No 1913 W a/ 9th July/83

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I.W.C. No. 565 9/

Gobt. of (1883) Madras

REVENUE.

Issued

Recd. 5/7/83 Encl.

G.O., 16th June 1883, No. 748.

No 1913 W a/ 9-7-83

JUNE.

Agricultural Operations in Bellary

conducted by Messrs. A. Sabapathy Mudaliar and Co.—Orders passed on a report on —.

[illegible] 9/7

S. E. Third Circle

S. E. Third Circle

2 copies to [illegible]

With order

Entd. in Receipt Regr.

10/13/7

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 15th March 1883, No. 756 :—

Read—the following letter from W. R. ROBERTSON, Esq., M.R.A.C., Agricultural Reporter to the Government of Madras, to the Director of Revenue Settlement and Agriculture, Madras, dated Saidápet, 23rd January 1883, No. 95 ; and Endorsement by W. WILSON, Esq., Director of Revenue Settlement and Agriculture, dated 1st March 1883, No. 293 :—

In the early part of last month, I availed myself of the permission granted me in the Proceedings of the Board, No. 2465, dated the 9th October last, to visit Bellary and inspect the agricultural operations conducted there by Messrs. A. Sabapathy Moodelliar and Co., and I have now the honor to submit my report on that inspection.

2. Messrs. A. Sabapathy Moodelliar and Co.'s operations have extended over a wide area of country. In 1881, the area worked by the ploughs they had introduced was 1,900 acres situated in 10 different villages ; while, last year, the area was increased to 3,430 acres situated in 17 different villages. Opportunities have thus been afforded to a large number of ryots for witnessing these important experiments, as the villages in which the experiments were conducted are scattered over a tract of country fully 30 miles wide. The portions of this land that I inspected are situated near Hagari and near Bantanahal. In my inspection of the land at the former place, I was accompanied by the Collector of the district, and we were conducted over the land by Mr. A. Sabapathy Moodelliar, Mr. Sabapathy Iyer and Mr. Firth. In inspecting the land at Bantanahal, I also had the benefit of the company of Messrs. Sabapathy Moodelliar and Firth. Before proceeding further, I must express the very great obligation I feel under to these gentlemen for the trouble they took in accompanying me over the land inspected, and for the full and valuable information they placed at my disposal. I fear (in the great interest I felt in what Mr. Sabapathy Moodelliar had done, and is doing) I somewhat transgressed the bounds of fair inquiry, for it must be remembered that the enterprise is entirely of a private nature ; but if I did do so, it was not resented, for not only was all available information fully afforded to my inquiries, but it was given in a way to suggest other and further questions.

3. The chief circumstances which induced Messrs. Sabapathy Moodelliar and Co. to give their attention to the introduction of improved ploughs for working the cotton soils of Bellary having been noticed at length in the General Report of this department for 1881-82, at pages 14—16, it is unnecessary to notice them again here. Messrs. Sabapathy Moodelliar and Co., have, for some time, been largely interested in the cotton trade of the district, and are now extending their operations to spinning and weaving cotton, and are constructing a large mill for these objects in the town of Bellary. A regular and full supply of cotton, of a good quality, is therefore a matter of considerable importance to this enterprising firm—objects quite sufficient to explain Messrs. Sabapathy Moodelliar and Co.'s interest in, and their desire to improve, the husbandry of the district. But, I believe, Mr. Sabapathy Moodelliar is influenced by other objects than mere personal gain, highly laudable as such an object would be. He has long been connected with the district, is familiar with a considerable part of it and the people of the cultivating classes, and has noticed with concern the gradually increasing poverty of the people and the less and less care devoted to the tillage of the soil—influences which, in a season of great drought culminated in the famine,

which so recently devastated the district, resulting in a loss of about one-third of the population and the abandonment of nearly one-third of the arable area. Mr. Sabapathy Moodelliar has deeply considered this and other circumstances bearing on the state of agriculture in Bellary, and has fully convinced himself that it is the imperative duty of all men possessing wealth, who have any interest whatever in the welfare of the district, to use some of that wealth and what influence they possess in promoting whatever may tend to further the interests of husbandry. Mr. Sabapathy Moodelliar looks upon this duty in the same light as many others of his countrymen who possess wealth do on the duty to provide choultries and similar institutions for Brahmins and other castes, but that the duty to promote the agriculture of the country is of paramount importance—a view in which I venture to believe all will concur who possess any real knowledge of India and its husbandry, and who desire to see the country prosper.

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Do. triple-furrow do.	1
Do. four-furrow do.	1
Total ..	401

They have already sold 132 of the Swedish ploughs and all of the Ransome's double ploughs. Some of the ploughs were sent to the Nizam's Dominions, the Mysore Province, a few to the Kurnool District, and to the Dharwar District in the Bombay Presidency. Thus the good influences set in operation are extending widely. Judging from the great gatherings of ryots I saw, and the great interest they appeared to evince, at Bantanahal and elsewhere, where the ploughs were exhibited at work, or the land that had been ploughed could be seen, Mr. Sabapathy Moodelliar is apparently doing much good in the district. It was a great pleasure to accompany him over the land, and to witness the interest with which the ryots listened to his remarks, and the apparent pride they took in the superior crops raised on the deeply-ploughed land. I am convinced that the movement is entirely spontaneous on the part of the ryots, and is due simply to their appreciation of the quality of the work done under Mr. Sabapathy Moodelliar.

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	Acre.
Land in a very dry state	$0\frac{1}{2}$
Land in a moderately dry state	$0\frac{3}{4}$
Land in a very good state	1

Mr. Sabapathy Moodelliar estimates that he can, when the land is in good condition, plough with his large plough, from 10 to 12 inches deep, with 4 pairs of cattle, at a cost of about Rs. 3 per acre, whereas he could not with the large country plough get as good work done for Rs. 8 per acre. I should consider, from what I saw done, that the large country plough would do a shorter length of furrow than one of the improved ploughs, and that one operation of the latter is equal in

effect to two of the former. Ploughing a furrow 12 inches wide, an improved plough would have to travel 8 miles to perform one acre of ploughing, but 20 per cent. of the time would be lost at the headlands in turning; the useful day's work would therefore be 4·8 hours; the cattle would thus need to travel nearly 2 miles per hour—a much faster speed than usual. I certainly saw some of the ploughs worked at a speed as great, but it was only for a short time and could not be kept up during a day. Probably, therefore, three-fourths of an acre may be taken as a full day's work with one of the improved ploughs when the land is in really good order. The country plough could not get over more than two-thirds of an acre per day, under similar conditions, and would need to go over the land twice; its effective work would therefore be one-third of an acre per day, and three days would be occupied to do one acre with six pairs of cattle.

6. No bad results have followed on deep-ploughing these black cotton soils, as far as is known; the fact is, that the cotton plant is the chief crop and its deep roots prepare the soil for deep ploughing.

7. Messrs. Sabapathy Moodelliar and Co. have ample facilities for repairing iron ploughs at their Cotton Presses, of which they have eight in different parts of the district. They trust to be able to make iron ploughs ere long.

8. Much of Messrs. Sabapathy Moodelliar and Co.'s land is worked on the share plan, that is, they pay rent, provide manure, the ploughs and the seed, and the cultivators find the manual labor and cattle labor and get from one-twelfth to one-sixth of the cotton yielded for harvesting it, while half of the remainder goes to Messrs. Sabapathy Moodelliar and Co. as their share; they are satisfied with the arrangement, and would be glad to get a larger area of land on the terms on which they hold much of that they now have. It appears to me much better that land should be thus utilized, instead of lying waste; there would be no difficulty in drawing up an "improving lease" to secure the interests of the State All new enterprises are uncertain at first, and if capital must be attracted to agriculture, some inducements must be held out, and Messrs. Sabapathy Moodelliar and Co.'s plan of providing capital has much to recommend it. This district appears to demand exceptional treatment if it is correct, as is asserted, that in the past 10 years, the population has diminished one-third, while there is one-third less land under cultivation.

9. Mr. Sabapathy Moodelliar does not confine his attention to deep culture; he is quite aware that, though deep culture is one of the most effective means at the command of the farmer for improving the outturn of his farm, it is only one of the means that are available for securing this desirable object. He is giving attention to the *one* manure, so abundant and yet so little used in India, viz., poudrette, and has made arrangements with the Town authorities of Bellary, Adoni and Cuddapah for obtaining supplies. Last year he manured a considerable area of black cotton soil with this manure, at the rate of about one ton per acre. The results were very satisfactory, but he considers that the rail charge is too high for such bulky manure. The rate appears to be 5 annas per waggon per mile, and the consignee loads and unloads the manure. The rate does not appear to be excessive, for it is only about half an-anna per ton per mile. Certainly the so-called poudrette usually made is so poor, it will not bear the cost of distant carriage; it should be used only near the places where it is collected and prepared or be made into a more concentrated manure. Messrs. Sabapathy Moodelliar and Co. consider that the land manured with poudrette last year shows this year also a marked superiority over the unmanured land; and the portions I saw certainly bore out this conclusion.

10. Messrs. Sabapathy Moodelliar and Co. are, I understand, making arrangements for collecting and crushing bones for use as manure.

It is not only in cultivation and manuring that Mr. Sabapathy Moodelliar is taking such a leading part, but in the introduction of cotton seed of superior kinds; he understands that a deeply-tilled and well-manured soil can be much better employed than in growing inferior, indigenous cotton. He has therefore imported into

the district large quantities of the following varieties:—Coimbatore, Hingunghat, Broach, Dharwar, Tinnevelly and Dhollera, with which most of the land he holds is cropped. Mr. Sabapathy Moodelliar is a firm believer in thin seeding, and has his cotton seed sown at the rate of only about 7 lb. per acre, in lines wide apart. He discourages, as much as possible, the culture of crops between the lines of cotton. in order that the cotton plants may benefit fully from the soil. My own opinion is that his anxiety on this score is unnecessary if care is taken in selecting a suitable crop for growing between the lines of cotton, for, during its early growth cotton does not need much from the soil, and a cereal crop may be grown and removed before the cotton needs the whole of the land; of course, when both cotton and a cereal crop are grown on the same land, more is demanded of the soil, and it must therefore be manured more highly than if cotton only is to be grown.

11. The crops I saw on Messrs. Sabapathy Moodelliar and Co.'s land were almost invariably much better than those of the adjoining land. In passing through the country, it is quite easy to discern by the crops the fields that have been deeply ploughed. Last year the cotton crop was very bad in Bellary, owing to the failure of the rains, and the average outturn on Messrs. Sabapathy Moodelliar and Co.'s land was only about 37½ lb. of clean cotton per acre; but adjoining lands treated in the usual way did not give 10 lb. per acre. One or two fields of low-situated land gave over 100 lb. of clean cotton per acre. Judging from the appearance of the crops when I saw them, the outturn this year will be very much larger than that got last year.

12. The absence of a variety in cropping is a great evil in the Bellary District, and Mr. Sabapathy Moodelliar appears to recognise this fact; he is doing what he can to introduce other crops on the black soil, such as wheat, sugar-cane, indigo and fibre crops.

13. Mr. Sabapathy Moodelliar has shown a practical interest in agricultural education in having given employment to two or three graduates of the School of Agriculture in connection with the enterprise under notice, and he is a warm advocate for a status being accorded to agricultural education equal to that of medical and engineering education.

14. Before concluding this report, I wish to bring to notice one or two points which specially attracted my attention while in Bellary: First, the necessity for screens, in the shape of plantations or fences, for sheltering stock and crops in severe weather; at certain seasons of the year, when the cold winds prevail, which sweep over these treeless plains, farm stock suffer severely. Efforts should, I think, be made to induce those interested in the land, who possess the means, to do what they can to raise screen fences or plantations. Some portions of the district where mixed soils prevail are not unlike the country around Erode, in the Coimbatore District, where a hedge shrub is grown largely known as "Moollukiluway," which is an excellent shrub for forming fences either for shelter or for enclosing crops. I have arranged with the Sub-Collector of Erode for a supply of cuttings of this thorn plant to be sent to Bellary at the proper season, but there are probably other shrubs equally well suited. Another point of interest is the water-supply for man and beast. I heard of instances in which, even in a good season, villagers have to send as far as five miles for their daily supply of water,—due in some instances, not so much to the absence of water, but to the water of their wells having become so saline as to be unfitted for drinking. Wells, which at one time contained good water, are now for this reason abandoned. It would, I think, be a great boon to the people in many places if, in the dry season, a small portable engine, with a centrifugal or other pump, could be sent by Government to the accessible places, for employment in emptying some of these wells, which cannot in many instances be emptied by the means at the disposal of the people. I believe that in most instances the increase in the quantity of salt in the water of these wells is to be attributed simply to the concentration of the salt brought in the natural spring water, due to the loss of water by evaporation over a term of years, and that, if the comparatively speaking concentrated solution of salt in the wells be removed, and the wells be thoroughly cleaned out, the fresh supplies of water when the

springs have come thoroughly into play will generally be fitted for drinking. The experiment is, I think, one well worthy of trial, for, if, successful, much good would result. But more than this is necessary; new wells are greatly required, both for enabling the people to get water for themselves and their stock, and for raising crops and trees where the soils are suitable. I venture, therefore, to invite attention to the suggestion I made in my report on the Coimbatore District relative to the employment of a few squads of men in boring for water in different parts of the district where water is specially required and is likely to be met with. There are other points of interest connected with the improvement of the district, but they need more careful local investigation than my short visit permitted.

Endorsement.

Submitted, through the Board of Revenue, for the information of Government.

2. Mr. Robertson's narrative of the enterprise and energy of Mr. Sabapathy Moodelliar, of Bellary, in the introduction of improved methods of tillage and culture and of unfamiliar—and to the crude native idea repulsive—forms of manure is extremely interesting, while it is equally manifest that the practical results of his improved methods have not failed of effect on other farmers in the district who have had an opportunity of seeing them. The demand for improved ploughs in Bellary steadily increases, and the demand is chiefly met by Mr. Sabapathy, who indents for them directly on England.

3. Referring in paragraph 8 to the *metayer* system adopted by Mr. Sabapathy in his agricultural operations, Mr. Robertson appears to advocate the adoption by Government of a similar method, so as to bring into cultivation a large area of land that is now lying waste. But not to speak of the fact that the *metayer* or sharing system, however successfully it may be worked by a private owner, has been discredited everywhere by Indian history as a Government method of agriculture and revenue, there remains the fact that the lands now waste are so chiefly from the want of people to cultivate them. Rather less than a quarter (not a third as Mr. Robertson puts it) of the population of Bellary disappeared with the famine, and something less than a quarter of the land in occupation before the famine is now lying waste and unoccupied. The people of India are not migratory, and it is improbable that these waste lands will be occupied by immigrant settlers.

4. Mr. Sabapathy's experiments with poudrette are said to have been "very satisfactory," but the report of them would have been more interesting and useful if accompanied by comparative statements of results. Mr. Robertson's suggested remedy for the cost of carriage of this manure to places distant from where it is made, viz., "to make a more concentrated poudrette and to *use it only near the places where it is collected and prepared*" is unintelligible, for the only purpose of concentration must be to fit it for carriage, while concentration is unnecessary if it is to be used only where it is collected and prepared.

5. With reference to the planting of "kiluway" hedges to screen crops and stock from blast (paragraph 14), I have to observe that in Coimbatore it is necessary to supplement for some crops, such as the betel vine, the kiluway hedge by high screens of matting.

6. I am afraid that the remedy for brackish wells proposed by Mr. Robertson in the same paragraph 14 would have only a very temporary effect. The soil is impregnated with salts of various kinds, and these salts as they get solved infiltrate into the water. As the water gets low, the water of course gets more heavily charged. The only lasting remedy is to condense it—a thing easily done by people who know so well how to distil—or to get water from a lower stratum, but this would be generally possible only by means of artesian wells, and they are not always possible.

Resolution—dated 15th March 1883, No. 756.

Submitted to Government.

2. The Board consider that Mr. Sabapathy Moodelliar's efforts to improve the agriculture of the district where he resides are most praiseworthy, and that he deserves every encouragement.

3. It occurs to the Board that in two directions the Government might possibly afford valuable assistance to the people in such a district as Bellary. One is by showing them how to extract from the existing salts, which are so abundant in the soils, those nitrogenous elements which are the great desiderata in manures. Whether this can be done in a cheap and practicable manner (if it can be done at all), and how it is to be done, are questions for a competent analytical or agricultural chemist, such as Dr. Nicholson or Mr. Harman of Bangalore, to decide. The Board believe they are correct in stating that at all Salt Factories a large amount of potential manure is lost in the mother liquors, which are thrown away from ignorance of their value, and, reasoning from analogy, it would appear that similar properties are to be discovered in the salts of the soil, which in their natural condition are usually noxious to vegetable growth, and by filtration into wells render the water undrinkable. The possibility of getting rid of the saline impregnation is therefore a matter of the deepest interest and importance, and the Board would urge on Government the desirability of having the subject scientifically investigated, considering it to be one on which funds might very advantageously be expended.

4. The other point is the sinking of artesian wells, which has indeed lately received the attention of Government in the adjoining district of Anantapúr (*vide* Board's Proceedings, dated 6th December 1882, No. 3024). More favorable conditions than those reported on for Anantapúr would probably be found in the neighbourhood of Bellary; but it would be well to have actual experiments made by a specially-qualified person, acting in consultation with a geologist.

(A true Copy and Extract.)

(Signed) J. A. DAVIES,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Director of Revenue Settlement and Agriculture.
" Collector of Bellary.
" " of Anantapúr.

ORDER—dated 16th June 1883, No. 748, Revenue.

Miscellaneous.

The Government concur with the Board in considering Mr. Sabapathy Mudaliar's enterprise very laudable. The difficulty and cost of effecting repairs appears to be the chief obstacle to the more extended use of European ploughs. Mr. Sabapathy will be supplied with a copy of Mr. Benson's late report on Agricultural Implements suited for introduction into India together with the order thereon.

G.O., 2nd February 1883, No. 143.

2. The Government do not entirely apprehend what is the proposal made in paragraph 3 of the Board's Proceedings, but any practical suggestion will receive their attention. It has been ascertained in the North-Western Provinces that barren saline lands can be reclaimed and their saline impregnations removed by planting *atriplex nummularia* (Salt Bush), and the Superintendent, Government Farms, has been directed to procure a supply of seed for trial at Saidápet. Possibly Mr. Sabapathy Mudaliar may wish to make an experiment at Bellary, in which case Mr. Robertson will supply him with some of the seed.

G.O., Mis. No. 243, dated 19th January 1883.

3. The subject of Artesian wells, the cost of which the Sanitary Commissioner believes has been greatly over-rated, has lately received considerable attention and efforts are being made to discover suitable localities for borings.

G.O., 16th February 1883, No. 224.
G.O., 26th January " " 170.

(True Extract.)

for Secretary to Government.

To the Board of Revenue.
" the Director of Revenue Settlement and Agriculture.
" the Financial Department.
" the Public Works Department.
" the Sanitary Commissioner.
" the Editor's Table.

Exd. W. H. French.

120 Copies.

No 1913 W a/ 9th July/83

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P.W.C. No. 565 9/1

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effect to two of the former. Ploughing a furrow 12 inches wide, an improved plough would have to travel 8 miles to perform one acre of ploughing, but 20 per cent. of the time would be lost at the headlands in turning; the useful day's work would therefore be 4·8 hours; the cattle would thus need to travel nearly 2 miles per hour—a much faster speed than usual. I certainly saw some of the ploughs worked at a speed as great, but it was only for a short time and could not be kept up during a day. Probably, therefore, three-fourths of an acre may be taken as a full day's work with one of the improved ploughs when the land is in really good order. The country plough could not get over more than two-thirds of an acre per day, under similar conditions, and would need to go over the land twice; its effective work would therefore be one-third of an acre per day, and three days would be occupied to do one acre with six pairs of cattle.

6. No bad results have followed on deep-ploughing these black cotton soils, as far as is known; the fact is, that the cotton plant is the chief crop and its deep roots prepare the soil for deep ploughing.

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9. Mr. Sabapathy Moodelliar does not confine his attention to deep culture; he is quite aware that, though deep culture is one of the most effective means at the command of the farmer for improving the outturn of his farm, it is only one of the means that are available for securing this desirable object. He is giving attention to the *one* manure, so abundant and yet so little used in India, viz., poudrette, and has made arrangements with the Town authorities of Bellary, Adoni and Cuddapah for obtaining supplies. Last year he manured a considerable area of black cotton soil with this manure, at the rate of about one ton per acre. The results were very satisfactory, but he considers that the rail charge is too high for such bulky manure. The rate appears to be 5 annas per waggon per mile, and the consignee loads and unloads the manure. The rate does not appear to be excessive, for it is only about half an-anna per ton per mile. Certainly the so-called poudrette usually made is so poor, it will not bear the cost of distant carriage; it should be used only near the places where it is collected and prepared or be made into a more concentrated manure. Messrs. Sabapathy Moodelliar and Co. consider that the land manured with poudrette last year shows this year also a marked superiority over the unmanured land; and the portions I saw certainly bore out this conclusion.

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It is not only in cultivation and manuring that Mr. Sabapathy Moodelliar is taking such a leading part, but in the introduction of cotton seed of superior kinds; he understands that a deeply-tilled and well-manured soil can be much better employed than in growing inferior, indigenous cotton. He has therefore imported into

the district large quantities of the following varieties:—Coimbatore, Hingunghat, Broach, Dharwar, Tinnevelly and Dhollera, with which most of the land he holds is cropped. Mr. Sabapathy Moodelliar is a firm believer in thin seeding, and has his cotton seed sown at the rate of only about 7 lb. per acre, in lines wide apart. He discourages, as much as possible, the culture of crops between the lines of cotton. in order that the cotton plants may benefit fully from the soil. My own opinion is that his anxiety on this score is unnecessary if care is taken in selecting a suitable crop for growing between the lines of cotton, for, during its early growth cotton does not need much from the soil, and a cereal crop may be grown and removed before the cotton needs the whole of the land; of course, when both cotton and a cereal crop are grown on the same land, more is demanded of the soil, and it must therefore be manured more highly than if cotton only is to be grown.

11. The crops I saw on Messrs. Sabapathy Moodelliar and Co.'s land were almost invariably much better than those of the adjoining land. In passing through the country, it is quite easy to discern by the crops the fields that have been deeply ploughed. Last year the cotton crop was very bad in Bellary, owing to the failure of the rains, and the average outturn on Messrs. Sabapathy Moodelliar and Co.'s land was only about 37½ lb. of clean cotton per acre; but adjoining lands treated in the usual way did not give 10 lb. per acre. One or two fields of low-situated land gave over 100 lb. of clean cotton per acre. Judging from the appearance of the crops when I saw them, the outturn this year will be very much larger than that got last year.

12. The absence of a variety in cropping is a great evil in the Bellary District, and Mr. Sabapathy Moodelliar appears to recognise this fact; he is doing what he can to introduce other crops on the black soil, such as wheat, sugar-cane, indigo and fibre crops.

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14. Before concluding this report, I wish to bring to notice one or two points which specially attracted my attention while in Bellary: First, the necessity for screens, in the shape of plantations or fences, for sheltering stock and crops in severe weather; at certain seasons of the year, when the cold winds prevail, which sweep over these treeless plains, farm stock suffer severely. Efforts should, I think, be made to induce those interested in the land, who possess the means, to do what they can to raise screen fences or plantations. Some portions of the district where mixed soils prevail are not unlike the country around Erode, in the Coimbatore District, where a hedge shrub is grown largely known as "Moollukiluway," which is an excellent shrub for forming fences either for shelter or for enclosing crops. I have arranged with the Sub-Collector of Erode for a supply of cuttings of this thorn plant to be sent to Bellary at the proper season, but there are probably other shrubs equally well suited. Another point of interest is the water-supply for man and beast. I heard of instances in which, even in a good season, villagers have to send as far as five miles for their daily supply of water,—due in some instances, not so much to the absence of water, but to the water of their wells having become so saline as to be unfitted for drinking. Wells, which at one time contained good water, are now for this reason abandoned. It would, I think, be a great boon to the people in many places if, in the dry season, a small portable engine, with a centrifugal or other pump, could be sent by Government to the accessible places, for employment in emptying some of these wells, which cannot in many instances be emptied by the means at the disposal of the people. I believe that in most instances the increase in the quantity of salt in the water of these wells is to be attributed simply to the concentration of the salt brought in the natural spring water, due to the loss of water by evaporation over a term of years, and that, if the comparatively speaking concentrated solution of salt in the wells be removed, and the wells be thoroughly cleaned out, the fresh supplies of water when the

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Endorsement.

Submitted, through the Board of Revenue, for the information of Government.

2. Mr. Robertson's narrative of the enterprise and energy of Mr. Sabapathy Moodelliar, of Bellary, in the introduction of improved methods of tillage and culture and of unfamiliar—and to the crude native idea repulsive—forms of manure is extremely interesting, while it is equally manifest that the practical results of his improved methods have not failed of effect on other farmers in the district who have had an opportunity of seeing them. The demand for improved ploughs in Bellary steadily increases, and the demand is chiefly met by Mr. Sabapathy, who indents for them directly on England.

3. Referring in paragraph 8 to the *metayer* system adopted by Mr. Sabapathy in his agricultural operations, Mr. Robertson appears to advocate the adoption by Government of a similar method, so as to bring into cultivation a large area of land that is now lying waste. But not to speak of the fact that the *metayer* or sharing system, however successfully it may be worked by a private owner, has been discredited everywhere by Indian history as a Government method of agriculture and revenue, there remains the fact that the lands now waste are so chiefly from the want of people to cultivate them. Rather less than a quarter (not a third as Mr. Robertson puts it) of the population of Bellary disappeared with the famine, and something less than a quarter of the land in occupation before the famine is now lying waste and unoccupied. The people of India are not migratory, and it is improbable that these waste lands will be occupied by immigrant settlers.

4. Mr. Sabapathy's experiments with poudrette are said to have been "very satisfactory," but the report of them would have been more interesting and useful if accompanied by comparative statements of results. Mr. Robertson's suggested remedy for the cost of carriage of this manure to places distant from where it is made, viz, "to make a more concentrated poudrette and to *use it only near the places where it is collected and prepared*" is unintelligible, for the only purpose of concentration must be to fit it for carriage, while concentration is unnecessary if it is to be used only where it is collected and prepared.

5. With reference to the planting of "kiluway" hedges to screen crops and stock from blast (paragraph 14), I have to observe that in Coimbatore it is necessary to supplement for some crops, such as the betel vine, the kiluway hedge by high screens of matting.

6. I am afraid that the remedy for brackish wells proposed by Mr. Robertson in the same paragraph 14 would have only a very temporary effect. The soil is impregnated with salts of various kinds, and these salts as they get solved infiltrate into the water. As the water gets low, the water of course gets more heavily charged. The only lasting remedy is to condense it—a thing easily done by people who know so well how to distil—or to get water from a lower stratum, but this would be generally possible only by means of artesian wells, and they are not always possible.

Resolution—dated 15th March 1883, No. 756.

Submitted to Government.

2. The Board consider that Mr. Sabapathy Moodelliar's efforts to improve the agriculture of the district where he resides are most praiseworthy, and that he deserves every encouragement.

3. It occurs to the Board that in two directions the Government might possibly afford valuable assistance to the people in such a district as Bellary. One is by showing them how to extract from the existing salts, which are so abundant in the soils, those nitrogenous elements which are the great desiderata in manures. Whether this can be done in a cheap and practicable manner (if it can be done at all), and how it is to be done, are questions for a competent analytical or agricultural chemist, such as Dr. Nicholson or Mr. Harman of Bangalore, to decide. The Board believe they are correct in stating that at all Salt Factories a large amount of potential manure is lost in the mother liquors, which are thrown away from ignorance of their value, and, reasoning from analogy, it would appear that similar properties are to be discovered in the salts of the soil, which in their natural condition are usually noxious to vegetable growth, and by filtration into wells render the water undrinkable. The possibility of getting rid of the saline impregnation is therefore a matter of the deepest interest and importance, and the Board would urge on Government the desirability of having the subject scientifically investigated, considering it to be one on which funds might very advantageously be expended.

4. The other point is the sinking of artesian wells, which has indeed lately received the attention of Government in the adjoining district of Anantapúr (*vide* Board's Proceedings, dated 6th December 1882, No. 3024). More favorable conditions than those reported on for Anantapúr would probably be found in the neighbourhood of Bellary; but it would be well to have actual experiments made by a specially-qualified person, acting in consultation with a geologist.

(A true Copy and Extract.)

(Signed) J. A. DAVIES,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Director of Revenue Settlement and Agriculture.
" Collector of Bellary.
" " of Anantapúr.

Order—dated 16th June 1883, No. 748, Revenue.

Miscellaneous.

The Government concur with the Board in considering Mr. Sabapathy Mudaliar's enterprise very laudable. The difficulty and cost of effecting repairs appears to be the chief obstacle to the more extended use of European ploughs. Mr. Sabapathy will be supplied with a copy of Mr. Benson's late report on Agricultural Implements suited for introduction into India together with the order thereon.

G.O., 2nd February 1883, No. 143.

2. The Government do not entirely apprehend what is the proposal made in paragraph 3 of the Board's Proceedings, but any practical suggestion will receive their attention. It has been ascertained in the North-Western Provinces that barren saline lands can be reclaimed and their saline impregnations removed by planting *atriplex nummularia* (Salt Bush), and the Superintendent, Government Farms, has been directed to procure a supply of seed for trial at Saidápet. Possibly Mr. Sabapathy Mudaliar may wish to make an experiment at Bellary, in which case Mr. Robertson will supply him with some of the seed.

G.O., Mis. No. 243, dated 19th January 1883.

3. The subject of Artesian wells, the cost of which the Sanitary Commissioner believes has been greatly over-rated, has lately received considerable attention and efforts are being made to discover suitable localities for borings.

G.O., 16th February 1883, No. 224.
G.O., 26th January " " 170.

(True Extract.)

(Signed) E. F. WEBSTER,
Secretary to Government.

To the Board of Revenue.
" the Director of Revenue Settlement and Agriculture.
" the Financial Department.
" the Public Works Department.
" the Sanitary Commissioner.
" the Editor's Table.

Exd. W. H. French.

120 Copies.

Govt. of {1883} Madras.

REVENUE.

Issued

Recd. Encl.

G.O., 16th June 1883, No. 748.

No 1913 w/s 9th July/83

JUNE.

Recorded
18/CB.

Sh. 3 Circle

Agricultural Operations in Bellary

conducted by Messrs. A. Sabapathy Mudaiiar and Co.—Orders passed on a report on —.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

READ—the following Proceedings of the Board of Revenue, dated 15th March 1883, No. 756:—

Read—the following letter from W. R. ROBERTSON, Esq., M.R.A.C., Agricultural Reporter to the Government of Madras, to the Director of Revenue Settlement and Agriculture, Madras, dated Saidápet, 23rd January 1883, No. 95; and Endorsement by W. WILSON, Esq., Director of Revenue Settlement and Agriculture, dated 1st March 1883, No. 293:—

In the early part of last month, I availed myself of the permission granted me in the Proceedings of the Board, No. 2465, dated the 9th October last, to visit Bellary and inspect the agricultural operations conducted there by Messrs. A. Sabapathy Moodelliar and Co., and I have now the honor to submit my report on that inspection.

2. Messrs. A. Sabapathy Moodelliar and Co.'s operations have extended over a wide area of country. In 1881, the area worked by the ploughs they had introduced was 1,900 acres situated in 10 different villages; while, last year, the area was increased to 3,430 acres situated in 17 different villages. Opportunities have thus been afforded to a large number of ryots for witnessing these important experiments, as the villages in which the experiments were conducted are scattered over a tract of country fully 30 miles wide. The portious of this land that I inspected are situated near Hagari and near Bantanahal. In my inspection of the land at the former place, I was accompanied by the Collector of the district, and we were conducted over the land by Mr. A. Sabapathy Moodelliar, Mr. Sabapathy Iyer and Mr. Firth. In inspecting the land at Bantanahal, I also had the benefit of the company of Messrs. Sabapathy Moodelliar and Firth. Before proceeding further, I must express the very great obligation I feel under to these gentlemen for the trouble they took in accompanying me over the land inspected, and for the full and valuable information they placed at my disposal. I fear (in the great interest I felt in what Mr. Sabapathy Moodelliar had done, and is doing) I somewhat transgressed the bounds of fair inquiry, for it must be remembered that the enterprise is entirely of a private nature; but if I did do so, it was not resented, for not only was all available information fully afforded to my inquiries, but it was given in a way to suggest other and further questions.

3. The chief circumstances which induced Messrs. Sabapathy Moodelliar and Co. to give their attention to the introduction of improved ploughs for working the cotton soils of Bellary having been noticed at length in the General Report of this department for 1881-82, at pages 14—16, it is unnecessary to notice them again here. Messrs. Sabapathy Moodelliar and Co., have, for some time, been largely interested in the cotton trade of the district, and are now extending their operations to spinning and weaving cotton, and are constructing a large mill for these objects in the town of Bellary. A regular and full supply of cotton, of a good quality, is therefore a matter of considerable importance to this enterprising firm —objects quite sufficient to explain Messrs. Sabapathy Moodelliar and Co.'s interest in, and their desire to improve, the husbandry of the district. But, I believe, Mr. Sabapathy Moodelliar is influenced by other objects than mere personal gain, highly laudable as such an object would be. He has long been connected with the district, is familiar with a considerable part of it and the people of the cultivating classes, and has noticed with concern the gradually increasing poverty of the people and the less and less care devoted to the tillage of the soil—influences which, in a season of great drought culminated in the famine,

which so recently devastated the district, resulting in a loss of about one-third of the population and the abandonment of nearly one-third of the arable area. Mr. Sabapathy Moodelliar has deeply considered this and other circumstances bearing on the state of agriculture in Bellary, and has fully convinced himself that it is the imperative duty of all men possessing wealth, who have any interest whatever in the welfare of the district, to use some of that wealth and what influence they possess in promoting whatever may tend to further the interests of husbandry. Mr. Sabapathy Moodelliar looks upon this duty in the same light as many others of his countrymen who possess wealth do on the duty to provide choultries and similar institutions for Brahmins and other castes, but that the duty to promote the agriculture of the country is of paramount importance—a view in which I venture to believe all will concur who possess any real knowledge of India and its husbandry, and who desire to see the country prosper.

4. Messrs. Sabapathy Moodelliar and Co. have introduced into this district the undermentioned ploughs :—

Swedish ploughs	334
Improved wood and iron ploughs	60
Ransome's double ploughs	5
Do. triple-furrow do.	1
Do. four-furrow do.	1
Total ..	401

They have already sold 132 of the Swedish ploughs and all of the Ransome's double ploughs. Some of the ploughs were sent to the Nizam's Dominions, the Mysore Province, a few to the Kurnool District, and to the Dharwar District in the Bombay Presidency. Thus the good influences set in operation are extending widely. Judging from the great gatherings of ryots I saw, and the great interest they appeared to evince, at Bantanahal and elsewhere, where the ploughs were exhibited at work, or the land that had been ploughed could be seen, Mr. Sabapathy Moodelliar is apparently doing much good in the district. It was a great pleasure to accompany him over the land, and to witness the interest with which the ryots listened to his remarks, and the apparent pride they took in the superior crops raised on the deeply-ploughed land. I am convinced that the movement is entirely spontaneous on the part of the ryots, and is due simply to their appreciation of the quality of the work done under Mr. Sabapathy Moodelliar.

5. The plough in most request is a Swedish Plough, No. 16, which after being strengthened is sold at Rs. 65 each. Though it is, I think, the largest and heaviest plough that has ever been introduced into this part of India, the ryots, in their appreciation of the deep-going power of the plough, sometimes drive it much deeper than it is intended to work, and the consequence has been that in several cases the powerful beam of the plough has been bent; but Messrs. Sabapathy and Co.'s Workshops have proved equal to this emergency, and the ploughs of the kind now sent out have first their beams strengthened by iron plates. The ploughs are sold to ryots either for payment in cotton, for cash, or on credit for 4 or 8 months. In some cases, the ploughs are lent on hire at Rs. 10 per month. Ploughing to an average depth of from 10 to 12 inches, these improved ploughs are said to do the undermentioned work per day of 6 hours :—

	Acre.
Land in a very dry state	$0\frac{1}{2}$
Land in a moderately dry state	$0\frac{3}{4}$
Land in a very good state	1

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Endorsement.

Submitted, through the Board of Revenue, for the information of Government.

2. Mr. Robertson's narrative of the enterprise and energy of Mr. Sabapathy Moodelliar, of Bellary, in the introduction of improved methods of tillage and culture and of unfamiliar—and to the crude native idea repulsive—forms of manure is extremely interesting, while it is equally manifest that the practical results of his improved methods have not failed of effect on other farmers in the district who have had an opportunity of seeing them. The demand for improved ploughs in Bellary steadily increases, and the demand is chiefly met by Mr. Sabapathy, who indents for them directly on England.

3. Referring in paragraph 8 to the *metayer* system adopted by Mr. Sabapathy in his agricultural operations, Mr. Robertson appears to advocate the adoption by Government of a similar method, so as to bring into cultivation a large area of land that is now lying waste. But not to speak of the fact that the *metayer* or sharing system, however successfully it may be worked by a private owner, has been discredited everywhere by Indian history as a Government method of agriculture and revenue, there remains the fact that the lands now waste are so chiefly from the want of people to cultivate them. Rather less than a quarter (not a third as Mr. Robertson puts it) of the population of Bellary disappeared with the famine, and something less than a quarter of the land in occupation before the famine is now lying waste and unoccupied. The people of India are not migratory, and it is improbable that these waste lands will be occupied by immigrant settlers.

4. Mr. Sabapathy's experiments with poudrette are said to have been "very satisfactory," but the report of them would have been more interesting and useful if accompanied by comparative statements of results. Mr. Robertson's suggested remedy for the cost of carriage of this manure to places distant from where it is made, viz., "to make a more concentrated poudrette and to *use it only near the places where it is collected and prepared*" is unintelligible, for the only purpose of concentration must be to fit it for carriage, while concentration is unnecessary if it is to be used only where it is collected and prepared.

5. With reference to the planting of "kiluway" hedges to screen crops and stock from blast (paragraph 14), I have to observe that in Coimbatore it is necessary to supplement for some crops, such as the betel vine, the kiluway hedge by high screens of matting.

6. I am afraid that the remedy for brackish wells proposed by Mr. Robertson in the same paragraph 14 would have only a very temporary effect. The soil is impregnated with salts of various kinds, and these salts as they get solved infiltrate into the water. As the water gets low, the water of course gets more heavily charged. The only lasting remedy is to condense it—a thing easily done by people who know so well how to distil—or to get water from a lower stratum, but this would be generally possible only by means of artesian wells, and they are not always possible.

Resolution—dated 15th March 1883, No. 756.

Submitted to Government.

2. The Board consider that Mr. Sabapathy Moodelliar's efforts to improve the agriculture of the district where he resides are most praiseworthy, and that he deserves every encouragement.

3. It occurs to the Board that in two directions the Government might possibly afford valuable assistance to the people in such a district as Bellary. One is by showing them how to extract from the existing salts, which are so abundant in the soils, those nitrogenous elements which are the great desiderata in manures. Whether this can be done in a cheap and practicable manner (if it can be done at all), and how it is to be done, are questions for a competent analytical or agricultural chemist, such as Dr. Nicholson or Mr. Harman of Bangalore, to decide. The Board believe they are correct in stating that at all Salt Factories a large amount of potential manure is lost in the mother liquors, which are thrown away from ignorance of their value, and, reasoning from analogy, it would appear that similar properties are to be discovered in the salts of the soil, which in their natural condition are usually noxious to vegetable growth, and by filtration into wells render the water undrinkable. The possibility of getting rid of the saline impregnation is therefore a matter of the deepest interest and importance, and the Board would urge on Government the desirability of having the subject scientifically investigated, considering it to be one on which funds might very advantageously be expended.

4. The other point is the sinking of artesian wells, which has indeed lately received the attention of Government in the adjoining district of Anantapúr (*vide* Board's Proceedings, dated 6th December 1882, No. 3024). More favorable conditions than those reported on for Anantapúr would probably be found in the neighbourhood of Bellary; but it would be well to have actual experiments made by a specially-qualified person, acting in consultation with a geologist.

(A true Copy and Extract.)

(Signed) J. A. DAVIES,
Acting Sub-Secretary.

To the Secretary to Government, Revenue Department.
Copy to the Director of Revenue Settlement and Agriculture.
" Collector of Bellary.
" " of Anantapúr.

Order—dated 16th June 1883, No. 748, Revenue.

Miscellaneous.

The Government concur with the Board in considering Mr. Sabapathy Mudaliar's enterprise very laudable. The difficulty and cost of effecting repairs appears to be the chief obstacle to the more extended use of European ploughs. Mr. Sabapathy will be supplied with a copy of Mr. Benson's late report on Agricultural Implements suited for introduction into India together with the order thereon.

G.O., 2nd February 1883, No. 143.

2. The Government do not entirely apprehend what is the proposal made in paragraph 3 of the Board's Proceedings, but any practical suggestion will receive their attention. It has been ascertained in the North-Western Provinces that barren saline lands can be reclaimed and their saline impregnations removed by planting *atriplex nummularia* (Salt Bush), and the Superintendent, Government Farms, has been directed to procure a supply of seed for trial at Saidápet. Possibly Mr. Sabapathy Mudaliar may wish to make an experiment at Bellary, in which case Mr. Robertson will supply him with some of the seed.

G.O., Mis. No. 243, dated 19th January 1883.

3. The subject of Artesian wells, the cost of which the Sanitary Commissioner believes has been greatly over-rated, has lately received considerable attention and efforts are being made to discover suitable localities for borings.

G.O., 16th February 1883, No. 224.
G.O., 26th January " " 170.

(True Extract.)

(Signed) E. F. WEBSTER,
Secretary to Government.

To the Board of Revenue.
" the Director of Revenue Settlement and Agriculture.
" the Financial Department.
" the Public Works Department.
" the Sanitary Commissioner.
" the Editor's Table.

Exd. W. H. French.

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Agricultural Operations in Bellary

conducted by Messrs. A. Sabapathy Mudaliar and Co.—Orders passed on a report on —.