	1,052	6,141	...	...	606	3,000	3,790	19,486	8,309	43,703	12,211	65,273	6	13	19
	Dry converted into wet.....	14,997	.....	1,368	7,781		2,386	13,505	595	3,403	148	842	1,371	7,838	41	245	74	431	13	68	4,628	26,332	5,996	34,113	9	31	40
	Total...	80,933	.....	5,270	29,351		4,543	25,049	1,164	6,208	283	1,569	2,423	13,979	41	245	680	3,431	3,803	19,554	12,937	70,035	18,207	99,386	7	16	23
Total of Government land.	Usual wet.....	1,09,172	.....	4,262	23,564		2,524	13,712	723	3,643	135	727	1,052	6,141	...	...	667	3,326	4,412	22,663	9,513	50,212	13,775	73,776	4	9	13
	Dry converted into wet.....	73,938	.....	1,780	10,028		4,218	23,902	829	4,782	165	913	2,006	11,518	113	635	124	731	16	79	7,471	42,590	9,251	52,618	2	10	12
	Total...	1,83,110	.....	6,042	33,592		6,742	37,614	1,552	8,425	300	1,670	3,058	17,659	113	635	791	4,057	4,428	22,742	16,984	92,802	23,026	1,26,394	3	9	12
Inams.	*Inams.*																										
	Usual wet.....	21,276	.....	377	19		175	70	59	35	...	...	...	...	...	...	...	...	512	...	746	105	1,123	124	2	4	6
	Dry converted into wet	12,815	.....	295	1,184		964	3,864	586	2,341	19	76	179	726	15	58	6	24	...	...	1,769	7,089	2,064	8,273	2	14	16
	Total...	34,091	.....	672	1,203		1,139	3,934	645	2,376	19	76	179	726	15	58	6	24	512	...	2,515	7,194	3,187	8,397	2	7	9
Grand Total.	Usual wet.....	1,30,448	.....	4,639	23,583		2,699	13,782	782	3,678	135	727	1,052	6,141	...	...	667	3,326	4,924	23,663	10,259	50,317	14,898	73,900	4	8	12
	Dry converted into wet	86,753	.....	2,075	11,21		5,182	27,766	1,415	7,123	184	1,019	2,185	12,244	128	693	130	755	16	79	9,210	49,679	11,315	60,891	2	11	13
	Total...	2,17,201	.....	6,714	34,795		7,881	41,548	2,197	10,801	319	1,746	3,237	18,385	128	693	797	4,081	4,940	23,742	19,499	99,996	26,213	1,34,791	3	9	12

MADRAS,
4th November 1869.

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. 1V.

STATEMENT showing the cultivation in the in undated Villages of the Gudivada and Bandur Talooks prior and subsequent to the Cyclone of 1st November 1864.

Talooks.	Villages.	Ayacut or arable land.		Cultivation of four years before the Cyclone of 1st November 1864.							
				Fusly 1271.				Fusly 1272.			
				Dry.		Wet.		Dry.		Wet.	
		Dry.	Wet.	Land.	Sist.	Land.	Sist.	Land.	Sist.	Land.	Sist.
		Acs.	Acs.	Acs.	Rs.	Acs.	Rs.	Acs.	Rs.	Acs.	Rs.
Gudivada.	1 Tummidi	760	2,127	108	275	1,599	2,299	113	289	1,457	2,073
	2 Veyivaka	128	1,219	44	84	1,143	516	44	84	1,143	516
	3 Utkur	414	446	47	44	305	356	47	44	305	356
	4 Kocherla	379	422	25	36	210	141	25	36	210	142
	5 Mallampudi	24	616	17	1	458	299	17	1	458	399
	6 Uppalakalavagunta ...	...	353	...	...	292	800	...	...	325	950
	7 Kuldindi	2,587	1,050	352	342	1,088	1,518	367	356	1,265	1,816
	8 Mattagunta	744	679	5	5	679	255	5	5	679	345
	9 Konnangi	...	1,869	...	...	796	1,500	...	...	849	1,600
	10 Amaravati	...	490	...	...	369	900	...	...	369	750
	11 Yadavalli	...	408	...	...	339	200	...	...	373	350
	12 Peddalanka	59	2,593	13	16	969	2,284	18	22	1,009	2,378
	13 Konkollu	975	1,360	539	439	1,045	1,761	545	459	1,147	1,941
	14 Chakerudravaram ...	113	207	20	38	148	327	20	38	158	345
	15 Chennur	3	3,208	...	...	1,542	7,619	...	...	2,875	8,616
	16 Urivi	12	1,812	...	...	820	2,250	...	...	849	2,500
	17 Bodagunta	23	467	8	18	275	632	8	20	249	630
	18 Vanudurru	373	883	231	222	519	778	227	218	516	782
	19 Vadavalli	217	1,047	40	56	406	1,254	40	57	635	1,370
	20 Lunkalakalavagunta...	277	388	...	...	330	620	...	...	348	720
	Total...	7,088	21,644	1,449	1,576	13,332	26,309	1,476	1,629	15,219	28,609
Bandar.	1 Amudalapalli... ...	365	210	143	87	129	213	143	86	129	212
	2 Satuluru	191	784	47	51	692	680	47	51	692	680
	3 Maddetipalli	175	56	127	68	19	25	127	68	19	25
	4 Mulapurru	734	857	426	458	265	341	426	459	265	342
	5 Artamur Davarada ...	1,212	622	291	282	568	585	291	282	530	585
	6 Kappaladoddi ...	426	160	92	84	115	266	92	84	115	266
	7 Nandigama	331	566	99	109	501	1,351	99	109	501	1,351
	8 Akulamunnad ...	1,208	172	771	585	167	373	839	632	173	385
	9 Vartallapalli	165	405	97	101	283	549	78	86	304	595
	10 Penumalli	118	474	58	105	378	645	58	105	381	650
	11 Peddana	1,204	719	356	307	514	787	355	308	514	787
	12 Madaka	282	131	130	80	93	120	130	123	93	227
	13 Palavaram	29	34	30	44	27	106	28	42	28	125
	Total...	6,440	4,690	2,667	2,361	3,751	6,041	2,713	2,435	3,744	6,230
	Grand Total...	13,528	26,334	4,116	3,937	17,083	32,350	4,189	4,064	18,963	34,839

STATEMENT showing the cultivation in the inundated Villages, etc.—(*Continued.*)

Talooks.	Villages.	Cultivation of four years before the Cyclone of 1st November 1864.									
		Fusly 1273.				Fusly 1274.				Total.	
		Dry.		Wet.		Dry.		Wet.		Dry.	
		Land.	Sist.	Land.	Sist.	Land.	Sist.	Land.	Sist.	Land.	Sist.
		ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Gudivada.	1 Tummidi	106	270	1,421	2,098	165	415	1,796	2,585	492	1,249
	2 Veyivaka	45	83	1,143	517	61	116	1,169	564	194	367
	3 Utkur	47	44	305	356	47	44	305	408	188	176
	4 Kocherla	25	36	224	164	40	58	354	302	115	166
	5 Mallampudi	17	1	458	399	17	1	458	499	68	4
	6 Uppalakalavagunta ...	...	...	326	950	...	...	332	1,013	...	...
	7 Kuldindi	384	374	1,248	1,798	374	374	1,260	1,827	1,477	1,446
	8 Mattagunta	5	5	679	345	5	5	670	395	20	20
	9 Konnangi	...	...	849	1,600	...	...	907	1,710	...	...
	10 Amaravati	...	...	369	750	...	...	411	829	...	...
	11 Yadavalli	...	...	373	375	...	...	373	375	...	...
	12 Peddalanka	18	22	1,009	2,378	59	35	2,055	2,423	108	95
	13 Konkollu	812	547	1,269	1,884	889	825	1,185	2,254	2,785	2,270
	14 Chakerudravaram ...	20	38	159	345	25	47	179	393	85	161
	15 Cheñnur	...	...	2,926	8,870	...	...	2,918	8,383	...	...
	16 Urivi	...	...	1,690	2,250	...	...	1,745	3,306	...	...
	17 Bodagunta	1	2	257	650	19	12	482	776	36	52
	18 Vanudurru	267	264	820	736	267	197	820	1,003	992	901
	19 Vadavalli	43	60	815	1,367	63	96	824	1,593	186	269
	20 Lunkalakalavagunta ...	...	...	348	720	2	2	362	898	2	2
	Total...	1,790	1,746	16,688	28,552	2,033	2,227	18,605	31,536	6,748	7,173
Bandur.	1 Amudalapalli	143	87	129	214	143	87	129	213	572	347
	2 Satuluru	47	51	692	680	44	48	633	604	185	201
	3 Maddetipalli	127	68	19	25	127	68	19	25	508	272
	4 Mulapurru	426	458	265	341	426	459	265	342	1,704	1,834
	5 Aratamur Davarada ...	291	282	523	578	284	270	484	566	1,157	1,116
	6 Kappaladoddi ...	92	84	115	266	92	84	115	266	368	336
	7 Nandigama	99	109	501	1,351	99	109	504	1,363	396	436
	8 Akulamunnad	848	640	173	385	849	640	174	410	3,307	2,497
	9 Vartallapalli	76	86	304	628	77	86	301	628	328	359
	10 Penumalli	58	105	381	650	58	105	381	651	232	420
	11 Peddana	355	308	514	787	355	308	514	787	1,421	1,231
	12 Madaka	181	138	169	262	181	138	169	262	622	479
	13 Palavaram	27	41	29	130	27	41	29	131	112	168
	Total..	2,770	2,457	3,814	6,297	2,762	2,443	3,717	6,248	10,912	9,696
	Grand Total...	4,560	4,203	20,502	34,849	4,795	4,670	22,322	37,784	17,660	16,874

STATEMENT showing the cultivation in the inundated Villages, etc.—(*Continued.*)

Talooks.	Villages.	Cultivation of four years before the Cyclone of 1st November 1864.						Cultivation of four years subsequent to Cyclone.			
		Total.		Average.				Fusly 1275.			
		Wet.		Dry.		Wet.		Dry.		Wet.	
		Land.	Sist.	Land.	Sist.	Land.	Sist.	Land.	Sist.	Land.	Sist.
		ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Gudivada.	1 Tummidi	6,273	9,055	123	312	1,568	2,264	154	395	1,771	2,673
	2 Veyivaka	4,598	2,113	49	92	1,149	528	44	84	1,143	516
	3 Utkur	1,220	1,476	47	44	305	369	47	44	305	408
	4 Kocherla	998	749	29	41	249	187	40	58	353	305
	5 Mallampudi	1,832	1,596	17	1	458	399	17	1	458	299
	6 Uppalakalavagunta ...	1,275	3,713	...	...	319	928	...	...	324	995
	7 Kuldindi	4,861	6,959	369	861	1,215	1,740	395	390	1,134	1,609
	8 Mattagunta	2,707	1,840	5	5	677	335	5	5	670	395
	9 Konnangi	3,401	6,410	...	...	850	1,603	...	...	1,337	1,000
	10 Amaravati	1,518	3,229	...	...	380	807	...	...	411	500
	11 Yadavalli	1,458	1,300	...	...	365	325	...	...	373	375
	12 Peddalanka	5,042	9,463	27	24	1,261	2,366	59	35	2,055	2,423
	13 Konkollu	4,646	7,840	696	568	1,161	1,960	890	597	1,184	1,803
	14 Chakerudravaram ...	644	1,410	21	40	161	352	25	47	158	353
	15 Chennur	10,261	33,518	...	...	2,565	8,380	...	...	2,919	9,137
	16 Urivi	5,104	10,306	...	...	1,276	2,576	...	...	969	2,500
	17 Bodagunta	1,263	2,688	9	13	316	672	19	12	476	688
	18 Vanudurru	2,675	3,299	248	225	669	825	320	303	840	1,065
	19 Vadavalli	2,680	5,584	46	67	670	1,396	62	103	824	1,593
	20 Lunkalakalavagunta ...	1,388	2,958	1	1	347	739	2	2	362	898
	Total...	63,844	1,15,006	1,687	1,794	15,961	28,751	2,079	2,076	18,066	29,535
Bandur.	1 Amudalapalli	516	852	143	87	129	213	143	87	129	213
	2 Satuluru	2,709	2,644	46	50	677	661	44	48	633	604
	3 Maddetipalli	76	100	127	68	19	25	126	67	19	25
	4 Mulapurru	1,060	1,366	426	458	265	342	426	459	265	341
	5 Artamur Davarada ...	2,105	2,314	289	279	526	578	262	256	478	551
	6 Kappaladoddi	460	1,064	92	84	115	266	92	84	115	266
	7 Nandigama	2,007	5,416	99	109	502	1,354	97	107	505	1,364
	8 Akulamunnad... ...	687	1,553	827	624	172	388	811	609	167	395
	9 Vartallapalli	1,192	2,400	82	90	298	600	77	85	286	612
	10 Penumalli	1,521	2,596	58	105	380	649	58	105	381	651
	11 Peddana	2,056	3,148	355	308	514	787	355	200	514	787
	12 Madaka	524	871	156	120	131	218	181	138	113	188
	13 Palavaram	113	492	28	42	28	123	27	41	29	185
	Total...	15,026	24,816	2,728	2,424	3,756	6,204	2,699	2,286	3,634	6,132
	Grand Total...	78,870	1,39,822	4,415	4,219	19,717	34,955	4,778	4,362	21,700	35,667

Proceedings of the Madras Government, Revenue Department,
6th December 1869.

STATEMENT showing the cultivation in the inundated Villages, etc.—(*Continued.*)

Talooks.	Villages.	Cultivation of four years subsequent to Cyclone.									
		Fusly 1276.				Fusly 1277.				Fusly 1278.	
		Dry.		Wet.		Dry.		Wet.		Dry.	
		Land.	Sist.	Land.	Sist.	Land.	Sist.	Land.	Sist.	Land.	Sist.
		ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.	ACS.	RS.
Gudivada.	1 Tummidi	225	168	551	2,836	227	169	638	3,296	227	169
	2 Veyivaka	85	85	8	44	93	95	12	63	97	97
	3 Utkur	69	37	75	400	67	35	62	340	69	37
	4 Kocherla	43	28	12	61	43	28	34	179	43	28
	5 Mallampudi	...	...	...	...	...	...	...	...	...	...
	6 Uppalakalavagunta ...	...	...	266	1,451	...	...	272	1,485	...	...
	7 Kuldindi	640	501	118	606	662	518	147	772	721	560
	8 Mattagunta	...	...	22	118	5	5	17	88	5	5
	9 Konnangi	...	...	62	347	...	...	69	323	...	...
	10 Amaravati	...	...	21	113	...	...	28	159	...	...
	11 Yadavalli	...	...	15	85	...	...	18	102	...	...
	12 Peddalanka	39	26	58	287	39	26	36	177	39	26
	13 Konkollu	891	618	367	2,042	891	618	478	2,665	891	618
	14 Chakerudravaram ...	47	93	103	529	45	91	63	325	46	47
	15 Chennur	...	...	1,575	7,844	...	...	2,030	12,720	...	...
	16 Urivi	...	...	609	3,306	12	30	724	3,904	12	30
	17 Bodagunta	5	6	149	799	5	6	168	892	1	2
	18 Vanudurru	353	329	160	861	352	329	197	1,078	340	317
	19 Vadavalli	62	103	341	1,874	73	90	644	3,543	73	90
	20 Lunkalakalavagunta...	4	7	150	844	4	7	164	932	4	7
	Total...	2,463	2,001	4,662	24,447	2,518	2,047	5,801	33,043	2,568	2,033
Bandur.	1 Amudalapalli	186	104	71	342	200	112	80	389	209	117
	2 Satuluru	64	53	143	713	64	53	192	973	64	53
	3 Maddetipalli	145	84	20	90	147	85	20	90	147	85
	4 Mullapurru	567	392	101	469	589	406	111	514	615	424
	5 Aratamur Davaraada.	383	207	31	148	410	220	114	533	439	236
	6 Kappaladoddi... ...	126	92	52	268	115	85	51	261	118	87
	7 Nandigama	109	133	365	1,958	116	139	405	2,174	116	138
	8 Akulamunnad... ...	968	482	41	209	994	493	48	256	1,099	544
	9 Vartallapalli	64	59	114	621	65	60	82	451	65	60
	10 Penumalli	78	62	147	769	97	85	155	808	93	82
	11 Peddana	709	473	228	1,200	704	466	261	1,372	638	449
	12 Madaka	206	92	90	432	208	94	90	434	208	94
	13 Palavaram	29	25	34	185	29	25	34	185	29	25
	Total...	3,634	2,258	1,437	7,404	3,738	2,823	1,643	8,440	3,890	2,394
	Grand Total...	6,097	4,259	6,099	31,851	6,256	4,370	7,444	41,483	6,458	4,427

STATEMENT showing the cultivation in the inundated villages, etc.—(*Concluded.*)

Talooks.	Villages.	Cultivation of four years subsequent to Cyclone. Fusly 1278. Wet. Land.	Wet. Sist.	Total. Dry. Land.	Dry. Sist.	Wet. Land.	Wet. Sist.	Average. Dry. Land.	Dry. Sist.	Wet. Land.	Wet. Sist.
		Acs.	Rs.	Acs.	Rs.	Acs.	Rs.	Acs.	Rs.	Acs.	Rs.
Gudivada.	1 Tummidi	318	1,651	833	901	3,278	10,456	208	225	819	2,614
	2 Veyivaka	19	99	319	361	1,182	722	80	90	295	181
	3 Utkur	64	336	252	153	506	1,484	63	38	127	371
	4 Kocherla	25	134	169	142	424	679	42	35	106	170
	5 Mallampudi	...	...	17	1	458	299	4	...	115	75
	6 Uppalakalavagunta ...	215	1,156	...	...	1,077	5,087	...	...	269	1,272
	7 Kuldindi	158	839	2,418	1,969	1,557	3,826	605	492	389	956
	8 Mattagunta	13	70	15	15	722	671	4	4	181	168
	9 Konnangi	99	556	...	...	1,567	2,226	...	...	392	556
	10 Amaravati	40	221	...	...	500	993	...	...	125	248
	11 Yadavalli	19	102	...	...	425	664	...	...	106	166
	12 Peddalunka	25	122	176	113	2,174	3,009	44	28	543	752
	13 Konkollu	44	244	3,563	2,451	2,073	6,754	891	613	518	1,689
	14 Chakerudravaram ...	51	256	163	278	375	1,463	41	69	94	366
	15 Chennur	967	6,630	...	...	7,491	36,331	...	...	1,873	9,083
	16 Urivi	205	1,144	24	60	2,507	10,854	6	15	627	2,713
	17 Bodagunta	71	397	30	26	864	2,776	7	7	216	694
	18 Vanudurru	74	398	1,365	1,278	1,271	3,402	341	320	318	850
	19 Vadavalli	207	1,142	270	386	2,016	8,152	68	97	504	2,038
	20 Lunkalakalavagunta...	61	347	14	23	737	3,021	3	6	184	755
	Total...	2,675	15,844	9,628	8,157	31,204	1,02,869	2,407	2,039	7,801	25,717
Bandur.	1 Amudalapalli... ...	57	271	738	420	337	1,215	184	105	84	304
	2 Satuluru	70	355	236	207	1,038	2,645	59	52	259	661
	3 Maddetipalli	11	51	565	321	70	256	141	80	17	64
	4 Mulapurru	60	276	2,197	1,681	587	1,600	549	420	134	400
	5 Artamur Davarada. ...	85	394	1,494	919	708	1,626	373	230	177	406
	6 Kappaladoddi... ...	48	250	451	348	266	1,045	113	87	67	261
	7 Nandigama	298	1,597	438	517	1,573	7,093	109	129	393	1,773
	8 Akulamunnad ...	51	267	3,872	2,128	307	1,127	968	532	77	282
	9 Vartallapalli	48	251	271	264	530	1,935	68	66	133	484
	10 Penumalli	131	681	826	334	814	2,909	82	83	204	727
	11 Peddana	246	1,294	2,456	1,588	1,249	4,653	614	397	312	1,163
	12 Madaka	54	261	503	418	847	1,315	201	105	87	329
	13 Palavaram	34	185	114	116	131	690	29	29	33	173
	Total...	1,193	6,133	13,961	9,261	7,907	28,109	3,490	2,315	1,977	7,027
	Grand Total...	3,868	21,977	23,589	17,418	39,111	1,30,978	5,897	4,354	9,778	32,744

MADRAS,
4th November 1869,

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. V.

Statement showing the prices of Grains per Madras Garce.

Years. Fusly.	Years. Official year.	Late Masulipatam District. White Paddy.	Late Masulipatam District. Black Paddy.	Late Masulipatam District. Jonnalu.	Late Guntoor District. White Paddy.	Late Guntoor District. Black Paddy.	Late Guntoor District. Jonnalu.	Late Guntoor District. Varga-lu.	Present Kistna District. White Paddy.	Present Kistna District. Black Paddy.	Present Kistna District. Jonnalu.
1	2	3	4	5	6	7	8	9	10	11	12
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1222... ...	1812-13	151	137	163	161	146	137	115	...	...	...
1223... ...	1813-14	146	134	173	172	146	181	129	...	...	...
1224... ...	1814-15	120	107	169	132	126	166	125	...	...	...
1225... ...	1815-16	106	86	145	121	106	150	108	...	...	...
1226	1816-17	125	103	149	137	118	141	105	...	...	...
1227... ...	1817-18	148	111	175	149	123	193	130	...	...	...
1228... ...	1818-19	148	121	220	164	147	239	176	...	...	...
1229... ...	1819-20	114	93	163	120	124	154	134	...	...	...
1230... ...	1820-21	120	94	182	139	115	192	124	...	...	...
1231... ...	1821-22	134	108	177	131	122	150	125	...	...	...
Total...	.....	1,312	1,094	1,716	1,426	1,273	1,703	1,271	...	...	...
Average...	.....	131	109	172	143	127	170	127	...	...	...
Per Candy.	.....	26	22	34	29	25	34	25	...	...	...
1232... ...	1822-23	121	110	159	154	118	199	133	...	...	...
1233... ...	1823-24	148	134	190	165	141	187	144	...	...	...
1234... ...	1824-25	178	143	216	178	169	182	158	...	...	...
1235... ...	1825-26	150	117	178	175	135	150	138	...	...	...
1236... ...	1826-27	107	88	117	103	97	112	107	...	...	...
1237... ...	1827-28	92	72	96	92	70	97	75	...	...	...
1238... ...	1828-29	95	73	102	101	82	124	97	...	...	...
1239... ...	1829-30	94	82	94	122	94	129	110	...	...	...
1240... ...	1830-31	98	81	120	111	86	122	90	...	...	...
1241... ...	1831-32	71	66	104	189	81	111	86	...	...	...
Total...	.....	1,154	966	1,376	1,390	1,073	1,413	1,138	...	...	...
Average...	.....	115	96	138	139	107	141	114	...	...	...
Per Candy.	.....	23	19	28	28	21	28	23	...	...	...
1242... ...	1832-33	143	113	235	192	154	192	190	...	...	...
1243... ...	1833-34	178	137	246	242	200	195	223	...	...	...
1244... ...	1834-35	119	97	137	123	127	151	143	...	...	...
1245... ...	1835-36	77	74	119	97	87	97	90	...	...	...
1246... ...	1836-37	86	74	105	115	102	100	81	...	...	...
1247... ...	1837-38	95	75	107	109	101	98	74	...	...	...
1248	1838-39	140	122	157	167	129	167	107	...	...	...
1249... ...	1839-40	94	78	102	126	100	119	82	...	...	...
1250	1840-41	96	86	108	104	85	101	72	...	...	...
1251... ...	1841-42	76	60	83	90	72	77	53	...	...	...
Total...	.....	1,104	916	1,399	1,365	1,157	1,297	1,115	...	...	...
Average...	.....	110	91	140	136	116	139	111	...	...	...
Per Candy.	.....	22	18	28	27	23	26	22	...	...	...

Statement showing the prices of Grains per Madras Garce.—(Continued).

Years.		Late Masulipatam District.			Late Guntoor District.				Present Kistna District.		
Fusly.	Official year.	White Paddy.	Black Paddy.	Jonnalu.	White Paddy.	Black Paddy.	Jonnalu.	Varga-lu.	White Paddy.	Black Paddy.	Jonnalu.
1	2	3	4	5	6	7	8	9	10	11	12
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1252... ...	1842-43	66	54	67	79	65	59	42	...	...	...
1253... ...	1843-44	64	49	54	81	65	46	34	...	...	...
1254... ...	1844-45	68	50	64	87	67	69	45	...	...	...
1255... ...	1845-46	97	85	130	115	103	135	98	...	...	...
1256... ...	1846-47	101	88	116	116	103	125	95	...	...	...
1257... ...	1847-48	89	81	194	104	90	123	88	...	...	...
1258... ...	1848-49	81	64	105	99	83	104	75	...	...	...
1259... ...	1849-50	90	72	106	92	81	97	67	...	...	...
1260... ...	1850-51	94	76	130	101	95	125	85	...	...	...
1261... ...	1851-52	81	66	117	92	86	123	89	...	...	...
Total...	.....	831	685	1,083	966	838	1,006	718	...	...	...
Average...	.....	83	68	108	97	84	101	72	...	...	...
Per Candy.	.....	17	14	22	19	17	20	14	...	...	...
1262... ...	1852-53	67	55	101	80	61	109	...	73	58	105
1263... ...	1853-54	112	92	178	120	101	153	...	116	96	166
1264... ...	1854-55	122	...	180	130	...	166	...	126	...	172
1265... ...	1855-56	124	...	168	143	...	178	...	133	...	173
1266... ...	1856-57	83	...	103	140	...	140	...	112	...	121
1267... ...	1857-58	88	...	117	165	...	175	...	126	...	146
1268... ...	1858-59	105	...	125	165	...	180	...	135	...	153
1269... ...	1859-60	...	...	...	...	...	...	...	116	...	131
1270... ...	1860-61	...	...	...	...	...	...	...	122	...	128
1271... ...	1861-62	...	...	...	...	...	...	...	143	...	149
Total...	.....	701	147	972	943	162	1,101	...	1,202	154	1,444
Average...	.....	100	73	139	135	81	143	...	120	77	144
Per Candy.	.....	20	15	28	27	16	29	...	24	16	29
1272... ...	1862-63	...	...	...	...	...	...	...	163	...	219
1273... ...	1863-64	...	...	...	...	...	...	...	189	...	251
1274... ...	1864-65	...	...	...	...	...	...	...	197	...	228
1275... ...	1865-66	...	...	...	...	...	...	...	179	...	191
1276... ...	1866-67	...	...	...	...	...	...	...	216	...	238
1277... ...	1867-68	...	...	...	...	...	...	...	154	...	189
Total...	.....	...	...	...	...	...	...	...	1,098	...	1,316
Average...	.....	...	...	...	...	...	...	...	183	...	219
Per Candy.	.....	...	...	...	...	...	...	...	36	...	44
1278... ...	1868-69	...	...	...	...	...	...	...	156	...	169
Per Candy.	.....	...	...	...	...	...	...	...	31	...	34

Madras,
4th November 1869.

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. VI.

Statement showing the Exports and Imports at the several Ports of the Kistna District.

Years.	Masulipatam.			Nizampatam.		
	Export.	Import.	Total.	Export.	Import.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1824-25... ...	2,67,282	2,75,653	5,42,935	.....	.....	.....
1825-26... ...	3,26,331	4,32,003	7,58,334	.....	.....	.....
1826-27... ...	2,72,856	6,95,799	9,68,655	.....	.....	.....
1827-28... ...	4,99,818	5,22,647	10,22,465	.....	.....	.....
1828-29... ...	5,46,199	4,27,563	9,73,762	.....	.....	.....
1829-30... ...	1,43,193	6,08,416	7,51,609	.....	.....	.....
1830-31... ...	5,58,493	5,94,699	11,53,192	.....	.....	.....
1831-32... ...	5,63,959	3,96,227	9,60,186	.....	.....	.....
1832-33... ...	1,56,279	10,92,012	12,48,291	.....	.....	.....
1833-34... ...	1,78,182	13,64,064	15,42,246	.....	.....	.....
1834-35... ...	90,829	12,22,165	13,12,994	.....	.....	.....
1835-36... ...	3,85,873	6,14,353	10,00,226	.....	.....	.....
1836-37... ...	1,13,500	4,98,607	6,12,107	.....	.....	.....
1837-38	1,18,461	5,58,669	6,77,130	.....	.....	.....
1838-39... ...	4,48,987	6,40,078	10,89,065	.....	.....	.....
1839-40... ...	1,80,820	4,96,087	6,76,907	.....	.....	.....
1840-41... ...	2,17,823	4,36,051	6,53,874	.....	.....	.....
1841-42... ...	1,75,146	5,34,757	7,09,903	.....	.....	.....
1842-43... ...	1,41,931	3,91,837	5,33,768	.....	.....	.....
1843-44... ...	73,505	2,06,017	2,79,522	.....	.....	.....
1844-45... ...	1,08,572	4,47,221	5,55,793	.....	.....	.....
1845-46... ...	1,39,288	3,93,165	5,32,453	.....	.....	.....
1846-47... ...	55,304	3,45,943	4,01,247	.....	.....	.....
1847-48... ...	1,01,425	4,61,999	5,63,424	.....	.....	.....
1848-49... ...	1,72,814	5,46,984	7,19,798	.....	.....	.....
1849-50... ...	91,167	4,85,349	5,76,516	.....	.....	.....
1850-51... ...	89,186	3,91,630	4,80,816	42,646	.....	42,646
1851-52... ...	1,10,148	2,50,831	3,60,979	57,262	84,210	1,41,472
1852-53... ...	3,33,666	1,46,365	4,80,031	69,360	27,327	96,687
1853-54... ...	2,54,412	2,89,073	5,43,485	1,02,551	40,941	1,43,492
1854-55... ...	2,58,528	6,26,496	8,85,024	1,21,362	37,366	1,58,728
1855-56... ...	2,64,741	6,26,561	8,91,302	1,27,058	60,388	1,87,446
1856-57... ...	4,64,611	3,45,423	8,10,034	1,50,389	30,929	1,81,318
1857-58... ...	6,05,985	3,51,659	9,57,644	2,06,888	85,139	2,92,027
1858-59... ...	6,29,888	4,79,954	11,09,842	2,49,556	52,927	3,02,483
1859-60... ...	4,68,386	6,99,640	11,68,026	2,20,772	72,966	2,93,738
1860-61... ...	9,03,563	8,14,801	17,18,364	2,30,300	45,971	2,76,271
1861-62... ...	11,28,283	8,03,238	19,31,521	1,71,926	56,169	2,28,095
1862-63... ...	14,76,908	9,58,690	24,35,589	2,87,829	64,300	3,52,129
1863-64... ...	20,17,668	13,38,397	33,56,065	2,02,307	94,503	2,96,810
1864-65... ...	15,04,906	12,53,047	27,57,953	2,58,676	75,411	3,34,087
1865-66... ...	22,51,257	10,26,309	32,77,566	2,09,574	73,663	2,83,237
1866-67	25,43,960	12,99,804	38,43,764	8,44,289	3,36,204	11,80,493
1867-68	32,85,404	12,94,628	45,80,032	3,37,656	81,980	4,19,636
1868-69... ...	.....	.....	.....	5,01,948	2,26,123	7,28,071
Total ...	2,47,19,537	2,76,84,911	5,24,04,448	43,92,319	15,46,517	59,38,866
Average ...	5,61,808	6,29,202	11,91,010	2,31,176	8[illegible],918	3,12,572

Statement showing the Exports and Imports.—(Continued.)

Years.	Kottapalem.			Ipurpalem or Vadarevupalem.		
	Export.	Import.	Total.	Export.	Impor.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1824-25...	.....	.....	.....	.....	.....	.....
1825-26...	.....	.....	.....	.....	.....	.....
1826-27...	.....	.....	.....	.....	.....	.....
1827-28...	.....	.....	.....	.....	.....	.....
1828-29...	.....	.....	.....	.....	.....	.....
1829-30...	.....	.....	.....	.....	.....	.....
1830-31...	.....	.....	.....	.....	.....	.....
1831-32...	.....	.....	.....	.....	.....	.....
1832-33...	.....	.....	.....	.....	.....	.....
1833-34...	.....	.....	.....	.....	.....	.....
1834-35...	.....	.....	.....	.....	.....	.....
1835-36...	.....	.....	.....	.....	.....	.....
1836-37...	.....	.....	.....	.....	.....	.....
1837-38...	.....	.....	.....	.....	.....	.....
1838-39...	.....	.....	.....	.....	.....	.....
1839-40...	.....	.....	.....	.....	.....	.....
1840-41...	.....	.....	.....	.....	.....	.....
1841-42...	.....	.....	.....	.....	.....	.....
1842-43...	.....	.....	.....	.....	.....	.....
1843 44...	.....	.....	.....	.....	.....	.....
1844-45...	.....	.....	.....	.....	.....	.....
1845-46...	.....	.....	.....	.....	.....	.....
1846-47...	.....	.....	.....	.....	.....	.....
1847-48...	.....	.....	.....	.....	.....	.....
1848-49...	.....	.....	.....	.....	.....	.....
1849-50...	.....	.....	.....	.....	.....	.....
1850-51...	.....	.....	.....	.....	.....	.....
1851-52...	.....	.....	.....	.....	.....	.....
1852-53...	.....	.....	.....	.....	.....	.....
1853-54...	.....	.....	.....	.....	.....	.....
1854-55...	12,737	12,249	24,986	1,42,307	1,04,201	2,46,508
1855-56...	8,000	11,513	19,513	80,359	74,054	1,54,413
1856-57...	25,568	48,971	74,539	81,768	1,48,209	2,29,977
1857-58...	24,614	88,131	1,12,745	1,22,046	1,27,571	2,49,617
1858-59...	15,689	50,427	66,116	1,91,433	1,03,839	2,95,272
1859-60...	24,022	50,861	74,883	2,01,643	1,52,679	3,54,322
1860-61...	50,120	2,566	52,686	2,67,979	2,85,425	5,53,404
1861-62...	41,990	39,187	81,177	2,82,220	1,73,726	4,55,946
1862-63...	42,925	14,149	57,074	3,40,003	1,29,841	4,69,844
1863-64...	25,818	48,398	74,216	3,43,310	1,15,432	4,58,742
1864-65...	18,349	48,398	66,747	3,17,567	6,25,811	9,43,378
1865-66...	36,856	50,420	87,276	3,08,259	5,28,227	8,36,486
1866-67...	50,308	34,889	85,197	2,78,957	7,19,906	9,98,863
1867-68...	60,525	66,225	1,26,750	3,77,492	9,18,202	12,95,694
1868-69...	25,742	27,202	52,944	3,36,130	9,34,742	12,70,872
				5,33,753	9,73,701	15,07,454
Total ...	4,63,263	5,93,586	10,56,849	42,05,226	61,15,566	1,03,20,792
Average ...	30,884	39,572	70,456	2,62,827	3,82,222	6,45,049

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Statement showing the Exports and Imports.—(Continued.)

Years.	Motupallee.			Total.		
	Export.	Import.	Total.	Export.	Import.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1824-25...	.....	.....	.....	2,67,282	2,75,653	5,42,935
1825-26 ..	.....	.....	.....	3,26,331	4,32,003	7,58,334
1826-27...	.....	.....	.....	2,72,856	6,95,799	9,68,655
1827-28...	.....	.....	.....	4,99,818	5,22,647	10,22,465
1828-29...	.....	.....	.....	5,46,199	4,27,563	9,73,762
1829-30...	.....	.....	.....	1,43,193	6,08,416	7,51,609
1830-31...	.....	.....	.....	5,58,493	5,94,699	11,53,192
1831-32 ..	.....	.....	.....	5,63,959	3,96,227	9,60,186
1832-33...	.....	.....	.....	1,56,279	10,92,012	12,48,291
1833-34...	.....	.....	.....	1,78,182	13,64,064	15,42,246
1834-35...	.....	.....	.....	90,829	12,22,165	13,12,994
1835-36...	.....	.....	.....	3,85,873	6,14,353	10,00,226
1836-37...	.....	.....	.....	1,13,500	4,98,607	6,12,107
1837-38...	.....	.....	.....	1,18,461	5,58,669	6,77,130
1838-39...	.....	.....	.....	4,48,987	6,40,078	10,89,065
1839-40...	.....	.....	.....	1,80,820	4,96,087	6,76,907
1840-41...	.....	.....	.....	2,17,823	4,36,051	6,53,874
1841-42...	.....	.....	.....	1,75,146	5,34,757	7,09,903
1842-43...	.....	.....	.....	1,41,931	3,91,837	5,33,768
1843-44...	.....	.....	.....	73,505	2,06,017	2,79,522
1844-45...	.....	.....	.....	1,08,572	4,47,221	5,55,793
1845-46...	.....	.....	.....	1,39,288	3,93,165	5,32,453
1846-47...	.....	.....	.....	55,304	3,45,943	4,01,247
1847-48...	.....	.....	.....	1,01,425	4,61,999	5,63,424
1848-49...	.....	.....	.....	1,72,814	5,46,984	7,19,798
1849-50...	.....	.....	.....	91,167	4,85,349	5,76,516
1850-51...	.....	.....	.....	1,31,832	3,91,630	5,23,462
1851-52...	.....	.....	.....	1,67,410	3,35,041	5,02,451
1852-53...	.....	.....	.....	4,03,026	1,73,692	5,76,718
1853-54...	5,180	28,860	34,040	5,04,450	4,63,075	9,67,525
1854-55...	1,716	34,630	36,346	4,74,702	7,84,795	12,59,497
1855-56...	17,359	52,597	69,956	4,98,926	8,99,268	13,98,194
1856-57...	12,821	40,955	53,776	7,75,435	5,93,849	13,69,284
1857-58...	6,702	81,909	88,611	10,35,622	7,10,677	17,46 299
1858-59...	14,979	36,462	51,441	11,11,755	7,72,449	18,84,204
1859-60...	53,267	43,697	96,964	10,34,426	11,52,589	21,87,015
1860-61...	22,886	42,687	65,573	14,89,089	10,79,751	25,68,840
1861-62...	27,797	20,027	47,824	17,09,999	10,48,462	27,58,461
1862-63 ..	30,690	52,244	82,934	21,81,662	12,04,815	33,86,477
1863-64...	20,944	1,06,696	1,27,640	25,84,304	22,13,805	47,98,109
1864-65...	39,781	93,167	1,32,948	21,29,971	19,98,250	41,28,221
1865-66 ..	31,988	16,596	48,584	28,08,632	18,86,894	46,95,526
1866-67...	77,933	44,831	1,22,764	38,93,982	26,33,930	65,27,912
1867-68...	52,514	70,893	1,23,407	40,72,229	24,48,468	65,20,697
1868-69...	66,922	68,937	1,35,859	11,28,365	12,95,963	24,24,328
Total...	4,83,479	8,35,188	13,18,667	3,42,63,854	3,67,75,768	7,10,39,622
Average...	30,217	52,199	82,416	7,61,418	8,17,240	15,78,658

Madras,
4th November 1869.

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. VII.

From the Master Attendant, to the Superintendent of Marine, Madras, dated Master Attendant's Office, 21st January 1863, No. 6.

HAVING been informed by Major Anderson that the survey of the Nizampatam backwater had been carried to the entrance, and the 7th of January being named as convenient to the District Engineer to meet me at that port, I left Masulipatam on the 6th by dawk, my boat having been sent round two days previous; I have now the honour to submit for your information the result of my observation and inquiry.

2. On approaching Nizampatam, the entrance to the backwater may be known by a few clumps of trees and two buildings a little back to the west of the entrance. On the east side the regular belt of tall Palmyrah trees begins, and extends along the coast to the entrance of Cotapalem. The coast for some miles to the south-westward of Nizampatam being bare of timber, these trees are very remarkable. On near approach, the entrance is also well defined by high sand hills on each side of the opening. The bungalows at Dindy, half a mile east, are visible. Extensive sand banks, nearly dry at low-water, surround the point on the west side of the inlet, contracting the channel to about 200 feet in width. This channel when examined by Major Anderson and myself was close over on the east shore inside, and from this took a course south a little easterly out to sea. In sounding out on half flood we had three-and-a-quarter fathoms sand inside, decreasing gradually over a hard bottom to six feet for a distance of 200 yards, when it deepened again regularly to two fathoms soft mud. This channel is liable to constant shifts not only in its direction but in depth. At times, during the south-west monsoon, the channel is said not to have more than one to one-and a-half feet at low water. It is difficult to arrive at anything like correct data from the class of natives inhabiting villages on the sea coast; at Nizampatam, the time from which they date all events is the great famine. A point was shown me at which the entrance to the backwater was said to have been situated about the time of this famine, upwards of three-quarters of a mile west of the present entrance: so that taking the time spoken of as 1832, the entrance is travelling eastward about four-and-a-half yards annually. I am aware that Masulipatam backwater, and similar outlets on this coast are obeying the same law, and have no reason to doubt this being correct. It does not appear to me, taking into consideration the nature of the bottom, the shiftings I have mentioned, and the very regular nature of the soundings in and out from the shoalest part of the channel, that anything could be done to fix or deepen the channel over this bar with the slightest prospect of any permanent benefit to the port. I am, on the contrary, inclined to the opinion that interference would be more likely to prove detrimental than otherwise.

3. I could not find any perceptible current outside: the fishermen state a current is felt only when it blows fresh during the south-west monsoon. I am inclined to the opinion that the sets of the currents in this bight are governed by the wind, and are never very strong, the regular current running from False Point Devy in a line with Motipilly bank, and at times setting strong into the bight.

4. It is usual for native vessels making use of this port to anchor in from two-and-a-half to three fathoms water east or west of the entrance according to the prevailing winds, so as to give themselves a sufficiently leeward berth to insure the cargo dhonies fetching them. The bottom is very soft along the entire coast outside one-and-a-half or two fathoms, and pretty good holding ground. I would recommend as the best anchorage the mouth of the backwater open in three or three-and-a-half fathoms, about two to two-and-a-half miles off shore. This berth could only be taken up if an improved class of boats were introduced; to enable the present dhonies in use to fetch, a ship must be to leeward. In moderate weather the cargo dhonies make a trip to the native crafts in the twenty-four hours, they are unable to do anything against fresh breeze, so that should ships other than native trade to Nizampatam, a better class of cargo boat, one capable on turning to windward is necessary to enable shipments to be made with anything like certainty. The distance from the bar to the place of shipment is nearly three miles up, a spacious deep backwater,

Proceedings of the Madras Government, Revenue Department, 6th December 1869.

and up which my boat turned with ease against wind and tide. I have no hesitation in stating that could boats, built on the principle I am endeavouring to introduce at Masulipatam, be brought into use at N izampatam, shipments could be effected with ease at all seasons. The introduction of a better class of cargo boat appears all that is necessary to be done for the port; the probability is, this will be found difficult to effect if it depends on the native merchants of the port.

5. The time of high water on the bar at fall and change is eight hours, fifty-eight minutes. The rise and fall on the spring-tide, four-and-a-half feet.

6. The village of Nizampatam is probably the most pleasantly situated on this coast as a residence for the warm season. The southerly or long shore wind, so disagreeable at other places, comes from the sea here and over a fine wide backwater cool to your door, and free from dust. The village occupies a point of land dividing the backwater into two branches, the smaller on the north-west side separating it from the Salt pans, Salt platforms, and loosing itself after a short distance in the water-sheds of the country; the large branch forms a channel of communication with the fine backwater at Kottapalem. Nizampatam, though situated in Repallee, a talook giving a revenue of upwards of four lacs annually, has no arable land attached; its importance is derived from its exports and Salt manufactures. I enclose a statement of its exports and imports for 1862-63.* The manufacture of salt exceeds one lac Indian Maunds annually.

* They will be forwarded when received.

7. Nizampatam contains 940 houses, of which 228 were tiled and of the better class. The port is also well supplied with well built godowns. They consist in all of 360 guddies or rooms, each capable of containing from fifteen to twenty-five candies, or in round numbers one lac bags of grain or other produce. The number of the inhabitants in 1862 was 2,664 souls, of whom 437 were Mahomedans. There are eighteen cargo boats or rather dhonies belonging to the port. These crafts when not required for their legitimate work, are employed trading from Nizampatam to Madras and other ports on the coast, and in which case they carry from 400 to 450 candies each. When employed as cargo boats they take 200 candies, for which the hire is 13 annas per candy to native crafts anchored in from two-and-a-half to three fathoms; but to ships they are in the habit of charging from one rupee to one rupee four annas the candy: the Nizampatam candy is equal to fifteen bags of two Bengal Maunds.

8. From Nizampatam I visited the port of Kottapalem having a much finer backwater than the first named place, the entrance to which is in latitude 15—51, longitude 80—48 but not shown on Fell's Chart, or mentioned in any directory that I am aware of. At this port there is no trade; some forty to fifty native vessels find shelter and repair here annually, and for which purpose, next to Coringa, it is the best port on the coast.

9. My journey from Nizampatam to Kottapalem was performed in my boat by the backwaters which connect with each other and possess a good deep channel nearly the entire distance; a mile and-a-half is rather narrow, and not more than three feet water at high tide; this however might be easily deepened. The backwater of Kottapalem is very deep, with one side of my boat touching the bank; I found two-and-a-half and three fathoms on the other side all the way down until near the entrance; here there is a little less water. About three-quarters of a mile from the entrance of the backwater there is a channel connecting with the river Kistna, at the village of Lankavadadibba. I find on inquiry there are many dhonies make use of this route going from Masulipatam south. My boat, in passing through the latter channel into the Kistna, found only three feet at high water for some distance to the west of Lankava ladibba, the inhabitants of which village endeavour to keep the channel filled up, as the assistance they are called on to give the dhonies making use of this passage finds them profitable employment, and which would of course be lost should the channel be deepened either by natural or artificial means. I forward a sketch showing the direction the channels take, forming natural navigable channel from the Kistna some miles south.

10. The village of Kottapalem is situated some four-and-a-half miles from the entrance of the backwater; it is scattered and consists of about one hundred and fifty huts; there is none but

the village authorities here. Vessels from this, when taking clearance, generally apply to Nizampatam Custom-house. I returned by sea to Nizampatam from this port. I found the channel from 300 to 400 yards in width, the course out south by west, the tide had been flowing about one hour when I crossed it; the least water was four feet; this depth I carried for about the one-third of a mile. There is said to be from nine to ten feet water on the top of spring-tides. I stood out on the course before mentioned till the extreme of the low land on False Point Devy bore east one-fourth, north, one-and-a-half fathoms; I then steered west by north for Nizampatam carrying one-and-a-half to two-and-a-quarter fathoms along this line a little more than a mile from shore.

11. On the west side of the entrance to Kottapalem the high and regular belt of Palmyrah trees end, and the coast from the entrance to False Point Devy is covered with Mangrove Jungle. At the back of the entrance two or three irregular clumps of high timber will be seen.

12. The bottom inside and outside is soft mud; but on the bar fine sand and mud. The native vessels run in here in any weather and do not mind touching. The general features of this entrance have not been known to change, the channel itself has been seldom known to shift, its doing so has been caused by inundation or an unusually high fresh from the Kistna.

13. I have exceeded the instructions given me in your letter of the 28th April. The importance of this channel navigation forming as it does a natural coast canal for miles, as well as the desirableness that something certain should be known of Kottapalem, a port of much importance to the native shipping, but not shown on the Chart of the Bay of Bengal, will I trust be a sufficient apology.

14. The information on these points, the short time I had to spare enabled me to ascertain, may I trust be interesting to you.

15. I send a sketch of Nizampatam, also one showing the coast line from Nizampatam to False Point Devy with the navigable channel adjacent.

(True Copy.)

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. VIII.

Extract from the Report of Captain Buckle, Civil Engineer, 2nd Division, dated July 1839.

* * * *

(40.) The whole sweep of the Kistna, as it traverses the boundary of the district, measures about 230 miles; but the breadth of the district, taken from where the river enters Palnaud across to the sea near Bapatla, is only ninety miles: consequently, as has been noticed by Mr. Topping, there is a most favourable fall of the country in that direction, but all advantages from this source appear to be cut off by the ranges of hills bordering the Kistna. Judging from the delineations of which in the surveys, and from the course of all the nullahs in Palnaud, as well as from inspections made in that part of the country, there seems but little probability of its being possible to draw a supply from the Kistna on the west side of the district. The whole Palnaud may be said to fall towards the Kistna, so that of course the east boundary, which divides it from Guntoor, is very high. The Kistna, in fact, flows along a valley receiving the drainage of the Hyderabad country on one side, and of Palnaud on the other. The only plan of slightest promise for a cut from the river which I could discern, was towards Mucktalah, and even there all the land near it proved to be very high, as well as being hilly and stony. But the difficulties connected with the river do not cease even here, for in addition to its running along a hollow, its own bed is very deep, in some parts sixty feet, and even eighty feet below the lip of its banks: consequently to keep the river full in this part of its course would demand an anicut of prodigious dimensions, and if we suppose such a work to be constructed, still but little benefit would be derived from it, because

as the country rises from the river, the water would not even then be high enough to irrigate it, and the only effect of such an anicut would be to force back the nullahs which fall into the river, and cause them to overflow in parts: in fact, nothing but danger would accrue from such a measure. This hypothetical anicut, indeed, either in or near Palnaud, would be impracticable; the risk that would accompany its execution having no probable advantages to justify the attempt. Having therefore seen that it would be impossible to convey a channel inland from the river, owing to the elevation of the country bordering it, it would also prove extremely difficult to conduct a channel parallel with the river, because there would still be the same necessity for an anicut; while the channel, in its course, would be interrupted by all the water-courses falling into the Kistna, as well as by the high ridges between them; nor are there any places on the banks adapted for irrigation until the Kistna approaches Bezwada.

(41.) There is nothing, therefore, to invite such an undertaking, though it is not unlikely that a channel, on a reduced scale, might be opened with good effect from a little below Amaravaty keeping it, for some distance in the river, attached to the bank, as is not uncommonly done in this country.

(42.) At Chintapally, I may observe, which is about thirty-five miles above Bezwada or a hundred miles from the sea, there is a remarkable contraction in the passage of the Kistna, its width decreasing suddenly to about 300 yards; but as might be expected it is proportionately deep; even in the dry season the water stands there from fifty to sixty feet deep in some spots, while during the freshes the depth is from thirty to forty feet more; so that, however favourable the breadth might appear, such a site as this could hardly be contemplated for an anicut even were the nature of the country such as could be traversed by a channel. In short, the conclusion at which I reluctantly arrive as regards the Guntoor side of Kistna, is precisely the same as that formed by Major Beatson, in regard to the north bank, namely, that from the whole upper course of the river until it arrives within ten or fifteen miles of Bezwada, it would be impracticable to lead off a channel; the reason being the same in both cases, high banks to the river, increasing in elevation as they recede from it, and the succession of ridges and vallies through which the path of the river lies.

* * * * *

(52.) The undertaking, however, which would benefit the country in the most extensive and permanent manner would be an anicut at Bezwada, which would at once supply both sides of the river with water for irrigation, and thus for ever remove the prospect of famine, for want of the means of raising paddy, for so long as the courses of the seasons endure, the quantity of water which, even in the most unfavourable years flows past between the Bezwada and Seetanagaram hills, would suffice for the cultivation of very many square miles.

(True Extract.)

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. IX.

MR. THORNHILL'S LETTER TO THE BOARD OF 8TH APRIL 1868, No. 109.

EXTENSION OF RAILWAY COMMUNICATION.

(1.)—*From Masulipatam or Bezwada to Hydrabad,* 220 *or* 180 *miles.*

This has the chief claim to attention. Its advantages whether in a Commercial, a Military or a Political point of view would be equally great.

Commercial advantages.

2. Viewed in a Commercial light it would connect Hydrabad, not only the largest city of the Deccan but the Capital of a country almost equal in extent to the entire Presidency of Madras, with its nearest sea-port, Masulipatam.

3. At Bezwada the line would connect itself with the canal systems of the Godavery and Kistna Deltas, and with the port of Cocanada as well as that of Masulipatam.

4. It would afford an outlet to all the inland produce with which the Deccan abounds, and an inlet for all foreign goods, for the rice of the Deltas of the northern coast districts and of the Burmese ports, and for the salt of the coast.

Oil Seeds, Wheat, etc.

5. Traffic returns have been taken for some years along the road by the officers of Department Public Works. These have been applied for, and shall be forwarded when received.

Country traversed by this line.

6. The country traversed by this line is about one-half in the British territory and one-half in the Hydrabad country. Within the Kistna District it passes through a part of the Bezwada Talook, and through the entire length of the Nandigama Talook. Within the former near the line are the towns of Bezwada and Kodapalli; in the latter Nandigama, Alaprole, Jaggiapetta, and others of minor importance.

7. Jaggiapetta is itself a great centre of trade, situated near the frontier of Hydrabad; it has for many years been a place of much commercial importance. Its merchants have dealings with all parts of the country, and have amassed much wealth.

8. I have no certain information of the importance of towns near the line within the Hydrabad territory.

Engineering difficulties.

9. The engineering difficulties of the line would, I believe, be found to be very small indeed.

10. From Masulipatam to Bezwada the country is the flat plain and the alluvial soil of the Delta on which the laying of a line of Railway must be perfectly simple if somewhat costly from the absence of building stone, metal, and good ballast.

11. From the latter point there is a gradual ascent over a generally level country with dry gravelly soil. There are but two streams of any size, the Moonyier and the Moory, both tributaries of the Kistna either dry or fordable for 11 months out of 12. There is one range of low hills 20 miles from Hydrabad over which the existing road passes at an easy gradient.

Military advantages.

12. The advantages in a military point of view are very clear.

13. For years all military stores and most of the troops destined for Hydrabad were landed at Masulipatam and sent on by road, and it is only since Railway carriage from Madras for a considerable portion of the route has been available that this line has been abandoned. With a line from Bezwada to Hydrabad troops and stores might be landed either at Cocanada or Masulipatam, and delivered at Hydrabad in less time than from Madras, not to mention the advantage, in a Military point of view of an alternative line.

14. Politically and socially the advantages of opening out a country situated as is that of Hydrabad can hardly be over-rated, but they are of too general a nature to be properly treated of here.

* * * * * * * *

(2.)—*Bezwada to Cuddapah, via Guntoor, Vinukonda, and Cumbum, 210 miles.*

This, although not of equal importance with the Masulipatam and Hydrabad line, is, I think, one well worthy of attention.

2. It would start from the south bank of the Kistna opposite Bezwada, and would pass through Guntoor, Vinukonda, and Cumbum to Cuddappah; about 80 miles would be within the Kistna District, the remainder in Kurnool and Cuddapah.

3. The advantages of the line would be that it would connect the canal system of the Godavery and Kistna Deltas, and the ports of Cocanada and Masulipatam with the inland districts of Kurnool, Cuddapah, and Bellary, and would enable the cheap rice and other products of the Deltas

to reach those districts where scarcity often prevails, and where the prices of food-grains are generally high.

Palnada.
Krosoor.
Guntoor.
Rajapetta.
Vinukonda.

4. It would either traverse or skirt the cotton growing talooks of this district, and convey the cotton either to our own canals and ports or to Madras. It would act as a feeder to the Madras and Bombay Railways, and would provide Railway communication with a slight detour between the irrigated districts of Godavery and Kistna and Madras.

5. Within this district the engineering difficulties would be very small.

6. The line would pass through an undulating country with no large streams, except the Gundlacamma near Vinukonda, which runs in a rocky bed of some depth but no great width.

7. Within the Kurnool and Cuddapah Districts it would traverse a long valley between hills, but would, nowhere, as I believe, have to cross any range of hills.

8. It would cross the Pennair near Cuddapah. Building material and metal is abundant throughout the entire length of route.

9. If the rumour that coal has been found near Cumbum be correct; that alone would be a strong argument in favour of the line.

(True Copy.)

(Signed) C. G. MASTER,
On Special Duty.

APPENDIX No. X.

From J. A. C. BOSWELL, Esq., Officiating Collector, Kistna District, to C. G. MASTER, Esq., on Special Duty in Kistna District, dated Narsarowpett, 14th October 1869, No. 171.

With reference to your letter, No. 17, dated 13th July last, requesting my opinion on the various points mentioned in paragraphs 22 and 28—32 of the accompanying copy of the Board's Proceedings, dated 31st March 1869, No. 2,069, I have the honour to state that the observations of the Board in all the above-mentioned paragraphs are strictly correct in my opinion.

2. The two causes alluded to in paragraph 22 have no doubt greatly checked the extension of irrigation. Many poor ryots who suffered from the cyclone of 1864 have not yet recovered from its direful effects. More than three-fourths of the population of this district live by agriculture. The cultivating classes along the sea coast are generally paupers, for their lands near the coast are not so productive as elsewhere; and having been inundated by the sea-wave, they have become more or less "chavudu," and have still further deteriorated in quality. The ryots, however, having no alternative but to cultivate, in order to earn their livelihood, and the little property they had having been lost in the cyclone, have often been obliged to borrow capital at high interest, while the returns from their labours have proved scarcely sufficient to maintain themselves and their families, as well as to discharge their debts. Consequently, they are obliged to retain in their possession as little land as they can actually cultivate, and throw up the rest which is unprofitable to them.

3. The enhancement of the water-tax by twenty-five per cent. has also greatly conduced to the relinquishment of wet lands. The consolidated wet-rates under the joint-rent system were, in many instances, below the present water-rate alone. Although the water-cess at four rupees an acre is very moderate when prices are high and soil good, the lands near the sea coast being arenaceous require more manuring. I should think that, if the water-cess on the sandy tracts were reduced to the former rate of three rupees an acre, a good deal of the present wet waste in the coast talooks would again be brought under the plough. No ryot would give up his land unless he finds it unprofitable to him to retain it.

4. With reference to paragraph 28 of the Proceedings alluded to above, I beg to state that the climate and soil of this district are no doubt very favourable for dry grains; but when water was

available for wet cultivation, the ryots did not hesitate to bring every acre of land which could possibly be cultivated under irrigation, and their profits were excellent for some years. But, as wet cultivation gradually increased, the supply of water became inadequate, and the lands further became "chavudu." Then the ryots were saddled with water-rate as well as land-tax; and the rates were increased, while the supply of water was lessened, and the soil began to show signs of deterioration. Uuder these circumstances the ryots naturally preferred to resort to dry grain cultivation again.

5. Whatever crop is extensively grown in a certain part of the district or country becomes the staple food of that part. In the upland talooks, where the cultivation of rice under tanks is very limited, Jonna and Sajja form the principal food; but in the Delta, rice is gradually becoming the staple food of the people. The decline in the price of rice is chiefly attributable to a decline in demand for exportation during the last few years. Before that, prices were ruling very high, owing to large exports to other districts where scarcity prevailed. In those days the Kistna and Godavery Deltas were the granaries of the surrounding country. I do not think that an extension of irrigation works would cause a glut of rice. Even now rice is occasionally brought for sale to Masulipatam—the central market of the rice-crop talooks in the Kistna Delta—from the adjoining talooks in the Godavery. Rice would still find a sale at Masulipatam if it were imported from Arracan and elsewhere, as before the construction of the anicut. Why it is not imported now is perhaps that the home consumption has increased, or they have found a better market. The extension of irrigation works is always likely to be profitable, and the utilization of the waters brought down by the river, which would otherwise run to waste, augments the wealth of the country, and provides against the effects of local drought. If the Kistna were to fail one year, all the stores in the district would not be sufficient to supply the population. You are aware of the defective means of export for this district. What we want are, first, a good port; second, the opening up and extension of the East Coast Canal to supply cheap water-communication; third, a railway when we can get it. But its construction must probably be delayed for years. It is easy to ascertain the quantity of rice and other grains, as well as cotton, exported during the last few years to Madras and elsewhere by steamers. The imports were likewise very large, and improved means of communication are greatly needed.

6. With regard to paragraph 29 of the Proceedings under reply, I have to state that the Board's observations about "chavudu" are entirely correct. No attempts have been made hitherto to prevent this result of irrigation by improving the drainage, preventing leakage from the channels, or otherwise. In my opinion a public assurance that neither land assessment nor water-cess would be levied on land which became "chavudu" so long as it remained unproductive; and that dry shist only would be collected if dry crops were grown after the "chavudu" had disappeared, would beneficially remove all the apprehensions of the people, and be most advisable. It has not been ascertained yet whether water freely supplied would remove this efflorescence of salt. If so surely a gratuitous supply of it might be granted in the commencement of the season when the river is full. Afterwards the water in the channels will not be sufficient for cultivation itself.

7. With regard to paragraph 30 I would state that the realization of the returns of the works by a separate cess is practically not so unpopular and unacceptible to the people as to be in any material degree an influencing cause in the rejection of water.

8. Adverting to paragraph 31, I beg to state that, in my opinion, the present charge for water is not too high, except for the "garuvu" lands on the coast on which it might be reduced to three rupees an acre. I do not think that the free option of taking and refusing water at any period need be conceded. It would open room for fraud and create incessant work for the Revenue Inspectors, who are already over-worked in the present large talooks.

9. As regards the presumptions of the Board in paragraph 32 of the Proceedings, I have only to say that complaints are frequently made by ryots of irregularity and deficiency of supply from channels in the Delta Talooks. At the same time, I must admit that this may often be partly owing to want of water in the river itself about the close of the season, or to the very inadequate supply

that can be received from channels. It is a well known fact that the Kistna channels can never afford a sufficient supply in the absence of rain. The widening of the main channels is already in progress, and should be completed as early as possible. The raising of the crown of the anicut is strongly to be urged. The Board observe that in the Kistna District the distribution of water is more entirely in the hands of Department Public Works than elsewhere. It is very desirable that this district should be at least on the same footing as other districts. The ryots generally desire a transfer of the work of distributing water from minor channels to the Revenue Department. I think it might be an improvement and if Government should deem it advisable to order it. The present establishment employed on the distribution of water exclusively should be likewise transferred from the Department Public Works to the Revenue Department.

(True Copy.)

(Signed) C. G. MASTER,
On Special Duty.

No. 72. ORDER THEREON, 6th December 1869, No. 3,112.

Irrigation, No. 1.

ORDERED to lie over.

(True Extract.)

(Signed) R. A. DALYELL,
Acting Secretary to Government.

Ed. A. S. Rodgers.

Ok
1/13/72
P. W. 4218/72.
Rg. 5 March/73 2 Bk 118

Proceedings of the Madras Government, Revenue Department, 21st August 1872.

Read again G. O., 21st May 1869, No. 1,432, 16th July 1869, No. 2,070, and 6th December 1869, No. 3,112.

No. 187. Read also the following Proceedings of the Board of Revenue, dated 25th July 1870, No. 5,022 :—

Read the following Proceedings of the Madras Government, dated 27th January 1870, No. ——, Revenue Department.

ABSTRACT.—Referring to the Board for remarks report from Mr. C. G. Master, on Special Duty, on the subject of irrigation works in Kistna Delta.

IN paragraphs 1 to 11 of this report Mr. C. G. Master gives an account of his appointment to investigate the reasons for the reluctance which the cultivators of the Kistna Delta have shown of late years to use the water provided by the anicut. He enumerates nine causes which had been suggested by Colonel Winscom, Colonel Anderson, and the Board, viz., the introduction of the new settlement, deterioration of soil under irrigation, falling prices, indolence of cultivators, insufficiency of water, want of communications, the concession of the option to continue or discontinue irrigation after taking water for two years, the cyclone of November 1864, and the enhancement of the water-rate in 1865.

2. In paragraphs 22 and 23 information is given as to the area commanded by the anicut and the statistics of irrigation from Fusly 1265 to Fusly 1278.

* Uncultivable			326,948
Cultivable—			
Government...	Dry	777,049	
	Wet	186,318	
Inams		142,115	
			1,105,432

3. There are 447 villages in the Delta with an area of acres 1,442,430.* The area occupied in Fusly 1278 was as follows,

Punjah	Acres	459,058,	assessed at Rs. 7,91,011
Nunjah	,,	60,710,	do. at ,, 3,35,228
Punjah converted into nunjah	,,	58,941,	do. at ,, 3,38,081

so that the area under wet cultivation had been nearly doubled by the anicut.

4. The extent of punjah which had been, or might have been, converted into nunjah up to Fusly 1278 is given by Mr. Master as follows :—

	Acres.	Assessment. Rs.
Already irrigated	48,228	2,53,530
Still unirrigated, but irrigable under existing channels	8,437	54,746
Irrigable under channels not yet made, but which might be made	113,388	5,59,862
	121,825	6,14,608

There was a steady increase in punjah converted into nunjah till Fusly 1277, when it amounted to 69,000 acres ; but in Fusly 1278 it fell to 59,000. The decrease was greatest in Repally and Bapatla. The advance which had been steady in Gudiwada and Bezwada was checked by the introduction of the new settlement and enhanced water-rate in Fusly 1276. In Bundur the extent was always small, and it almost disappeared in Fusly 1276, probably because the increase in the demand followed so close on the cyclone of 1864.

5. The area of land rated as nunjah which was cultivated before anicut irrigation commenced depended on precarious supplies of water from streams and rain-fed tanks. It averaged acres 43,565 ; but in the first eleven years after the anicut was built it increased to acres 75,000, or by seventy-two per cent. The introduction of the new settlement into the northern taluqs had a marked effect on this species of cultivation. The average of the three years from Fusly 1276 to Fusly 1278 shows a decrease of fifty-three per cent. on the extent for Fusly 1275. The area in

Fusly 1278 was less than the area cultivated before the anicut was made, and even the revenue has fallen since Fusly 1275 in spite of the increase in the assessment.

6. The revenue derived from converting punjah into nunjah in zemindaries and inams and from supplying water for crops grown on punjah has fluctuated considerably; but it increased from Rs. 2,363 in Fusly 1265 to Rs. 1,35,651 in Fusly 1278. The extent of land involved is not known; but, as far as can be ascertained by inspecting the figures, it is about 42,000 acres. In zemindaries the revenue derived from irrigating dry crops decreased suddenly after Fusly 1273, in which year it was first tried, and again after Fusly 1277; but no reason is given. The revenue from punjah converted into nunjah has steadily increased.

7. The total revenue derived from anicut water up to Fusly 1278 was Rs. 48,66,551.

8. In paragraphs 24 to 68 an account is given of the past and present systems of wet cultivation and the manner in which the water-rate rules have been applied.

9. Anicut irrigation began in Fusly 1265 and great eagerness was shown for water up to Fusly 1273, when application began to be made for leave to relinquish irrigation. The first water-rate rules were passed in October 1861. They fixed the rate at Rs. 1-8-0 for the first year and Rs. 3 for the second year, and they gave the cultivator no opportunity of giving up water after he had once taken it; but this was, nevertheless, allowed on the production of a certificate from an Officer of the Department of Public Works showing that the land was unfit for irrigation either from its soil or its position. The water-rate was raised to Rs. 4 an acre in May 1865, and the new settlement and the new water-rate, which together increased the demand by forty-seven per cent., were introduced into Bezwada, Gudiwada, and Bundur in Fusly 1276. The revised rules allowed ryots (for the future) to refuse water after trying it for one or two years; but not after taking it for three years. This concession affected a very small portion of the land which had been converted from dry into wet, and it remained almost unknown to the ryots. Cultivators thought they could never give up water after once taking it. There were cases in which fine punjah had become saline and worthless under irrigation, and, seeing that hundreds of acres on which dry crops were raised were paying water-rate, they became afraid to try the experiment of taking water. It was clear that hardship had been caused and that there was reason to fear that few would venture to try irrigation unless the rules were temporarily relaxed, and in their orders of August 1868 and June 1869 the Board directed that an opportunity of re-conversion should be offered to all ryots holding land irrigated by anicut water.

10. These general changes had different effects in the different taluqs.

11. The taluqs north of the river are Bundur, Gudiwada, and Bezwada. When the anicut irrigation commenced they were all under easy joint-rent or sharing systems. In Bundur and Gudiwada the joint-rents were raised when anicut water was taken with reference to the extent irrigated and its produce. In Bezwada, where there had been no wet cultivation previously, fixed rates, varying from R. 1 to Rs. 3-8-0, were charged. The first water-rate rules of 1861 raised the varying rates in Bezwada to a uniform rate of Rs. 1-8-0 for the first year of irrigation and Rs. 3 afterwards; but they were not allowed to affect the joint rents in Bundur and Gudiwada. The enhanced water-rate of Rs. 4 was imposed in Bezwada in Fusly 1275 without producing any effect except upon the revenue, and it was introduced into Gudiwada and Bundur with the new settlement in Fusly 1276. The effect of this sudden increase in the revenue demand was, as has been already remarked, to cause a large relinquishment of land.

12. In the taluqs south of the river—Repally and Bapatla—a field assessment had been introduced before the anicut irrigation commenced. In the uplands of Repally, where there was no nunjah, a water-rate was charged which rose by R. 1 a year from *nil* to Rs. 4. In Fusly 1272 this arrangement was superseded by the rate of Rs. 1-8-0 in the first year of irrigation and Rs. 3 afterwards, and in Fusly 1275 the revised rules raised the rate to Rs. 4. In the lowlands of Repally and in Bapatla, where there had been nunjah previously, a consolidated nunjah assessment was charged, and this has been left undisturbed up to the present time pending the settlement of Guntoor.

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13. When irrigation commenced in zemindari and inam lands they seem to have been treated generally like the Government lands in the neighbourhood. The rules of 1861 and 1865 were applied to them directly they were issued.

14. The effect of the permission to relinquish irrigation on production of a Department of Public Works certificate has extended to 2,700 acres, and that of the Revised Rules of 1865 and the Board's Orders of 1868 and 1869 to acres 10,119, altogether 12,819 acres have been re-converted from nunjah into punjah. This amount is twenty-two per cent. on the area of Fusly 1278. It appears that in some cases ryots have availed themselves of the liberal order of 1869 who had previously made no complaint, and that in some cases ryots have gone on using water after applying to be allowed to give it up. Mr. Master believes that much of the relinquished irrigation will be taken up again, and the Board have no doubt this will be the case when the fear of deterioration of the soil (which Mr. Master has shown is unduly great) and of a withdrawal of the coveted option has passed away.

15. The accounts of Fusly 1278 show that, while the extent of punjah occupied has remained almost undiminished, the extent of nunjah has decreased by acres 19,303 assessed at Rs. 1,06,542. More than half this decrease occurred in Gudiwada, and must be ascribed to the pressure of the settlement. Falling prices and deterioration of the soil were the reasons generally given. Acres 4,000 in Bapatla were given up because of want of drainage.

16. In paragraphs 69 to 156 Mr. Master discusses the causes of the reluctance to use anicut water. It appears that in the 368 villages into which irrigation has been introduced acres 26,213, or twelve per cent. on the cultivable area in the villages under anicut irrigation, are declared by the ryots to be unfit for wet cultivation. As far as can be ascertained the percentage to be ascribed to the different causes at work is as follows:—

Soil—		25·6
Soudoo or salt efflorescence	12·3	
Pulludu or looseness and poverty of soil	3·1	
Vellatunga or coarse grass	1·2	
Gulukarai or gravel	———	42·2
		18·8
Inundation (by the cyclone)		
Irrigation—		30·1
Inaccessibility to irrigation	8·4	
Flooding	·5	
Leakage	———	39·0
		100·

This statement cannot be implicitly relied upon; but it is satisfactory so far as it goes, for it shows that, although the extent unfit for irrigation through peculiarities of soil has probably been exaggerated, it is only acres 11,067, or five per cent. of the cultivable area.

17. Mr. Master divides the causes into—

I.—Physical causes.
II.—Causes depending on the character of the people.
III.— Do. resulting from the action of the Revenue Department.
IV.— Do. within the province of the Department of Public Works.

18. Physical Causes.—The extent to which *Soudoo* prevails has already been noticed. The efflorescence is caused by the water-liquifying salts in the soil. It renders land barren for years, and the suddenness with which fertile punjah has thus become sterile on being irrigated has alarmed the people. It can be remedied in time by manuring and flooding. *Gulukarai* and *Pulludu* lands seem to be unfit because of their being too loose and light; no cure has been suggested. *Vellatunga* is a coarse grass which smothers the paddy, and can only be eradicated

with great trouble in the dry weather. It is difficult to estimate the real effect of the *cyclone*, because it does not seem to have much influenced cultivation till the revenue demand was raised; but then it became evident, for the percentage of land relinquished in villages which had been inundated was much greater than in villages which has escaped. 5,000 acres are supposed to have been permanently injured. It has been suggested that the *rainfall* has been so favourable during the last few years that the ryots have not felt the want of irrigation. Mr. Master shows that this has not been the case, inasmuch as the rains have not been remarkable either as being copious or as being seasonable. Valuable information is given as to *prices* which it had been suggested had fallen so as to check wet cultivation. It is clear that whatever effect they may have produced in causing the relinquishment or refusal of water has been slight and transitory. It is noticeable, however, that of late years, or since Fusly 1264, the price of paddy has risen in comparison with cholum, so that the difference of profits in favour of wet cultivation has increased. Taking the data of the Settlement Department, the comparison, according to the prices of Fuslies 1277 and 1278, will stand as follows :—

Price per Garce from Fusly 1260 to Fusly 1278.

Grain.	1260—1264.	1265—1269.	1270—1274.	1275-1276.	1277-1278.
	RS.	RS.	RS.	RS.	RS.
Cholum.....	138	138	187	215	179
Paddy	100	122	154	193	155
Difference, per cent.	38	11	21	9	15

Grain.	Produce of an Acre.		Expenses per Acre.		Profit per Acre.
	Madras measures.	Value.	Labour, etc.	Assessment.	
		RS.	RS.	RS.	RS.
Paddy	753	36·47	12·55	5·74	18·18
Cholum	296	16·56	5 23	1·74	9·59

19. Causes depending on the character of the people.—Mr. Master shows satisfactorily that the ryots are not prevented from taking water either by natural *indolence* or by an unreasonable *preference for dry cultivation*. The ryots are as eager in the Kistna District as elsewere to increase their profits, and their fear of abandoning a system which gives them splendid crops for one which *may* make their land barren under certain conditions of soil is quite consistent with perfect readiness to accept irrigation where it can be profitably applied. It does not appear to be true that irrigation improves the land so as to make it produce *better dry crops* when the irrigation is stopped.

20. Causes resulting from the action of the Revenue Department.—*The new settlement and 4-Rupee water-rate* introduced into the northern taluqs in Fusly 1276 increased the demand by forty-seven per cent. and caused the relinquishment of no less than a third of the ryots' holdings. There is abundant proof that the people have not recovered even yet from this sudden shock, and it has necessarily made them unable to pay additional water-rates on the portion of their lands which they have retained. The *incidence of the water-rate* cannot be otherwise than unequal because it is uniform, and the properties the land would show under irrigation were excluded from the data of the settlement. It is heavier in Kistna than Godavery; but there is no reason to think it is too high "except for exceptionally poor lands," and it is not desirable that water should be wasted in these whilst it can be more profitably employed elsewhere. Looking to the retrogression in the northern taluqs Mr. Master advises a temporary modification of the water-rate in the joint-rent villages of Gudiwada and Bundur; but the Board are not convinced

that this is necessary. The introduction of a graduated water-rate would cause confusion, which should be avoided now that a uniform rate has prevailed so long and it could only be calculated on the irrigable properties of the soil, with regard to which there are no data in existence. The most doubtful question which came before Mr. Master was the question whether the ryots should be allowed a free or restricted *option* with regard to taking and relinquishing water. It was at first intended by Government to allow an unrestricted option; but in practice, when anicut irrigation was first introduced, the ryots did not ask for any option, and the charge was never discontinued unless the means of irrigation failed. This practice was confirmed by the rules of 1861. In 1863 the Secretary of State pronounced in favour of allowing relinquishment of water, and the rules of 1865 permitted ryots to refuse water after trying it for two years. It has already been shown that this order, applying, as it did, to only a few acres of ground, was almost inoperative and had to be extended in 1868 to lands for which water had been taken in previous years and the owners of which had had no opportunity of declining irrigation, though some could only cultivate dry crops on land for which the water-rate was charged. The objection to the grant of unrestricted option is that it would necessitate annual examinations of fields, offer opportunities for fraud and extortion, especially in zemindaries, and materially increase the work of the Officers of the Revenue Department and the Department of Public Works. The officials of the district belonging to both the departments concerned are opposed to the grant of any free option than is allowed at present; but Mr. Master is in favour of it *if* the difficulties in the way are not insurmountable. He points out that the procedure must be made much stricter than it is now if free option is granted, and that, if the option is restricted as at present, the rules should be altered so as to allow the transfer of nunjah to punjah whenever it becomes unfit for irrigation from any uncontrollable cause; that the date for the application to convert land should be changed from the 31st March to the 30th June or the 31st July;* and that application for water for punjah crops should be sent to the Tahsildars through Revenue Inspectors. He is of opinion that the period of option now allowed, viz., three years, should not be altered. Some officials think it too long, others too short, and the ryots are not unanimous. The charging of a *separate cess* for water, which it had been suggested might be unpopular, is not cared for by the people.

* Conceded by Government Order dated 24th June 1870, No. 937, Revenue Department.

21. Causes within the province of the Department of Public Works.—The chief cause of the reluctance to undertake wet cultivation is clearly the *precariousness of the water-supply*, which is caused at present not so much by scarcity of water as by the state of the channels. Out of acres 3,293 of land, which had to be cultivated with dry crops in Fusly 1278 although the owners were paying the water-rate, acres 2,548 were without the means of irrigation, 68 were rendered unfit by flooding, and 665 by other causes. Successive jummahbundy reports show that year after year the failure of irrigation is always dreaded and often experienced. Some of the channels are so narrow and silted up that they cannot carry the requisite volume of water. At the close of each season it is usually necessary to economize water by filling and closing the channels in rotation. This state of things is no new discovery, but has been repeatedly brought to notice. It is due partly to the eagerness of the ryots at first to extend their wet cultivation beyond the capacity of the channels, partly to waste of water through the ignorance of the people and the faulty design of some of the works, and partly to the necessary abandonment of the cross bunds which in the beginning were placed across channels to irrigate high land. The Engineers fear that the shallowness of the river in October and November will always be a source of anxiety. The *drainage* of the Delta is admitted on all hands to be incomplete, and this has compelled the relinquishment of water in many instances. As regards the *administration of the Public Works Department* in the distribution of water, etc., there is not much to be said. There are the same faults amongst the subordinates as there are everywhere when the supervision is insufficient, and the difficulty and delay in clearing minor channels is an admitted evil in all parts of the Presidency. As regards *communications and means of export* Mr. Master shows that much remains to be done. The two Imperial roads are in great part unmade and impassable

in bad weather. The local roads though improving are still far from sufficient. The three navigable canals are only navigable during part of the year, and even then the navigation is sometimes interrupted. The ports are so inconvenient that much of the produce is shipped from Cocanada in the Godavery District.

22. Having now passed in review the facts recorded in Mr. Master's satisfactory and exhaustive report, the Board will proceed to express their views on the subject.

23. It is clear that the disappointing state of the anicut revenue is due to no peculiarities either in the soil or the disposition of the people. Irrigation increased too rapidly at first. More punjah was converted into nunjah than the channels could supply. Ryots who had subjected themselves to the water-rate with eagerness found that even when their supply of water was cut short the Sircar required that they should still pay the water-rate. In their ignorance of the new species of cultivation they did not anticipate that any soil could be the worse for irrigation, and when, in a few cases, Soudoo appeared, they became alarmed and did not know where the evil would stop. The fear that water might fail or the soil turn barren almost assumed the proportions of a panic. Then came the devastating cyclone of 1864 closely followed by the sudden increase of the revenue demand in Fusly 1276, which forced the ryots to contract their holdings by a third. It is not to be wondered at that the people are slow to recover their confidence.

24. It may be concluded, therefore, that, presuming there is water enough in the river, there is no cause for anxiety as to the ultimate success of the anicut. There is probably no larger proportion of land unfit for irrigation in the Kistna Delta than would be found to be so in any other tract of country. Estimating it at five per cent. (paragraph 16), the area which will be irrigated may be taken to be about acres 115,000; on the other hand, the progress of irrigation will be gradual and not sudden. The Water Works must be improved and extended at a great cost of time and labour. The effects of the settlement of Fusly 1275 in the northern taluqs and of the settlement which is pending in the southern taluqs, must pass away. Finally, the communications and the ports of the district must be improved to keep pace with the demands of trade in a rice-producing district.

25. The most perplexing question before the Board is as to the liberty of relinquishing water when it has once been taken, which should be conceded to the cultivators. It seems to be proved that the ryots are only too glad to get water when it is profitable; that there is no extraordinary percentage of land unfit for irrigation; and that the supply of water is not so copious that it is desirable to expend any of it unprofitably. The present rules force the ryot to leave his land dry once in three years, if he has any fear that Soudoo, etc., may appear in the future. It can never have been intended to make people pay for water when they could not get it or when it would be absolutely injurious to the soil, and the restriction of the period of option to three years must have been meant to prevent ryots from giving up water capriciously. The Board are convinced that there is no danger of this, and it seems to follow that the option should be entirely free. But the Officers of the Revenue Department and the Department of Public Works interested in the Delta and the Collector of the neighbouring district of Godavery are almost unanimous in considering that free option need not, and should not, be conceded. After carefully examining the question in all its aspects the Board are strongly of opinion that it is safe and wise to conform to the spirit of the original intention of Government, of the despatch of the Secretary of State in 1863, and of the condition on which the Governor-General in Council passed the Water Cess Act, and make the option entirely free. It is probable that if this is done the strength of the Revenue (and perhaps of the Department of Public Works) establishment must be increased; but the cost will be amply re-paid by the accelerated readiness with which ryots will take irrigation when they have once realized the fact that the cause for their very reasonable dread of the tempting experiment has been swept away.

26. If Government decide, however, that the option should still be restricted, the Board will be prepared to submit a draft showing the modifications which they consider necessary in the present rules.

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27. With regard to Soudoo, which is a real evil, though its extent has been so much exaggerated, the Board propose that water for flooding land so affected be given freely and without payment so long as it continues barren.

28. With regard to public works, the Board have little to say which will not suggest itself to every one on reading Mr. Master's report. As the causes which have checked irrigation are temporary and the profit which will be secured by the anicut works is certain, there is no reason why the money requisite for improving and extending them should not be obtained by borrowing.

29. It is very desirable that the Imperial roads should be completed. The one from Masulipatam to the Hyderabad frontier is in an indifferent state throughout, and the portion between Masulipatam and Bezwada is impassable in wet weather. The greater part of the other, the Great Northern Road, has been left untouched for years.

30. The local roads are gradually improving. The Road Fund is large, and the expenditure is often limited only by want of supervision. It must be remembered, however, that the cost of roads in the Delta, and especially of bridges, which, as Mr. Master shows, are much wanted, is very great. The Collector will consider and report on the proposition that additional ferries should be provided.

	Rs.
Receipts in 1869-70	2,82,810
Expenditure in ,, ...	1,43,253

31. The great wants of the district are a Railway from Masulipatam to Hyderabad and an extension of the East Coast Canal from Nellore. The former project should find a place in the great scheme of Indian Railways. The Kistna and Godavery Deltas are the proper rice-farms of the Nizam's country, and the value of the Railway as an outlet for their surplus produce and, therefore, as a stimulus to the use of irrigation can scarcely be over-estimated. The Board have very little doubt that it would be successful financially. A statement is appended showing the exports of produce from the ports of the district for the last ten years. It will be observed that the export of rice is very trifling, and it follows that the market for it must be in the interior.

32. The port of Nizampatam is the best in the district. There is a road in progress between it and Repally which should be pushed on, and the Collector should consider the expediency of connecting it with Guntoor and Bapatla by a road to Chandole. The Board hope that the proposed road from Cheltalurpad to Ipurpalem will soon be commenced. This port should be connected with Bapatla. Mottapally will be touched by the Imperial salt line from Inkole to Chinna Ganjam when it crosses the sand heaps at which it now stops.

33. It is recommended by Mr. Master that the water-rate should be temporarily reduced in villages near the coast injured by the cyclone, and he is of opinion that if it is feasible the distribution of water should be managed by the Revenue Department. The Board consider that the water-rate should be kept uniform, and they do not think the time has come when it would be safe to have the great works and the minor channels under different departments. It is, of course, desirable that there should be as close supervision of the Delta Goomastahs as possible.

34. The only other point to be noticed is the difficulty of keeping the village and field channels in repair. The Board believe that here, as elsewhere, it is impossible for the Department of Public Works to take charge of petty village irrigation works, and they think the time has come when the villagers should be compelled by law to do the work themselves.

Exports from the Kistna District of the under-mentioned articles for ten years.

Years.	Paddy and Rice.		Other dry Grains and Pulses.		Oils.		Seeds.		Cotton.		Indigo.		Spices.		Tobacco.		Total value.
	CWT.	Rs.	CWT.	Rs.	GALLONS.	Rs.	CWT.	Rs.	Lbs.	Rs.	CWT.	Rs.	CWT.	Rs.	CWT.	Rs.	Rs.
1859-60	.....	.....	44,796	1,05,628	16,134	5,944	20,415	83,035	198,670	15,913	.....	.....	3,885	12,843	108	3,921	2,80,284
1860-61	.....	.....	27,844	81,587	2,843	1,890	51,442	2,37,258	458,017	36,677	.....	.....	2,224	10,939	646	8,241	3,76,592
1861-62	.....	.....	46,531	1,51,911	12,631	9,650	103,402	4,27,413	317,716	30,924	.....	.....	330	2,100	1,298	15,782	6,37,779
1862-63	.....	.....	6,219	17,480	14,583	11,919	215,087	8,69,253	187,600	36,946	10	3,000	7,942	40,234	453	5,027	9,83,909
1863-64	8,751	28,735	1,063	3,506	30,085	30,085	127,853	5,14,842	444,634	3,12,405	132	20,282	7,607	46,189	1,495	15,916	9,71,360
1864-65	.....	.....	7,196	16,442	44,077	44,077	36,710	1,47,373	1,312,103	9,96,538	9	1,708	673	4,576	1,965	17,032	9,27,634
1865-66	.....	.....	1,189	6,550	21,540	21,540	1,438	5,825	.....	.....	.....	.....	1,276	7,379	2,106	23,528	66,822
1866-67	39,728	1,46,676	6,603	42,356	32,183	32,183	23,445	97,166	150,000	43,650	.....	5,689	379	31,566	879	5,574	4,03 221
1867-68	57	176	2,182	10,223	41,571	41,571	60,263	2,55,694	1,653,300	5,47,125	.....	4,611	545	25,358	2,729	8,57,906	
1868-69	493	1,005	1,718	6,431	23,218	23,218	137,865	5,81,599	1,868,700	3,95,990	2	350	1,510	84,797	15,203	10,58,593	

Proceedings of the Madras Government, Revenue Department, 21st August 1872.

No. 188. ORDER THEREON, 21st August 1872, No. 1,239.

Irrigation, No. 4.

IN the Order in Public Works Department dated 17th December 1868 the Government communicated certain papers regarding the irrigation works of the Kistna District to the Board of Revenue, in view to their considering the practical working of the Water-Rate Rule, which prescribes that when water is taken for three years consecutively for the purpose of raising wet crops in dry lands, such lands shall then be permanently classed as wet, and the full assessment and water-rate levied so long as irrigation can be supplied to them. They were to report whether it would be desirable to revoke the rule experimentally.

2. The immediate cause of this reference was the expression of opinion by the Chief Engineer for Irrigation, the late Colonel Anderson, that the option given by the rule was likely to prevent ryots from taking water every third year, as by this means they would retain the classification of their land as "*dry*" and every third year would obtain a dry crop improved by the floodings of the two previous years.

3. In reply to this reference the Board pointed out that the revocation of the rule would certainly not have the effect of increasing the number of applications to convert dry into wet cultivation, as even under the three years option given by the rule there had been very serious complaints, so much so that the Board had found it necessary to allow all ryots who had converted their dry land into wet the option once more of re-converting it into dry, no matter for what period they might have been supplied with water.

4. The Board had granted this concession on the representation of Mr. Thornhill, then Collector of the district, that 4,000 acres of land in the Repally Taluq which had been converted from dry to wet, had under the rule been charged with water-rate though not an acre of it had been cultivated with a wet crop, and that in many other cases there was a strong wish on the part of the ryots to re-convert their lands into dry, owing either to the insufficient supply of water or to the land having become impregnated with salt from the application of water. It was also represented that the limited option sanctioned by the rule had never been really given to the ryots, the lands having been supplied with water as it became available on the application of the ryots, and "measured at the close of the season for the assessment of the water-rate and thenceforward entered as 'Dry into Wet.'"

5. The Board entered at some length into what appeared to them to be the temporary causes which were likely to check the spread of wet cultivation in the district. They expressed their opinion that it would be desirable to ascertain whether when land became "*Soud*" * an assurance that neither land assessment nor water-rate would be charged and that water would be gratuitously supplied for flooding, would remove the apprehensions of the people; whether the imposition of a separate cess for water had any material effect in causing the rejection of water; whether the fact of the distribution of water being in the hands of the Department of Public Works had any influence towards the same end; whether the present charge for water (Rs. 4 per acre) was too high; whether it would be safe to concede the entire option of taking or refusing water to the ryots; and finally recommended that a special officer should be appointed to conduct an inquiry into the whole question on the spot.

* "Chavudu," an efflorescence of salt.

6. In the G. O. under date 21st May 1869, No. 1,432, the Government expressed themselves in favour of giving the ryots a larger option in regard to taking or refusing water; but observed that, when heavy expenditure was incurred by the State for irrigation works, it was essential that an agreement should be taken from the parties interested that they would accept and pay for the water for a term of years. They, however, agreed with the Board as to the importance of an inquiry of the nature indicated before final orders were passed, and appointed Mr. C. G. Master to the duty.

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7. The papers now under consideration are Mr. Master's report on the subject, with the Board's Proceedings thereon. The Board in their Proceedings have summarized Mr. Master's report very completely. It appeared that instead of 500,000 acres being irrigable in the Kistna Delta as originally estimated by the Public Works Department, there are only 186,318 acres of registered wet land, and 121,825 acres of dry land which have been, or can hereafter be, converted into wet; so that, supposing the whole of the wet land in the district to be under the influence of the new works (which, however, is not the case), there would only be 308,143 acres irrigable by them when completed, being little more than one-half of the estimate. Of the 186,318 acres classed as Nunjah only 61,710 were cultivated at the date of the report, and nothing was stated as to whether any portion of the remainder was in any way dependent on the new irrigation works. Of the 121,825 acres of dry land capable of irrigation 48,228 acres were then irrigated, 113,383 acres could not be irrigated without an extension of the works, and only 8,437 acres capable of wet cultivation were not taken up.

8. The two statements (Appendices I. and II. of Mr. Master's report) do not agree, as in No. I. the dry cultivation converted into wet is stated to have reached 68,963 acres in Fusly 1277 and to have fallen to 58,941 in Fusly 1278, whereas from Statement No. II. it would appear that only 56,665 were capable of being converted from dry to wet under existing channels, of which only 8,437 had not been entered on up to Fusly 1278. The only explanation which suggests itself is that the latter statement referred to the new works only, and that the former included old works as well as new. From the latter statement it would appear that the conversion of dry into wet had been nearly equal to the supply of water. It is clear that the chief cause for any backwardness in applying for water is the insufficient supply, and the secondary cause the fact that much land becomes "Soud" on the application of water, though undoubtedly the imposition of the new assessment had at first a marked effect in checking the cultivation of the ordinary nunjah land. The cyclone of 1864 had also a similarly unfavourable influence in the villages which were affected by it.

9. As to the particular points to which Mr. Master's attention was specially directed, it would appear to have been his opinion that the supply of water gratis to land which has become "Soud," and the exemption of such land from both land-tax and water-rate so long as it continues in this state, was not really needed, the concession of 1868 under which the land assessment only of land so situated is charged being considered sufficient; that the separate charge of the water-rate is a matter of indifference to the ryots, being only shown in the accounts, and the rate being viewed by them as a component part of the assessment on their land; that it would undoubtedly be a popular arrangement to transfer the general distribution of water to the Revenue Department, if feasible; and that village and field channels should certainly be left to the ryots to maintain. He considered that the charge of Rs. 4 water-rate per acre could not be viewed generally as too high except in the villages visited by the cyclone of 1864, where he advocated a temporary reduction to Rs. 3; and that there is much to be said both for and against giving the ryot entire option in regard to taking or refusing water. On the whole, he saw great difficulties in the way of granting it (see Report, paragraph 243).

10. The Board of Revenue did not think it necessary to remit any portion of the water-rate in any locality. They would give the ryots entire option as to taking or refusing water, making any addition to the strength of the Revenue Department which such a change might render necessary; they would grant water free for the flooding of land which has become "Soud;" they would leave the distribution of the water to the Department of Public Works, but have the Delta Goomastahs more closely supervised; they would require the villagers themselves to keep in repair and manage the village and field channels; they would improve the ports and communications of the district and put in hand the Railway from Masulipatam to Hyderabad and the extension of the East Coast Canal from Nellore. They consider, on the whole, that there is no cause for anxiety in regard to the success of the anicut project; that if the works give a full and proper supply of water the irrigation of the district will inevitably be gradually developed; and that the disappointing state of the anicut revenue is in no way to be ascribed either to peculiarities of the soil or to

the disposition of the people, but to exceptional causes which will be only temporary in their action and effect.

11. The time which has elapsed since the date of the papers above recorded has enabled Government to judge more accurately of the probable effect of the rule regarding option in the use of water which it is proposed to relax, and they find that whereas from Fusly 1265 to 1275 the area of *wet* holdings in the Delta increased to areas 168,308, assessed at Rs. 9,26,058, it fell rapidly from that date to acres 122,446, assessed at Rs. 6,63,519, in Fusly 1278. Improvement has since been manifested, as shown below; but the most recent result is still very considerably below that which was attained five years before:—

	Acres.	Rs.
Fusly 1279	134,661	7,32,988
,, 1280	144,789	7,88,878

12. During this period the system of imperfect option has been in force, and from the evidence adduced in the papers before them the Government cannot doubt that the restriction against ceasing to pay for irrigation after three years consecutive use of it has materially checked the free application for water, for it must be observed that the works have been gradually extended in the above period, so that the results are deduced from a wider area.

13. The Government do not doubt that the main cause why so much land has not been irrigated as was originally anticipated is the incomplete state of the works. The supply of water is insufficient and uncertain, and due attention has not been paid to drainage. As the works are improved and completed the area under irrigation will undoubtedly extend, for there is evidently no general reluctance on the part of the ryots to convert their lands into "Nunjah" if a sufficient and seasonable supply of water be assured and its use proves to be profitable.

14. The works are now being carried on as speedily as possible by means of Loan Funds, and all that seems necessary in this direction is to impress on the Engineering Officers the primary importance of perfecting existing works rather than of extending them.

15. As regards the regulation of the irrigation, the Government after mature consideration have come to the same conclusion as the Board of Revenue that that entirely free option as to the use of the water from year to year, which was prescribed by the Secretary of State in 1863 as the rule to be generally observed, and formed the condition of the Governor-General's assent to the enactment of Madras Act VII. of 1865, for the levy of a separate water-rate, should be absolutely and unreservedly conceded, subject only to such notice of relinquishment as may be fairly demanded in order to prevent waste.

16. The Government see no cause for apprehension that this freedom will prove injurious to the revenue, or productive of material additional expense or inconvenience to the Revenue or Public Works Departments.

17. There is every reason to believe that, so far as the present rule affects the revenue, it acts injuriously by checking applications for water or inducing relinquishments when perfect certainty as to the advantage of its continued use has not been attained by the ryot, and that to relax [illegible] increase [illegible] and [illegible] ater.

18. Uncertainty or inadequacy of supply, imperfect drainage or proved injurious effects on the soil, are reasons for relinquishing irrigation which should be unhesitatingly admitted. Should the cultivation of dry crops be preferred by the landholder, to force him to pay for irrigation is unjustifiable.

19. The Governor in Council is fully satisfied that self-interest is the best guide in determining the weight that should be allowed to these several considerations, and that, when it is really for the benefit of the ryot to take and retain the use of irrigation, he will unhesitatingly do so if he is a free agent in the matter, and that to attempt to coerce him is in the highest degree inexpedient.

20. His Excellency in Council resolves, therefore, to adopt the Board's view and to direct that in the Godavery and Kistna Deltas the free option of taking or relinquishing water from year

to year be unreservedly conceded to the ryots, subject only to the condition that due notice shall be given. He believes that even when new works are desired it is impolitic to maintain any restrictions which are opposed to the interest of the ryot, and that only when from the position of the land it cannot but derive benefit from surrounding irrigation should free option in the matter of taking or not taking water be denied.

21. The Government desire that the Board will revise the rules now in force on the subject of the Delta Water-rate and submit the existing rules, and those they would propose in lieu of them in parallel columns, for the consideration of Government. The free use of water for flooding "Soud" land may be conceded when the supply is available.

22. As regards the other points to which attention is specially directed in the papers under consideration, the Governor in Council is of opinion that no reason is shown for deeming modification of the revised Land Settlement, or of the water-rate necessary; but, if still deemed advisable, some temporary remission out of the land assessment may be allowed in those villages which were devastated by the cyclone of 1864.

23. The Government trust that the change in the organization of the Public Works Department, which is about to be introduced, and which will assign a District Engineer to each district, will go far to remedy the administrative deficiencies which are believed to exist; but it will be considered in the Department of Public Works whether the transfer in the deltas of the charge of village and field channels to the ryots themselves, and the distribution of the water among the ryots to the Revenue Department, is expedient.

24. The improvement of the internal communications of the country is now in the hands of the Local Fund Boards, and the Government do not doubt that these will be developed as fast as means are available for the purpose; but the importance of the short branch line of rail from Hyderabad to Masulipatam will be again considered in the Department of Public Works.

25. The attention of Government is already directed to the extension of the East Coast Canal and the improvement of the minor ports.

26. In conclusion, the Governor in Council desires to thank Mr. Master for the thorough and satisfactory manner in which he carried out the investigation entrusted to him. His exhaustive report and the fairness with which he has stated the case both for and against opposing views on moot points has enabled the Government to come with confidence to a final judgment in the matter.

(True Extract.)

Acting Under-Secretary to Government.

To the Board of Revenue.
,, the Public Works Department.
,, the Chief Engineer for Irrigation.
,, C. G. Master, Esq.
,, the Director of Revenue Settlement.

Exd. A. S. Rodgers.

No 713 P.W.D.

Proceedings of the Madras Government

Read the following

Pro: No 1239 dated 21st Aug 1872

Rec'd Sept 1st (P.W.D. No 713 of 1872)

The Chief Engineer
for Irrigation

(G.O. No 1239 dated 21st August 1872.)

The suggestions in
para 290 of Mr Master's
Report on Irrigation and
the Kistna District, that
Village and Field Channels
be left to the Ryots themselves
to repair and manage
is quite in consonance
with the Principles followed
in Provincial Public Works
Officers

No 713 P.W.D.

I do not think it
necessary to bring the
whole of the Kistna
Irrigation Works
under the Irrigation
Act. The Engineer
in charge of the
Kistna Works
should be directed
to carry out
the suggestions
contained in
para 290 of
Mr Master's
Report.

C. Bird
Esq

No. 1239 of 1872.

Public Works Department.

Irrigation works in Kistna District.—Mr. C. G. Master's report on this subject reviewed.

Read the following letter from the Board of Revenue, No. 713, dated 5th August 1872:—

Read also the following letter from the Chief Engineer for Irrigation, No. 1239, dated 21st August 1872:—

The suggestions in para 290 of Mr. Master's Report on Irrigation and the Kistna District, that Village and Field Channels be left to the Ryots themselves to repair and manage is quite in consonance with the Principles followed in Provincial Public Works Officers

No. 713, dated 5th August 1872.

No. 713 of 1872.

From

THE BOARD OF REVENUE.

To

THE CHIEF ENGINEER FOR IRRIGATION.

Dated August 21st.

Recd. —o— 31st Aug.

Encl. 1.

G. O., 21st August 1872, No. 1,239.

AUGUST.
Nos. 187-189.

Irrigation works in Kistna District.—Mr. C. G. Master's report on this subject reviewed.

Sent

No 713-5 August 73.

No 118

A.C. 17 Feb 1873
6 12 Feb 1873 A. Sec.

Noted to Col Strachey

Officers; with whom it appears to be matter of surprize, and doubt, that a contrary practice should any where have obtained. Instructions will accordingly be issued in the Revenue and Public Works Departments; absolutely restricting the functions of the subordinate Officers of the latter Department to the regulation of the water supply in Channels which supply the lands of more than one Village; and vesting in the Villagers [Officers themselves] the charge of the water supplied to single Villages from the moment it quits the regulating sluice; over which however they will have no control.

I quite agree in the principles laid down in the Memo of the Chief Engineer for Irrigation but I should like to know how it is proposed to undertake the system under which the Village field channels are to be maintained by the Villagers themselves - the action of the D.P.W ceasing at the village sluice.

The Board recommend that steps be taken to enforce this obligation by a legislative enactment. Some means beyond simple suasion must be given to the D.P.W officers & to Collectors were requisite. Should a Proclamation be published in the Gazette & by beat of Tom Tom. giving the fullest publicity to this ruling. - or are we to Establish

The subject of the extension of the East Coast Canal northwards has not been lost sight of. In the Gazette of the 9th August, 1872 it was arranged that Mr. Walch should relieve Mr. Farrington of the East Coast Canal Ranges on account of the latter Gentleman's state of health; and be employed in executing the extension from Doorgooraj patam to Nizampatam, and planning for completing communication with Nizampatam. It has not been possible to work out the

B.d will be best after consulting the Coll.rs from whose data this arrangement should be made & best. and whether any increase in the number of peons - or any other measure is requisite.

WS

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(the practice in this respect seems uncertain)

Para XXII of Lord Napier's Minute recorded with G.O. 2376 of 20 Sept. 1871.

customary labor by Law. W

the programme then laid down; but the extension South of Nishapatam was sanctioned in G.O No 274 of 28th January 1873, and will be provided for in the Budget of 1873-74 And the Nellore District Engineer will apply for such extra establishment as he may need for planning and estimating the extension north of Nishapatam on the same scale as laid down for the Southern portion.

The Government will be prepared to receive with favor any propositions that may be laid before

by the S. W. Ry Co for perfecting the communication by Road between Bezwada and Hyderabad - The more so, as it would appear that communication by Rail between Hyderabad and the Eastern Coast, can better be made in conjunction with a line opening the new Coal Fields South of the Godavery River - It had been projected to run to Chowdah, round by Warangul, a short branch from which latter place to the Head or lowest Barrier on the Godavery, would not only traverse a promising Coal

Coal field; but join Holt River at a place from which cheap water Communication would be available to Cocanada, a much more desirable Port than Maruligatam.

The subject noted in paras 7 and 8 of Lieutt Colonel Mullins' note will doubtless commend themselves to the attention of the Revenue Board, who will issue such instructions and regulations regarding them as may be found necessary.

Gnw.

J. H. Dr Engr Nellore
" Ch Engr for Irrign Coy
" Rep Secy
" Fenl "

Disp 7/3/73. [illegible] 1872 [illegible]

Nos. 4218 & 597

Govt. of [1873] Madras.

PUBLIC WORKS.

2nd Distrt Engr

Nellore

Letters

Recd. Encl.

G. O. 5th Sessions, No. 718.

Nos. 118 & 120

Channels. Canal Waters

Papers on the subject of the transfer of the work of the Supervision & Management of Village & field channels in the Kistna Dt to Revenue & the distribution of waters to the Revenue Dept.