

RECORDS OF THE BOMBAY
GOVERNMENT.

I.—NEW SERIES.

PAPERS AND EXTRACTS
BEARING ON THE SUBJECT OF
SUBSOIL WATER CLASSIFICATION
IN
GUJARÁT.

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of the scale, but as Mr. Fletcher has pointed out [his para. 9] these exemplifications were misleading, because Colonel Godfrey had not the requisite data to work them out with accuracy.

8. Mr. James's [para. 12].—There will be no difficulty in working out the financial effect of the subsoil water assessment, if it is treated as a detail of classification. Such calculations cost money, and if called for with respect to one item of classification ought to be called for with respect to others, *e. g.*, position class. It would be very interesting if the effect of all the items of classification were thus separately exhibited, but this would add considerably to the cost of compiling the Settlement Report.

9. I would suggest to Government that it would be a good plan if the whole of the correspondence regarding the subsoil water question is printed separately in the form of a separate compilation.

APPENDIX.

Note by Acting Survey Commissioner, Baroda, on the subsoil water assessment.

TO THE SUPERINTENDENT, BARODA SURVEY.

I have the honour to place the following remarks on paper regarding the introduction of something like the subsoil water classification of the Bombay Survey into our Survey. * * *

2. * * * In introducing a subsoil water assessment the object is not to recoup the loss from the abandonment of direct well taxation but principally to differentiate between lands which have facilities for irrigation, where irrigation will be profitable, and where it would be unprofitable or positively harmful owing to the danger of bringing up salt in the irrigation water; and again between lands which have not the facility for irrigation and those which have, provided the water is not salt and useless. In fact, we have to solve the problem of fair distribution, which is after all the great problem at the bottom of all survey operations.

3. I look on the question of a subsoil water assessment, then, as a question of classification and of classification alone. And the question is whether our classification rules are sufficient to differentiate between the classes of land described above and similar kinds of land. I think that you will agree that the application of the rules does not meet the cases we have to deal with, but that it will not be difficult to apply them so as to meet the difficulty, even with perhaps hardly perceptible modifications.

4. To make my meaning plainer, take the case of two tracts of black soil of full depth, of even surface, and in all points similarly classifiable under our present rules.

There may be two points of difference :

(a) In one tract, though no salt may be apparent in the surface soil, to a depth of three feet, yet it may be that wells tap a stratum of salt, and that if irrigation is attempted it will be either harmful or only useful for barley. In the other the wells have sweet water, and irrigation is most profitable, and perhaps the tract may be covered with kacha wells.

(b) In the one the general level of the soil may be high and water too deep for profitable utilization. The tract may be upland, of good deep soil and there may be no danger of salt. In the other the lie of this land is low; the water strata are close; wells may be cheap and water brought to the surface after little expenditure.

Now, under the rules practically I think in both cases the soil classification would be the same, and yet it does not require much argument to prove that in fairness and in solving the problem of fair distribution of the Government demand, a real difference should be made. Neither in ordinary classification can we with the material at our command and within an expenditure which is reasonable, nor in the special cases which I am trying to indicate, do more than make

an approximation to the relative productive capabilities of the soils. But such an approximation is near enough for the practical problem with which we have to deal. We cannot dig test wells to find out the depth and character of the water underlying. We cannot use the diviner's rod, but we can as practical men use the evidence of existing wells and other evidence available, make a difference in the valuation which for practical purposes is sufficient. We know that our information is not full, and so, as in all cases of classification, we have to leave a margin for error and insufficient knowledge, and yet we feel that our action is called for in the interests of the tax-payer, so that the burden of the assessment should fall as evenly as possible on the different kinds of land and as fairly as possible. We must use the local knowledge of the people, and though in cases of this kind that information must be received with caution, for many reasons it must not be ignored, but must be utilized by the Assistants, though no discretion can be allowed to classers. With your experience as a classer you will bring more cases to mind than the one I have indicated, but I have said enough to show how I look on the question.

(Signed) E. C. OZANNE.

Baroda, 25th November 1889.

No. 467 of 1891.

To

THE SURVEY AND SETTLEMENT COMMISSIONER.

Surat, 22nd July 1891.

SIR,

With reference to your endorsement No. 1333, dated 20th instant, on Mr. Fletcher Superintendent Deccan Survey's opinion on subsoil water classification, I have the honour to submit herewith a scale which I have framed, paying special attention to that officer's remarks in his paras. 10 and 11.

2. In the plains of Gujarát utilizable subsoil water is usually found under gorat and besar soils only, the maximum classification of which ordinarily is 14 annas. Wherever pure black soil prevails there, as a rule, the underground springs are salty owing to which wells are conspicuous by their absence. Taking these facts into consideration and the further one that the best garden produce requires a certain amount of consistency in the soil which is caused by the presence of loam, I have fixed the first grade of soil at from 16 to 11 annas. The other grades call for no explanation.

3. In your remarks on my Sánand Report you have agreed with me as to the unfairness of taxing salt water of the 4th order in connection with jiráyat land. The scale for this order of water has therefore been made for rice land only. As the soil classification of rice lands practically runs from 5 annas to 8 annas only, soil grades for rice seem unnecessary. I have therefore not made any. It will be seen that the scale is the same as that for the first grade of soil under Order III. The reason of this is that rice crops can as effectively be saved by water of the 4th order as by that of the 3rd, and in the cold season both are used in rice lands for raising crops of barley and occasionally of wheat.

4. The scale as framed will, I think, suit all inland tálukás which have no rocky substratum. Those with rocky substratum should have the scale lowered according to their special circumstances. In the case of tracts containing soil of the superior order, which is classable up to 24 annas, and in that of the coast tálukás like those of Bulsár, Jalálpur, &c., where owing to the greater humidity

in the atmosphere garden produce is raised with much less trouble than in the dry tálukás inland, it may perhaps be found necessary to alter the scale to make it suitable to the new order of things.

5. As regards the táluka of Parántij, the revision proposals for which are due next cold season, I am of opinion that the two divisions of Parántij proper and Modása should be treated differently, because, while the former has no rocky substratum, in the latter it prevails throughout. Moreover, the Modása underground springs are weak and consequently there are but few wells indeed which can be worked the whole day without being exhausted. Further, the level of the springs sinks several feet in the hot weather leaving the wells in the high localities nearly dry. I would, therefore, propose that for the Modása Division the scale should be reduced by one-half. As the Parántij Darvari is now in hand an early answer would be highly esteemed.

I have, &c.,
T. R. FERNANDEZ,
Deputy Superintendent, Revenue Survey, Gujarát.

Scale showing the Anna Value of the classes in each order of subsoil water as fixed by the depth from surface to water and the classification of the soil.

Grade of Soil.	ORDER I.				ORDER II.				ORDER III.				ORDER IV.				REMARKS.
	A Class up to 10 feet.	B Class over 10 and up to 20 feet.	C Class over 30 and up to 35 feet.	D Class over 35 and up to 60 feet.	A Class up to 10 feet.	B Class over 10 and up to 20 feet.	C Class over 30 and up to 35 feet.	D Class over 35 and up to 60 feet.	A Class up to 10 feet.	B Class over 10 and up to 20 feet.	C Class over 30 and up to 35 feet.	D Class over 35 and up to 60 feet.	A Class up to 10 feet.	B Class over 10 and up to 20 feet.	C Class over 30 and up to 35 feet.	D Class over 35 and up to 60 feet.	
16 to 11 annas.	4	3½	3	2	3½	3	1½	1	2	1½	1	½	2	1½	1	½	The scale for the 4th order of water is applicable to rice lands only. Exceptional jirayat lands which grow tobacco with the aid of salt water will be specially dealt with.
10 to 8 annas.	3½	3	1½	1	3	2½	1	½	1½	1	½	...	...	...	...	...
7 to 5 annas ...	2½	2	1	½	2	1½	½	...	1	½	...	...	...	...	...	...

N.B.—Soils below 5 annas of classification are not to be subjected to subsoil water assessment.

T. R. FERNANDEZ,
Deputy Superintendent, Revenue Survey, Gujarát.

Surat, 22nd July 1891.

No. 1393 of 1891.

To

THE DEPUTY SUPERINTENDENT,
GUJARÁT REVENUE SURVEY.

Poona, 28th July 1891.

SIR,

In reply to your letter No. 467, dated 22nd instant, I have to say that it is absolutely necessary that the scale should be fixed for Parántij now, as you point out. I am prepared then to authorize your completing the darvaris without delay, to prevent loss of revenue. If Government does not sanction the scale, the darvaris may have to be done over again, but that is the lesser risk. I have consulted Mr. Fletcher, who has now studied the question, and would make the following comments on the scale proposed by you:—

- (1) I am very strongly of opinion that a depth over 35 feet should not be admitted. Water may be obtainable at a greater depth profitably,

but the expense incurred in case of success and the risk of failure after expenditure on excavation make it evident that when such depths are concerned, it cannot be said that water for irrigation is "easily obtainable." I may go as far as 40 feet if you show strong reasons.

- (2) I approve of the soil gradations, but think that they should be slightly altered as shown in the appended statement. If rice land is, as you say, usually classed from 5 to 8 annas, this is because 8 annas in the scale are allotted to water. A rice soil classed at 8 annas would then, if dry-crop, be classed at 16 annas. The question is whether the increase for subsoil water facilities should be based on the jirayat valuation or on the rice valuation. I think on the latter, because though the value of well water is not so great in rice land as in jirayat, yet the low soil valuation of rice land will practically exclude the scale for the higher soil grades.
- (3) I approve of the proportion which you fixed for the soil grades with minor modifications. I think the incidence of increase should be proportionately higher on poor than on better lands, because the value of water on poor land, provided it is not bad unirrigable land, is greater, and your scale excludes all soils classed below 5 annas. Should we not say below 4 annas? for otherwise fairly assessable rice land may unreasonably escape.
- (4) I think the way to that with tracts where a rocky substratum has to be pierced before water is reached, is to provide a fault, which will cause a reduction in the scale which is necessary. This method will also apply to other obstacles to irrigation from wells, *e. g.*, weakness of springs. A fault may be here defined as $=\frac{1}{2}$ the scale increase. Where necessary $\frac{1}{2}$ a fault only may be allowed.

2. I shall be obliged if you will work out the proposed scale for a few villages, chosen as representative ones, in Dholka, Virangam, Sanand, Daskroi and Gogha, and compare (a) the classification result, and (b) the absolute result according to the sanctioned maximum rate, and if you will submit the comparisons with your remarks and opinion.

I have, &c.,

E. C. OZANNE,

Survey and Settlement Commissioner.

No. 496 OF 1891.

To

THE SURVEY AND SETTLEMENT COMMISSIONER.

Surat, 1st August 1891.

SIR,

With reference to your letter No. 1393 of 25th ultimo, I have the honour to remark as follows regarding the three clauses of your paragraph 1 :—

Clause 1.—I agree with you that the maximum depth of wells should be reduced, but I think at the same time that the limit should be reduced from 50 feet to 40 feet. If it is lowered to 35 feet then most of the wells in Nadiad and Anand will, I think, escape the subsoil water rate, and you are aware how largely they contribute to make tobacco cultivation the great success it is. There are wells to be met with in Gujarat as deep as 60 feet which are regularly used for raising crops of wheat and barley.

Clause 2.—In respect of this clause I would remark that although rice soil is classed from 5 annas to 8 annas, in calculating the *akar* the classifi-

cation values are doubled; for instance, 5 annas become 10 annas and 8 annas 16 annas; so it will be seen that rice soil will receive a treatment in no way different from jirayat.

Clause 3.—In the Deccan a soil may be 7 annas and lower, but still whatever there is of it may be 1st class, for I think insufficiency of depth is one of the chief prevailing causes which there lower the valuation. In Gujarát, on the contrary, full depth is met with everywhere except in the few hilly talukás. The chief faults that here reduce the valuation are sand and salt. To bring gorat soil down to 7 annas and below, the existence of $3\frac{1}{2}$ faults and more of each of the defertilizing ingredients are necessary. In Gujarát therefore soils below 8 annas are really very poor and it could not, I would respectfully add, be said of them that the value of water on them is greater than on good lands. Soils below 5 annas are nearly all sand or salt, and I am strongly of opinion that they should not be assessed for subsoil water.

2. With regard to your para. 2 the depth details of the Dholka and Daskroi wells are not available, for they were graded under the three depths fixed by the Superintendent and approved by your predecessor. The information called for by you can therefore be furnished in respect of Viramgám, Sánand and Gogha only, and it will be submitted no sooner it is ready.

3. As I think nearly all the wells in Táluka Parántij are within 35 feet in depth, there is no reason to delay the application of the new scale to it till the point raised by me in my remarks on your clause 1st is settled. I am therefore issuing instructions to my Classing Assistants accordingly.

I have, &.,

T. R. FERNANDEZ,

Deputy Superintendent, Revenue Survey, Gujarát.

No. 1438 OF 1891.

To

THE DEPUTY SUPERINTENDENT,
GUJARÁT SURVEY.

ff

Poona, 4th August 1891.

SIR,

I have the honour to sanction the accompanying scale for the assessment of subsoil water in the Parántij Táluka including Modása, in anticipation of the sanction of Government. The sanction of Government will be asked when my final report on the subsoil water question is submitted; but I cannot wait till that time without seriously impeding the work of completing the darvaris.

2. I have considered your letters Nos. 467 of 26th July and 496 of 1st August. I have agreed to reduce the depth from 50 to 40 feet. As regards your explanation as to the manner of calculating the *ákar* in rice land, I have added a note to the scale. In other respects there is no difference of opinion between the scale submitted by you and that sent for your remarks with my No. 1393 of 28th July, except the differences which I suggested in the latter scale and which you apparently approved.

I have, &c.,

E. C. OZANNE,

Survey and Settlement Commissioner.

Suggested Scale for Gujarát subsoil water additions to be made to the soil classification annas.

Soil annas.	I.				II.				III.				IV.			
	A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.	A.	B.	C.	D.
	10 feet and less.	11 to 20.	21 to 40.	...	10 feet and less.	11 to 20.	21 to 40.	...	10 feet and less.	11 to 20.	21 to 40.	...	10 feet and less.	11 to 20.	21 to 40.	...
Above 12	4	3	2	...	3½	2½	1½	...	2	1½	1	...	1	½	...	...
11-11 to 8	3½	2	1½	...	2½	1½	1	...	1½	1	½	...	1	½	...	...
7-11 to 5	2½	1½	1	...	1½	1	½	...	1	½	...	...	...	...	...	...

A fault ($=\frac{1}{2}$ of addition) to be given for rocky substratum or other obstacle to construction of well and one also for deficiency in the supply obtainable.

Order IV to be applied only to rice lands.

In rice land the addition required by the above scale is that which is calculated on the soil classification annas doubled.

E. C. OZANNE,

Survey and Settlement Commissioner.

Extract paragraphs 1 and 5 of Government Resolution No. 7204, dated 20th October 1891, sanctioning proposals for the Revision Survey Settlement of the Sánand Táluka.

The receipt of these papers has now enabled the Governor in Council to consider and pass orders on the proposals for the revision settlement of the Sánand Táluka, which were first submitted, with memorandum No. 1659, dated 5th May 1891, from the Commissioner, N. D. There have been peculiar difficulties in arriving at sound conclusions, partly on account of some differences of opinion regarding the grouping of the villages, and partly on account of doubts as to the advisability of adopting the system of assessing subsoil water advantages, sanctioned by Government Resolution No. 2282, dated 29th March 1890.

5. The next question is as to the subsoil water assessment. In addition to the views expressed by those members of the 1889 Committee, on whose report Government Resolution No. 2282, dated 29th March 1890, was passed, now remaining in India, Government have had before them the opinions and conclusions of Messrs. Ozanne and Fletcher. The object of that Resolution was to get rid of the idea that the new subsoil water assessment should be equal to the old well assessment, and Colonel Godfrey's scheme was a loyal attempt to carry out this object. The application of his scheme to certain tálukás appeared to justify the conclusion that it was generally applicable, but further experience has shown that it is not so. The weight of opinion, both expert and otherwise, is so strongly against its further application that Government are justified in so modifying the orders contained in the above quoted Government Resolution as to substitute for them the scheme provisionally sanctioned by the Survey and Settlement Commissioner in his letter No. 1438, dated 4th August 1891, to the Deputy Superintendent, Gujarát Revenue Survey. This should therefore be done.