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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. <u>906</u>	Press <u>Min</u>
<u>29-30</u>	
Dated <u>1-4-</u>	<u>18 64</u>

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*Proceedings of the Madras Government, Public Works Department,
1st April 1864.*

No. 29. Read the following Proceedings of the Madras Government in the Revenue
Department:—

Communicating Notes by his Excellency the Governor and
the Honorable Members of Council on the subject of Canal } (Here enter 23rd March 1864, No. 501.)
Irrigation, &c.

No. 30. ORDER THEREON, 1st April 1864, No. 906.
Communicated to the Superintending Engineers.

(True Extract.)

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

To the Superintending Engineers:

Exd. S. T. Augustin.

11/3

*Proceedings of the Madras Government, Revenue Department,
23rd March 1864.*

No. 276.

Read the following papers:—

MEMORANDUM No. 3,916.

1. Forwards, by desire of His Honor the Lieutenant-Governor of the Punjab, one copy of printed papers on Canal Revenue Establishments, and distribution and economy of water.
2. The Punjab Government would be glad to receive any remarks on the points adverted to in these papers, which may aid in leading to practical conclusions on the subjects discussed.

LAHORE,
19th December 1863.

(Signed) ROBERT MACLAGAN, *Lieutenant-Colonel,
Secretary to Government, Punjab.*

No. 277.

NOTE BY THE HONORABLE THE PRESIDENT.

1. The accompanying Memoranda have been forwarded by the Punjab Government, with a statement that any remarks would be acceptable which might aid in leading to practical conclusions on the subjects under discussion. As similar or rather analogous questions have, for some time past, been discussed in this Presidency, and as I, after a good deal of consideration, have arrived at conclusions differing in many respects from those which seem to be laid down as axioms in these Memoranda, I may as well submit my views for the consideration of the Government of the Punjab.

2. I cannot of course pretend to give an opinion upon the suggestions made for utilizing the various classes of Officers now employed, either by the Canal Department or that of the Revenue; but I am in a position to discuss the primary question of the mode of assessing the water-rate, as well as the secondary questions of the position, whether under or above the soil, of the distributing channels; and of the mode of determining the area of irrigated land.

3. In dealing with the question of the mode of assessing the water-rate, Mr. Cust lays down, as a sort of axiom, "that all land, irrigated by canals, should be assessed for the Land Tax at dry (Baranee) rates only, and the Canal authorities should, with the sanction of the Government, be allowed to raise the water-rate to such a scale as is justified on commercial principles;" he then goes on to say that there are two modes of assessing the water-rate:—

A.—By the volume of water discharged.

B.—By the area of land irrigated.

I infer from this that the Canal authorities are to be permitted to make the most of the article they have to sell, subject to the reservation that the rate charged be uniform, whether it be by the cube yard or unit of volume, or the Acre, as the unit of area irrigated.

4. Is however this rule of assessing land at dry rates, and adding a separate charge for water supplied, so thoroughly established as to justify us, in dealing with the state of things in India, to assume it as an axiom? If it be so, why is it necessary to limit its application to water supplied by canals?

5. The experience of the Madras Presidency is decidedly adverse to such a system. In the first place, the dry assessment is, with reference to a great deal of land, a purely hypothetical assumption of value, for much of the land which is valuable when irrigated, would never be cultivated at all unless water could be supplied to it; and, in the second place, the dry assessment, if we go so far as to suppose it to be an accurate measure of the relative value of the soils of different fields when under dry cultivation, is not in any way an exponent of that relative value when these soils are irrigated; at all events the dry assessment, added to a fixed charge for water, is found in Madras to be a mode of deriving a revenue from the land which acts most unfairly upon both tenant and landlord, upon the people and the Government. For instance, it is a pretty general rule throughout the Madras Presidency that the dry assessment varies from 8 Annas to 3 Rupees per Acre, while the wet assessment ranges from 2½ Rupees to 10 Rupees per Acre. The difference between the two lowest rates, viz., 8 Annas and 2½ Rupees, may be taken to represent the Government share of the additional produce due to the action of water upon the poorer quality of soil; while that between the two higher rates of 3 Rupees

and 10 Rupees is the value of the Government share of the additional crop from a similar application to the best soil. The experience then, of this Presidency, goes to show that the occupant of the poorer quality of soil can afford to pay 2 Rupees for the water required to irrigate an Acre, without any undue pressure; while the occupant of the better description of soil can pay, and, if treated upon the same principle as the occupant of the poor soil, should be called upon to pay 7 Rupees for an equivalent quantity of water.

6. What, however, would be the result if the dry assessment were adopted as the exponent of the value of the soil, and a fixed rate be demanded for the water, say of 3 Rupees per Acre?

7. The occupant of the poor soil would have to pay a mixed sum, partly land assessment, partly water-rate of $3\frac{1}{2}$ Rupees or 1 Rupee per Acre more than he is now called upon to pay; while the lucky occupier of rich land would get his Acre for 6 Rupees instead of 10; and thus put 4 Rupees, in excess of what is assumed to be his fair profit, into his pocket. The assessment on all land, irrigated or unirrigated, is calculated upon an average of crops, after making all necessary deductions, and is assumed to represent the value of one-third of the net crop. In the case then of the occupier of poor land, who is made to pay $3\frac{1}{2}$ Rupees joint land assessment and water-rate, a demand of $\frac{1}{3}$ th or very nearly one-half of his net crops is made upon him, while the occupant of rich soil is only called upon to pay one-fifth of his net crops instead of one-third.

8. I cannot then but think that the system hitherto followed in India, of computing the rent or assessment upon land, whether irrigated or not, with direct reference to its productiveness, as evidenced by the average crops, is not only a simpler plan than that of mixing up the hypothetical value of land under dry cultivation with a fixed charge for water, but also a fairer plan both as regards landlord and tenant, Government and people.

9. I will now consider the relative merits of the two modes of assessing the water-rate mentioned by Mr. Cust, viz. :—

A.—By the volume of water discharged.

B.—By the area of land irrigated.

Here again it is assumed as a matter of course that, though the first mode cannot be adopted, and though every attempt to introduce it has failed, it is in itself, *theoretically*, so superior to the second, that we ought always to look upon some mode of measuring the discharge as an object to be attained, and the measurement by area as only a temporary arrangement. We are not told in what this superiority consists, but from the context I gather that the measurement of the water is supposed to be a more economical mode of arranging with the occupier for the quantity required by him, than the measurement of the area irrigated. In order, however, to determine this, it will be necessary to examine into the circumstances upon which the *cost* and the *value* of the water depend.

10. The *cost* to the Government is the interest of the money expended upon the works, added to the cost of maintenance and repairs, and that of management. In Madras the money expended upon some of the large irrigation schemes varies from 10 to 20 Rupees per Acre irrigated. If we take 15 Rupees as the average, the interest at 5 per cent. would be $\frac{3}{4}$ of a Rupee, and if we allow another $\frac{1}{4}$ Rupee per Acre for repairs, &c., the cost to the Government will be 1 Rupee per annum per Acre. The quantity of water supplied varies of course with the character of the soil, the crop, &c., but the maximum may be put at 5,000 cube yards for a single crop, and if we take 4,200 cube yards as the mean, we shall not be far wrong. The *cost* therefore to Government is 1 Rupee for 4,200 cube yards of water—the supply being spread over a period of about three months.

11. The *value* to the Government is the amount at which it sells this water. In Madras as I have before shown, this value varies according to the quality of the soil to which the water is applied, and ranges between 2 Rupees and 7 Rupees. Assuming, however, that a fixed water-rate is established, this, so far as we can see at present, will be estimated at from 3 to 4 Rupees per Acre or per 4,200 cube yards or, say, 1 Rupee per 1,000 cube yards.

12. We have thus arrived at an approximation to the cost and value of water, that is the cost in the canal and the value when sold, but we have yet to bring it to market, and the question we have to consider is, what is the most economical mode of doing this? That is of delivering to the occupier of the land the amount of water which he may require.

13. We will dismiss, for the present, at all events, all considerations arising out of peculiar tenures of land; assuming only that in order to arrive at the dry assessment of land to which the Government, under any circumstances is entitled, the area of the holdings must be ascertained, *that is the land must be surveyed*.

14. Should the Government determine to measure the water as it issues from the canal, it must erect the necessary distributing and measuring sluices. There are no data by which the cost of these can be determined; but they are by no means simple either in construction or in management, and will require to be watched and worked by a special class of servants. If on the contrary, the Government prefer to charge upon the irrigated land a fixed rate per Acre, then an ordinary means of discharging and distributing the water will answer, and the only question to be solved is the amount of land actually irrigated. I have, however, before observed that the land must be surveyed, with a greater or less degree of exactness, in order to determine the amount of the dry assessment, and the process which is considered sufficient, for the one may for the present answer sufficiently for the other. However, I shall be prepared to discuss this more fully when I allude to the mode of determining the areas of the cultivated land generally.

15. With reference then to the mode of assessing the water-rate, the conclusion at which I have arrived are as follows :—

First.—That the system of charging a single rent or assessment upon the land, the amount which is determined, whether the land be irrigated or unirrigated, by the productive power of the land as determined by the actual crop, is in every respect fairer to the Government and to the Ryot, than that of assuming a hypothetical assessment, based upon the supposition that the land is cultivated for a dry crop, and adding to this hypothetical assessment some arbitrary water-rate based upon commercial principles, which I suppose to mean as high a rate as the Ryot can be made to pay.

Second.—That under circumstances analogous to those which characterize the relation between the Government and the cultivator of the soil in India, the measurement should be applied to the land and not to the water that is the rate, whatever it may amount to, should be an acreable charge.

AREA OF IRRIGATED LAND.

16. It would seem from the remarks of the Punjab authorities that difficulties have been experienced, or at all events have been anticipated in the determination of the areas of the holdings to which water is supplied.

17. This may be the effect of the system of assessing the village and leaving the individual payments to be determined by the village authorities. It is a difficulty which is not experienced in Madras, when the village Map and Register determines the form and area of each individual occupation, so that all that the Revenue authorities have to find is the number on the Register of the fields to which water has not been distributed: and as generally speaking, all the land under the irrigation channel is irrigable, there is but little difficulty in determining the portion left dry during any season.

18. The cost of surveying the irrigated land annually, however roughly such an operation may be performed, must cause a serious deduction from the profits of the water-rate, or a serious addition to the *cost* of the water.

19. I cannot but think that a village survey carefully executed would remove all difficulties as to the distribution of water, and would probably pay its own expenses by bringing to light a quantity of cultivation both irrigated and unirrigated, from which the Government has hitherto derived little or no revenue.

20. A village survey should provide for permanent boundary marks, indicating not only the external boundary of the village, but also such sub-divisions of its area, when no lines of separation, either natural or artificial occur, as would split it into blocks of from 50 to 100 Acres. Within these blocks the outlines and areas of cultivated portions should be surveyed and marked on the Plan, and it would be easy to mark the outline of land capable of being irrigated, all of which might be considered liable to the rate, while it would be left to the occupier, who declined to make use of his privilege, to show that he had not irrigated his land.

21. A simple measurement of the area of unirrigated holding, which would form but a small proportion of the irrigable land, would settle all questions as to the supply of water; while the existence of the boundary marks would make this a short and simple process.

POSITION OF DISTRIBUTING CHANNELS.

22. Stress has been laid upon the waste of water caused by the position of the irrigating channels above the surface of the ground to be irrigated, and it has also been said that the leakage from these, causing swampy patches of ground here and there, is prejudicial to the health of the community.

23. It has been proposed as a means of remedying these evils, but principally, I believe, to secure the imaginary benefit of measuring the water, that all the water required for irrigation should be lifted from channels carried below the level of the ground.

24. I question in the first place the existence, or at all events the extent of the evils complained of. I do not think that the leakage from the channel above ground need be great; at all events the fact of a leak is detected at once, while the waste arising out of the permeability of the subsoil does not make itself visible for some time. As to the action of the leakage upon the health of the people, its quantity must be so small in proportion to that of the water applied to irrigation as hardly to deserve notice.

25. The main objection, however, to the proposal of lifting the water is the enormous cost of the labor required to perform the work. If we take 4,200 cube yards as the supply required for an Acre and suppose this to be spread over a period of three months, the quantity of the daily supply to the Acre would be about 48 cube yards. Now a cubic yard of water weighs $27 \times 62\frac{1}{2} = 1,687\frac{1}{2}$ lbs., 48 cube yards will therefore weigh 81,600 lbs., and if this has to be raised 2 feet, a height only just sufficient to give it a sufficient head for distribution, the weight raised 1 foot high will be 1,63,200 lbs.

26. The labor of an Englishman is considered as equivalent to 5,000 lbs. raised 1 foot high per minute, that of a Hindoo would not probably be equivalent to raise more than 3,000 lbs., but taking the Englishman, $\frac{1}{5} \times 5,000 = 326$ the number of minutes employed daily in raising sufficient water for the daily irrigation of an Acre, if this be multiplied by 90 the number of days during which water is required $90 \times 326 = 2,934$ minutes is the number of minutes during which the man would have to work to raise water sufficient to irrigate an Acre, and this divided by 60 would give 48.9 hours or, at ten hours per day, very nearly 5 days. If however we take the co-efficient of labor of an Hindoo as 3,000 lbs., then the 5 days would be transmuted into $8\frac{1}{2}$, and the cost would amount to very near 2 Rupees to be added to the cost of the water, or deducted from the profits: such a proposition could not be entertained for an instant.

27. Before I conclude I may as well say a few words upon the subject of the collection of the water-rate.

28. Several of the difficulties, out of which the Government of the Punjab is striving to extricate itself, seem to me to have originated in the fact that the Canal Department has overstepped the proper limit of its functions. As a general rule the Public Works Department should execute, or superintend the execution of, the canal itself, and of all the various sluices and major channels required for the distribution of water. It should also keep these works in repair, but here, it appears to me, its legitimate functions cease. If, on the plea that the water in the canal is the property of the Department, its Officers proceed to dispose of it, and to collect the

proceeds of the sales, they assume to themselves functions altogether foreign to their organization, and are obliged to employ a separate set of agents.

29. I do not think that it would be wise to throw upon the Public Works Department the charge of levying the money payable for water supposing it were possible to determine the quantity by a measuring sluice, though it might record the quantity passing through; but I am quite sure that its Officers would be placed in a very invidious position were they called upon to collect a rate chargeable upon the acre of irrigated land.

30. Even in Madras, where the Officers of the Revenue Department collect the Land Assessment, which includes a water-rate on irrigated land, a sufficiently angry correspondence has occasionally passed between the Collector and the District Engineer on the subject of the addition made to the Land Revenue by the action of certain works of irrigation. Were the two Departments called upon to go over the same ground, one to levy a dry assessment and the other a water-rate, all sorts of complications would arise.

W. T. DENISON.

No. 278. NOTE BY THE HONORABLE E. MALTBY.

1. I concur generally in the Minute which the President has written on the subject of Canal Irrigation at the request of His Honor the Lieutenant-Governor of the Punjab.

2. The loss of revenue to the state on the richer lands, and the heavy burden imposed on the poorer soils, by attempting to introduce a general dry assessment and supplement it by a water-cess where irrigation is supplied, have been often pointed out by me in my Minutes arguing in favor of a Nunjah assessment, that is to say, an assessment based on a portion of the staple crop raised on wet lands.

3. I concur in the advisability of employing the revenue Officers to collect the water-cess. There seems no difficulty on this point especially when the charge for water is made according to the area irrigated at so much per acre.

(Signed) E. MALTBY.

16th March 1864.

No. 279. NOTE BY THE HONORABLE T. PYCROFT.

1. I concur in the views of His Excellency the President and of the Honorable E. Maltby upon this question.

2. The assessment on irrigated land should, in my opinion, be a consolidated rate, fixed in reference to the value of the produce of the land when under irrigation. All attempts to fix separate rates for the land—as dry land—and for the water, must as shown by Sir W. Denison result in complication and inequality of assessment, and will not be fair either to the Government or to the cultivator.

3. The Officers of the Public Works Department cannot be too strictly confined to the performance of their own proper duties—the construction, repair and maintenance of Public Works. They should have nothing to do with the assessment or collection of the public revenue.

4. In the bringing to account the revenue derivable from irrigated lands—as in any other process in which subordinate native agency must be largely employed—frauds to a considerable extent are, I fear, unavoidable. The best remedy lies in a good Village Survey and Village Maps, which facilitate the control of the superior over the inferior Revenue servants, and the detection of their irregularities.

5. The device suggested by some of the Officers in the Punjab for enforcing economy of water by making its application to the land laborious and therefore expensive, will hardly find approval in this part of India. Here it has always been found that a Ryot will till as much land, wet or dry, as he can cultivate at a profit. If the assessment on his land be moderate he will extend his cultivation, and make the water that he gets go as far as possible. In such case if he does waste water it is not wilfully and because he is insensible to its value, but because of his

6 *Proceedings of the Madras Government, Revenue Department,*
23rd March 1864.

ignorance and the backward state of agriculture in India. The progress of agricultural science and diffusion of education will do more to correct his mistakes in this respect than the creation of artificial restraints and difficulties.

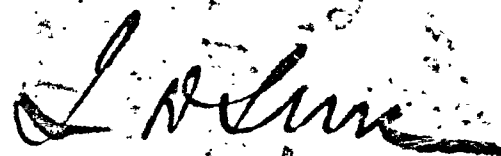
(Signed) T. PYCROFT.

No. 280.

ORDER THEREON, 23rd March 1864, No. 501.

Resolved that the Notes of His Excellency the Governor and the Honorable Members of Council be forwarded to the Government of India and the Government of the Punjab; and be communicated to the Department Public Works, Revenue Board and Revenue Settlement Department for their information.

(True Extract.)



Secretary to Government.

To the Department Public Works. ✓
„ Board of Revenue.
„ Director of Revenue Settlement.
„ Superintendent of Revenue Survey.

Nov. 1864
 Mrs. J. W. Smith
 No. 1330

Dear Mr. Foster
in the Rev. Archdeacon

Recd 128 - Mac/sec

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Communicating
Notes by the Sparks
Kagomee and
the Keweenaw People.

It arrived in the
early part of June
and was delivered
with a box of

7029-30.

210906.

Communicated to
the City Engineers.

Delaware
1st of June 1843

Accepted for
the City Engineer
X 82

Dec 2nd 1891