Public Works (1896) Department.

G.O., No. 5390

Dated 25-6-96

[Despatch Abstract.]

Investigation of an irrigation project, Orders stating that it is not considered worthwhile for the reasons given to undertake the investigation of any irrigation project in the upland taluks of the Godavari D^t., and calling for a report as to whether any sensible reduction can be made in the charges for maintenance of the Dummagudem head works and Canal.

[P. W. 26. 3,000 - 23-10-96.]

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

IRRIGATION.

Govt. of {1896} Madras.

PUBLIC WORKS.

Dated June, 25th.

Read. *Encl.*

G.O. No. 539 I., 25th June 1896.

JUNE.

Investigation of Irrigation Project

Orders stating that it is not considered worth while, for the reasons given, to undertake the investigation of any irrigation project in the upland taluks of the Gódávari district, and calling for a report as to whether any sensible reduction can be made in the charges for maintenance of the Dumagudiem Head Works and canal.

No. 539 I., 25TH JUNE 1896.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From W. C. DEMORGAN, Esq., Executive Engineer, in charge of I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 29th April 1896, No. 189 D.

With reference to G.O. No. 192 I., dated 21st February 1896, I have the honour to inform you that there are no records in the office of the Superintending Engineer, I Circle, connected with the *Sabari* or as it is written on the map "*Saveri*" project.

2. I however caused search to be made among the records of the late Upper Gódávari Superintending Engineer's office and forward the following documents in original for your information :—

(*a*) Original letter from the Secretary to Chief Commissioner, Central Provinces, No. 3/26, dated 3rd June 1868, to the Superintending Engineer, Upper Gódávari, forwarding Captain Glasford's report on the scheme.

(*b*) Copy of annual report for 1870–71 from the Superintending Engineer, Upper Gódávari, to the Secretary to Chief Commissioner, No. 64/342, of 5th May 1871.

3. Captain Glasford's report is, it appears, a criticism on a scheme proposed by Major Haig for constructing an anicut on the Saveri river, about 50 miles from its junction with the Gódávari, in the neighbourhood of Poreh, with canals parallel to the river, by which means he calculated that 150,000 acres in Bhadráchalam and Rékapalle taluks would be brought under cultivation.

The estimate of 150,000 acres is certainly a very sanguine one, and Captain Glasford in his report points out the various objections and difficulties. The construction of the canals would involve many heavy masonry works, and a glance at the map shows that these lines would cross all the important affluents of the Saveri. The country is sparsely populated, difficult of access, and the supplies of food materials insufficient. As far as I am aware there are no signs of the immigration that was anticipated. In fact the reverse is rather the case.

Captain Glasford advocates the improvement of the irrigation supply by constructing new tanks and improving the old ones. And as this could be done tentatively and by degrees, it would be much more reasonable in every respect than embarking on a large and costly scheme.

4. From B, the annual report of Upper Gódávari, 1870–71, it would appear that the larger scheme was abandoned and a smaller one investigated. This consisted in the irrigation of some 18,000 acres in Rékapalle taluk from an anicut to be constructed on the Sokaleru. Rs. 2,900 were spent on the survey and the work of the year detailed. There are no records in this office to show whether any further advance was made on the investigation or any final orders passed.

5. If any projects for improvement of Bhadráchalam and Rékapalle taluks are contemplated, it would, in my opinion, be preferable to improve existing or construct new tanks. I am personally unacquainted with the locality, but from an examination of the map and what I hear, I am disposed to think that either the Saveri or Sokaleru schemes would be far more difficult and expensive than anything in the worst parts of the Rushikulya and with far less prospect of ever proving remunerative.

6. The President of the Local Fund Board has been addressed, and replies that the Board is not prepared to contribute towards the maintenance of the Dumagudiem anicut and canal.

No. 122 I.

Note by the Chief Engineer for Irrigation.

The papers forwarded by the Executive Engineer in charge, I Circle, it is considered, go to show that any irrigation projects on a large scale undertaken in the sparsely inhabited upland taluks of the Gódávari district are not at all likely to meet with success from a remunerative point of view. The constant communication maintained between this district and Burmah leads to a stream of emigration from the former to the latter which prevents any overstocking of population of the agricultural type. The unhealthiness of the localities indicated in the report is also a strong reason against any attempt being made to undertake investigations of irrigation projects, more especially when there are numerous others already more or less investigated in healthier and more populous tracts and for which funds have not been forthcoming.

2. In scrutinising the charges incurred on the Dumagudiem anicut and canal, it appears that the largest items are "Wages for the maintenance of Dumagudiem works" and "Maintenance of canal," and these are annually recurring charges. The Superintending Engineer should be called upon to report whether any sensible reduction can be made upon these items, both of which appear out of proportion to the work involved. The subject, then, of final abandonment of the works or their future maintenance can be decided upon. It appears hardly necessary that a separate sub-division should be maintained, and an upper or lower subordinate attached to the Rajahmundry sub-division would, it is considered, suffice to watch the interests of the Government at Dumagudiem.

MADRAS, 5th June 1896. (Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E., Chief Engineer for Irrigation.

ORDER—No. 539 I., dated 25th June 1896.

His Excellency the Governor in Council does not consider it worth while, for the reasons given, to undertake the investigation of any irrigation project in the upland taluks of the Gódávari district.

2. The Superintending Engineer, I Circle, will report whether any sensible reduction can be made in the charges for maintenance of the Dumagudiem Head Works and canal.

(True Extract.)

Under Secy. to Govt., P.W.D., Irrigation Branch.

To the Superintending Engineer, I Circle.
" Chief Engineer for Irrigation.
" Revenue Department.

Exd. Shaik Karim.
Spare Copies

No. 539 I, d 25th June 1896.

PUBLIC WORKS DEPARTMENT,
IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Irrigation

UNDER date the

READ the following

Letter from the Exec: Engineer, in charge, I Circle. } (Hd. Qrs. No. 189 - G.D. dated 29.4.96)

Note by the Chief Engineer for Irrig: (Hd. Qrs. No. 122 I. dated 5.6.96)

420

The papers forwarded by the Executive Engineer in charge, I Circle, it is considered, go to show that any irrigation projects on a large scale undertaken in the sparsely inhabited upland taluqs of the Godavari district are not at all likely to meet with success from a remunerative point of view. The constant communication maintained between this district and Burmah leads to a stream of emigration from the former to the latter which prevents any overstocking of population of the agricultural type. The unhealthiness of the localities indicated in the report is also a strong reason against any attempt being made to undertake investigations of irrigation

irrigation projects, more especially when there are numerous others already more or less investigated in healthier and more populous tracts and for which funds have not been forthcoming.

2. In sanctioning the charges incurred on the Dummagudem Anicut and Canal, it appears that the largest items are "wages for the maintenance of Dummagudem Works" and "maintenance of Canal," and these are annually recurring charges. The Superintending Engineer should be called upon to report whether any sensible reduction can be made upon these items, both of which appear out of proportion to the work involved.

The subject then, of final abandonment of the works or their future maintenance can be decided upon.

It appears hardly necessary that a separate Sub-division should be maintained, and an Upper or Lower subordinate attached to the Rajahmundry subdivision would, it is considered, suffice to watch the interests of the Government at Dummagudem.

A.G.H. 7.6.96

Order thereon 43

His Excellency the Governor in Council does not consider it worthwhile, for the reasons given, to undertake the investigation of any irrigation project in the up-land taluqs of the Godavari district.

2. The Superg. Engineer, First Circle, will report whether any sensible reduction can be made in the charges for maintenance of the Dummagudem Head Works and Canal.

Pneedk 5/6/96

DESPATCHED 13 JUN 96

To
The Superg. Engineer, First Circle.
" Chief Engineer for Irrigation.
" Revenue Dept.

W. CURRET No. 5696

Enclosure

Reads: 22.6.96

Drumagindiem Canal Wala and Sabari and other irrigation projects in the uplands of the Godavari district

Some Rivers 17/6

E. I. Form No. 1—500—14-5-95

No. 3/26 3560

SECRETARY TO CHIEF COMMISSIONER'S OFFICE, C. P., D. P. W.,

Nagpore, 3rd June 1868.

FROM

SECRETARY TO CHIEF COMMISSIONER,

PUBLIC WORKS DEPARTMENT,

CENTRAL PROVINCES.

TO

The Superintending Engineer

Upper Godavary Circle

SIR,

Your No. 37 dated 15 January/68

In returning sanctioned Estimate with Plan amounting to Rs 9,162/- of the cost of a preliminary survey for one year of two lines of Irrigation Canals in the Budzachellum and Pakapilly Talookes, debitable to Part IV, Establishment, Irrigation Budget 1868/69, I am desired to inform you that Mr. Harris would like to see the scheme worked out in detail, and that he has every confidence in your having the investigations properly carried out.

2. A copy of Captain Glasfurd's Report on the Seavy Irrigation Project is forwarded

This is no doubt Saveri or Savari, as the name is spelt on map. HWell EE.

Sebey.

Forwarded for information.

CHIEF ENGINEER FOR IRRIGATION 3 MAR. 93 No.

I have the honor to be
Sir,
Your most obed. Servant
W. Bedford Capt. R.E.
for Secy. to Chief Commr.
C.P. & B.P.W.

Pws. 3
5656/92

Memorandum by Captain Bedford on the Seory Irrigation Project papers forwarded by the Secretary to the Chief Commissioner P.W. Department in his No. 1/2 dated 3 March to the Deputy Commissioner Upper Godaveery Dist.

Savri

36 80

The Secretary Chief Commissioner P.W. Department enquires:-

1st Whether the Scheme is deemed feasible

I know of no insurmountable objects to be met with in this particular project as far as the Annicut and canals go- There will require to be several Substantial aqueducts over the Seelair River and the Soklair and other large streams that flow at right angles to the course of the proposed canals- Some of the most serious obstacles in my opinion would be the remoteness of the site of the chief works, the necessity of Establishments for the importation of supplies of all descriptions as it is improbable traders will venture so far into the interior, and the difficulty and expense of inducing labourers to remain in such a remote and unhealthy Country - The rates of labour of every description would probably be far higher than they are at Doomagoodium and Luchampilly-?

Spelt Sil er River and Sokal er R. wDch.

There is an Exhampili ? below Porch on Savri R. but it appears to be an insignificant place.

But it seems to me that the most important point respecting this Project and one which could be readily ascertained without much expense is, will the Seory River, fifty miles above its Savri R. Confluence

confluence with the Godavery supply the quantity of water required to irrigate 150,000 acres?

I think that till this has been carefully ascertained and put beyond a doubt, it cannot be stated with even an approach to certainty whether the project is feasible or not -

And regarding this point I beg to be permitted to observe that any calculation made at the confluence of the Savari Seory with the Godavery would be quite deceptive regarding the quantity that would be available for irrigation from the proposed Canals. The Seelair River, by far the largest tributary of the Seory and which in the driest season has always a considerable body of water - flows into it - twenty five miles below the site of the proposed Anicut - The Soklair also a small, but perennial stream, joins the Seory below the inflow of the Seelair It appears to me therefore that to obtain the correct discharge of the Seory for the purposes of this project it should be gauged as near the site of the proposed Anicut as possible -

2nd Whether the people would desire to use the water:-

I am certain the people would be very willing to use the water for irrigation - I have more than once pointed out the eagerness with which the people of this District take up lands which can be irrigated either from Tanks or by throwing small

Silver R.

Somewhere near the Ferry below Porch.

dams across hollows to retain the surface drainage, vide my Report on a tour to Nirmul in October 1866.

My proposals for irrigating a portion of the Seroncha Taluk and my final settlement report now with the Settlement Commissioner -

3rd Whether they (the people) want water and would pay for it -

I consider water is wanted to a considerable extent and that a certain quantity of land would be taken up were the means wherewith to irrigate it provided -

The people would willingly pay for the use of the water they require -

The actual extent of land that would be taken up by the present population were the means to irrigate it afforded them will be found in my Final Settlement Report - In Budrachellum and Rakapilly I estimate it would amount at the outside to about half that or 10,144 acres in about ten or fifteen years hence -

The rates paid for irrigated lands in Budrachellum and Rakapilly are

by Telingas Rs 4-- per acre
by Koys " 1-8- per Acre

The Koys being a wild race and very far behind the Telingas as cultivators pay less -

I agree with Major Haig in his 3d paragraph where he states that the Bustar Chellum and Raka pilly Talooks offer the most extensive field for irrigation from the larger Rivers -

I agree with Major Haig in his 8th Paragraph where he states there will require to be a large increase to the population of this District before it will afford any thing more than an insignificant amount of traffic to the River, and that this increase must come from immigration.

I agree with Major Haig in his 9th 10th and 11th paras that almost the sole inducement we can at present offer to the inhabitants of the surrounding Districts[x] is, better Government and a lighter land Revenue -

x Nizam's territories & Bustar

I agree with Major Haig generally in his 18th para where he states that the inducement to immigration into this District must as a general rule be somewhat stronger than the mere difference between the two systems of Government before we can expect any large increase to the present population -

I agree with Major Haig in his 19th para that the conditions of the case would be materially altered were irrigation more extensively available and I agree that we might then look for a considerable increase to the population from immigration chiefly from Bustar and the Nizam's territories.

I

irrigation
[sic in orig]

I do not exactly understand from Major Haig's 21st para whether he means that the Koy population would appreciate the benefits of education more than other classes, but I wish to state that all classes in this District are equally alive to the advantages of irrigation and that all exhibit equal eagerness in taking up every spot to which water can be led or on which it can be collected -

The Koys are poor cultivators, possessing but few cattle and being in the habit of borrowing them when they can from their wealthier Telinga neighbours - They pay far less for their lands than Telingas do, and will probably not pay higher rates for some years -

I quite agree with all Major Haig says from his 21st to 25th para I think that irrigation will have a powerful effect in inducing the Koys to settle down and abandon their present restless habits, indeed I believe it is the only inducement for I know of some Good Villages favorably situated with respect to irrigation from perennial streams where the population have been fixed for years - Till these wild tribes abandon their restless mode of life, we can hardly look forward to any marked improvement in their Social or moral condition -

Paras 27 to 33 discuss professional matters

I

I have therefore no Remarks to make thereon
I observe it is proposed to irrigate about 150,000
acres or nearly the whole area of the Bhadra-
chellum and Rakapilly Taluks by means
of an Anicut across the Seary about fifty
fifty miles from its confluence with the Godavery
and twenty five miles further up than the boundary
of the District and two Canals one on each
bank of the River - It seems therefore that an
Anicut and fifty miles of Canal will have
to be constructed before we can get the water into
the Bhadrachellum and Rakapilly Taluks -
As this is probably the last opportunity I shall
have of saying any thing on the subject of Irri-
gation in this District I beg to be permitted to
supplement my remarks made in my Final
Settlement Report - I have there gone fully into
the subject and have given a careful Estimate
of the extent of land that would be taken up
were the means to irrigate it provided by Govern-
ment - I based this Estimate upon facts and
Statistics and making I believe ample allowance
for a large increase in the energy of the Agricultural
classes - Greater consumption of food by the
people themselves and the stimulus that would
be given to cultivation by increased demand
I fixed the Amount of irrigated land required
by the present population in excess of what
they

Savari

already have, for the next twenty years
at 15,000 acres - of which I states that 8,000 acres
should be provided at once I am perfectly certain
that future experience will show that this Estimate
is over and not under the mark -
Now the Badrachellum and Rakapilly Taluks
to which only the Seary Irrigation Project extends
would according to the above Estimate require
8705 acres of irrigated land in addition to what
they already have and of this 4,643 acres should
be provided at once - This is the requirement
of the present population -
But the Seary Project Provides for 150,000 acres
From this Subtract the present cultivated area
of Badrachellum and Rakapilly and there remain
124200 acres or 14 times more than the Estimated
requirement - To cultivate this area we should
require an increase by immigration of 14
times the present population !!
I believe I am as sanguine as most people
regarding the effect an extended system of irriga-
tion will have on the Country - and I wish to go
for as to conjecture that the present population
might under very favorable circumstances be doubled
in twenty five or thirty years - But surrounded as we
are by sparsely populated tracts an increase to the
extent sufficient to cultivate 124,200 acres of irrigated
land is I feel convinced to remote that at present

it

it seems to me to be taking a flight into the regions of speculation to give it a thought-

I see that in his 33 paragraph Major Haig proposes to cut the canals at first to a section sufficient to convey water for an area not much in excess of the present cultivated area, demonstrating thereby that the Project can be begun on a small scale suited to present requirements and gradually expanded as required-

In addition to the cost of the Annicut and the fifty miles of Canal necessary to bring the water into the District, it should be recollected that to give irrigation to our widely scattered population miles upon miles of Canal would be necessary to irrigate patches of land here and there- we could hardly expect all the people to move to one particular locality and ~~scute~~ Scoot down there for our convenience- Americanism?

I beg it may be understood that I am far from detracting from this Project- I think it is an admirable one, and that if the discharge of the Leary be found sufficient to irrigate the proposed area and there were people enough to cultivate it & that we had any reliable prospect of the requisite increase to the population within a reasonable period- I should think that it could not fail to succeed as a Reproductive work- But I must say that this want of population appears to me a serious

a serious if not perfectly insurmountable obstacle- 40 SP

And after all I presume if Government desire to give this District the benefits of irrigation they would invite free discussion as to the most economical and certain effectual method of doing so-

It is admitted on all sides that many of the former Governments paid great attention to the subject of irrigation, and had advanced in this respect considerably beyond what their successors have yet attempted, and our own efforts, I believe have in many notable instances been confined to renewing and repairing old works- It will therefore be probably conceded that these Governments must have had a good idea of the systems of irrigation best adapted for different Provinces-

In this part of India they appear to have directed their efforts to give the people irrigation from an elaborate system of Tanks And here it will be well worth the while to take up sheet No 74 of the Trigonometrical Survey Maps of the District immediately to the South and West of the Godavery and Observe the manner in which every Stream is dammed up along its course-

This system appears to have been extended to

to this side of the Godavery also but unfortunately most of the Tanks are now quite out of repair and some have been so, for such a length of time that they are quite overgrown with jungle.

It seems to me that he could not do better than follow the example of the Government that instituted this system of irrigation, first by repairing all old Tanks and afterwards Constructing new ones as our requirements increase. I think that for a poor and sparsely populated District such as this, this system has many special advantages not the least being the manner in which it can be spread without much expense so as to irrigate the lands of every village. In my Final Settlement Report I mentioned that I hoped soon to be able to lay before the Chief Commissioner a proposal for irrigation in this District and I now beg to submit a statement which I have only lately been able to complete of all Tanks out of repair in this District containing all the information I have been able to collect respecting them. It will be observed that if repaired these Tanks will give irrigation to about 4000 acres and this with the extent of irrigation from the Tanks proposed in my letter 901 dated 11th June last would furnish 10,000 acres.

I conclude with the Remark that the number of Tanks can be increased to almost any extent as our requirements increase. I beg to state that this completes my proposal for irrigation for the present requirements of the District.

I admit that by the side of the Scory Projects this looks a very humble proposal indeed but I trust that this will not disqualify it in the Chief Commissioner's opinion.

I think it is a practical one and while it does not commit the Government to any particular course, it provides for present wants economically and in accordance with the customs of the Country and can be enlarged to any extent.

After all the question upon which the Government will most probably base its decision is which will be the most remunerative application of the Rupees for the District.

This question embraces such a variety of considerations that the only apology I can offer for this somewhat lengthy Memorandum is my desire to throw as much light upon the subject as possible. Which ever scheme may be taken up the result to the people will be the same. There will be placed within their reach the means of effecting that improvement in their material condition after which only we may hope fully look forward to the results of education and other civilizing influences.

True Copy

Charles Pelham

Supt to Pr Sec to C.P.

61

1293
1267
R130

1863
1870
23

SUPERINTENDING ENGINEER PRINTER
GODAVARI CIRCLE
27 APR. 96

CHIEF ENGINEER
FOR IRRIGATION.
26 MAY 96
No. 780

EASTERN DIVISION
Genl. No. 102
21 APR. 96
GODAVARI.

Dss. 2
5626/96

No. 64/342.

Dumagudiem
5th May 1871

580

From.

The Superintending Engineer
Upper Godavari circle

To.

The Secretary to Chief Commr.
Public Works Deptt &c. &c.

Sir

I have the honor to submit the following report upon the operations in this Circle during the past year 1870-71.

The expenditure during the year has been as follows

Communications

Original Works

1st Barrier Division	Rs	114293
2nd Barrier Dv.		222442
Repairs 1st Barrier Dv.	Rs	2921
Minor Works 1st Barrier Division	Rs	351
2d Barrier Dv.		1675
Total Communications		341,682

Brought forward ———		3,41,682
Military Buildings		
Original Works		
2nd Barrier Division — Rs	2,078	
Repairs		
2 Barries Division —	166	
Total Military Buildings .	2,244	2,244
Civil Buildings —		
Original Works —		
1st Barrier Division Rs —	309	
Repairs		
1st Barrier Division Rs —	214	
2nd Barries Division —	1917	
Total Civil Buildings Rs	2,440	2440
Irrigation		
Minor Works		
1st Barrier Division Rs —	6,796	
Total Irrigation Rs	6,796	6,796
Total Works		3,53,162
Establishments —		
Direction ——— Rs	22,786	
Construction ———	116818	
Total Establishments —		139,604
Total expenditure —		1,92,766

2. The budget grant for original works Communications was Rs 380,484 and the total expended in the 1st and 2nd Barrier Divisions excluding minor works and repairs, for which there was separate appropriation, was Rs 3,36,735 thus shewing a short expenditure of Rs 43,749 Exclusive of the decrease in the value of stock within the Divisions. This short expenditure was principally at the 2nd Barrier Division, and was due to the great difficulty which has been experienced this year, in procuring labor, owing to several causes, amongst which are the Excellent harvest in the coast districts, from which labor is recruited, and the works which are in progress this year at the coast and in the Godavari Delta, both of which render the coast people

unwilling to leave their homes.

The expenditure on Establishments may be thus subdivided

Salaries	Rs	128,654
Travelling allowances		8,671
Contingencies		2,279
		139,604

and the percentages upon the Total expenditure for works or Rs. 3,53,162 are as follows-

Salaries	36·42	per cent
Travelling allowances	2·45	— " —
Contingencies	0·64	— " —
Total	39·51	— " —

of which 6·45 per cent is due to Direction —

1st Barrier Division

3. The following is a statement shewing, in detail for each work in the 1st Barrier Division, the expenditure during the year and up to the 1st April 1871 compared with the various Estimates submitted.

Name of works	Estimated cost	Total expended up to 1st April 1871	Total expended during 1870-71	Total of each head of service	Remarks
Anicut	323,870	238,269	4,970		
Canal	173,496	170,826	2,924		
Head Locks	151,726	157,641	3,180		
Tail Locks	183,392	183,352	248		
Flood Embankments	59,864	58,615	283		
Scouring Sluices	107,487	104,603	357		
Regulating Tanks at Gongole	18,760	17,284	5,008		
Embankment of Buregula Nullah	11,286	11,445	3,990		
River Improvements from Purnoxalato Bhudrachellum	239,665	203,744	20,519		
Do — Do Reach	129,699	75,744	28,414		
Retaining Walls to Canal	17,689	652	652		
Canal Plantations	2,812	2,667	369		
Shelter for Establishment & Store	98,614	96,943	1,312		
Miscellaneous Contingencies station Improvements	306,001	302,061	15,793		
Coal operations	862	1,215	1215		
Repairs of Telegraph line	1,352	1,194	1194		
Improvements of Shoals	"	"	1,112		
River Transport Service	186,471	"	10,558		
Tools and Plant	677,342	622,618	11,502		
Removing Deposit at Tail Locks	4,386	4,386	693		
Total Original works Communications				114,293	
Removing Deposit at Tail Locks (Repairs)	2,921	2,921	2,921		
Total Repairs of Communications				2,921	
carried over				117,214	

Name of Works	Estimated cost	Total Sanctioned to April 1871	Total Expended during 1870-71	Total of each Head of Service	Remarks
Brought forward				117,214	
Police Station House alterations	54	54	54		
Extra Assistant Commissioner's Bungalow	162	160	160		
Enclosure wall round old Burial ground	571	309	309		
Total Civil Buildings				523	
Survey of Long Canal & Barrier	240	241	241		
Fair weather Road Tarlagudiem to Assurelli	1785	110	110		
Total Minor works Communications				351	
Irrigation Works					
Sebbery Irrigation Project Survey	2,908	2,900	2,900		
Improvements of Village Tanks Do	411	411	411		
Cherla Tank Irrigation Project	5,717	3,185	3,485		
Total Minor Works Irrigation				6,796	
Establishment & direction and Construction — Salaries			80,541		
Travelling allowances			5,930		
Contingencies			1,444		
Total Establishments direction & Construction				87,915	
Grand Total Expenditure Rupees				2,12,799	

Establishment & Direction
Salaries 20765
Travelling allowances 1368
Contingencies 853 22786 Total

The quantities of the principal kinds of work executed during the year have been as follows.

1st Works of the Minor Project

Annicut

Rubble masonry — cubic feet — 11,569
Masonry Pitching behind annicut do — 11,317

Canal

Earth excavation — cubic feet — 264,776
Dry stone Pitching — do — 165

Gungole Regulating Tank

Earth Filling — cubic feet — 400,236
Earth Excavation — do — 57,588
Dry stone Pitching — do — 15,106

River Improvements from Bhudrachellum to Purnasala

Rock Excavation — cubic feet — 79,180
Rough stone filling in alignment Spurs — cubic ft — 1,72,758
Temporary Dams of Stone & Earth cft — 95,337
Excavating Earth, sand & gravel do — 31,933

Head Lock

Wrought Iron work — lbs — 12,244
Cast iron work — lbs — 8,893

Flood Embankment

Earth filling Cubic feet — 38,449

Dry stone Pitching Cubic feet — 4,297

Scouring Sluices

Rubble & Cement filling left 1,276

Retaining Walls for Canal

Rock Excavation — Cubic feet 4,984

Embankment of Buregula Nullah

Earth Filling — Cubic feet 241,052

Rock excavation for foundation left 22,281

Rubble Masonry — Do 12,671

2nd River Improvements of 2nd Reach

Albaca Works

Roughstone filling in Training wall Cft 176,179

Rock excavation — cubic feet — 330,232

stone work in dams — do — 67,755

Earth work in dams — do — 593,792

3rd Miscellaneous Works

Station Improvements

Clearing jungle — Super. ft. 6,812,230

Enclosure wall round old

Burial ground —

Excavation for foundations left — 2541

Earth Filling — do — 914

Brick Masonry in Mud — do — 1462

besides other petty items of work.

Arranged

Arranged under the different classes of work the progress made is as follows.

Rubble Masonry — Cubic feet		24,140
Masonry Pitching	do	11,317
Rubble in Cement filling	do	1,276
Dry stone Pitching	do	19,568
Brick masonry in mud	do	1,462
Earth Excavation	do	324,905
Earth Filling	do	680,657
Rock excavation	do	436,677
Rough stone Filling in dams and Training Walls Cubic feet		648,937
Stone and Earth in Temporary dams — Do		75,684
Excavating Earth, sand and gravel Do		31,933
Jungle clearing Sup. feet		6,812,230
Wrought Iron work — lbs		12,244
Cast iron work	do	8,893
Removing Deposit Cubic feet		1,419,311

The following is a statement showing the total quantities of each kind of work executed up to 1st April 1871 on the works in progress during the year.

Name of works—

Name of works—	Foundations	Earth Excavations	Rubble masonry	Cust stone masonry	Earth filling	Masonry pitching	Dry stone pitching	Rock excavations	Teak frame work	Wrought Iron	cast Iron	Excavating Earth sand and gravel	Alignment Spurs	Rubble in cement filling
Anicut	Cft.	Cft.	Cft.	Cft.	Cft.	Cft.	Cft.	Cft.	Cft.	Lbs.	Lbs.			
	19506	153023	70523	6203	172805	11317	-	-	-	-	-			
Canal	"	152095	1291	"	"	10182	165	"	"	"	"			
Flood Embankment	-	-	12383	"	"	"	"	"	"	"	"			
Scouring Sluices	-	21892	17783	10744	55306	"	2137	38456	1197	"	"			
Head Works	-	105531	24805	11229	55246	"	4118	"	2268	12244	8893	"	"	7592
Tail Works	"	129842	32056	7051	79406	"	4200	"	1831	"	"	"	"	"
Kungole Lands	"	25264	4398	29	134293	853	28369	"	"	"	"	"	"	"
Kungole River Sluices	"	37654	12571	"	160146	"	1540	"	"	"	"	"	"	"
Road Improvement By Aanicut & Purnasala	"	"	"	"	"	"	"	248459	"	"	"	3063353	517110	"
	"	"	"	"	"	"	"	128526	"	"	"	"	169299	"
18 — 19 Reach														

As the sum available for expenditure upon the works at this Barrier was so limited and as the Anicut was so far advanced as to give a depth of three feet of water in the Canal, and a depth of not less than two feet in the Channel between the head of the Canal and Purnasala, it was determined to defer the completion of the Anicut Masonry until another opportunity, when works, which were of more immediate importance had been completed, or sufficiently far advanced, and when in consequence a larger amount of money would be available.

The work done at the Anicut was therefore only what was rendered absolutely necessary by circumstances, and consisted in permanently closing the temporary vents, and gap in the 161 level with solid

rubble masonry in Cement, in lieu of the temporary teak wood framing planking and rough stone filling which had been used the previous year, as this plan of closing had not been found to be reliable when exposed to the blows of great trees passing over the anicut and the recoil of the surf in the basin below.

Some portions of the small wall running along the upstream face of the anicut, intended to enable the anicut to be worked at, with ease, at an earlier period of the year, when it is intended to complete it, which there was no time to finish in the preceding season were completed, and a pavement of masonry pitching was laid in a deep pool, at the down stream side of the anicut, where the soft=ness of the rock rendered it neces=sary to protect the bed against

the action of the over fall.

The remainder of the available labor was employed upon the improvements of the river Channel below the Tail Locks from Gongle to Bhudrachellum and upon the river works at Albaca in the second reach between Dumgudiem and Enchampilly.

Between Dumagudiem and Bhudrachellum the work done consisted in the widening of the rock Channel at Bhudra=chellum, where the passage was too narrow for safe Navigation, and where thirty feet was added to the width of the entire passage and in the construction of several of the stone dams and alignment spurs which were required for the improvement of the sandy

reaches which exist between the rocky cuttings and Channels.

Three of these align= ment spurs were constructed a short distance above Bhudrachellam near the village of Yettapaka at the foot of the sandy reach below Mothi Island where there has al= ways been difficulty on account of the accumulations of sand left there by the freshes, and another at the head of Mothi Island where it was desired to close a channel which ran in a direction diagonal to the navigable Channel and acted upon it most prejudicially by sweeping the sand into it and thus causing obstructions at its head.

The training wall, at the foot of Mothi Island, which is intended to remove the sand which collects at that point; on account of the change of velocity in the current the slope of the Mothi Island Channel being greater than that of the sandy reach below; was also commenced and a length of 600 feet completed.

The last work in this reach which was in progress, be= fore the monsoon, was the construc= tion of the rough stone dam which crosses the Channel at the right bank of the river above the Tail Locks and is intended to turn the whole of the water which passes down that side of the river into the Channel which flows past the Tail Locks thus deepening and improving the Channel at

at their entrance and for some
distance below. This work was
raised to the full height and sec:
tion and completed for the full
length before the freshes came
down, but after they had subsided
it was found that the crown and
in some places, the slopes of the
dam had suffered considerably
from the washing away of the sand
upon which these parts had been
unavoidably laid so that it has
been necessary to bring up the
work to its original section with
new stone and pack in the upper
surface a fresh with gravel and
chips of stone.

The work done upon
this portion of the river since the
water has fallen sufficiently to
allow it to be approached has been
the repair of this stone dam above
the

the Tail Locks and the construction
of another stone alignment spur, op-
posite the three which were thrown
in last year in the sandy reach
below Mothi Island. This alignment
spur was most urgently required
as from want of it; although the
action of those formed previous to
the freshes was all that was expected
from them, their only fault being
that the level of their crests was not
sufficiently high, above the level
of summer water; the channel
became almost wholly impassable
to steamers early in December
the spurs already formed having
sanded up the bed on that side
of the river and thus forced the
water round into a circuitory channel
studed with small rocks which
the spur now being constructed
is intended to close.

The action of the small dam at the head of Mothe Island and of the training wall at its foot, were so far as they had been constructed all that could be desired the cross channel which the dam was intended to close being completely choked with sand and the channel below the island having been considerably deepened at its shallowest part by the action of the training wall. A good deal however remains to be done in the improvement of this reach but so far as the works estimated for have been constructed their effects may be considered to be sufficiently satisfactory.

The work done at Albaca, the only point in the 2nd Reach at which improvements are now being

being carried on, consisted in the early part of the year, previous to the coming down of the freshes, in the construction of a large bed spur or training wall, which was found to be necessary to divert the water from its customary channel through the rocks along the bank, and drive it into the channel cleared for steamers, through the upper reef, in the previous year.

This training wall has a length of over 1600 feet, and is raised to a height of 4 feet, above low water in the pool below the reef, with a top width of 6 feet and slopes of from 2 to 3 to 1 on the lower side; it was completed for the length above stated before the freshes, but its action, although it to some extent improved the navigation of

of the Channel, by removing the sand which accumulated formerly at the head of the reef, was not wholly satisfactory as a considerable quantity of water still turns round the end of the groyne, so that it will be necessary to add consider=ably to its length, so as to com=pletely train the water over to its intended channel, the current having too decided a tendency to follow its original course, to be completely Controlled by so short a wall as was originally thought to be sufficient for the purpose.

It was originally in=tended to begin work upon the excavation of the Channels through the three reefs, at Albaca, at the end of December, but, as these Channels have all to be cut through the deepest part of the river

15 80

river bed, where the summer Channel runs, almost the whole of the work has to be approached by means of dams to exclude the water, and the river still continuing to Keep up in December, and being much higher than usual in the following month, the state of the passages was too unfavorable for these dams, to allow of their be=ing commenced until the begin=ning of February.

The progress of the ac=tual excavation of the Channels during the two remaining months of the year was much hindered by the want of labor, which has been more than ordinarily diffi=cult to procure this season and by the delay which was necessari=ly caused by the construction of the heavy dams to expose the bed.

The state of the work at the

at the end of the year was as follows.

The upper reef, at the head of the Channel, where the fall in the water surface is considerable, and the difficulty in forming dams proportionately great, was completely enclosed with dams made of stone and earth brought from the river banks.

At the 2nd or middle reef about one third of the length of the reef was enclosed with dams of the same construction, and rock excavation was in full progress at the head of the Channel where the depth of cutting was greatest and where its removal will be of the greatest service to the navigation; while on the third or lower reef excavations were in progress extending over about two thirds of the whole length of the Channel. The whole of this portion is also surrounded by dams, but principally of earth, the velocity of the natural current being much less than that met with at the upper and middle reefs.

16 DB

The works of the Head Lock have long been completed with the exception of the small accommodation bridge which crosses the head gates of the Lock to carry the cart and passenger traffic across the Canal. The bridge has a span of 30 feet with a width of road way of 9 feet and is formed of iron lattice work and cross web girders. The ends of the side girders are secured by means of cast iron pillars, bolted down to the stone work of the piers, and supported by bases of cutstone. The bridge is now practically completed, as the whole of the iron work was put together in position by the end of the year,

and

and only required a small portion of the planking of the road way and the painting of the iron work to be added.

During the monsoon, owing to the total cessation of work in the river bed and the small quantity of work which remained to be done on land, great difficulty was experienced in providing work for the laborers, whom it was desired to retain for future operations in the coming working season.

These were partly employed upon the completion of the Gongole Regulating Tank, the breach in which had been repaired at the close of the hot season, in the construction and widening of the escape and in the construction of the small irrigation Channel which leads the water stored by the Tank, to the low ground near Dimagudiem

Some of the laborers were also employed in completing the embankment of the Boregula Nullah, a protective work formed across the same stream on which the Gongole Tank is constructed, with the intention of retaining the surplus water discharged by the escape of the regulating Tank and the drainage of the intermediate basin and thus completing the Control of the water.

The foundations of the regulating culvert of this lower Tank have also been excavated, the masonry of the Culvert itself completed, and the embankment raised to the level of the upper breast wall.

Upon the Canal some of the catch water drains were deepened and improved, and some parts of the Canal banks which were found ob-

=structive to Steamers, were cut away
and a large quantity of mud and
silt, which had deposited in the
entrance of the Tail Locks, and upon
the slopes and brims of the Canal,
during the freshes, was removed so that
the navigation of the Locks was kept
open during the season. This latter
operation was performed principally
by means of the scraper, attached
to the shamrock steamer, and the
dredge, but towards the end of the
season it formed employment for
a good number of coolies. The
quantity of work done is shewn
under the head of removing de-
=posit.

Employment was also
provided for about 160 men, by
the improvement and repair
of the small village Tanks
at Cherlah, but the work done
at

at this place will be mentioned
under the head of Irrigation.
It remains only to mention that
at the close of the cold weather many
workmen, who would otherwise
have been unemployed, were pro=
=vided with work upon the widen-
=ing of a portion of the Canal near
the head, where the slopes were
cut away so as ultimately to add
a width of 15 feet to the Canal.
While engaged upon this work
the laborers were only allowed
to work half time, as the work was
undertaken as a substitute for
the batta or ~~the~~ subsistance allow
=ance necessarily given to them
until the falling of the water would
allow of work being commenced
in the river bed.

The average number
of laborers employed during the

year has been 1453 1/6 of whom 154 1/3 were Artificers, 887 1/4 contract laborers, and 411 7/12 were employed on daily pay, this shews a considerable decrease upon those employed in the preceding year, when the numbers were, 323 1/4 artificers, 1435 5/6 contract and 677 3/4 daily labourers, or in all 2436 5/6.

The average number of people in the hospitals, during the same period and of all classes, has been 41 per day, giving a daily rate of 2.82 per cent upon the total laboring strength. Comparing this percentage with those obtaining in previous years we have for 1868-69 3.64 per cent, for 1869-70 4.26 per cent, and for 1870-71 2.82 per cent from which it would appear that the past year has been a more than ordinary healthy season.

2nd Barrier Division

The quantities of the Chief kinds of work executed during the year have been as follows—

Anicut

Stone work of lower course	Cubic ft	49,130
—do— of Middle Course	—do—	258,224
—do— of Upper Course	—do—	220,390
Rock excavation	—do—	16,348

Locks

Rock excavation	Cubic feet	273,624
Rubble masonry	—do—	116,617
Cutstone	—do—	1,626
Earth Filling	—do—	28,495

Up Stream Guard Wall

Rubble Masonry	Cubic feet	25,189

Down stream Guard Wall

Rock excavation	Cubic feet	18,450
Rubble Masonry	—do—	7,011

Sluice Wall

Rubble Masonry	cubic feet	4,310

Removing

Removing Rock from river bed below the Locks—
Rock Excavation cubic feet — 64193

Towing Path—
Running feet of Tow path — 2,801

Station Improvement.
Reclearing Jungle Square chains 2819
Construction of Roads—lineal feet 7,917
Repairs of — do — do — 7,489
Cutting drains — do — 10,133
Repairs of — do — do — 1,773

When arranged under the different classes of work the progress made is as under—

Stone Work in Anicut cubic feet 527,744
Rock Excavation — do — 372,615
Rubble masonry — do — 223,127
cut stone do — do — 1,626
Earth Filling — do — 28,495
Towing Path — lineal feet — 2,801
Reclearing jungle Square chains 2,819
Construction of Roads lineal feet 7,917
Repairs of — do — do — 7,489
Cutting drains — lineal feet — 10,133
Repairs of — do — do — 1,773

The following is a statement of expenditure incurred upon each work, in detail, during the year and up to the 1st April 1871 compared with the Estimated amounts

Name of work	Estimated Cost	Total expended to 1st April 1871.	Total expended during 1870-71	Total of each head of service	Remarks
Anicut	728376	274,537	71,787		
Locks with Wingwalls	331,872	132,228	40,473		
Upstream Guard wall	49,230	31,315	4,922		
Down stream guard wall	23,738	17,751	17,084		
Sluice Wall	130,712	58,294	4639		
Removing Rock from River bed below Locks	51,450	2,185	1,765		
Towing Path	1,673	1,513	1,513		
Station Improvements	32,677	19,269	5,100		
Shelter for Establishment and Stores	65,413	59,967	6,845		
River Transport	80,296	11029	10,977		
General Contingencies	115,275	101,471	29,303		
Repairs to Telegraph lines	1,352	831	831		
Tools and Plant	266,452	186,417	27,203		
Total Original Works Communications				222,442	
Road from Assurelli to Tarlaguediem	1,785	1,675	1,675		
Total Minor Works Communications				1,675	

Name of work	Total Estimated expenditure Rupees	Total Expended up to 1st April 1870-71 Rupees	Total Strength of Establishment during 1870-71	Remarks
Military Hospital &c—	2,908	2,078	2,078	
Sepoy Lines				
Total Military Buildings original work			2,078	
Military Buildings Repairs	231	166	166	
Total Military Buildings Repairs			166	
Deputy Commissioners Cutchery Sepoy Lines	1467	1107	1107	
Civil Hospital Sepoy Lines	1110	640	640	
Petty Repairs to Buildings	455	170	170	
Total Civil Buildings Repairs			1917	
Establishments — Salaries	"	4,813		
Contributions — Travelling allowances & Contingencies	"	2741		
	"	835		
Total Establishments Contributions		5,689		
Grand Total Expenditure Rupees		127,507		

The total quantities of each chief kind of work done up to the 1st April 1871 are shewn in the following abstract for each work of the 2nd Barrier Project.—

Name of work	Stone work of Anicut Cubic feet	Rock Excavation Cubic feet	Rubble masonry Cubic feet	Cut stone masonry Cubic feet	Earth Fillings Cubic feet	Towing Path lineal feet.
Anicut	2,405,720	37,391	"	"	"	"
Locks	"	771,072	225,095	2,126	28,495	"
Up stream Guard Wall	"	25,340	99,408	"	"	"
Down stream do	"	18,450	77,011	"	"	"
Sluice Wall	"	56,769	153,880	"	"	"
Removing Rock from River Bed below Locks	"	64,193	"	"	"	"
Towing path	"	"	"	"	"	2801
Total	2405,720	973,215	555,394	2126	28,495	2801

The following table shews the percentages of work done during the year, and upto the 1st April 1871, upon the total Estimated quantities of each Kind of work.

Description of work	Total Estimated quantity of each class of work.	Total quantity Executed Upto 1st April 1871	Total quantity Executed During year 1870-71	Percentage of work done Upto 1st April 1871	Percentage of work done During year 1870-71
Stone work of Anicut	6,748,015	2,405,720	527,744	35·65	7·82
Rock Excavation	2,091,486	973,215	372,615	46·53	17·81
Rubble Masonry	1,273,853	555,394	223,127	43·59	17·51
Cutstone Masonry	56,754	2,126	1,626	3·74	2·86
Earth Filling	162,045	28,495	28,495	17·58	17·58
Towing path	3000	2,801	2801	93·36	93·36

From this table it appears that of the total quantity of Stone work in the Anicut, including the lower middle and upper courses, 7·82 per cent has been executed during the year, while the total quantity laid up to the end of the year was 35·65 per cent of the Estimated quantity. Up to the close of the year 1869-70 the total quantity completed amounted to 35 per cent of the Estimated quantity, so that the progress made this year would appear to be only 0·65 per cent, instead of 7·82 per cent as above stated.

This discrepancy is owing to a correction made in the progress reports of the total quantity shewn as done up to date, as it was lately found, when comparing the quantities actually contained in the anicut as per section with those shewn as progress, that the quantities in the Anicut as per section were less than those in the progress reports by a quantity of 278,783 cubic feet which has been deducted from the total quantity of work done to date, in order that a more correct comparision may

be made.

No alteration has been neces-sary in the quantity of Rubble masonry executed to date. which shows an increase of 17·51 per cent done during the year or 43·59 per cent up to April 1st 1871.

Of the total quantity of stonework laid during the year in the anicut the proportions laid in the three courses are as follows.

Lower course	9·32	per cent
Middle "	48·92	"
Upper "	41·76	"
	100·00	

The greater part of the progress made has been therefore on the middle and upper courses which are formed entirely with stone obtained from the Hill quarries whereas the stone required for the Lower course is obtained from

from the river bed. This fact itself accounts for the slow rate of progress, as the operation of quarrying Hill stone is much more delaying than if the stone were procured from the bed of the river, as almost all of the laborers could be employed on the light quarrying in the bed, whereas the Hill quarries require a superior description of men and more difficult to obtain.

It appears also that 41·76 per cent of the work done consisted of the upper course, the execution of which is necessarily extremely slow, as the blocks of which it consists are of very large size and consequently troublesome to move and place in position, and as the Hill quarries only yield a small quantity of this description of stone when compared with

the whole quantity quarried.

The Anicut is now under construction from the right bank at Neelumpilly, to the place where the deep gap exists through which the summer channel flows, in length about 23 chains out of a total length of 3430 feet and on about 12 chains of this length the facing of the upper course is in progress.

This upper course is of a very superior description, the stones being of great size and weight and solidly built into place with concrete and in some cases rubble masonry laid in Hydraulic Cement and will form a most efficient protection to the hearting of loose stone.

It has been endeavoured as far as possible during the year to push on the construction of the upper course rapidly, so as to complete as great a length as possible before the monsoon, in order to secure the loose stone of the body of the Anicut, and preserve it from being washed down during the floods, as is otherwise unavoidably the case to some extent.

During the year a considerable quantity of the excavations for the two lower chambers of the Locks has been done, and the masonry of the Locks has also made good progress the flooring and part of the side walls of the 2d Lock having been commenced. The foundation of the lower Lock has not yet been reached but the rock is excavated to about the level of the 2nd lock floor.

On the Sluice wall but little progress has been made, as the work has reached the level of the sluice sills, and now requires

the cutstone masonry in the Vent floors, and piers for which the material is under preparation.

The Rubble masonry of the upstream and downstream Guard-walls has also been in progress during the year and the former work is well advanced, while the latter is almost completed and only requires the addition of the dressed stone copings provided for in the Estimate.

Of the masonry which still remains to be executed the greater part lies in the Sluice Wall and the Locks.

The average number of men employed daily in this Division during the year has been 1519 men, and of these the average daily number in hospital has been 85 or a per centage of 5.59 upon the total laboring strength.

Transport Service

The Steamer "Godávari" was kept running between Enchampilly and Dowlaishweram carrying Government stores for the 1st and 2nd Barriers and calling at several stations on the way for passengers and cargo put on board by private merchants.

One of the other steamers was employed during a part of the time but was discontinued as it was found that one steamer was quite sufficient to perform the work required.

The remaining Steam tug was sent up above the 2nd Barrier to work in the 3rd reach.

The Steamer between Dowlaish-=weram and Enchampilly com-=-menced to run on the 25th June

and continued to carry goods and passengers until the month of December when she ceased to run regularly and at the close of the month was laid up at Dunagudiem in ordinary.

The work done by the steamer and boats amounted to 100,285 Tons of Government Stores carried one mile at a cost of Rs 19,252 from which has to be deducted the receipts on account of private cargo and passengers, paid into the treasury Rs 10577/- leaving the actual cost of carriage Rs 7614/- or at the rate of 1 anna 3 pie per ton per mile. This is 4 pie in excess of the cost of transport last year, but the difference is mainly due to the decrease in the tonnage of stores carried; being 100285 against 273,810 carried the previous year; upon which the Establishment employed gives a higher percentage.

Military Buildings.

The principal work in progress has been the Military Hospital at Seroncha, which was commenced in September 1870 and would probably have been completed during the year had it not been for a heavy fall of rain in the early part of March which destroyed a number of sundried bricks and delayed the work until others could be made.

The Estimated cost of this work is Rs 2908/ and of this Rs 2078 have been expended during the year. The rest of the expenditure upon Military Buildings consisted in periodical repairs to several of the

station buildings at Seroncha.

Civil Buildings

The expenditure under this head consisted almost entirely in repairs of buildings at Seroncha and Dumagudiem namely the court house of the Deputy Commissioner and the Civil Hospital at Seroncha and of the Police Station House and ~~of the~~ Extra Assistant Commissioner's Bungalow and Office at Dumagudiem.

The other work on which progress was made was the enclosure wall round the Burial ground at Dumagudiem for which about 50 per cent of the masonry was completed at a cost of Rs 309 against an Estimate of Rs 571/. It was intended that this small work should have been completed during the year but it was delayed from similar causes to those which delayed the completion of the Military Hospital at Seroncha namely a difficulty in procuring bricks of a sufficiently good quality.

Irrigation Works.

Several small irrigation projects have been surveyed and Estimated for during the past year. These have been chiefly projects for Tank Irrigation and intended only to supply water for irrigation during the monsoon, there being no site available so far as is known at present from which a perennial supply could be obtained.

The following are the projects which have been under investigation.

1. Cherlah and Singasamudram Tanks (Major Project)
2. Cherla village Tank (Minor Project)
3. Nullamilly village Tank

4. Madapoor Tank Scheme.

5. Sebbery Irrigation Project

and of these the first four have been Estimated for, and for the latter surveys have been made.

Sabari

Cherlah and Singasamu=dram Tank Project.

This a project for restoring these two village Tanks to the state in which they originally were before they were allowed to fall into dis=repair. There are two Tanks the one dependent upon the other as the Singasamudram Tank is too small to utilize the whole of the drainage from its Catchment and the surplus water is therefore led into the Catchment basin of the Cherla Tank, which is more favorably situated for the con=struction of a large reservoir, while the area of its own drainage basin is but small. The Estimate prepared included the cost of repairing and strengthening the embankments of both Tanks of raising them so as to utilize fully the entire supply avai=lable from their joint catchment areas, and the addition of proper culverts for distributing the water and surplus es=capes.

It was Estimated that the quantity of water available for irri=gation, after deductions for Evapo=ration and other source of loss would be 99,542,019 cubic feet from a proba=ble mean annual rainfall of 34.6 inches. It was calculated also that 4000 Cubic yards or 432,000 cubic feet was a sufficient allowan for one acre of rice and that con=sequently the storage would be equal to the irrigation of 863 acres of land, of which, 145 acres were already un=der cultivation, having a balance of

of 718 acres to produce a return to Government.

The Estimated cost of these improvements was Rs 31,414/ which would require a water rent of Rs 4/- per acre to yield an Annual returns of rather more than 9 per cent.

Cherla village Tank (minor Project) The project formerly noticed embraced the improvement of two Tanks, the Cherla and Singasa-mudram Tanks, but it was consider-ed to be advisable, looking to the large cost of the Major project, to prepare a separate Estimate for the repair of the Cherla Tank alone.

The drainage area of the basin was found to be 20,741,063 superficial feet and the off-flow was Estimated at 57.32 per cent upon the joint area of Tank and basin, so that with an annual rainfall of 34.6 inches the quantity of water available for irrigation,

irregation, after making due allowance for evaporation &c., was 26,609,742 Cubic feet capable of irrigating 246½ acres of rice land of which 110½ acres were already under cultivation leaving 136 acres as the area from which returns were to be derived.

The total cost of the Project was Estimated at Rupees 5717 upon which the returns would be 9.51 per cent with a water rent of Rupees 4/- per acre.

The works required were the repair and the raising of the Tank Embankments to contain a sufficient proportion of the whole off-flow to allow of the whole supply being utilized with the addition of two distributing sluices of iron and a surplus escape of length suffi-cient to discharge maximum floods.

During the monsoon a party of workmen were employed upon this project in raising and

repairing the Embankments and
the quantities of the Chief items
of work done were as follows.
Earthwork in Filling Cubic feet 393,628
Quarrying rough stone do 18,371
at a total cost of Rupees 3485/0/0
the whole of which was espended
during the year under review.

Nullamilly village
Tank. This was a small project
for the improvement of an exciting
village Tank situated about
3½ miles from Dimaguduem.
The drainage area of the Tank
as it exists is calculated to be
capable of irrigating about 95
acres and it was proposed to en-
large the Catchment area by the
addition of a portion of neighbour-
ing valley the drainage from which
would be led into the Nullamilly
Tank

This project has been investigated under my instructions two years or so ago, and found impracticable.
Rupees 25/5/-

Tank by means of an additional
Embankment and artificial Channel

This would it was estimated
increase the catchment area
of the tank to 30,062,900 square feet
upon which the mean off-flow
would amount to 52-82 per cent
of the rain fall or 34.6 inches per
annum, so that the quantity of
water available for irrigation
after deductions were made for
evaporation &c &c would be 41,013,824
Equal to the complete irrigation
of 380 acres of rice land, of which
80 acres were already under irri-
gation, leaving 300 acres to afford
returns upon the money espended.

The total Estimated cost
was Rupees 12,849/ upon which a
return of 9⅓ per cent would be
derived from a water rent of
Rupees 4/- per acre.

The works which it was proposed to construct with this object, were the repair of Embank=ments of the old supply Channel, the widening, and deepening, of this water course so as to enable it safely to carry the whole addi=tional supply and the raising and strengthening of the existing Tank Embankment, with the addition of a culvert and surplus Escape.

The last project Esti=mated for was that for construct=ing a Tank for monsoon Irriga=tion at the village of Madapoor. This is the largest of all these small projects and had a drainage area of 9¼ square miles from which the lowest Estimated off-flow at 30 per cent of the rain fall was 223,327,800 cubic feet, or allowing for

for Evaporation 170,768,300 cubic feet equal to the irrigation of 1581 acres of rice land.

The works proposed were an Embankment with two distribut=ing Culverts and a surplus Escape the length of the latter being 450 feet discharging with a head of 2 feet at a maximum.

The cost of the entire pro=ject was Estimated at Rupees 43,946 inclusive of all Contingent Charges and the cost of distributaries, and as the whole area irrigated would produce a return, if the water rent were assumed to be Rupees 4/ per acre, the return derived would be at the rate of 14⅓ per cent upon the outlay per annum.

The percentage of return given, in each of the above cases, is that which it is supposed would be

be realized after a certain number of years when the whole of the area available for irrigation under each Tank had been occupied, and when the interest which would have accumulated during the early years of the project, when the whole area was not under cultivation, had been paid off. The time which would elapse, in each case, before the full return would be received, is not however capable of exact determination as it depends so much upon the rate at which the land would be taken up, and upon the class of cultivators who could be induced to settle upon it, a question which, in a thinly populated country is one of considerable uncertainty.

The project which now remains to

Lower Godavari

to be noticed is that for the irrigation of that part of the Rajahmundry Taluk which lies to the south of the Sebbry river, and is contained between that stream, the hills bordering upon the Madras Presidency, and the Godavari, and bounded on the east by the Sukilairoo, a tributary of the Sebbry river.

The area included between the Sukilairoo, Sebbry, and Godavari Rivers, is about 36,000 acres, of which probably about 18,000 may be capable of cultivation, and the project consists in the construction of an irrigation Canal, drawn from the Sukilairoo, which should be capable of supplying this area with water during the monsoon.

The work done during the year consisted in the survey of this main line of Canal, and

the lines of some of the main distre=
=butaries; observations were also
=taken of the discharge of the sup=
=plying stream during the five
months from August to December
and from these it would appear
that the mean hourly flow of the
stream was about 28000 Cubic yards
during the five months over which
the observations extended while the
minimum was 11000 cubic yards
per hour.

The following is the mileage
of work done on the Survey

	Lin: ft	miles
Main Canal lines cut and levelled over	329,437	– 62⅓
Water shed lines for approxi=mate distributaries cut and levelled over	125,056	– 23⅔
Cross sections for Canal Alignments cut and levelled over	544,502	– 103⅛

cross

	Lin: ft:	miles
Cross sections of streams.	7,766	– ½
Longitudinal Sections of do	– 73772	– 14
Cross sections of Suppling stream	3750	– 7/10
Surveys of Streams	79,413	– 15.

The cost of the survey was
Rs 2,900/ including the cost of all Con=
=tingent charges and the cutting of
the jungle through which the lines
passed.

The levels run for the Madas
=poor and Nallamilly projects amount
=ed to 615,597 lineal feet or 116½ miles
and were executed at a cost of
Rupees 411/-.

In conclusion I beg to
recommend the following Officers
and Subordinates for favorable
notice.

Executive Engineer

Mr. Van Stavern

Assistant

Assistant Engineers

Mr. Glass and Mr. Sherman

Subordinates

Messrs. Barrow and Spiers

Lower Subordinates

Messrs. Thompson Y. Lutchumanasami

and Kaholam.

Mr. Dennison Continued to conduct the operations of the Agency satisfactorily. and Captain Barber to command the steamers with effi=

ciency.

I have the honor to be,

Sir,

Your most obedient hble. serv.t

(S.) R. H. Rhind b E.

Offg: Supg: Engineer

U G. L.

(True Copy)

R. H. Rhind

CHIEF ENGINEER
FOR IRRIGATION.
2 MAY 96
No. 78 Ld

EASTERN DIVN.
GODAVARI.
Genl. No. 10
21 APR. 96

Sw.4.4
5696/96

No. 1896 D. Camp Dowlaiswaram
Dated 29 4/96.

From

W. C. De Morgan Esqr
Exg Engrin ch 1st Circle

To

The Chief Engineer
for Irrigation
Madras.

Encls 2.

Sir,

With reference to G.O. no. 192 21.2.96
I have the honour to inform you that there are no records in the office of the Superintending Engineer, First Circle, Connected with the Sabari or as it is written on the map "Savari" Project.

2 I however caused search to be made among the records of the late Upper Godavari Subg Engineers

Engineer's office and forward
the following documents
in original for your infor-
-mation.

A. Original letter from
Secretary to Chief Commissioner
Central provinces No: 3/26
dated 3rd June 1868 to the
Supg Engineer Upper
Godavari forwarding
Captain Glasford's report
on the Scheme.

B. Copy of annual
Report for 1870-71 from the
Supg Engineer, Upper Goda-
-vari to the Secretary to Chief
Commissioner No: 64/342
of 5th May 1871.

32. Captain Glasford's
report is, it appears, a
criticism on a scheme
proposed by Major Haig
for

for Constructing an Anicut
on the Saveri River, about
50 miles from its junction
with the Godavari, in the
neighbourhood of Perch
with Canals parallel to the
River, by which means he
Calculated that 150,000
acres in Badrachallam,
and Rekapalli Taluqs
would be brought under
Cultivation.

The estimate of 150,000 acres
is certainly a very sanguine
one, and Captain Glasford
in his report points out
the various objections and
difficulties. The Construc-
-tion of the Canals would
involve many heavy
masonry works and a
glance at the map shows
that

that these lines would Cross
all the important affluents
of the Saveri. The Country
is ~~scarcely~~ sparsely populated,
difficult of access, and the
supplies of food material
insufficient. As far as I
am aware there are no
signs of the immigration
that was anticipated. On
the contrary the reverse is rather
the case.

Captain Glasford
advocates the improvement
of the irrigation supply by
Constructing new tanks,
and improving the old
ones. And as this could
be done tentatively and
by degrees it would be
much more reasonable
in every respect than
embarking

embarking on a large
and costly scheme.

3. From B, the annual
report Upper Godavari
1870-71, it would appear
that the larger scheme
was abandoned, and
a smaller one investi-
-gated. This consisted
in the irrigation of some
8000 acres in Rekapalli
Taluq, from an anicut
to be Constructed on the
Sokaleru. Rupees 2900
were spent on the Survey
and the work of the
year detailed. There
are no records in this
office to show whether
any further advance
was made on the in-
-vestigation or any f-

or

so passed.

4. If any projects for improvement of Bhadra-Challam and Rekapalli Talugs are contemplated, it would in my opinion be preferable to improve existing or construct new tanks. I am personally unacquainted with the locality, but from an examination of the map and what I hear, I am disposed to think that either the Saveri or Sokaleru Schemes would be far more difficult and expensive than anything in the west part of the Rushikulya and with far less prospect of ever proving remunerative

5. The President of the Local Fund Board has been addressed and replies that the Board is not prepared to contribute towards the maintenance of the Dummagudiem Anicut and Canal.

I have the honour to be
Sir,
Your most obedt Servt

30/4

Exec Engineer Ch[ittoor] Div[ision]

1/5

9.8.95. 627 9
12.9.95. 7469.
21.2.96. 1929.

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