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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

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Dated	17. 12. 1874	196 .

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department,
17th December 1874.

No. 217. Read the following Proceedings of the Board of Revenue, dated 11th November 1874, No. 3,247 :—

Read the following letter from Surgeon J. J. L. RATTON, M. C., on special salt duty, to C. A. GALTON, Esq., Acting Sub-Secretary to the Board of Revenue, dated Tuticorin, 19th September 1874, No. 41 :—

With reference to your office memorandum No. 1,164, I have the honor to forward a reply to the question proposed in Board's Proceedings, paragraph 27, dated 18th July 1874.

2. My calculations as to the minimum ground-area that can be profitably worked for salt manufacture are made out as follows : Considering that the mean specific gravity of sea-water on the east coast of the Presidency during the salt season is 1,026·82 ; that sea-water of this density contains 2·610 per cent. by weight of common salt, and that in the process of salt manufacture 3·5 parts of the above 2·610 are obtainable. Considering that a cubic foot of sea-water of the above density will weigh at 82° F., the mean surface temperature of the sea during salt season, 1022·84 ounces. And again considering that the mean ridge one inch vertical in three days, taking as in my previous reports 10,000 square feet and thirty days as units, it follows that 10 inches vertical of sea-water will be evaporated from an area of 10,000 square feet in thirty days, or 8,338·3 cubic feet weighing 8,518,465·9 ounces will be evaporated in thirty days, leaving 3·5 per cent. of its weight, or 1 garce 10 maunds of common salt behind. Theoretically speaking, therefore, the yield from 10,000 square feet in thirty days will be 1 garce 40 maunds.

3. Practically, various deductions have to be made from the outturn shown in last paragraph. Owing to the number of ridges, paths and channels which divide and sub-divide an ullum, on an average 15 per cents of the whole area is dry and unproductive, and 15 per cent. should be deducted from the outturn found. Again, there is leakage in the very best of ullums. I have been at pains to ascertain its amount and do not think that I can put it at less than 15 per cent. of the whole irrigation. In my experimental pans it was much more, but these were quite new. There is waste also in scraping, ridge-heaping, transporting, drying out, stacking and breaking up for weighment, which amounts to 1 bottom about 5 per cent. Something too should be deducted for bad weather. Even in a fair season of six months' duration there is a loss of about fifteen days, or 2½ days in thirty, which calls for a further deduction of 8·3 per cent. *Per contra* there is the effect accumulated bitterns have in expediting the separation of common salt from sea-water, so that it is not necessary to evaporate beyond 25° B., and salt is obtained in less time or more of it in a given time than shown in paragraph (1). This increment, I think, neutralizes the last deduction of 8·3 per cent. Deducting the three first items of loss, amounting to 35 per cent, from the theoretical

crop, the corrected outturn per 10,000 square feet in thirty days will be 104 measures.

4. The usual Kodiyaram or contract price paid for salt by Government is Rupees 10 a garce or 1 Anna 4 Pies per measure.

5. The expenses of salt manufacture are about as follows: The average cost of preparing salt-pans is Rs. 5 per 10,000 square feet. (The cost of making them for the first time, with which this calculation is not concerned, is nearer Rs. 20 for the same area). Less than two coolies cannot be employed in a set of salt pans, but two coolies can conduct the manufacturing operations over an area of 50,000 square feet. Cheyr-hire averages about Rs. 5 a-month. The salt season may be reckoned at six months. The cost of replacing and repairing worn out or damaged implements, etc., amounts to about Rs. 5 during the season. Their original cost is but a trifle more. The cost of extra labor at the time of storing and thatching, the price of thatch and sundries, liberally estimated, amount together to 8 Annas per 10,000 square feet in thirty days. Hence in a salt season of six months, the account of an ullum of 10,000 square feet would show on the debtor side—

	Rs.	A.	P.
To Preparation	5	0	0
" Hire of two coolies	60	0	0
" Repairing implements, etc.	5	0	0
" Extra aid during storing	3	0	0
Total ...	73	0	0

And on the credit side—

	Rs.	A.	P.
By Kodiyaram value of 5 garce 2½ measures of salt produce	52	0	0
And the Profit and Loss account would show a loss of Rupees	21	0	0

6. An area of 20,000 square feet would give 104 Rs. worth of salt as against an expenditure of Rs. 81. The profit balance Rs. 23, does not leave any margin for bad seasons. It is insufficient. An area of 30,000 square feet would turn out 156 Rs. worth of salt at a cost of Rs. 89, the difference, Rs. 67, is, all things considered, about the lowest margin of profit that can be safely worked for in salt manufacture. I would recommend the minimum area of independent holdings to be fixed at 30,000 square feet. On the other hand, as showing the value of extending the area as far as is compatible with the amount of labor, it may be stated that an ullum of 50,000 square feet would yield 260 Rs. worth of salt on an outlay of Rs. 130, showing a profit of more than 100 per cent. on the expenditure.

7. I have not noticed in the foregoing remarks the fact that many of the cultivators, especially in the Southern Districts, work with brine stronger than sea-water. Some use salt brine three times its density, and others, as at Tuticorin, Aniengaud, and Vedaranien, brine much stronger still. These brines yield, according to their density, three or four times as much salt as seawater. At Levingepuram, the pit brine marks 12° B. It should yield, if it were of the same composition, about four times as much salt as sea brine which marks but 3° B. It is not desired to draw a hard and fast line at the minimum ullum. Deputy Collectors with their hydrometers can regulate the pro dimensions in their

different divisions by reference to the density of the brine supply. At Levingepuram for instance, if Levingepuram were not so sandy, the value of the outturn for 10,000 square feet in six months, shown in paragraph 6 to be 52 Rs., might be multiplied by 4, giving a return of Rs. 208 on an outlay of Rs. 72, and 10,000 square feet would then be an ample minimum area to work with. This by way of example only. At Levingepuram the leakage is more than 15 per cent.

8. I have been carefully gathering the information herein contained during the last three years, and I believe the facts may be relied on.

In his report on salt manufacture in the Southern Districts, dated 11th October 1873, Dr. Ratton drew the attention of the Board to the evils arising from the minute sub-division of salt-pans, and remarked that "a strict limitation of the minimum size of salt-pans to be held and treated as a separate possession to half or even a quarter cawny, would be a decided step towards the improvement of salt manufacture." He further added, that he would prescribe a minimum standard area known to be capable of yielding good salt profitably, and reconstruct pans on that basis. The Board observed [illegible] standard ullum for working purposes, and accordingly called upon Dr. Ratton to state the limit he would fix. The letter above recorded is the reply.

Paragraph 25, page 8, Dr. Ratton's Report on Southern Districts.

Paragraph 6, page 85.

2. Dr. Ratton considers that an ullum of 30,000 square feet, which is a little above half a cawny, is the minimum that can be worked with profit, when the manufacture is carried on with sea-water. He thinks that it would yield a profit of Rs. 67. Where sub-soil brine is used, a considerably smaller area would yield a fair margin of profit.

3. The Board fully agree with Dr. Ratton in thinking that the effect of small holdings is detrimental. The holders can have no inducement to work carefully, and the cost of manufacture will always be greater in small than in large holdings. But the evil is hardly susceptible of an effectual remedy. As already observed by the Board, division of property under the ordinary law of inheritance, or by forced sales or transfers, cannot be prevented; but a great deal can be done by local officers explaining to the manufacturers the advantage of large holdings, and the desirability of carrying on the manufacture only where the holdings are too small to be separately worked. All Collectors of Salt Districts are requested to do their best to promote the object in view.

4. The Board understand that the divided portions of an ullum are never recognised and registered as separate ullums, but only as fractions of an ullum, and that sub-division is never carried to the extent of diminishing the usual size of the salt-bed and the condensing reservoirs. Should, however, in any case the sub-division be carried to the extent of reducing the ordinary and usual size of a salt-bed, or of the reservoirs, Collectors are competent to refuse registry in such cases, and to prevent manufacture of salt in such ullums. When new ullums

ares granted, care should be taken that their size does not fall short of the minimum prescribed by Dr. Ratton, and the size of the bed and the reservoir should also be prescribed. Dr. Ratton observes that though the reason is inexplicable "the finest silk is known to be produced in the largest beds."

See Dr. Ratton's description of a scientific arrangement of the silkworm on page 28 "et seq." Reports on Northern Districts.

Paragraph 29, page 7.

8. In paragraph 27 of their Proceedings, dated 18th July 1874, the Board remarked that it was "impossible to enforce the amalgamation of existing properties; but without interfering in any way with the rights of property, the amalgamation of small properties might be carried into effect by registering a larger one in the joint names of the holders of its constituent parts, just as a field is held by joint putadars, as opportunities occur." On a further consideration of the subject, the Board doubt whether such a joint registration will be productive of any good, while it may lead to discussions and litigations with regard to the individual rights to produce salt and receive Kalidarum. Collectors are, therefore, requested to consider that part of the Proceedings above quoted as cancelled.

(A true Copy and Extract)

(Signed) H. B. STOKES,
Acting Secretary.

No. 1213. Office, Madras, 15th December 1877. No. 1213.

Separate Revenue No. 15
1877.

Revenue.

(True Extract)

(Signed) C. H. MASTER,
Acting Secretary to Government.

No. 3,247.

PROCEEDINGS OF THE BOARD OF REVENUE, dated 11th November 1874.

Read the following letter from Surgeon J. J. L. HATTON, M. D., on special salt duty, to C. A. GALTON, Esq., Acting Sub-Secretary to the Board of Revenue, dated Tuticorin, 19th September 1874, No. 41:—

WITH reference to your office memorandum No. 1,464, I have the honor to forward a reply to the question proposed in Board's Proceedings, paragraph 27, dated 18th July 1874.

2. My calculations as to the minimum ground area that can be profitably worked for salt manufacture are made out as follows. Considering that the mean specific gravity of sea-water on the east coast of the Presidency during the salt season is 1,025·82; that sea-water of this density contains 2·610 per cent. by weight of common salt, and that in the process of salt manufacture 2·5 parts of the above 2·610 are obtainable. Considering that a cubic foot of sea-water of the above density will weigh at 82° F., the mean surface temperature of the sea during salt season, 1022·34 ounces. And, finally, considering that the mean rate of evaporation of sea-water of all densities, evaporated during salt manufacture, is one inch vertical in three days, taking as in my previous reports 10,000 square feet and thirty days as units, it follows that 10 inches vertical of sea-water will be evaporated from an area of 10,000 square feet in thirty days, or 8,333·3 cubic feet weighing 8,519,465·9 ounces will be evaporated in thirty days, leaving 2·5 per cent. of its weight, or 1 garce 40 maunds of common salt behind. Theoretically speaking, therefore, the yield from 10,000 square feet in thirty days will be 1 garce 40 maunds.

3. Practically, various deductions have to be made from the outturn shown in last paragraph. Owing to the number of ridges, paths and channels which divide and sub-divide an ullum, on an average 15 per cent. of the whole area is dry and unproductive, and 15 per cent. should be deducted from the outturn found. Again, there is leakage in the very best of ullums. I have been at pains to ascertain its amount and do not think that I can put it at less than 15 per cent. of the whole irrigation. In my experimental pans it was much more, but they were quite new. There is waste also in scraping, ridge heaping, transport, drying out, stacking and breaking up for weighment, which amounts to, I believe, about 5 per cent. Something too should be deducted for bad weather. Even in a fair season of six months' duration there is a loss of about fifteen days, or 2·5 days in thirty, which calls for a further deduction of 8·3 per cent. *Per contra* there is the effect accumulated bitterns have in expediting the separation of common salt from sea-water, so that it is not necessary to evaporate beyond 29° B., and salt is obtained in less time, or more of it in a given time than shown in paragraph (1). This increment, I think, neutralizes the last deduction of 8·3 per cent. Deducting the three first items of loss, amounting to 35 per cent, from the theoretical crop, the corrected outturn per 10,000 square feet in thirty days will be 104 maunds.

4. The usual Kaduvuram or contract price paid for salt by Government is Rupees 10 a garce, or 1 Anna 4 Pies per maund.

5. The expenses of salt manufacture are about as follows. The average cost of preparing salt-pans is Rupees 5 per 10,000 square feet. The cost of making them for the first time, with which this calculation is not concerned, is nearer Rupees 20 for the same area). Less than two coolies cannot be employed in a set of salt-pans, but two coolies can conduct the manufacturing operations over an area of 50,000 square feet. Cooly-hire averages about Rupees 5 a-month. The salt season may be reckoned at six months. The cost of replacing and repairing worn out or damaged implements, etc., amounts to about Rupees 5 during the season. Their original cost is but a trifle more. The cost of extra labor at the time of storing and thatching, the price of thatch and sundries, liberally estimated, amount together to 8 Annas per 10,000 square feet in thirty days. Hence in a salt season of six months, the account of an ullum of 10,000 square feet would show on the debtor side—

		Rs.	A.	P.
To	Preparation	5	0	0
,,	Hire of two coolies	60	0	0
,,	Repairing implements, etc.	5	0	0
,,	Extra labor, thatch, sundries	8	0	0
	Total ...	78	0	0

And on the credit side—

	Rs.	A.	P.
By Kadivaram value of 5 garce 24 maunds of salt produce	52	0	0
And the Profit and Loss account would show a loss of Rupees	21	0	0

6. An area of 20,000 square feet would give 104 Rupees worth of salt as against an expenditure of Rupees 81. The profit balance, Rupees 23, does not leave any margin for bad seasons. It is insufficient. An area of 30,000 square feet would turn out 156 Rupees worth of salt at a cost of Rupees 89, the difference, Rupees 67, is, all things considered, about the lowest margin of profit that can be safely worked for in salt manufacture. I would recommend the minimum area of independent holdings to be fixed at 30,000 square feet. On the other hand, as showing the value of extending the area as far as is compatible with the amount of labor, it may be stated that an ullum of 50,000 square feet would yield 260 Rupees worth of salt on an outlay of Rupees 105, showing a profit of more than 150 per cent. on the expenditure.

7. I have not noticed in the foregoing remarks the fact that many of the salt-pans, especially in the Southern Districts, work with brine stronger than sea-water. Some using pit brine three times its density, and others, as at Tuticorin, Autengarai, and Vedarniem, brine much stronger still. These brines yield, according to their density, three or four times as much salt as sea-water. At Levingepuram, the pit brine marks 12° B. It should yield, if it were of the same composition, about four times as much salt as sea brine which marks but 3° B. If it be not desired to draw a hard and fast line at the minimum ullum, Deputy-Collectors with their hydrometers can regulate the pan dimensions in their different divisions by reference to the density of the brine supply. At Levingepuram for instance, if Levingepuram were not so sandy, the value of the outturn for 10,000 square feet in six months, shown in paragraph 5 to be 52 Rupees, might be multiplied by 4, giving a return of Rupees 208 on an outlay of Rupees 72, and 10,000 square feet would then be an ample minimum area to work with. This by way of example only. At Levingepuram the leakage is more than 15 per cent.

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See Dr. Ratton's description of a scientific arrangement of the ullum at page 28 "*et seq.*" Report on Northern Districts.

Paragraph 23, page 7.

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(A true Copy and Extract.)

Acting Sub-Secretary.

To all Collectors of Salt Districts.

Copy to the Acting Secretary to Government, Revenue Department.
" to Dr. J. J. L. Ratton, on special duty.
" to all other Collectors.
" to all Salt Deputy Collectors.
" to the Inspector-General of Police.

Edd. W. H. French.