

It was during his stewardship that the Agricultural Journal of India changed from being a quarterly into a bi-monthly and schemes of agricultural development were vigorously pushed through. The knowledge he must have gained while at Pusa of the inner workings of the Imperial Government and the prodigious schemes for reconstruction launched by the British Ministry to put the Empire on its feet once again would, we hope, have made him ponder over the work which was awaiting him in his former scene of activities.

The Hon'ble Dewan Bahadur L. D. Swamikannu Pillai on relief of his duties as Acting Director of Agriculture went on leave. He has been posted as Collector of North Arcot. We trust he will continue to evince sympathy with the department even in his new sphere of office.

**Advantage of a two ramped (Bellary) mhote
over a single-ramped (local) mhote
in case of deep wells.**

One of the serious problems that confront a garden-land ryot is irrigation. Among the various lifts presented to a ryot, mhote is most suited since it costs little, does not require much mechanical skill and is more efficient than most other lifts.

It is the endeavour of all to get more efficient work, with less exhaustion to the working animals. This is secured by the introduction of a two ramped or Bellary mhote. To get a definite idea a comparative study is essential of the two mhotes working side by

side. At an excursion made to Vadavalli, when I was a student at the College, I happened to come across a single-ramped or local mhote and a two-ramped (Bellary) mhote working side by side in a ryot's garden.

Construction:—The construction of a local mhote is well known to all. In a Bellary mhote the bucket is bigger. There are two ramps and the slope is sharper. The ordinary mhote bucket holds about 40 gallons whereas the capacity of a double-ramped mhote bucket is 50 to 60 gallons. The ramp in a single-ramped mhote has an inclination of 1 in 5 whereas it is 1 in 3 in the other.

Since the ramp is steeper it will be very difficult to back the animals up in one and the same ramp. The second ramp obviates this difficulty, the pair at the bottom of the ramp after the delivery of water in the bucket is unyoked and allowed to go up by the second ramp. The yoking and unyoking is very simple with a hook and ring system.

The driver after unyoking walks up the ramp with the mhote rope. He is here aided in the ascent by the downward pull of the bucket. By the time he reaches the top of the ramp there is a second pair ready to be yoked in charge of another man. This time the second man drives the animals and meanwhile the first driver gets ready with his pair to receive the hook in his turn. Thus alternately each pair is used and the trouble of backing up the animals is thus saved. Herein lies one advantage from the humane point of view.

Backing up is as tiresome as, if not more tiresome than, going down the ramp, lifting the bucket. In the Bellary mhote the trouble of backing up is saved. The two pairs take rest alternately and feel less exhausted at the end of the day. The less the exertion of the animals, the greater the length of life, and hence less the depreciation. Herein lies a second advantage.

The greater the steep, the greater the weight of the animal used i. e. the greater the internal work developed. To use technical

terms "out-put" and "in-put" become greater. It is this increased ratio that helps us to use a larger bucket. Herein lies the third advantage.

Now I shall consider the working side of it. In the ryot's garden mentioned above I compared the working of the two mhotes for 15 minutes. By the time the single mhote baled out 12 buckets, the double ramped mhote baled out 22 ie., the single mhote can bale out 48 buckets in an hour while the double-ramped mhote could bale out 88 in the same time. The depth of the well was 40 feet. The steep of the ramp and the size of buckets are the same in both cases. The comparison is as follows:—

Water baled out in the single-ramped mhote in 1 hour supposing the capacity of the bucket to be 40 gallons.	40 × 48	1920
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Water baled out in the double-ramped mhote in 1 hour supposing the capacity of bucket to be the same.	40 × 88	3520
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The loss in the latter case per hour comparing its work with two single-ramped mhotes.	3840—3520	320
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Hence the loss per day of 8 hours.	8 × 320	2560
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The water baled out in a single-ramped mhote in a day of 8 hours.	8 × 1920	15360
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The cost of lifting 15360 gallons $1\frac{1}{2}$ Rs.

do 2560 ,, $2560/15360 \times 24$ as. = 4 as.

According to the figures there is a loss of 4 as to be incurred in the double-ramped mhote system. At the same time we have to consider the saving of a set of mhote material and the saving in depreciation due to prolonged life of the animals. We can neglect the cost of mhote framework since there is an additional ramp in the double-ramped mhote system to compensate. We may take the price of a set of mhote material to be about Rs. 60 and a pair of

animals to be about Rs. 400. The animals working in the single ramped mhote may be taken to live for eight years and those in the double ramped mhote for ten years or at any rate we may consider the latter pair to outlive the former by two years.

Then the saving by depreciation comes to 2% per annum
Therefore saving by depreciation on Rs. 800 Rs.

(cost of 2 pairs of animals) per annum. $2 \times 800 / 100$ 16
Therefore saving by depreciation per day. $16 \times 16 \times 12 / 365$ 8 pies
Gain by a set of mhote material costing Rs. 60.

Depreciation on Rs. 60 @ 15% $60 \times 15 / 100$ Rs. 9

Interest on Rs. 60 @ 5% $60 \times 5 / 100$ Rs. 3

Therefore saving by Bellary system per annum Rs. 12

Therefore saving by Bellary system per day $12 \times 16 \times 12 / 365$ 6 ps.

Altogether there is a saving of 14 pies to make up the loss of 4 as. as mentioned previously. So the loss by Bellary system as is worked by the ryot of Vadavalli comes to one anna 4 pies.

But he can not only make up the loss but gain too if he used a bigger bucket. Let us suppose that the bigger bucket is of 50 gallons capacity and he could bale out 80 buckets in an hour insted of 88. Then the work is done.

Water baled out by Bellary mhote in 1 hour	80×50	gallons. 4000
Water baled out by local mhote in 1 hour	48×40	1920
Therefore quantity of water gained per hour by Bellary mhote comparatively 2 single mhotes.	$4000 - 1920$	2080
Therefore quantity of water gained per day by Bellary mhote.	2080×8	16640
Cost of lifting 15360 gallons	$1 \frac{1}{2}$ Rs.	
Therefore the cost of lifting 1280 gals.	2 as.	

Saving by depreciation and mhothe material
from previous figure.

14 pies.

Therefore gain by a double ramped mhothe if
a bigger bucket is used is

2 as. 10 pies.

A bigger bucket with a capacity of 60 gallons can be conveniently used and the profit accruing is higher.

In the case of deep wells, the use of a double ramped mhothe is thus more advantageous than a single mhothe both from humane and economical points of view.

K. Avadainayagam.

[About fifty Bellary mhotes are working in Ganapathy, Peele-
madu and other villages in the Coimbatore Taluk—Editor.]

A tour in Guntur Cattle-breeding tracts.

(A Rambler)

I arrived at Chirala on the 19th and left for Chilakalavorepeta where I arrived the same evening, having journeyed 24 miles unenlivened by the vast stretches of sorghum fields skirting the road all the way. This village is, as Indians estimate it, an important centre in the tract where the famous Ongole breed is reared and lies on the Guntur-Ongole road. The predominating soils of this tract are black loams or alluviums brought down and deposited by the several jungle streams which with their torrents obstruct the passage of a hapless footman or carter on a rainy day, but yield readily to a soil-digger when they are dry. These streams pursue a winding course, and by their very sluggishness at low water, ensure an unfailing supply for cattle roaming into them to quench their thirst or have a plunge. They drain the surrounding country very well and grass grows rich and in large quantities on lands lying near. The two features which give this tract an eminence for its breed of cattle are the plentiful grazing and good water supply. Many villages have grown up on the banks of these streams and the important ones are Dandamudi, Uppilipadu, Cottipadu, Velore and Snadepadu all which I visited.