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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

G.O. No.
B.P. No.

1277

Press
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Dated 17-6-1968

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1277
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*Proceedings of the Madras Government, Public Works Department,
25th May 1875.*

Read the following papers :—

No. 437. From J. H. LATHAM, Esq., Chief Engineer and Manager of the Madras Irrigation and Canal Company, to Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Kurnool, 29th March 1875, No. 43.

Prospects of the Canal.

I HAVE the honor to acknowledge the receipt of G. O., No. 371, of the 9th ultimo. I enclose (per book post) a copy of my letter, No. 71, of 18th idem, to Messrs. Dodson and Wilks, and the latter's reply. Mr. Dodson was, at the time, absent at Someshwaram, and his reply only reached me the other day (Good Friday), and its classification is made under a misapprehension of the meaning of my letter. This I much regret, but I will do my best to answer the order of Government without further delay. I enclose Mr. Dodson's summary only.

2. The subject of discussion is the income of the canal necessary to cover capital charges, such as interest, &c. The object of the discussion seems to be how far the canal will, or can ever, repay these charges by direct revenue, and consequently what likelihood there is of canals being made in this country by private firms or companies receiving only direct revenue in return for their outlay. The determination of the best terms on which canals can be made by Government is, I presume, the final object of the whole discussion.

3. The epoch of the discussion is 30th June 1874. Up to that date the expenditure on the canal had been, avoiding technicalities as much as possible,

Nature of Outlay and Charges, as affecting the scheme as a whole.	Capital not re-payable.	Debt due out of Revenue.	Annual Charge.
	£	£	£
On account of a million sterling raised for the scheme by the Company under a State guarantee of 5 per cent. (omitting fractions)...	1,000,000	...	50,000
Raised by the Secretary of State directly at about 4 per cent. (say)...	600,000	...	24,000
NOTE.—The mortgage debentures are a separate financial operation, which will only complicate matters if introduced here. It is a speculation which will stand or fall on its separate merits.			
Guaranteed interest paid up to date of epoch ...	...	652,193	...
Simple interest thereon at 4 per cent. ...	...	62,564	...
Interest on loan at 4 per cent. to epoch ...	...	114,310	...
NOTE.—Here again there exists a separate speculation of the Secretary of State and Company, by which the former is to be paid 5 per cent. by the Company, whatever the loan cost the country to raise.			
Simple interest on the last-mentioned interest ...	...	12,244	...
Simple interest on debt at 4 per cent., your supposed market rate (paragraph 2 of your letter accompanying the Government Order) ...	...	...	33,652
Total ...	1,600,000	841,311	107,652

Thus if we add the working expenses, viz., £20,000, it results that, at the epoch, £127,652, or, say, Rupees 14,00,000 of gross returns are required from irrigation,

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This revenue, after allowance for remissions, it must be admitted, is quite possible to be earned by the canal as it exists, without more annual outlay than above allowed.

This may be shown thus:—

4. It must be remembered that the canal and largest channels have been, for all purposes of construction and apportionment, taken as required to convey two cubic yards of water an hour for every acre to be brought under their supply. Smaller channels are apportioned by a scale making them capable of passing a much larger supply. For the purpose of estimating returns these discharging powers give but a very rough approximation, and I propose to take 1.8 cubic yards an hour as the quantity, delivered at a tank sluice, actually known, within close limits of error, to suffice for rice cultivation in climates sufficiently resembling Kurnool. Between the head sluice or canal entrance at Soonkesula and the delivery sluices lie an area of canal water and damp earth which, including the main channels, is about 10,000 acres, of which half are tanks. Perhaps for a full canal this should be taken at 15,000 acres. During the first crop the canal receives from the drainage of the country at least as much as evaporates from the canal, but let us suppose an extreme year when this is not the case. Then since the canal can with ordinary care, and under the assumed maintenance allowance, supply demands enough to utilize 400,000 cubic yards an hour admitted at the head sluice, this will suffice to maintain an outspread of 222,222 acres of water or damp earth. Deducting 15,000 acres within the ground occupied by the canal, it appears that the canal can easily maintain 200,000 acres of rice cultivation with a margin for other purposes. It will be sufficient to estimate this at Rupees 6 an acre for first crop, and at Rupees 2 for second crop. I am aware that considerable areas will grow double crops, chargeable at Rupees 12; and that large areas will grow 4-Rupee crops requiring water only every 3rd, 4th, up to 7th day, so that 3 or 4 acres may be cultivated with the water required for one acre of rice; but these cultivations, as is the case with all second crop cultivation, involve more waste of water than rice, and I think the above to be fair. This gives for direct returns—

An average of 207,000 acres at Rupees 6 =	12,42,000
" " " " " 2 =	4,14,000
	16,56,000
Deduct remissions 5 per cent.	82,800
	15,73,200

5. As to the area of the soil irrigable, I regret that Mr. Dodson's table is obviously inaccurate. Thus in Cuddapah taluq he returns 8,499 acres irrigable, and 18,115 commanded, whereas of this last 11,034 acres require only field channels to be made to supply them without any works. The village plans of Mr. Dodson's division are not so complete as those of the Upper Division. There is, however, enough to show that there is ample area for irrigation available.

6. From navigation no returns can be drawn unless the Secretary of State decides upon trying it, but the same may be said of the estimate of irrigation. Unless the Secretary of State decide upon some means of carrying produce, that produce will not be grown.

7. It is obvious that, before the present canal pays half the above gross revenue, the Nellore canal will be made. This will involve some widening and strengthening of

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the first 75 miles of canal. The cost of the whole will be about a tenth, and the returns about one-third of the present canal; or, if navigation be also paying on this canal, it will of course be provided for in the Nellore portion, and will somewhat increase the cost.

8. If any further information be desired I will give it my best attention.

From J. H. LATHAM, Esq., Chief Engineer and Manager, Madras Irrigation and Canal Company, to A. J. DODSON, Esq., Conservancy Engineer, Lower Division, dated Kurnool, 18th February 1875, No. 71.

I HAVE the honor to ask your prompt and thorough attention to a State paper, G. O., No. 371, of 9th instant, which I circulate to you to-day. It is, I believe, in connection with a report immediately required by the Supreme Government, and may influence that Government in sanctioning any future expenditure of private capital on the canal or its navigation. In such a case delay will probably be exactly equivalent in its result to neglect, and should be avoided at all reasonable cost.

All that the Madras Government ask of you is in each village concerned.

In each taluq—

I.—(a) The accurate areas under irrigation, i.e., to any part of which you are at this moment able to supply water on application, assuming the existing canal and channels in working order, and field channels only required to be made to reach the field (10 and 5 link), then as accurately as may be:—

(b) How many of these are not practically arable (as being vagoos, hedgerows, rocks, graves, &c., &c.)

(c) How many are thorough deep black cotton.

(d) " " " injuriously sandy.

(e) " " " shallow, or barren red soil suitable for irrigation, but plainly unsuitable for crop without reclamation and manure.

(f) How many are really good irrigating soil of sand, silt or red soil, neat or mixed with black cotton.

II.—Approximate areas commanded but not yet brought into the irrigation. Though this is approximate, it needs to be given as accurately as possible. Where you have the village plans the areas will be taken from them, though until they shall have been levelled over it is not certain but what lumpy ground or hillocks may exist which cannot be irrigated, and the division into soils will take place as before.

* For areas commanded but requiring considerable works to reach them, the area and cost may be noted in the margin, or, if the cost be so small in proportion to the area as to make the scheme obviously advantageous, the areas should be given in more detail in the columns, and also an abstract of the estimate given in the remarks.

I enclose a sample of headings for the table.

From C. H. WILKS, Esq., Conservancy Engineer, Upper Division, to J. H. LATHAM, Esq., Chief Engineer and Manager, Madras Irrigation and Canal Company, dated Kurnool, 17th March 1875, No. 73.

Your letter No. 59 of 18th ultimo.

I have the honor to forward herewith a plan and statement of the land irrigable and commanded under the canal in the Upper Division.

2. The Plan.—The area colored green is irrigable land, arable and unarable, which can be easily supplied from our existing sanctioned distribution schemes.

The orange is land commanded which can be supplied only by new schemes, new sluices, or decided extensions.

3. One scheme for irrigating the land north of the Bowanassey has not been entered; but the channel as formerly laid out is shown.

The channel would irrigate about 13,000 acres; but the expensive and formidable work of crossing the Bowanassey river seems to be a sufficient hindrance to the scheme, at least until every other available plot has been taken up.

4. The notes in the remark column will explain each separate scheme, and in some cases rough estimates have been given.

The Nizam's villages have been excluded, as we have orders not to supply water to them.

5. *The Statement.*—Great care has been taken to arrive at an accurate account of the land under the headings recommended by you.

The *Total Irrigable area* is from the Village Registers, printed and issued under authority by the Revenue Survey: these registers record the areas of every portion of the land within the village boundaries separately, as remarked and surveyed by that department.

Fields and tracts not arable are so described in the above Register. Where portions of fields only are occupied by roads, vagoos, village sites, or graves, not so described, or are too high to be reached by the canal water, these unarable portions have been calculated from the authorized village maps by the scale (of 16 inches to the mile) to which they have been lithographed by the Survey Department.

6. In order to ensure every possible accuracy in detail, the best Overseers and Amins were called into Kurnool to give their evidence as to the soil. Every Kandem, or Trigonometrical Sub-division of each village, was separately taken into consideration, portions of each different soil have been separately taken out, and it could be scarcely possible to have a more accurate account. The village of Kortamuddy, about half of which is irrigable, is the only one of which the Survey plan has not been received, and for this the taluq map has been used.

7. The portion called *commanded area* is of course not so well known as that called irrigable. Of these villages most were taken from the taluq map by myself. Thus, plans of Yellagode, Abdoolapooram, Goontakundala, Boyarevula, Modekur, Talamudippi, Rollepau, Kurivena were not available. The deductions for land not arable were made from a comparison of the neighbouring and similar villages by taking a percentage. This varied from about 3½ to 8 per cent. of the whole area; 4 per cent. was generally the average in large villages for roads, vagoos, &c.

8. *Soils, Black Cotton.*—The line between black cotton and mixed soils is a very indistinct one; and I can only say that there is very little really pure "regady" (regar). I have entered what is commonly called black cotton soil, the dark soil in which the white cholam and cotton are known to flourish, and which is generally very deep.

9. *Soudoo.*—(I am not aware whether this be the same as "reh;" certainly it produces no such disastrous results.) There seems to me to be a misapprehension about soudoo soil. There exists very little real soudoo. I have entered as soudoo only those portions which are so bad as to be nearly incapable of cultivation. I say nearly because a careful man can grow rice on soudoo land, and will in the course of a few seasons render this despised land very fertile. In proof of this I would point out the gardens now so flourishing and valuable on the south side of the Hindry river. The land is mostly deep soudoo, or, if not so originally, became coated with salts after the first advent of water; but the cultivators were well enough off and sensible; they continued to use the water and improve the land, which is reckoned about the best in Kurnool, and now there is not an acre which is not cultivated.

There are some acres elsewhere that have been spoilt by salts, by having been irrigated for a season without manure and then abandoned. This is generally away from the towns, where land is cheap, and cultivators ignorant. In Kulloor they never give up the land because of the soudoo. The popular notion that irrigation always destroys the land by producing soudoo is a

popular error or excuse, and should be refuted. Nearly all new land when first irrigated will produce more or less the appearance of soudoo. But this disappears with ordinary treatment.

10. *Shallow and poor.*—This column contains shallow, stony ground, generally poor. But most of it is fit for irrigation if carefully cultivated. Nearly one-fourth of the land in Kulloor (Kurnool) is of this description, often scarcely 6 inches deep, but it is extensively cultivated.

11. *Good mixed.*—This contains all good soil mixed with sand, silt, all red soil, pure or mixed with black cotton in various proportions. It is in villages possessing this soil that irrigation (if we except Kulloor and its neighbourhood) has made the greatest progress. For instance I would mention Moomurri, Gunnapaveram, Rudraveram, Pamulpau, and Kurimudela.

12. The delay in answering the letter has been attributable partly to my own illness, and partly to the very detailed way in which the work has been carried out. I have allowed no deviation from the plan of arriving at the facts by actual measurement or figures from the register, except as above stated when plans were not forthcoming.

8 per cent. of the whole area of land lying within the village boundaries is not arable.

41.1	do.	do.	black cotton.
1.8	do.	do.	soudoo.
14.0	do.	do.	poor and shallow.
35.1	do.	do.	good mixed.

This shows that of the area under consideration—
90 per cent. is fit for the cultivation of wet crops.

Total up to Mittacondal
Cutting.

AND CANAL COMPANY.

by the existing Canal and Channels, 1874-75.

main channels would come to 11,880 Rupees or about 0.6-6 per acre, probably 0.8-6 per acre would be sufficient to supply the whole district.

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Areas irrigable and Areas commanded by the

Total... 1000

Public Works Department, 25th May 1875.

existing Canal and Channels, 1874-75.—(Concluded.)

KURNOOL,
17th March 1875

(Signed) C. H. WILKS,
Conservancy Engineer.

LOWER DIVISION.

Abstract of Areas irrigable and Areas commanded by the existing Canal and Channels, 1874-75.

Talugs.	No. of villages.	IRRIGABLE AREA.						AREA COMMANDED.					
		Total.	Not Arable.	Black Cotton.	Sandy.	Shallow and Poor.	Good, mixed Soil.	Total.	Not Arable.	Black Cotton.	Sandy.	Shallow and Poor.	Good, mixed Soil.
		ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.
Nundial ...	23	18,839-96	643-69	10,051-24	107-00	3,404-81	4,633-22	8,087-23	210-68	5,230-59	62-00	1,346-31	1,187-65
Koilauntla ...	28	27,290-00	411-00	9,585-00	55-00	6,860-00	10,379-00	36,691-00	748-00	22,662-00	135-00	5,195-00	7,951-00
Sirwell ...	45	36,883-35	1,672-33	8,689-47	171-68	5,859-99	20,989-88	23,507-02	638-93	13,962-35	22-00	3,318-66	5,565-08
Jumbunuddoogo	5	2,390-00	245-00	405-00			1,740-00						
Prodatoor ...	23	8,143-00	303-00	857-00	160-00	1,032-00	5,791-00	3,463-00	270-00	70-00	10-00	1,120-00	1,990-00
Cuddasph ...	24	8,499-00	494-00	390-00	110-00	790-00	6,715-00	18,115-00	1,200-00	1,360-00	506-00	2,694-00	12,355-00
Totals ...	148	102,045-31	3,769-02	29,977-71	603-68	17,446-80	50,248-10	89,810-25	3,067-61	43,284-94	735-00	13,673-97	29,048-73

DROOF,
22nd March 1875.

(Signed) A. J. DODSON,
Conservancy Engineer.

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25th May 1875.

No. 21.

Note by the Chief Engineer for Irrigation.

THE information furnished by the Chief Engineer and Manager, Madras Irrigation and Canal Company, with reference to G. O., No. 371, of the 9th February 1875, is of much importance in connection with the possibilities of irrigation under the Company's canal. Mr. Latham uses the term area commanded in a different sense to that commonly adopted and applied to irrigation projects generally in India. He takes it to mean the area which could be watered, were distribution channels provided, in addition to that which can now be watered, whereas in the ordinary sense it is the whole area to which water can be supplied at a level suitable for irrigation. Recasting, then, the information given in the statements transmitted by Mr. Latham, and adding thereto particulars of the irrigation of 1873-74 taken from the Revenue statements of that year, and of 1874-75 from the Chief Engineer's report for the month of February 1875, the following general results are exhibited:—

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Talugs.	Number of Villages.	Area com- manded.	Deduct not available and und.	Command- ed and available.	AREA NOW IRRIGABLE, &c., FOR WHICH DISTRIBUTORIES ARE AVAIL- ABLE.			AREAS IRRIGATED.		PERCENTAGE OF IRRIGATION IN—			
					Regur.	Other soils.	Total.	1873-74.	1874-75.	1873-74.		1874-75.	
										To area commanded, column 5.	To area now irri- gable, column 8.	To area commanded, column 5.	To area now irri- gable, column 8.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.	ACRES.
amulkotta	11	3,753	807	2,946	60	2,547	2,607	1,541	1,049	52.30	59.11	35.60	40.24
undikotkur	46	114,320	12,179	102,141	27,270	37,217	64,487	4,515	3,026	4.42	7.00	2.96	4.69
Nundial	18	34,832	2,084	32,748	24,363	7,098	31,461	758	440	1.29	1.53	1.34	1.40
Koilkuntla	23	26,877	1,023	25,854	10,051	8,038	18,089		298			0.91	1.64
Sirw	28	63,981	1,349	62,632	9,585	17,239	26,824	440	289	0.70	1.64	0.46	1.08
Jammalamadugu	45	60,390	2,505	57,885	8,689	26,350	35,039	1,663	1,588	2.87	4.74	2.74	4.53
Prodatoor	5	2,390	245	2,145	405	1,740	2,145	130	44	6.06	6.10	2.05	2.05
Cuddapah	23	11,603	743	10,860	857	6,823	7,680	2,777	2,109	25.57	36.16	19.42	27.46
	24	26,614	2,310	24,304	390	7,505	7,895	3,475	1,359	14.30	44.02	5.59	17.21
Total	233	344,760	23,245	321,515	81,670	114,557	196,227	15,299	10,202	4.76	7.78	3.17	5.20

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2. It is possible that, when the accounts of the area of irrigation in 1874-75 come to be completed, the results will be less unfavorable than those above shown, but the statement shows conclusively that hitherto irrigation in certain taluqs has been remarkably unpopular, and that compared with what was practicable the actual extent has been altogether nominal.

3. Perhaps the most satisfactory fact in the above statement is that the area of arable land commanded is very considerable. As general experience would have indicated, irrigation has made most way in taluqs in which the soil of the lands furnished with the means of irrigation is not regur. In the Nundikotkur and Sirwel taluqs, however, although the proportion of other soils is large, the ryots have not shown any desire to make use of the canal water. It seems highly probable that the proportion of regur land irrigated will always be small, and out of 196,227 acres for which means of irrigation have already been provided 81,670 acres are of this description of soil. What proportion of the 321,515 acres of column 5 are regur remains to be ascertained.

4. The estimate of revenue given in paragraph 4 of Mr. Latham's letter is not, it is thought, at all likely to be realized. Possibly the area of irrigation may ultimately attain to about 200,000 acres or roughly to two-thirds of the arable land commanded, though this is somewhat doubtful looking to the large proportion of regur land within the tract affected. The average rate for first crop will certainly not however, with the rates now in force, ever be as high as 6 Rupees an acre for the first crop. In Kurnool in 1873-74 the average for the season was about 4.45 Rupees, and in Cuddapah not quite 4 Rupees. It will not be safe to assume more than 4½ Rupees at the outside as the average for the whole area. Again it is not at all likely that more than a small proportion of the lands will be twice cropped. There is no instance in the Presidency, where there is irrigation on a large scale, in which the second crop area is large. Mr. Latham's report for February gives the second crop area at about one-eighth of the first crop, and probably some of the former had not been irrigated for first crop. It appears to be useless, under present circumstances, for this office to make any forecast, for practically the data as regards area which will be irrigated in ten or twenty years are wanting, and without that the calculations would be useless.

OOTACAMUND,
27th April 1875.

(Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

No. 438.

ORDER THEREON, 25th May 1875, No. 1,432.

IRRIGATION, No. 53.

His Excellency the Governor in Council considers the information furnished, with reference to G. O., No. 371, dated 9th February 1875, by the Chief Engineer and Manager, Madras Irrigation and Canal Company, as to areas commanded by the Company's canal to be of much importance and interest. The reports called for in the same order from the Collectors of Kurnool and Cuddapah are awaited, and the details given in the foregoing papers will be com-

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municated to them through the Revenue Department, in order that they may have the advantage of these particulars in drawing up their reports, should these not already have been completed.

(True Extract.)

J. H. Stuart

Major, R.E.,

Offg. Joint Secretary to Government.

To the Revenue Department. ✓

" Chief Engineer for Irrigation.

" " and Manager Irrigation and Canal Company.

" Examiner of Railway and Irrigation Accounts.

Exd. E. C. Shunker.

20 Spare Copies will be sent from office

G.O. 15 February 1875. L. 299 m.
Bapne 175. - 416-417 O.W.

Rev. 1875. Sept
N. 2231

Govt. of 1875 Madras.

PUBLIC WORKS.

To

THE REVENUE DEPARTMENT.

&c. &c. &c.

Dated May 25th.

Issued

Recd.

June 12th

Encl.

G. O., 25th May 1875, No. 1432.

MAY.

Nos. 437-438

No. 1277
Forwarded to the Board
of Revenue for communication
to the Collector of Ramanath
Cuddalore -

17 June 75.

Financial prospects of the Madras Irrigation and Canal Company. - Passing orders on the note of the Chief Engineer for Irrigation on the information of the Chief Engineer and Manager of the Company with reference to G. O., No. 371, of the 9th February 1875, regarding the -

14. Late Boarding Officer, 25 June

Indefinite 4719/75