

(1) Number of pages 8  
(2) Date of repair 21-7-86  
(3) Initials of the Referencer long

# TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

*Revenue* DEPARTMENT

|          |      |        |
|----------|------|--------|
| G.O. No. | 2442 | Press. |
| B.P. No. |      | Mis.   |

|       |           |      |
|-------|-----------|------|
| Dated | 30-4-1877 | 197. |
|-------|-----------|------|

*R.R.*  
Not to be folded or roughly handled

Read the following papers :—

No. 250. Endorsement of the Chief Engineer for Irrigation, dated 26th November 1875, No. 1,399.

From Major J. BEATTY, R.E., Acting Superintending Engineer, Godavery District, to Lieutenant-Colonel J. MULLINS, R.E., Chief Engineer for Irrigation, dated Camp, Thadepalligudem, 12th November 1875, No. 2,370.

I HAVE the honor to submit herewith the report of the Executive Engineer, Dumagudiem Range, on the probable cost of a canal for boats from the existing steam-boat canal near Gungole to Budrachellum.

One Range Officer's report with covering letter.  
" Map of First Barrier, Upper Godavery. (Despatched by Banghy on 10th November 1875.)  
" Letter of the Executive Engineer proposing a toll on the timber traffic.

2. You are of course aware that the great works near Dumagudiem, called the first barrier works, were undertaken for the purpose of providing a passage for navigation past the great barrier of rocks met with in the bed of the Godavery between Budrachellum and Dumagudiem.

3. The anicut is situated at the upper end of that barrier, and according to the original project it was proposed to lead off a steam-boat canal from the anicut which would follow the left bank of the river for 25 miles and lock into it at a place called Sudarum near Devarapilly, about  $8\frac{1}{2}$  miles below Budrachellum.

4. All the head works were completed, but only about  $2\frac{1}{4}$  miles of the steam-boat canal, which now terminates by locking into the river in the midst of the rocky barrier, and above some of the principal obstructions. The present tail locks are situated at the mouth of the Borragula vagu (in the lands of the village of Gungole), marked No. 6 on the accompanying plan, (all the vagus below Dumagudiem are numbered), the result is that an expenditure of about 26 lakhs of Rupees has been rendered almost useless.

5. Steamers can only use the canal for about six months at most. During the remainder of the year native boats with difficulty reach it by a circuitous channel through the rocks, and sometimes in the dry season this channel becomes impassable even for boats of the smallest draught. At such times boats have to stop at Budrachellum, and cargoes must be conveyed overland past the barrier, and re-shipped above Dumagudiem.

6. The probable cost of completing the steam-boat canal to Sudarum, according to Colonel Haig's original scheme, was estimated some years ago at about 15 lakhs of Rupees, and as there seems to be no prospect of this work being undertaken, the present Executive Engineer, Mr. Vanstavern, has suggested the formation of a boat canal of the least expensive description, to connect the present steam-boat canal near Gungole with the river at Budrachellum. Steamers would then be able, as now, to use the short canal for about six months in the year, and native boats could pass the barrier all the year round by the boat canal.

7. On the question of terminating a boat canal at Budrachellum, I find that Colonel Haig has written that, "all the serious obstructions are above Budrachellum, and below that place the only difficulties are shoals which are no worse than boats

meet with between the first and second barriers." Colonel Haig also observes that a flight of locks into the river can be constructed "much more cheaply at Budrachellum than at Sudarum; at the latter place there are some difficulties, at the former you could almost cut the chambers out of the solid rock and merely put in sills and gates."

8. Mr. Vanstavern has estimated that a cheap boat canal from Gungole to Sudarum with locks there into the river would cost about  $5\frac{3}{4}$  lakhs, but he recommends terminating it at Budrachellum for the reasons given by Colonel Haig, and then its cost would be only a little over 3 lakhs.

9. The present canal which terminates at Gungole, about  $2\frac{1}{4}$  miles below Dumagudiem head lock, is called the "short canal" in contradistinction to the Sudarum line, which is called the "long canal." The boat canal would take off from the "short canal" a little above the Gungole tail locks, and after running parallel to the river for about a mile, or a mile and a half, it turns to the south-east in order to take advantage of the western branch of an important nullah called the Torbaka vagu, which flows into the Godavery about 7 miles below the Gungole tail locks. All small nullahs or streams in the Upper Godavery are called vagus. The Torbaka vagu drains 76 square miles.

10. After reaching the vagu the boat canal would follow the course of that stream for about  $4\frac{1}{2}$  miles, straight cuts being made where practicable through the numerous bends. Mr. Vanstavern proposes that the canal should leave the vagu about a mile above the place where it flows into the Godavery, and then run nearly parallel to the river up to its tail locks at Budrachellum.

11. Here I must observe that it is not yet quite certain whether the boat canal should go through the high ground between the river and the vagu. On this point Colonel Haig has stated that "no estimate was ever made for taking the canal round Duntinum point, and that it is possible that line would be cheaper than going through the high ground, and down the line of the vagu, even though it should be necessary to cut through rock for a mile."

12. But Mr. Vanstavern writes, "no correct surveys have been made for the line round Duntinum point. I have walked over that line, and estimate that there would be nearly four miles of rock cutting; the bare rock appears in many places and at others closely crops up out of the ground; this rock consists of gneiss and granite, and I think it would be a costly undertaking." Another objection to the line by Duntinum point is that flood embankments would be required along the whole distance from Gungole to Torbaka; but as there is a difference of opinion on this question, both lines should be carefully examined, and borings made to ascertain the exact quantity of rock on each line.

13. A lock would be required at the head of the boat canal with flood gates to prevent the river in times of high fresh entering it over the Gungole tail locks and flowing down it. This lock would have its sills on the same level. The next lock would be about  $\frac{3}{4}$ ths, of a mile above Seetumpetta, where the canal leaves the vagu, and as near the vagu as practicable, because the approach will be sure to silt up during freshes in the vagu. This lock would also have flood gates to shut out the freshes.

A flight of three locks will also be needed at the end of the canal near Budrachellum; and for this, as above stated, there is a very convenient rocky site. Flood gates would be required at the upper end of these locks.

2442  
2

A regulating dam, with sluices in the body wall, would have to be constructed at the mouth of the Torbaka vagu, and a surplus weir near the tail locks at Budrachellum.

The project would also include the flood banks necessary to exclude the river in the higher freshes.

14. Mr. Vanstavern's estimate for the boat canal from Gungole to Budrachellum is as follows:—

|                                                                                                              | RS.    |
|--------------------------------------------------------------------------------------------------------------|--------|
| Excavation by the line of the western branch of the Torbaka vagu to Seetumpetta lock; about 8 miles          | 34,600 |
| Flood banks on this section                                                                                  | 25,000 |
| Completing the excavation with flood banks from Seetumpetta to Budrachellum; about $5\frac{1}{2}$ miles      | 20,000 |
| Head lock with floodgates at Gungole, and bridge over tail bay to carry the Budrachellum and Dumagudiem road | 37,500 |
| Regulating dam on the vagu where boat canal enters the Torbaka vagu                                          | 15,000 |
| Do. with sluices at the mouth of the Torbaka vagu                                                            | 21,000 |
| Lock at Seetumpetta                                                                                          | 37,000 |
| Sluice and surplus weir in the old tramway embankment on vagu No. 19                                         | 7,350  |
| Repairs of tank bunds on the smaller vagus                                                                   | 10,100 |
| Flight of three locks with flood gates at Budrachellum                                                       | 68,250 |
| Surplus weir at Budrachellum                                                                                 | 12,400 |
| Contingencies at 5 per cent.                                                                                 | 14,800 |

Total, Estimate ... 3,03,000

15. So far as I can judge, in the absence of a proper survey and levels, it seems to me doubtful whether the earthworks have not been somewhat underestimated; but, on the other hand, the sums allowed for masonry works are probably much more than will be needed, and, on the whole, this rough estimate may be found a very fair approximation to the actual cost of the work.

16. I send herewith a statement showing the traffic on the short canal during the last four years. Notwithstanding the great difficulties that the navigation has now to contend with, and which it is proposed to remove by means of the boat canal, the imports have increased in value from Rupees 31,722 in 1871 to Rupees 88,776 in 1874, and exports in the same years have increased from Rupees 9,065 to Rupees 73,430. In addition to this there is an average annual export of 16,550 logs of timber, valued at Rupees 1,19,100.

17. Mr. Vanstavern proposes\* that a toll of 1 Anna per log should be levied on all timber passing through the canal, which he observes would pay for the lock maintenance. A small license fee of 4 Annas per ton might also be levied on boats using the canal, to be increased to 1 Rupee when a boat canal to Budrachellum is constructed and opened to traffic.

18. Should Government order the preparation of detailed estimates for Mr. Vanstavern's proposed boat canal, it will be necessary to send up an experienced

\* Vide accompanying letter.

Surveyor and to provide the Range Officer with a Draughtsman. The estimate would be as follows:—

|                                                                                | RS.   |
|--------------------------------------------------------------------------------|-------|
| A Surveyor for six months at Rupees 150                                        | 900   |
| Six Lascars at 10 Rupees each                                                  | 360   |
| A Draughtsman and Estimator for four months at Rupees 80                       | 320   |
| Contingencies, such as bench-marks, clearing jungle, marking out the line, &c. | 720   |
| Borings where necessary to ascertain the nature of soil                        | 200   |
| Total                                                                          | 2,500 |

TRANSFERRED to the Chief Engineer, Public Works Department.

(Signed) JOHN MULLINS, Lieut.-Col., R.E.,  
Chief Engineer for Irrigation.

No. 250-A.

#### MEMORANDUM.

THE proposal of Major Beatty to investigate the best line for, and the cost of constructing a boat canal from near the end of the present Short Canal from the first barrier anient on the Upper Godavery to Budrachellum, is one which should, the undersigned thinks, be adopted. It is considered also that, under present circumstances, attention should be turned to a boat canal rather than to an extension of the steamer canal, and, so far as the information adduced by Mr. Vanstavern and Major Beatty goes, it would appear that a canal terminating at Budrachellum in the 17th mile will secure practically nearly all the advantages which would be obtainable from continuing canal navigation to Sudaram, some  $8\frac{1}{2}$  miles lower down the river, while in one important respect—easy access to the navigable channel of the river—the higher terminus is represented to present marked superiority.

2. It will be desirable therefore to sanction the cost, estimated at Rupees 2,500, of the further investigations, and it is most desirable that they should be undertaken and completed by Mr. Vanstavern, who is thoroughly acquainted with the locality, rates of work, &c.

3. With regard to some of the details of the boat canal, it may be noticed that the proposed depth of 4 feet of water and bottom width of 15 feet are too little for effective navigation, and it is thought that 5 feet depth and a water width at surface of 35\* feet are the least that should be provided for even in the first instance, seeing

\* Equivalent generally to 20 feet bottom width. that the navigable width would then be only  $35 - 7\frac{1}{2} = 27\frac{1}{2}$  feet, which will be none too much for boats to pass each other conveniently, and the width of rafts must then be limited to 12 feet as a maximum, which is smaller than the dimensions allowed on the delta canals. Tow-paths on both sides not much above water level, say, 3 feet as a maximum, should be arranged for, and the cross sections should be laid out with the spoil so placed as to allow of ample room for future widening. Second class locks,  $105 \times 15$ , will be likely to meet all requirements for very many

2442  
3

years to come, and should the traffic hereafter need the use of steamers capable of passing such locks, there will probably be no difficulty in procuring steamers of sufficient power and of dimensions adapted to the locks.

4. Mr. Vanstavern should take care permanently to mark out the centre line of the canal as finally selected, and to establish bench-marks, which should be shown on the survey, and of which the reduced levels should be tabulated thereon.

5. Major-General Walker's strictures on the manner in which the Upper Godavery navigation works were carried on by Colonel Haig with, as a result, but little practical benefit from a very large total expenditure, would be just supposing that the event could reasonably have been foreseen from the beginning, but it is believed that Colonel Haig had good reason to suppose that the great scheme of opening up water communication with Central India, by means of the Godavery and its tributaries, had been demonstrated to be one of such great value and importance as to ensure its being carried on to completion at any cost not out of proportion to the mileage of navigation which would thereby be secured and made available. Had the Godavery navigation been treated as a trunk line of communication, and dealt with as the railways generally have been, there might have been no cause to regret the commencement of works in more than one locality, because this arrangement would have in the long run facilitated and hastened the opening up of the country. It appears then to the undersigned that Colonel Haig was as much or as little right in the course adopted by him, as is the Railway Engineer who arranges for commencing most of his big bridges and all the more difficult works along a given line of railway of considerable length, in order that the opening of the line to traffic may not be hindered and delayed by the incompleteness of those works which take the longest time to construct. All great undertakings require faith in their utility; they should not be begun if they are not to be completed. Colonel Haig's error arose from his not appreciating sufficiently the instability of opinion in respect to public works; had he judged that what was esteemed to be of great value at one time would in the course of a few years be deemed to be of little moment, he would doubtless have adopted the exact course which General Walker condemns him for not following.

6. The undersigned views the boat canal to Budrachellum as the best arrangement which can under present circumstances be adopted to prevent in part money already spent from continuing to be useless, and it may be proper to indulge the hope that at some future time, with perhaps the aid which some development of traffic resulting from the turning of the first barrier will bring, a reaction in favor of Sir Arthur Cotton's scheme may set in, and an extension of the works be sanctioned. The approximate estimate for the boat canal is just over 3 lakhs of Rupees. If 4 or even 5 lakhs will suffice to complete the turning of the first barrier on a reduced, but still perfectly serviceable scale, it will be a good thing to do this work, and whether this small sum of money be likely to be available or not within a year or two, it will be well to ascertain the best way of doing the work and the cost of doing it, while there is an officer available who has the experience and local knowledge necessary to determine what the arrangements should be.

(Signed) JOHN MULLINS, Lt.-Col., R.E.,  
Chief Engineer, P.W.D.

20th March 1877.

Proceedings of the Madras Government, Public Works Department,  
10th April 1877. No. 1,232.

No. 251.

ORDER THEREON, 10th April 1877, No. 1,232.

CIVIL WORKS, No. 24.

Fund.—PROVINCIAL SERVICES.

Class.—Communications.

Main-head.—Original Works.

Head.—(7.) Navigable Canals.

Project of which the work forms part.—Canal for boats from the steam-boat canal near Gungole to Badrachelum.

Work.—Investigation, &c., of the Project.

Amount.—Rupees 2,500.

To be carried out by the Public Works Department.

HIS GRACE the Governor in Council after a careful consideration of the letter No. 2,370 of the 12th November 1875, from the Superintending Engineer, Godavery, and its accompaniments, and of the memorandum, dated 20th March 1877, of the Chief Engineer, Public Works Department, is of opinion that the proposal to investigate at an estimated cost of

Rupees 2,500, the best line for a boat canal in continuation of the short canal from the anicut near Dumagudiem at the head of the first barrier on the Godavery, and to frame reliable estimates for this boat canal after the surveys and levels have been completed, is one which should receive the approval of Government, and the Superintending Engineer is accordingly authorized to arrange for the work being undertaken as soon as possible.

2. Major Beatty's special attention should be given to the remarks of the Chief Engineer in the first four paragraphs of his memorandum, and the Superintending Engineer should understand that Government attach much importance to the early completion and submission of the project.

3. The estimate now sanctioned, aggregating Rupees 2,500, is noted in detail in the last paragraph of the Acting Superintending Engineer's letter printed above.

4. Rupees 2,500 are appropriated for the work from the Provincial Reserve at the disposal of Government for 1877-78.

5. This sanction is registered as Provincial No. 11—W of 1877-78.

(True Extract.)

*EA* *Mad* Colonel, R.E.,  
Secretary to Government, P.W.D.

To the Superintending Engineer, Godavery.

„ Chief Engineer for Irrigation.

„ Examiner of Public Works Accounts.

„ Revenue Department. ✓

Ed. S. T. Austin.

20 Spare Copies

Red. 11 28<sup>27</sup>/<sub>4</sub>

No 2442.

Comm: to the  
Board of Revenue

Q 30 April 1877 -

15. S. the N. of Rancocas 20-17-77