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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. 2463 Press Mis.

457-58

Dated 27—9—1871.

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department, 27th September 1871.

No. 457. Read the following Endorsement of the Deputy Secretary to the Government of India, Nos. 392-406-I:—

From the Deputy Secretary to the Government of India, Public Works Department, (Irrigation,) to the Joint Secretary to the Government of the North-Western Provinces in the Public Works Department, Irrigation branch, dated Simla, 19th August 1871, No. 391-I.

I AM directed to acknowledge the receipt of your letter No. 708-I. C. of the 12th instant, and papers enclosed, describing the results of an experiment in the cultivation of "oosur" land, *i. e.*, land affected by the "reh" efflorescence, in the Allygurh Division, Ganges Canal.

2. In reply, I am to state that His Excellency the Governor-General in Council is of opinion that there is no subject more interesting or important than that of the reclamation of "reh" lands, and considers that all experiments in this direction should be greatly encouraged, and their results most accurately recorded.

3. The present experiment seems to lead to the conclusion that the process of efflorescence is generally a gradual one; that the saline particles come slowly to the surface, and when caused by the exudation of canal water, can be counteracted by constant, but very deep, cultivation.

4. It certainly appears to be a more promising experiment than those by which "reh" can be supposed to be counteracted by deep thorough drainage, though His Excellency greatly fears that the process pursued and apparently with so much success might have to be every year, or at short intervals, renewed, to prevent the recurrence of "reh" in the soil.

5. It seems doubtful whether tile drainage and irrigation can be carried on together. All tile drainage shows a disposition to get stopped, but to what extent on most Indian soils water thrown on the surface by irrigation would have the effect of rapidly stopping drains, it is not possible at present to determine.

6. In India, however, where labour is so cheap, and in the irrigated districts chiefly, where the produce is so valuable, an experiment of this kind would be worth trying, and it appears very probable that open drains 100 to 150 feet apart, and about 3 feet deep, might be found sufficient to prevent efflorescence in the intervals, especially if irrigation were constantly in use. These drains will, doubtless, have to be scoured, perhaps more than once in a year, but the process in soft alluvial soils would be extremely inexpensive and easy.

7. There may, however, be many descriptions of and causes for saline efflorescences, all of which would probably require different treatment. Although land on which "reh" effloresces is also called "oosur," the true *oosur* is understood to be land free from efflorescence, but is underlaid at a depth of from six inches to one foot by a stratum, more or less continuous, sometimes of considerable thickness of kunkur, sometimes in block (known as silia), and at other times in strings and nodules. "Reh" is of course merely a generic name for all saline efflorescences. Sometimes it is an impure sulphate or carbonate of soda, sometimes a *bona fide* chloride of sodium, and sometimes carbonate or nitrate of potash, but generally more or less a mixture of all. It rises to the surface by capillary attraction.

8. In conclusion, I am to communicate to the Government, North-Western Provinces, the thanks of His Excellency for the interesting information afforded in the present papers, and to say that the foregoing remarks should be regarded as suggestions made with the view of eliciting discussion, and that a further report will consequently be awaited of the experiments ordered to be undertaken on the larger scale.

From the Officiating Joint Secretary to the Government, North-Western Provinces, in the Public Works Department, Irrigation branch, to the Secretary to the Government of India, Public Works Department, dated Nynee Tal, 12th July 1871, No. 708-I. C.

I AM directed by His Honour the Lieutenant-Governor of the North-Western Provinces to refer to your No. 147-I., of the 21st May 1869, and to forward, for the information of His Excellency the Governor-General in Council, copies of the papers noted in the margin, containing a very interesting report by Captain Parsons, Executive Engineer, Allyghur Division, Ganges Canal, on the results of an experiment in the cultivation of "oosur" land, *i.e.*, land affected by the reh efflorescence.

No. 1,996, dated 22nd June 1871, from the Officiating Superintending Engineer, 1st Circle, Irrigation Works.
No. 1,044, dated 14th idem, from the Executive Engineer, Allyghur Division, Ganges Canal, to the address of the Officiating Superintending Engineer, 1st Circle, Irrigation Works.
Valuation Statement of Oosur field, reclaimed in the years 1870-71 and 1872.
General Order No. 706 I. C. of 12th July 1871, to Officiating Superintending Engineer, 1st Circle, Irrigation Works.

From Captain C. S. MONCRIEFF, R.E., Officiating Superintending Engineer, 1st Circle, Irrigation Works, North-Western Province, to the Joint Secretary to the Government, North-Western Provinces, Public Works Department, Irrigation branch, dated Meerut, 22nd June 1871, No. 1,996.

Cultivation of Oosur Land in the Allyghur Division, Ganges Canal.

IN reply to General Order No. 1,169-I., of 17th April, I have the honour to forward an interesting report by Captain Parsons on an experiment made in his division by Sub-Conductor McArther, on the reclamation of oosur land. This shows an actual cost of reclamation of Rupees 41 per acre, and a probability that two years' produce would cover this outlay. It remains of course to be seen whether the salts will rise again in the soil or not, and how often the process of trenching and manuring may be necessary. As I think too that both Captain Parsons and Mr. McArther are apt to be sanguine in their views, I am far from looking on this remedy for 'oosur' land as proved. It is, however, a very interesting and so far successful experiment, and I would respectfully suggest that a small sum, say Rupees 500, might well expended on repeating it on a larger scale. If such a sum would be put at my disposal, I should like to give about Rupees 300 to the Executive Engineer, Allyghur Division, and the balance to the Executive Engineer, Boolundshuhur Division. Sub-Engineer Elahee Buksh attached to the latter division is very well qualified to carry out an experiment of this sort.

From Captain B. J. PARSONS, Executive Engineer, Allyghur Division, Ganges Canal, to the Superintending Engineer, 1st Circle, Irrigation Works, North-Western Provinces, dated Allyghur, 14th June 1871, No. 1,044.

WITH reference to your No. 1,316, dated 24th April, I have the honour to inform you that two experiments have been made to cultivate oosur land in this division, one has proved successful, and the other failed. The former was carried out on Mr. McArther's method, and the latter according to the verbal instructions of Dr. Jameson.

2. In July 1870 Mr. McArther took up two pieces of land near the Poordilnuggur bridge, Cawnpore Branch Canal, within our boundaries, aggregating 1¾ acres, on which not even grass would grow.

3. He first of all spread horse, cow, and sheep's dung over the surface to a depth of about three inches, and damped the soil with canal water. On one side across the full breadth a trench was dug one foot deep and one foot wide, and the soil used to make a boundary to the field.

Trench No. 2 was then dug a foot from the first, of the same width and depth, and the soil, well mixed up with the manure, was thrown into trench No. 1.

Trench No. 2 was filled up with soil in a similar way taken from trench No. 3, and so on till the whole length of the field had been trenched.

4. All clods were carefully broken up and all small kunkur and rubbish cleared off the ground.

5. Small water-course channels were then made, and the ground divided into plots (kyarees) in the usual way, and a top-dressing of manure and silt of about three inches was roughly mixed with the soil by *phowrah* (hoes).

6. It was then too late to sow rice, so plants nine inches high were purchased and put in by hand six inches apart after the *kyarees* had been well flooded.

7. The crop was above the average of those in the neighbourhood.

8. After the rice was cut about the 30th November, barley and peas were sown. The land was ploughed with a country plough one way and then crossed, and the seed was sown in the furrows made by the second ploughing. The crop received the usual waterings, and seemed to be a most promising one, for it was about four feet high on the 23rd February when a severe hail storm very nearly destroyed the whole of it. The crop was cut on the 27th March.

9. On the 8th of April the land was sown with indigo, and, in accordance with the system in vogue, the land was first irrigated, and without ploughing the seed was sown broad-cast, and the surface merely scratched over with a *babool* branch.

10. The crop is a most promising one, and there is at present every reason to expect an outturn of 84 maunds of plant, that is at the rate of 48 maunds per acre, or 30 maunds per beegah.

11. In the rubbee of 1871-72 wheat will be sown in these reclaimed oosur tracts and report of the result forwarded in due course.

12. I selected a few days ago a plot of most unpromising oosur land near the Poordilnuggur bridge and have directed Mr. McArther to prepare this land for the next rubbee.

13. An account current showing the outlay and return herewith accompanies.

14. The other experiment referred to was conducted by Mr. Thornhill in the following way. The piece of land operated upon was about a beegah. Trenches four feet apart, two feet wide, and two feet deep were dug, and the trenches filled in with silt. Twenty-four loads of manure were then spread over the surface, and the land was then ploughed several times, watered and sown with indigo. The plant at first came up very thick, but after having been again watered the ground threw up "reh" which completely destroyed the entire crops.

ALLYGHUR DIVISION, GANGES CANAL.

Valuation Statement of Oosur Field reclaimed, 1870-71 and 1871-72.

Dr. *Cr.*

Fusl.	Value of produce, etc.	Amount.	Total of each fusl.	Fusl.	Expenditure.	Amount.	Total of each fusl.
		Rs. A. P.	Rs. A. P.			Rs. A. P.	Rs. A. P.
Khurreef, 1870.	M. S. 25 0 Rice (common Soondee), at Rs. 1-4-0 per maund...	31 4 0		Khurreef, 1870.	Digging and preparing 1 acre 30 poles	64 0 0	
	6 10 „ table rice (Lall Dom), at Rs. 2 per maund ...	12 8 0			Sprinkling above with canal silt ...	3 0 0	
	Rice straw, value	7 0 0			Four days, two carts carting manure at 8 Annas	4 0 0	
		50 12 0			Purchase and planting rice plants.	10 0 0	
					Canal water-rate	2 6 0	
					Cutting and clearing from straw...	3 0 0	
						86 6 0	
Rubbee, 1870-71	11 20 Barley, at Rs. 1 per maund.	11 8 0		Rubbee, 1870-71	Three days' plough, at 10 Annas...	1 14 0	
	12 Bhoosa, at 4 mds. per Rupee...	3 0 0			Purchase seed grain ...	1 12 0	
					Tending and top dressing ...	5 0 0	
		14 8 0			Canal water-rate	1 12 6	
					Cutting and thrashing	3 0 0	
						13 6 6	
Khurreef, 1871.	Estimate 84 maunds Indigo plant, at Rupees 36 per 100 maunds ...	30 4 0		Khurreef, 1871.	Purchase indigo seed	1 7 0	
					Sowing, 8 Coolies	1 0 0	
Total...	.....	95 8 0			Clearing, 24 „	3 0 0	
Balance...	.....	15 8 0			Water-rate	1 12 6	
					Tending and cutting	4 0 0	
						11 3 6	
Total...	.....	111 0 0		Total...	.....	111 0 0	

N.B.—Value of land reclaimed Rupees 33 per acre. The profits of next rubbee's crop will more than clear the account.

(Signed) B. J. PARSONS, Captain,
Ex. Engr., Allyghur Divsn., G.C.

Memorandum from the Officiating Joint Secretary to the Government, North-Western Provinces, to the Officiating Superintending Engineer, Public Works Department, dated Nynee Tal, 12th July 1871, No. 706-I.C.

THE undersigned is directed, by His Honour the Lieutenant-Governor of the North-Western Provinces, to acknowledge the receipt of Officiating Superintending Engineer's letter No. 1,996, of the 22nd ultimo, and to request Captain Moncrieff to convey to Captain Parsons the thanks of His Honour for the interesting and intelligent report submitted by him on the results of experiment in the cultivation of "oosur" land in the Allyghur Division, Ganges Canal.

2. A further statement will be looked for of the condition and bearing powers of the successful plot in reference to the ensuing khurreef harvest, how far it continues fertile or shows symptoms of recurring reh and barrenness. No absolute conclusions can be formed till we have had a longer and wider experience. Eventually if the experiment succeeds the papers will be published; in the meantime they will be forwarded to the Government of India for information.

3. His Honour has been pleased to direct that an assignment be made of Rupees 500 from Item No. 97 of current year's Budget, to enable further experiments being made on a larger scale in the Allyghur and Boolundshuhur Divisions, Ganges Canal; of the sum of Rupees 500 now allotted, Rupees 300 are assigned to the former, and the balance to the latter, division.

COPIES of this correspondence forwarded to the Agricultural Department and the Local Governments and Administrations marginally noted for information, and to the Home Department for publication in the *Gazette of India*.

Madras. Bombay. Bengal. Punjab. Oudh. Central Provinces. | British Burmah. Mysore and Coorg. Rajpootana. Hyderabad. Central India. Ajmere. Sindh.

(Signed) F. H. RUNDALL, Colonel, R.E.,
Dy. Secy. to the Govt. of India.

No. 458. ORDER THEREON, 27th September 1871, No. 2,463.

IRRIGATION, No. 26.

COMMUNICATED to the Chief Engineer for Irrigation, to the Superintending Engineers, and to the Revenue Department.

(True Extract.)

Captain, R.E.,
Under-Secretary to Government.

To Superintending Engineers.
To the Chief Engineer for Irrigation.
„ Revenue Department.

Exd. E. C. Shunker.

No 4115.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

IRRIGATION.

To

THE JOINT SECY. TO GOVT., N. W. PROVINCES
IN THE P. W. DEPT., IRRIGATION BRANCH.

Nos. 391 I.

Dated Simla, 19th August 1871.

Received 1 September/71

Encl. and.

Acknowledges receipt of papers describing the results of an experiment in the cultivation of "Oosur" land in the Allyghur Division, Ganges Canal, and states that all experiments in this direction should be greatly encouraged and their effects accurately recorded.

Adds that a report of the experiments ordered to be undertaken on a larger scale will be awaited.

William Ogilvie

No 2463-27 "Lieut. Col.

No 2463 to the Chief Engr. for Irrigation, for information.

From C.S. Gage Esq
29th Sept/71

To the Chief Engineer
" Executive Engineer
" Revenue Secretary

Allyghur 28/9/71

C. No. 4115.

Govt of {1871 Works.

PUBLIC WORKS.

To The Superintending Engr.

Dated

Recd. Encl. 1

G. O. 27 Sept 71. No 2463.

Nos. 457 & 468

Cultivation of Oodur land in the Allyserk Du-Sanyer Canal - Communicating to the Chief Engr the circular & rules & forwarding the papers detailing the results of an experiment in the Cultivation of land affected by the reh efflorescence -

No 2463 & 4 Dated 24 63 Forwarded to the Chief Engr for Execution, by order of the Revenue Department -

Chief Engr's Office 28/9/71.

Forwarded to the Supdg Engr & Asst Engr Chingleput for information & guidance -

By order &c

Sd/ [illegible]

Secy to Govt

To the Supdg Engr
" Chief Engr's Establishment
" Revenue Department