

*Proceedings of the Madras Government, Public Works Department,
1st February 1872.*

Read the following letters:—

No. 15. From the Secretary to the Government of India, Public Works Department, (Account—Irrigation,) to the Secretary to the Government of Madras, Public Works Department, (Irrigation Branch,) dated Fort William, 16th January 1872, No. 19—A. I.

IN continuation of Public Works Department letter No. 8—A. I., dated 8th January 1872, I am directed to forward herewith a draft memorandum to accompany the abstract of financial results of Irrigation Works under the Government, North-Western Provinces, and to request that, if possible, a similar memorandum may be prepared to accompany the abstract of financial results of Irrigation Works under the Government of Madras.

No. 16. From the Controller of Public Works Accounts, to the Secretary to Government, Public Works Department, dated Fort St. George, 24th January 1872, No. 2,607.

I HAVE the honour to acknowledge the receipt of the Proceedings of Government of the 18th instant, No. 156, and, in returning the statement received therewith, to offer the following remarks.

1. Statement showing the financial results of the Irrigation Works under the Madras Government to the end of 1870-71.

2. The figures in the statement have been compared with the annual returns received from the several Superintending Engineers, and such corrections as were found to be necessary have been made. The amounts appearing against 1870-71, in the columns as per margin, agree with those entered in the statement of remunerative works for that year. The sums noted under "Capital outlay to end of year" against 1870-71, agree with the aggregate of those noted in the column "during year" added to the expenditure up to the end of 1863-64. In those cases in which no outlay was incurred up to the 30th April 1864, the figures in the column "during year" agree in the total with the expenditure recorded against 1870-71 under "Capital outlay to end of year."

3. As respects the Pennair anicut, it is necessary to explain that the local authorities having altered the figures up to the end of 1869-70 against "Receipts" and "Charges," with reference to G. O., No. 1,467, dated 30th May 1871, and the details for each year not having been furnished by the Superintending Engineer, the required modifications have been made in the figures appearing against 1863-64.

4. With respect to the "Channel from the Venkatagerry river to Chennoor tank," the Superintending Engineer, in submitting his statement of remunerative works for last year, stated that the required information regarding "income" had

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1st February 1872.*

not been received from the Collector. The omission in that return has not yet been supplied, but as soon as the particulars are received from the Superintending Engineer they will be laid before Government. Meanwhile, I have no alternative but to show a "deficiency" against the work in the accompanying statement opposite to 1870-71, to the extent of the charge for interest (Rupees 868), no expenditure on maintenance and repairs having been incurred in that year.

5. In the return received from the Government of India, the "Channel from Nullalem to Tetty," in North Arcot, is shown as a separate item. I have blended the details in connection with this work with those appearing under the "Cheyaur project," to which the above appertains, and with which the Superintending Engineer now includes the item as an auxiliary work.

6. The "Anicut across the Manumuthanuddy river near Maimathoor," in South Arcot, has been entered by me as a separate work, and will be found numbered XXIIA.

7. The totals of the columns "Capital outlay to end of year," "Profit," and "Loss" have been left blank, as the aggregate of the figures entered therein would not represent correct results, and no instructions are given as to what should appear in those columns.

8. The two points upon which the Government of India desire to be furnished with information are—

(1.) The principle on which the receipts under the head "Revenue" have been arrived at, and the sources from which charges under "Capital" and "Revenue" have been derived; and,

(2.) How it is that the aggregate annual outlay, as shown in the remunerative returns against working expenses, amounts to only 1½ lakhs of Rupees, when the yearly expenditure on Irrigation repairs in this Presidency is equivalent to 11¼ lakhs.

9. As respects the first of these points, I beg to invite attention to my letters No. 2,099A, dated 14th November 1871, as per margin. To show how difficult it is for this office, under present arrangements, to check the figures appearing in the Superintending Engineer's remunerative returns against "Capital" and "Maintenance and repairs," I would adduce the following case:—

My books show a capital expenditure of Rupees 66,980 in 1870-71 on the Pennair Anicut Works. The Superintending Engineer's statement of remunerative works recorded an outlay against the same project of Rupees 70,451, and on reference being made to that officer, it was ascertained that the difference (Rupees 3,471) between these figures represented the expenditure on certain minor works. In the absence of details, application was made to the Range Officer fully to reconcile the discrepancy, and from that officer's reply it appears that the actual difference is Rupees 3,477, made up of the following small items of

*Proceedings of the Madras Government, Public Works Department,
1st February 1872.*

expenditure on works connected with the Pennair Anicut Works, but not so shown in his Progress Reports rendered to this Office:—

				RS.
No. 1	...	...	...	396
" 2	...	...	...	122
" 3	...	...	...	295
" 4	...	...	...	1,365
" 5	...	...	...	303
" 6	...	...	...	180
" 7	...	...	...	31
" 8	...	...	...	238
" 9	...	...	...	52
" 10	...	...	...	295
" 11	...	...	...	200

Total... 3,477

If the Range Officer's figures are correct, it is clear that the total expenditure of the year on this project was Rupees 70,457. A second reference was accordingly made to the Superintending Engineer, but no reply has up to date been received.

10. As already reported to Government, I have applied to the Superintending Engineers for the details making up the figures appearing in their remunerative statements under "Capital" and "Maintenance and Repairs." As soon as these are received, I will have them carefully checked in this office.

11. With reference to the second point noted above, I beg to explain that, while the statement of remunerative works professes to record the expenditure on repairs in connection with the larger works in this Presidency, the yearly outlay on Agricultural repairs, as shown in the Public Works Accounts, embraces the charges for the maintenance of every irrigation work, large and small, to which attention has been devoted by Public Works Officers.

No. 17. ORDER THEREON, 1st February 1872, No. 309.

IRRIGATION, No. 2.

ORDERED that the following letter be sent:—

(Here enter No. 310, dated 1st February 1872.)

(True Extract.)

(Signed) J. CARPENDALE, Colonel, R.E.,

Secretary to Government.

Exd. S. T. Augustin.

30
PUBLIC WORKS DEPARTMENT,
FORT ST. GEORGE, 1st February 1872.

No. 18.

No. 310.

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,

PUBLIC WORKS DEPARTMENT.

IRRIGATION, No. 3.

No. 8 A. I., Public Works Department, Accounts.
„ 19 „ „ „ „

SIR,—With reference to the communications from the Government of India marginally noted, I am directed to return herewith the statement showing the financial results of the Irrigation Works in this Presidency to the end of 1870-71, which was received with the first mentioned letter. The results for the year 1870-71, which were absent from the printed form, have now been inserted, and the figures generally have been checked.

2. I am to invite attention to the remarks of the Controller of Public Works

No. 2,099A, 14th November 1871.
„ 2,607A, 24th January 1872.

Accounts contained in the letters enclosed, addressed to this Government, the earlier of which accompanying the statement of remunerative works for the year 1870-71, explains some of the difficulties met with in arriving at correct results and in exercising a check over the returns furnished by the Superintending Engineers or the Revenue authorities, while the second describes the nature of the manuscript entries made in the abstract statements as well as the corrections and alterations considered necessary, and further reports with reference to the inquiries made by the Government of India in the third paragraph of their letter of the 8th instant, No. 8—A. I., relative to the principle on which the receipts under the head Revenue, and the charges under Capital and Revenue are obtained, as well as in regard to the apparent discrepancy between the aggregate outlay on all Irrigation Works shown in the remunerative statement and the annual expenditure on Repairs, Agricultural.

3. As respects the first inquiry, I am to observe that this Government will not be in a position to afford the required information till the receipt of a report from the Revenue Board, to whom reference has been made regarding the returns furnished by Collectors, and I am to point out, in reference to the second, that as shown by the Controller, the outlay in the remunerative statement under the head Annual Working Expenses includes merely expenditure on the larger irrigation works of the Presidency, while the charge shown in the Public Works Accounts covers the maintenance of every irrigation work which has come into the hands of Public Works officers.

4. In conclusion, I am desired to state that owing to the limited time allowed for the submission of the return, and to the absence of the Acting Chief Engineer for Irrigation on tour, the memorandum asked for as an accompaniment, if possible, cannot be furnished.

I have the honour to be,

Sir,

Your most obedient servant,

(Signed) J. CARPENDALE, Colonel, R.E.,

Secretary to Government.

Enl. S. T. Augusta.

All communications
should be addressed to
the Secretary.

No. 19 A. J.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
ACCOUNT.

Irrigation.

H.

The Secretary to the Government of Madras,

Public Works Department,

Irrigation Branch.

Fort William, 16th January 1872.

Sir.

In continuation of Public Works
Department letter No. 8 A/ I. dated 8th January
1872, I am directed to forward herewith
a draft memo: to accompany the abstract
of financial results of Irrigation Works
under the Government North Western
Provinces and to request that if possible
a similar memo: may be prepared to
accompany the abstract of financial results
of

of Irrigation Works under the Government
of Madras.

I have the honor to be,

Sir,

Your most obedient Servant

W. Dickins. Col. R. A.

Secretary to the Govt. of India.

P. O. 1872 Defect.
Proc. of the Secretary
From File 71
The Government of India

Dated 16th } January 72
Received 22nd }
26th

One 4th ✓ N^o 19

Forwarding a
draft Memo. to accompany
the abstract of financial
results of Irrigation
Works in the N. W.
Provinces, & requesting
a similar Memo. with
the abstract of financial
results of Irrigation
Works under the Govt. of
Madras.
N^o 309-310-1 Feb 72

A^o 15

25th July 1872

N^o 2607 Office of the Controller of
Public Works Accounts.

Sol. St. George, 24th January 1872.

From
The Controller of Public Works Accounts,
Madras.

The Secretary to Government,
Public Works Department,
Madras.

Sir,
I have the honor to
acknowledge the receipt of
the Proceedings of Govern-
ment of the 18th inst.,
N^o 156, and, in return-
ing the statement
received thereon, to
offer the following remarks.

The figures in the
statement have been
compared with the
Annual Returns received
from the several

Superintending Engineers,
and such corrections as
were found to be necessary
have been made. The
amounts appearing
against 1870-71 in the
columns as
per margin,
agree with
those entered

1. Capital outlay during year.
2. 0 - Total of year.
3. Receipts.
4. Charges.
5. Interest @ 4 per cent.

in the Statement of
Remunerative works
for that year. The sum
noted under "Capital
outlay to end of year"
against 1870-71 agree with
the aggregate of those
noted in the column
"during year" added
to the expenditure up
to the end of 1863-64. In
those cases in which

no outlay was incurred
up to the 30th April 1864,
the figures in the
column "during year"
agree in the total
with the expenditure
recorded against 1870-71
under "Capital outlay
to end of year."

3. As respects the
Remainder Account, it is
necessary to explain that
the local authorities
having altered the
figures up to the end
of 1869-70 against "Receipts"
and "Charges," with
reference to G. O. No. 1467,
dated 30th May 1871, and
the details for each
year not having been
furnished by the

Superintending Engineer,
the required modifica-
tions have been made
in the figures appearing
against 1863. 64.

4. With respect to
the "Channel from the
Venketgherry River to
Chennoor Tank," the
Superintending Engineer,
in submitting his State-
ment of Remedial
Works for last year,
stated that the requir-
ed information regard-
ing "Income" had not
been received from the
Collector. The omission
in that Return has
not yet been supplied,
but as soon as the
particulars are received

from

from the Superintending
Engineer, they will be
lodged before Government.
Meanwhile, I have no
alternative, but to
show a "deficiency"
against the work in
the accompanying
Statement opposite to
1870. 71. to the extent of
the charge for interest
1 Rupee 868/; no expendi-
ture on maintenance
and repairs having
been incurred in
that year.

5. In the Return
received from the Govern-
ment of India, the
"Channel from Kullam
to Telly" in North Arcot
is shown as a separate

item. I have blended
the details in connection
with this work with
those appearing under
the "Cheyenne Project,"
to which the above
appertains, and with
which the Superintend-
ing Engineer now
includes the item as
an auxiliary work.

6. The "Bridge across
the Mainnotnamuddy
River near Mainnotthor"
in South Arch has been
entered by me as a
separate work, and
will be found numbered

XXII.

The totals of the
7 columns "Capital outlay
to end of year", "Profit", and

"Loss" have been left
blank as the aggregate
of the figures entered
therein would not
represent correct results,
and no instructions
are given as to what
should appear in those
columns.

8. The two points
upon which the Govern-
ment of India desire to
be furnished with
information are

(1) The principle on which
the receipts under the
head "Revenue" have been
arrived at, and the
sources from which the
charges under "Capital"
and "Revenue" have been
derived, and

(2) How it is that the aggregate
annual outlay, as shown
in the Remunerative

Returns against working
expenses amounts to
only $1\frac{1}{2}$ lacs of Rupees,
when the yearly expendi-
ture on Irrigation Repairs
in this Presidency is
equivalent to $11\frac{3}{4}$ lacs.

9. As respects the fish
of these points, they to
invite attention to my
letters as per margin.
To show how difficult it
is for this Office, under
present arrangements,
to check the figures
appearing in the Superin-
tending Engineer's

Remunerative Returns
against "Capital" and
"Maintenance and
Repairs". I would adduce
the following case.
My books show a Capital

A. 2099A,
dated 14th
November 1871.
P. 2332, dated
14th December 1871.

expenditure of Rupees
6,980 in 1870-71 on the
Bumoir Ancient Works.
The Superintending
Engineers' statement of
Remunerative Works
recorded on outlay
against the same
project of Rupees 7,451,
and on reference being
made to that Officer,
it was ascertained
that the difference
/ Rupees 3,471 / between
these figures represent-
ed the expenditure on
certain minor works.
In the absence of
details, application
was made to the
Range Officer fully to
reconcile the discrepancy.

and from their Officers' reply, it appears that the actual difference is Rupees 3477, made up of the following small items of expenditure on works connected with the Benair Aicub works, but not so shown in his Progress Reports rendered to this Office:-

No. 1.	396
" 2.	122
" 3.	295
" 4.	1365
" 5.	303
" 6.	180
" 7.	31
" 8.	238
" 9.	52
" 10.	295
" 11.	200

Total Rs. 3477

If the Range Officers' figures are correct, it is clear that the total expenditure of the year on this Project was Rupees 70,457. A second reference was accordingly made to the Superintending Engineer, but no reply has up to date been received. 10. As already reported to Government, have applied to the Superintending Engineers for the details making up the figures appearing in their Remunerative Statements under "Capital" and "Maintenance and repairs". As soon as these are

received, I will have
them carefully checked
in this Office.

11. With reference to
the second point noted
above, I beg to explain
that while the State
-ment of Enumerative
Works professes to
record the expenditure
on Repairs in connection
with the larger works
in this Presidency, the
yearly outlay on
Agricultural Repairs,
as shown in the
Public Works Accounts,
embraces the charges
for the maintenance
of every Irrigation
work, large and small,

to

to which attention has
been devoted by Public
Works Officers.

Have the honor to be
Sir,

Your most obedient servant.

S. Hoell

Controller of Public Works Accounts.

11/11

Edw

Public Works 1872 Department
Pr. of Govt. for February
No. 388
72

From
The Controller of P.W.
Accounts,
Madras.

To
The Secretary
to Government,
P.W.D.
Madras.

Dated 24th January 1872.
Recd 25th 3

No. 2607

Returning the State-
ment showing the finan-
cial results of the Irriga-
tion Works under the
Madras Government
to the end of 1870. 71,
and offering remarks
thereon.

No. 309-310-1st July 72

No. 16

ABSTRACT
OF THE
FINANCIAL RESULTS
OF THE
IRRIGATION WORKS
UNDER THE
GOVERNMENT, N. W. PROVINCES.

P. W. D. Press—30, 12, 71—20.

ABSTRACT OF THE FINANCIAL RESULTS OF THE IRRIGATION WORKS IN
THE NORTH WESTERN PROVINCES FROM COMMENCEMENT
TO END OF 1870-71.

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(5)

161-5800 (15)
 532 178 200
 332 278
 332 223
 306 133
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30-11-73

Interest account of the GANGES CANAL.

	CHARGE FOR INTEREST AT 5 PER CENT.	DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.		DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.	
		Total net direct revenue.	Difference.	Total net direct and indirect revenue.	Difference.
	Rs.	Rs.	More. Less.	Rs.	More. Less.
1870-71	12,01,219	10,42,896		1,58,323	
1869-70	11,71,785	9,59,433		2,12,352	
To end of 1868-69 ...	1,36,92,858	37,29,307		99,63,551	
TOTAL	1,60,65,862	57,31,636		1,03,34,226	

Particulars of receipts during 1869-70 and 1870-71.

	Water-rates.	Transit dues.	Transit profits.	Mill rents.	Produce from canal plantations.	Fines.	Sundries.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...								
1869-70 ...	17,57,373	...	33,796	20,637	60,464	13,266	5,617	19,11,612
								18,91,383

Abstract of charges for working expenses during 1869-70 and 1870-71.

1870-71 and 1870-71.											
	REMISSION OF REVENUE.	ESTABLISHMENT.							REPAIRS.	MAINTENANCE OF PLANTATIONS.	TOTAL.
		Direction.	Work establishment.	Revenue establishment.	Navigation establishment.	Medical.	Fees to lumberdars and putwarees.	Total.			
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...											
1869-70 ...	8,184	96,853	72,078	2,51,245	11,368	600	35,996	4,68,140	426,334	29,292	8,63,716
											9,31,950

Abstract of the financial results of the EASTERN JUMNA CANAL.

Abstract of the financial results of the EASTERN SUMMA CANAL

	CAPITAL OUTLAY.		REVENUE.			NET REVENUE.			PERCENTAGE OF NET REVENUE ON CAPITAL.			
	During year.	To end of year.	Direct income by water-rates.	Indirect income by increased land revenue.	Total.	Working Expenses.	Direct.	Indirect.	Total.	Direct.	In-direct.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	27,569	19,73,320	5,66,367	1,80,955	3,85,412	1,80,955	3,85,412	19,80				
1869-70	32,222	19,45,751	6,11,644	1,65,171	4,46,473	1,65,171	4,46,473	23,33				
1868-69	55,811	19,13,529	6,25,450	1,54,054	4,71,396	1,54,054	4,71,396	25,37				
1867-68	56,690	18,57,718	4,83,146	1,41,463	3,41,683	1,41,463	3,41,683	18,97				
1866-67	48,970	18,01,028	5,57,367	1,21,657	4,35,710	1,21,657	4,35,710	24,86				
1865-66	33,334	17,52,058	4,45,252	1,28,986	3,16,266	1,28,986	3,16,266	18,40				
1864-65	40,435	17,18,724	3,39,458	1,23,807	2,15,651	1,23,807	2,15,651	12,84				
1863-64	14,627	16,78,289	2,65,022	1,06,760	1,58,262	1,06,760	1,58,262	9,51				
1862-63	15,724	16,63,662	2,15,574	85,181	1,30,393	85,181	1,30,393	37,91				
1861-62	8,178	16,47,938	2,50,532	1,13,052	1,37,480	1,13,052	1,37,480	8,38				
1860-61	12,052	16,39,760	2,76,097	1,18,765	1,62,332	1,18,765	1,62,332	9,97				
1859-60	6,270	16,27,708	2,59,273	1,05,752	1,53,521	1,05,752	1,53,521	9,46				
1858-59	27,039	16,21,438	1,81,022	92,546	88,476	92,546	88,476	5,54				
1857-58	15,746	15,94,399	66,218	76,904	—10,686	76,904	—10,686	—3,01				
1856-57	58,710	15,78,653	89,601	1,35,397	—45,796	1,35,397	—45,796	4,82				
1855-56	1,43,288	15,19,943	1,48,309	81,877	66,432	81,877	66,432	—01				
1854-55	1,85,632	13,76,655	95,892	95,654	228	95,654	228	7,29				
1853-54	58,460	11,91,023	1,61,328	78,720	82,608	78,720	82,608	6,15				
1852-53	33,629	11,32,563	1,51,408	82,793	68,615	82,793	68,615	8,36				
1851-52	28,133	10,98,934	1,66,856	77,257	80,599	77,257	80,599	6,54				
1850-51	8,344	10,70,801	1,42,833	73,925	68,908	73,925	68,908	6,73				
1849-50	38,056	10,67,457	1,49,504	80,165	69,339	80,165	69,339	9,34				
1848-49	35,796	10,29,401	1,63,246	70,424	92,822	70,424	92,822	5,77				
1847-48	15,788	9,93,605	1,25,407	69,042	56,365	69,042	56,365					
To end of	9,77,817	...	12,54,320	9,75,219	2,79,101	9,75,219	2,79,101					
1816-47	19,73,320		77,91,116	35,30,526	42,60,590	35,30,526	42,60,590					
Total												

Interest account of the EASTERN JUMNA CANAL.

	CHARGE FOR INTEREST AT 5 PER CENT.	DIFFERENCE BETWEEN NET REVENUE AND CHARGE FOR INTEREST.		DIFFERENCE BETWEEN NET REVENUE, DIRECT AND INDIRECT, AND CHARGE FOR INTEREST.			
		Total net direct revenue.	Difference.		Total net direct and indirect revenue.	Difference.	
			More.	Less.		More.	Less.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	97,287	3,85,412	2,88,125				
1869-70 ...	95,676	4,46,472	3,50,796				
To end of 1868-69 ...	21,29,491	34,28,706	12,99,215				
TOTAL ...	23,22,454	42,60,590	19,38,136				

Particulars of receipts during 1869-70 and 1870-71.

	Water-rates.	Mill rent.	Produce from canal plantations.	Fines.	Sundries.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...						5,66,367
1869-70 ...	5,83,842	6,905	12,687	7,626	584	6,11,644

Abstract of charges for working expenses during 1869-70 and 1870-71.

	REMISSION OF RE- VENUE.	ESTABLISHMENT.					REPAIRS.		MAINTENANCE OF CANAL PLANTATIONS.	TOTAL.
		Direction.	Work esta- blishment.	Revenue estab-lish- ment.	Fees.	Total.				
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	...									1,80,955
1869-70 ...	95	26,726	7,044	62,471	4,082	1,00,323	56,021		8,732	1,65,171

Abstract of the financial results of the DOON CANALS.

Abstract of the financial results of the DOON CANALS.														
CAPITAL OUTLAY.			REVENUE.			WORKING EXPENSES.		NET REVENUE.		PERCENTAGE OF NET REVENUE ON CAPITAL.				
During year.		To end of year.	Direct income by water-rates, &c.		Indirect income by increased land revenue.	Total.			Direct.	Indirect.	Total.	Direct.	In-direct.	Total.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	515	5,49,977	43,113			24,658	18,455					335		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1869-70	8,552	5,49,462	38,284			24,927	13,957					258		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1868-69	752	5,40,910	38,705			25,253	13,452					249		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1867-68	...	5,40,158	38,738			25,375	13,363					247		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1866-67	954	5,40,158	34,819			19,939	14,880					276		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1865-66	5,503	5,39,204	28,955			20,430	8,525					157		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1864-65	13,713	5,33,701	27,357			27,589	—232					—04		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1863-64	18,834	5,19,988	21,531			16,125	5,406					107		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1862-63	16,341	5,01,604	15,649			22,020	—6,371					—131		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1861-62	26,771	4,85,263	16,011			22,386	—6,375					—139		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1860-61	27,330	4,58,492	14,923			14,337	536					12		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1859-60	19,109	4,31,162	12,308			13,270	—962					—23		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1858-59	31,588	4,12,053	11,668			12,814	—1,146					—30		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1857-58	38,485	3,80,465	10,715			12,356	—1,641					—47		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1856-57	15,676	3,41,980	10,418			9,768	650					19		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1855-56	14,516	3,26,304	9,617			14,318	—4,701					—150		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1854-55	2,996	3,11,788	8,436			13,492	—5,056					—163		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1853-54	2,12,934	3,08,792	9,233			7,086	2,147					223		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1852-53	2,631	95,858	10,358			7,517	2,841					304		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1851-52	635	93,227	11,936			8,390	3,546					377		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1850-51	621	92,592	10,425			6,214	4,211					457		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1849-50	463	91,971	9,098			5,616	3,482					380		
To end of 1848-49	91,503	...	54,685			40,877	13,808							
TOTAL	5,49,977	...	4,86,932			3,94,207	92,775							

Interest account of the DOON CANALS.

			CHARGE FOR INTEREST AT 5 PER CENT.	DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.		DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.			
				Total net direct revenue.	Difference.		Total net direct and indirect revenue.	Difference.	
					More.	Less.		More.	Less.
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
1870-71	...	...	27,473	18,455		9,018			
1869-70	...	...	27,045	13,957		13,088			
To end of 1868-69	...		3,77,153	60,363		3,16,790			
TOTAL ...			4,31,671	92,775		3,38,896			

Particulars of receipts during 1869-70 and 1870-71.

	Water-rates.	Mill rent.	Produce from canal plantations.	Fines.	Sundries.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71						43,113
1869-70	22,720	13,783	302	62	1,417	38,284

Abstract of charges for working expenses during 1869-70 and 1870-71.

	REMISSION OF REVENUE.	ESTABLISHMENT.					REPAIRS.	MAINTENANCE OF CANAL PLANTATIONS.	TOTAL.
		Direction.	Works.	Revenue.	Fees.	Total.			
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71									21,658
1869-70	141	2,150	2,469	10,036	845	15,500	8,415	241	24,327

Abstract of the financial results of the ROHILKHAND CANALS (including BIJNOUR CANALS.)

Abstract of the financial results of the ROHILKHUND CANALS (including Dams)														
CAPITAL.		REVENUE.			WORKING EXPENSES.		NET REVENUE.		PERCENTAGE OF NET REVENUE ON CAPITAL.					
		Direct in- come by water- rates, &c.		Indirect by increased land revenue.	Total.									
During year.		To end of year.						Direct.		Indirect.	Total.	Direct.	In- direct.	Total.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	40,390	6,03,104	29,415	75,749	75,749	—46,334	—8.23							
1869-70	1,18,302	5,62,714	26,907	71,384	71,384	—44,477	—10.00							
1868-69	74,862	4,44,412	39,370	44,317	44,317	—4,917	—1.33							
1867-68	22,383	3,69,550	17,405	44,574	44,574	—27,169	—7.82							
1866-67	6,283	3,47,167	47,034	35,432	35,432	—11,602	—3.40							
1865-66	4,411	3,40,884	26,028	39,913	39,913	—13,915	—4.13							
1864-65	7,293	3,36,473	47,737	31,903	31,903	—15,834	—4.81							
1863-64	20,223	3,29,180	44,153	28,704	28,704	—15,449	—5.00							
1862-63	13,952	3,08,957	38,081	30,529	30,529	—7,552	—2.55							
1861-62	27,362	2,95,005	39,666	28,116	28,116	—11,550	—4.31							
1860-61	29,319	2,67,643	42,488	29,981	29,981	—12,507	—5.21							
1859-60	6,507	2,38,324	34,655	30,505	30,505	—4,150	—1.79							
1858-59	...	2,31,817	17,786	11,955	11,955	—5,831	—2.51							
1857-58	69,966	2,31,817	6,310	4,313	4,313	—1,997	—0.97							
1856-57	42,323	1,61,851	14,516	26,180	26,180	—11,634	—5.56							
1855-56	19,127	1,19,028	24,088	29,656	29,656	—5,568	—5.56							
1854-55	8,780	99,901	14,620	9,548	9,548	—5,072	—5.56							
1853-54	32,901	91,121	21,293	4,406	4,406	—16,887	—29.00							
1852-53	16,516	58,220	11,177	4,420	4,420	—6,757	—16.20							
1851-52	14,764	41,704	17,150	2,415	2,415	—14,735	—54.69							
1850-51	1,100	26,940	8,006	4,311	4,311	—8,695	—14.29							
1849-50	2,567	25,840	7,305	3,871	3,871	—8,434	—14.75							
1848-49	4,682	23,273	15,311	3,598	3,598	—11,713	—67.30							
To end of 1847-48	18,591	...	2,935	3,538	3,538	—603								
	6,03,104	...	5,93,466	5,99,348	5,99,348	—5,882								

Interest account of the ROHILKHUND CANALS.

	CHARGE FOR INTEREST AT 5 PER. CENT.	DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.			DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.		
		Net direct revenue.	Difference.		Net direct and indirect revenue.	Difference.	
			More.	Less.		More.	Less.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	28,136	Loss 46,334		74,470			
1869-70	22,220	" 44,477		66,697			
Up to end of 1868-69 ...	1,98,741	84,929		1,13,812			
TOTAL ...	2,49,097	Loss 5,882		2,54,979			

Particulars of receipts during 1869-70 and 1870-71.

		Water-rates.	Mill rents.	Produce from canal plantations.	Fines.	Sundries.	Total.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	{ Rohilkhund ... Bijnour ...						
1869-70 ...	{ Rohilkhund ... Bijnour ...	23,746	40	1,264	76	142	25,268
		1,459	11	59	...	110	1,639

Abstract of charges for working expenses during 1869-70 and 1870-71.

		ESTABLISHMENT.				REPAIRS.	TOTAL.
		Direction.	Works.	Revenue.	Petty.	Total.	
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	{ Rohilkhund ... Bijnour ...						
1869-70 ...	{ Rohilkhund ... Bijnour ...	3,264	18,529	34,064	...	55,857	13,745
		118	...	...	1,150	1,263	514
							69,602
							1,782

Under Establishment is included large charges for Survey charges for re-modelling and working new canals in Rohilkhund ordered to be charged to Revenue until decision is arrived at regarding their construction, when the charge will be transferred to Capital.

Abstract of the financial results of the AGRA IRRIGATION WORKS.

	PERCENTAGE OF NET REVENUE ON CAPITAL.			NET REVENUE.			WORKING EXPENSES.			REVENUE.			CAPITAL.	
	Direct.	Indirect.	Total.	Direct.	Indirect.	Total.	Direct by water-rates.	Indirect by increased land revenue.	Total.	Direct by water-rates.	Indirect by increased land revenue.	Total.	During year.	To end of year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	—10	—02	—17	—44	—156	—135	—296	99	188	441	563	...	596	2,20,486
1869-70	—02	—17	—44	—156	—135	—296	99	188	441	563	...	...	...	2,19,890
1868-69	—44	—156	—135	—296	99	188	441	563	...	...	...	...	...	2,19,890
1867-68	—156	—135	—296	99	188	441	563	...	...	...	...	...	...	2,19,890
1866-67	—135	—296	99	188	441	563	...	...	...	...	...	...	1,493	2,19,890
1865-66	—296	99	188	441	563	...	...	...	...	...	...	...	5,236	2,18,397
1864-65	99	188	441	563	...	...	...	...	...	...	...	...	9,421	2,13,161
1863-64	188	441	563	...	...	...	...	...	...	...	...	...	22,044	2,03,740
1862-63	441	563	...	...	...	...	...	...	...	...	...	...	48,089	1,81,696
1861-62	563	...	...	...	...	...	...	...	...	...	...	...	40,809	1,33,607
1860-61	...	...	...	...	...	...	...	...	...	...	...	...	3,417	92,738
1859-60	...	...	...	...	...	...	...	...	...	...	...	...	9,653	89,321
To end of 1858-59	...	...	...	...	...	...	...	...	...	...	...	...	79,668	...
TOTAL	...	...	...	...	...	...	...	...	...	...	...	...	2,20,486	1,10,829

Interest account of the AGRA IRRIGATION WORKS.

		CHARGE FOR INTEREST AT 5 PER CENT.		DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.		DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.	
				Difference.		Difference.	
				Direct net revenue.	More.	Less.	More.
1870-71 ...	...	Rs. 10,994	Rs. 230	Rs. ...	Rs. 11,224	Rs.	Rs.
1869-70 ...	...	10,994	" 64	...	11,058		
Up to end of 1868-69	...	1,00,469	29,000	...	71,469		
TOTAL	...	1,22,457	28,706	...	93,751		

(14)

These works were abandoned in 1866-67, consequent on the receipts not covering the working expenses.

Abstract of the financial results of the BUNDLEKHUND IRRIGATION WORKS.

		CAPITAL.		REVENUE.		WORKING EXPENSES.		NET REVENUE.		PERCENTAGE OF NET REVENUE ON CAPITAL.	
		During year.	To end of year.	Rs.	Direct by water-rates, &c.	Indirect by increased land revenue.	Total.	Rs.	Rs.	Direct.	Indirect.
1870-71 ...	...	5,550	69,550	Rs. 1,950	Rs.	Rs.	Rs.	Rs.	Rs.	— 747	
1869-70 ...	...	8,566	64,000	1,573				6,736	—4,786	—15.22	
1868-69	...	26,601	55,434	2,077				9,801	—8,288	— 4.92	
1867-68	...	7,420	28,833	1,303				3,497	—1,420	—13.69	
1866-67	...	21,413	21,413	1,475				4,235	—2,932	—14.43	
1865-66	...	...	...	955				4,506	—3,091		
TOTAL	...	69,550	..	9,333	...	...	...	1,024	—69		
								29,919	—20,586		

(15)

The first outlay on these works is not known, and the amount shown above under head of Capital merely represents the outlay since 1866-67.

Interest account of the BUNDLEKHUND IRRIGATION WORKS.

	CHARGE FOR INTEREST AT 95 PER CENT.	DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.		DIFFERENCE BETWEEN NET DIRECT AND INDIRECT RE- VENUE AND CHANGE FOR INTEREST.			
		Net direct revenue.	Difference.		Net direct and indi- rect reve- nue.	Difference.	
			More.	Less.		More.	Less.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 { Humeerpoor { Jhansie ...		Loss.					
1869-70 { Humeerpoor { Jhansie ...	34 2,738	2,258 6,930	...	2,292 8,768			
Up to end of 1868- 69 ... { Humeerpoor { Jhansie ..	34 2,478	6,134 1,378	...	6,168 3,856			
Total ... { Humeerpoor { Jhansie ...							
TOTAL ...	8,484	Loss. 20,586	...	29,070			

Particulars of receipts during 1869-70 and 1870-71.

	Water- rates.	Produce from canal plantations.	Total.	
	Rs.	Rs.	Rs.	Rs.
1870-71 { Humeerpoor { Jhansie ...	...	...	...	...
1869-70 { Humeerpoor { Jhansie ...	1,390 169	... 14	...	1,390 183

Abstract of charges for working expenses during 1869-70 and 1870-71.

			REMISSION OF REVENUE	ESTABLISHMENT			REPAIRS.	TOTAL.
				Direc- tion.	Petty.	Total.		
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	{ Humeerpoor	...						
	{ Jhansie	...						
1869-70	{ Humeerpoor	...	81	168	1,282	1,450	2,116	3,647
	{ Jhansie	...	...	220	1,196	1,416	4,798	6,214

Capital expenditure on works in course of execution.

	BUNDLEKHUND IRRIGATION WORKS.				TOTAL.	
	During year.	To end of year.	During year.	To end of year.	During year.	To end of year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	19,809	1,16,929	8,36,559	21,32,340		
1869-70 ...	46,287	97,120	8,98,623	12,95,781		
1868-69 ...	30,554	50,833	3,46,318	3,97,153		
1867-68 ...	20,279	20,279	45,363	50,840		
1866-67 ...	...	...	5,477	5,477		
TOTAL ...	1,16,929	...	21,32,340	...		
	AGRA CANAL.		EASTERN GANGES CANAL.		LOWER GANGES CANAL.	
	During year.	To end of year.	During year.	To end of year.	During year.	To end of year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	7,23,602	17,42,242	45,524	1,73,381	47,564	99,788
1869-70 ...	6,82,735	10,18,580	1,17,377	1,27,857	52,224	52,224
1868-69 ...	3,05,284	3,35,845	10,480	10,480	...	...
1867-68 ...	25,084	30,561	...	...	...	...
1866-67 ...	5,477	5,477	...	...	...	...
TOTAL ...	17,42,242	...	1,73,381	...	99,788	...

General abstract of the financial results of the whole of the Canals under the Government, North Western Provinces.

	CAPITAL ACCOUNT.			REVENUE ACCOUNT, 1870-71.						CHARGE FOR INTEREST, 1870-71.	PERCENTAGE OF NET REVENUE ON CAPITAL, 1870-71.			PERCENTAGE OF NET REVENUE ON CAPITAL, 1869-70.		
	Outlay during 1869-70.	Outlay during 1870-71.	Total outlay to end of 1870-71.	Direct revenue.	Working expenses.	Net direct revenue.	Add indirect revenue.	Total net direct and indirect.	Direct.		Indirect.	Total.	Direct.	Indirect.	Total.	
Canals in operation.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.							
Ganges Canal ...	5,88,666	2,53,780	2,42,78,162	19,11,612	8,68,716	10,42,806			Rs.	12,01,219	4.34				4.09	
Eastern Jumna Canal ...	32,222	27,569	19,73,320	5,66,367	1,80,955	3,85,412				97,287	19.80				23.33	
Doon Canals ...	8,552	515	5,49,977	43,113	24,658	18,455				27,473	8.35				2.58	
Rohilkhand Canals ...	1,18,302	40,390	6,03,104	29,415	75,719	46,334				23,136	8.23				10.00	
Bundelkhand works...	8,566	5,550	69,550	1,950	6,736	4,786				3,200	7.47				15.22	
TOTAL	7,56,308	3,27,804	2,74,74,113	25,52,457	11,56,814	13,95,643				13,87,915						
Agra Irrigation Works	...	596	2,20,486	...	230	230				10,994	10				02	
Irrigation works under construction ...	8,08,623	8,36,559	21,32,340	...	...	...				64,789						
GRAND TOTAL	16,51,931	11,64,959	2,98,26,939	25,52,457	11,57,044	13,95,413				14,33,098						

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Interest Account of all the Canals in the North Western Provinces from commencement to end of 1870-71.

Interest Account of all the Canals in the North Western Provinces from commencement to end of 1870-71.									
	CHARGE FOR INTEREST AT 5 PER CENT.			DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.			DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.		
	During 1869-70.	During 1870-71.	To end of 1870-71.	Net direct revenue.		Difference between direct revenue and charge for interest.	Net direct and indirect revenue.		Difference between net direct and indirect revenue and charge for interest.
				1870-71.	To end of 1870-71.		1870-71.	To end of 1870-71.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Canals in operation.									
Ganges Canal ...	11,71,785	12,01,219	1,60,65,862	10,42,896	57,31,636	-1,58,323	-1,03,34,226		
Eastern Jumna Canal ...	95,676	97,287	23,22,454	3,85,412	42,60,500	+2,88,125	+19,38,136		
Doon Canals ...	27,045	27,473	4,31,671	18,455	92,775	-9,018	-3,38,896		
Rohilkhand Canals ...	22,220	28,136	2,49,097	-46,334	-5,882	-74,470	-2,54,979		
Bundelkhand Works ...	2,772	3,200	8,484	-4,786	-20,586	-7,986	-29,070		
	13,19,498	13,57,315	1,90,77,568	13,95,643	1,00,58,533	38,328	-90,10,035		
Agra Irrigation Works...	10,994	10,994	1,22,457	-230	28,706	-11,224	-93,751		
Canals under construction	19,858	64,789	87,462	...	...	-64,789	-87,462		
GRAND TOTAL	13,50,350	14,33,098	1,92,87,487	13,95,413	1,00,87,239	-37,685	-92,00,248		

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ABSTRACT
OF THE
FINANCIAL RESULTS
OF THE
IRRIGATION WORKS
UNDER THE
GOVERNMENT, PUNJAB,
To end of 1870-71.

P. W. D. Press—4, 1, 72—20.

ABSTRACT OF THE FINANCIAL RESULTS OF THE IRRIGATION WORKS
UNDER THE GOVERNMENT OF THE PUNJAB TO END OF 1870-71.

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Abstract of financial results of the Western Jumna Canal.

	CAPITAL OUTLAY.		REVENUE.			WORKING EXPENSES.	NET REVENUE.			PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY.		
	During year.	To end of year.	Direct income by water-rates.	Indirect income by increased land revenue.	Total.		Direct income.	Indirect income.	Total.	Direct.	Indirect.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
870-71	1,51,776	25,97,437	12,53,012			3,77,018	8,75,994			35.82		
869-70	1,37,087	24,45,661	12,21,072			3,55,106	8,65,966			37.51		
868-69	24,056	23,08,574	8,66,963			3,23,990	5,42,973			23.8		
867-68	6,850	22,84,518	7,72,599			2,62,148	5,10,451			22.36		
866-67	—11,958	22,77,668	4,90,468			2,53,149	2,37,319			10.36		
865-66	1,60,630	22,89,626	5,26,468			2,14,780	3,11,688			14.68		
1864-65	99,094	21,28,996	3,97,052			1,43,508	2,53,544			12.49		
1863-64	45,893	20,29,902	3,52,119			1,71,242	1,80,877			9.27		
1862-63	1,00,910	19,84,009	4,03,969			2,22,496	1,81,473			9.63		
1861-62	42,135	18,83,099	4,63,345			2,18,646	2,44,699			13.29		
1860-61	25,519	18,40,964	3,66,334			2,03,172	1,63,162			8.79		
1859-60	20,987	18,15,445	3,29,452			1,63,132	1,66,320			9.27		
1858-59	5,719	17,94,458	2,34,183			1,06,639	1,27,544			7.13		
1857-58	22,170	17,88,739	2,63,236			1,60,380	93,856			5.31		
1856-57	11,113	17,66,569	3,42,946			1,24,236	2,18,710			12.4		
1855-56	75,581	17,55,456	2,92,796			1,02,966	1,89,830			10.94		
1854-55	83,050	16,58,423	3,25,548			1,26,027	2,19,284			13.22		
1853-54	1,23,728	15,75,373	3,24,029			1,50,081	1,75,467			11.14		
1852-53	3,758	14,51,645	3,05,254			1,25,477	1,98,552			13.68		
1851-52	22,957	14,47,887	3,14,722			1,37,931	1,67,323			11.55		
1850-51	66,552	14,24,930	3,09,594			1,41,174	1,73,548			12.18		
1849-50	6,107	13,58,378	2,90,683			1,24,682	1,84,912			13.61		
1848-49	62,446	13,52,271	3,02,885			1,05,390	1,85,293			13.68		
1847-48						1,31,963	1,70,922			13.25		

Abstract of financial results of the Western Jumna Canal—(concluded).

Abstract of financial results of the WESTERN JUMNA CANAL

PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY.														
CAPITAL OUTLAY.			REVENUE.			WORKING EXPENSES.			NET REVENUE.					
During year.		To end of year.	Direct income by water-rates.	Indirect income by increased land revenue.	Total.	Rs.	Rs.	Rs.	Direct income.	Indirect income.	Total.	Direct.	Indirect.	Total.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1845-46	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1844-45	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1843-44	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1842-43	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1841-42	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1840-41	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1839-40	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1838-39	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1837-38	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1836-37	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1835-36	...	...	...	...	...	...	...	...	...	...	...	...	...	...
To end of 1834-35	...	...	...	...	...	...	...	...	...	...	...	...	...	...

(4)

(5)

Interest Account of the Western Jumna Canal to end of 1870-71.

		CHARGE FOR INTEREST AT 5 PER CENT.	DIFFERENCE BETWEEN NET DIRECT PROFITS AND CHARGES FOR INTEREST.			DIFFERENCE BETWEEN NET DIRECT AND INDIRECT PROFITS AND CHARGE FOR INTEREST.		
			Net direct revenue.	Difference.		Net direct and indirect revenue.	Difference.	
				More.	Less.		More.	Less.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
1870-71	...	1,29,872						
1869-70	...	1,22,283	8,75,994	7,53,711				
To end of 1868-69	...	28,27,970	74,67,914	46,39,944				
		30,80,125						

Abstract of the receipts during 1869-70 and 1870-71.

	WATER-RATES.	MILL-RENTS.	TRANSIT DUES.	SALE OF TIMBER AND GRASS.	FINES.	SUNDRIES.	CONTRIBUTIONS.	TOTAL.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71								
1869-70	12,01,722	11,629	8,268	11,402	16,017	3,266	708	12,53,012

Abstract of the charges under working expenses during 1869-70 and 1870-71.

ESTABLISHMENT.			TOOLS AND PLANT.	PROFIT AND LOSS.	WORKS.	REPAIRS.	PLANTA- TIONS.	TOTAL.	
Direction.	Construction.	Total.							
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
1870-71 ...									
1869-70 ...	35,552	1,89,372	2,24,924	4,010	60	6,342	1,38,199	3,483	3,77,018

Abstract of financial results of the BAREE DOAB CANAL.

Abstract of financial results of the BAREE DOAB CANAL.

	CAPITAL OUTLAY.		REVENUE.			WORKING EXPENSES.	NET REVENUE.			PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY.		
	During year.	To end of year.	Direct income by water-rates, &c.	Indirect income by increased land revenue.	Total.		Direct income.	Indirect income.	Total.	Direct.	Indirect.	Total.
1870-71	Rs. 5,78,045	Rs. 1,26,02,503	Rs. 7,33,558	Rs.	Rs.	Rs. 3,77,965	Rs. 3,55,593	Rs.	2.95			
1869-70	2,68,449	1,20,24,458	6,85,439			3,48,576	3,36,863		2.86			
1868-69	1,50,217	1,17,56,009	7,81,507			4,07,980	3,73,527		3.21			
1867-68	1,11,981	1,16,25,792	6,87,415			4,18,299	2,69,116		2.33			
1866-67	B—48,069	1,15,13,811	5,84,749			3,17,103	2,67,646		2.31			
1865-66	1,53,658	1,15,01,880	4,67,594			3,55,059	1,12,535		.98			
1864-65	3,08,491	1,14,08,222	4,90,660			4,19,526	71,134		.64			
1863-64	3,86,083	1,10,99,731	3,51,259			3,71,105	—19,846		—18			
1862-63	4,27,636	1,07,13,648	3,23,165			3,78,968	—55,803		—54			
1861-62	7,94,409	1,02,86,012	3,05,932			2,87,190	18,742		.19			
1860-61	7,92,735	94,91,603	2,26,876			2,63,031	—36,175		—41			
Up to 1859-60	87,88,868	...	A 8,49,849			2,91,529	5,58,320					
Total	1,26,02,503	...	64,88,003			42,36,351	22,51,652					

B Outlay of year, less Madhopoor workshops.

A Entirely from Huali Canal.

B Outlay of year, less Madhopoor workshops.

Interest Account of the Baree Doab Canal up to end of 1870-71.

	CHARGE FOR INTEREST AT 5 PER CENT.	DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.		DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.	
		Net direct revenue.	Difference.		Total net direct and indirect revenue.
			More.	Less.	
1870-71	Rs. 6,01,223	Rs. 3,55,593	...	...	Rs. 2,45,630
1869-70	5,87,800	3,36,863	...	...	2,50,937
To end of 1868-69	48,16,505	15,59,196	...	...	32,57,309
	60,05,528	22,51,652	...	...	37,53,876

Abstract of the receipts during 1869-70 and 1870-71.

	Water-rates.	Mill-rents.	Sale of timber and grass.	Transit dues.	Fines.	Sundries.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	6,92,276	23,054	12,345	806	2,054	3,023	7,33,558
1869-70	6,66,651	9,664	3,933	...	1,074	4,117	6,85,439

Abstract of the charges under working expenses during 1869-70 and 1870-71.

	REMISSION AND FREE GRANTS.	ESTABLISHMENT.			WORKS.	REPAIRS.	PLANTATIONS.	TOOLS AND PLANT.	PROFIT AND LOSS.	TOTAL.
		Direction.	Executive.	Total.						
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	3,300	38,416	1,75,149	2,13,565	...	1,45,490	11,961	3,111	538	3,77,965
1869-70	...	25,107	1,30,224	1,55,331	8,178	1,72,271	6,996	5,800	...	3,48,576

Abstract of financial results of DELHI AND GOORGAON IRRIGATION WORKS.

PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY.													
CAPITAL.		REVENUE.			WORKING EXPENSES.	NET REVENUE.			PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY.				
		During year.	To end of year.	Direct income by water- rates.		Indirect in- come by land revenue.	Total.	Direct.	Indirect.	Total.	Direct.	Indirect.	Total.
1870-71	...	...	...	...	...	...	...	...	...	...	...	...	...
1869-70	...	839	1,83,830	4,718	...	Rs.	Rs.	Rs.	Loss. 7,439	Rs.	Rs.	L. 4.06	...
1868-69	...	7,277	1,82,991	1,727	...	...	...	...	Loss. 7,559	...	...	L. 4.37	...
1867-68	...	5,013	1,75,714	6,654	...	...	...	...	4,801	...	...	1.08	...
1866-67	...	352	1,70,701	4,087	...	...	...	...	Loss. 3,037	...	...	L. 1.78	...
1865-66	...	1,196	1,70,349	3,460	...	...	...	...	Loss. 13,457	...	...	47.95	...
1864-65	...	12,074	1,69,153	1,598	...	...	...	...	Loss. 11,640	...	...	47.41	...
To end of 1863-64	...	1,57,079	...	14,526	...	...	...	...	89,715	...	...	...	...

Interest account of the Delhi and Goorgaon Irrigation Works up to end of 1870-71.

Interest account of the Deent and ...

	CHARGE FOR INTEREST AT 5 PER CENT.	DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.			DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.		
		Net direct revenue.	Difference.		Total net direct and indirect revenue.	Difference.	
			More.	Less.		More.	Less.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	9,192						
1869-70 ...	9,150	—7,439		16,589			
To end of 1868-69 ...	1,66,417	—1,09,029		2,75,446			
	1,84,759						

Abstract of the receipts during 1869-70 and 1870-71.

	Water-rates.	Sale of timber and grass.	Fines.	Sundries.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	...	...	...	...	...
1869-70 ...	3,872	811	10	25	4,718

Abstract of the charges under working expenses during 1869-70 and 1870-71.

	ESTABLISHMENT.			Repairs.	Plantations.	Total.
	Direction.	Executive.	Total.			
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	...	...	...	...	...	...
1869-70 ...	368	5,996	6,364	5,755	38	12,157

Abstract of financial results of the Upper Sutlej Canals.

(10)

CAPITAL.		REVENUE.			WORKING EXPENSES.	NET REVENUE.			PERCENTAGE OF NET REVENUE TO CAPITAL OUTLAY.		
During year.	To end of year.	Direct revenue by water-rates.	Indirect revenue by increased land revenue.	Total.		Direct.	Indirect.	Total.	Direct.	Indirect.	Total.
Ra.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	L. 9.22	L. 6.09	L. 2.18
1870-71	54,248	5,04,547	57,398		1,04,467	Loss. 47,069					
1869-70	41,220	5,10,299	56,235		84,834	Loss. 28,599					
1868-69	33,834	4,69,079	51,661		61,144	Loss. 9,483					
1867-68	34,013	4,35,245	61,134		53,174	7,960			1.98		
1866-67	36,206	4,01,232	42,112		30,958	11,154			3.06		
1865-66	5,208	3,65,026	47,085		40,853	6,232			1.73		
To end of 1864-65	3,59,818.	...	1,92,321		4,08,987	Loss. 2,16,066					
	5,64,547		5,07,946		7,84,417						

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Interest account of the Upper Sutlej Canals to end of 1870-71.

	CHARGE FOR INTEREST AT 5 PER CENT.	NET CHARGE TO GOVERNMENT AFTER DEDUCTING REVENUE.			NET RESULTS INCLUDING DIRECT AND INDIRECT PROFITS.		
		Net.	Difference.		Net indirect revenue after deducting loss.	Difference.	
		Loss.	More.	Less.		More.	Less.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	25,514	47,069		72,583			
1869-70	23,454	28,599		52,053			
To end of 1868-69	1,83,640	2,00,803		3,84,443			
Total	2,32,608	2,76,471		5,09,079			

Abstract of the receipts during 1869-70 and 1870-71.

				WATER-RATES.	SALES OF TIMBER AND GRASS.	FINES.	SUNDRIES.	CONTRIBUTION.	TOTAL.
				Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	...	...	...	50,551	4,135	318	1,078	1,316	57,398
1869-70	...	...	...	49,223	2,875	421	410	3,306	56,235

Abstract of the charges for working expenses during 1869-70 and 1870-71.

Abstract of the charges for the year 1870-71

	WORKS.	ESTABLISHMENT.			REPAIRS.	PLANTATION.	TOOLS AND PLANT.	PROFIT AND LOSS.	TOTAL.	
		Direction.	Executive.	Total.						
		Rs.	Rs.	Rs.						Rs.
1870-71	...	...	20,072	35,436	55,508	47,693	448	818	...	1,04,467
1869-70	...	1,073	3,345	21,516	24,861	58,120	343	437		84,834

Abstract of the financial results of the LOWER SUTLEJ AND CHENAB CANALS.

CAPITAL.		REVENUE.			WORKING EXPENSES.	NET REVENUE.			PERCENTAGE OF NET REVENUE TO CAPITAL OUTLAY.		
During year.	To end of year.	Rs.	Rs.	Rs.		Direct.	Indirect.	Total.	Direct.	Indirect.	Total.
1870-71	...	10,661	1,11,495	A 1,34,168	B 1,87,658	Loss. 53,490		Rs.	L 53		Rs.
1869-70	...	17,506	1,00,834	A 1,39,956	B 1,72,230	Loss. 32,274		Rs.	L 38.73		Rs.
1868-69	...	12,999	83,328	A 1,22,415	B 1,55,652	Loss. 33,237		Rs.	L 47.26		Rs.
1867-68	...	5,024	70,329	A 1,11,359	B 1,40,489	Loss. 29,130		Rs.	L 44.6		Rs.
1866-67	...	6,087	65,305	3,506	10,167	Loss. 6,661		Rs.	L 11.25		Rs.
1865-66	...	1,259	59,218	8,012	12,380	Loss. 9,368		Rs.	L 16.17		Rs.
...	...	57,959		19,192	2,94,880	Loss. 2,75,688					
To end of 1864-65	...	1,11,495		5,33,608	9,73,456	Loss. 4,39,848					

A A A A.—Includes the following sums brought to account on other side as charges, under the head statute labour and fines—

1870-71 = 1,23,891
 1869-70 = 1,32,501
 1868-69 = 1,14,999
 1867-68 = 1,04,854

ditto.

B B B B.—Includes ditto

Interest account of the Lower Sutlej and Chenab Canals up to end of 1870-71.

Interest account of the ...

	CHARGE FOR INTEREST AT 5 PER CENT.	DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.			DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVE- NUE AND CHARGE FOR INTEREST.		
		Net direct Revenue.	Difference.		Total net direct and in- direct Revenue.	Difference.	
			More.	Less.		More.	Less.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	5,042	—53,490		58,532			
1869-70 ...	4,165	—32,274		36,439			
To end of 1868-69 ...	36,528	—3,54,084		3,90,612			
	45,735	—4,39,848		4,85,583			

Abstract of the receipts during 1869-70 and 1870-71.

	Water-rates.	Sales of timber and grass.	Fines.	Miscellaneous.	Drawn from Fine Fund.	Value of Statute labour.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	683	7,428	1,818	368	34,336	89,535	1,34,168
1869-70	682	5,577	692	504	42,966	89,535	1,39,956

Abstract of the charges under working expenses during 1869-70 and 1870-71.

	ESTABLISHMENT.			REPAIRS.	REPAIRS FROM FINE FUND.	PLANTATION.	TOOLS AND PLANT.	STATUTE LABOUR.	TOTAL.
	Direction.	Construction.	Total.						
1870-71	Rs. 3,744	Rs. 31,719	Rs. 35,463	Rs. 6,881	Rs. 54,428	Rs. 325	Rs. 1,026	Rs. 89,535	Rs. 1,87,658
1869-70	Rs. 5,406	Rs. 25,198	Rs. 30,604	Rs. 8,675	Rs. 42,966	Rs. 229	Rs. 221	Rs. 89,535	Rs. 1,72,230

Abstract of the financial results of the INDUS CANALS.

CAPITAL.		REVENUE.			WORKING EXPENSES.	NET REVENUE.			PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY.		
		Direct.	Indirect.	Total.		Direct.	Indirect.	Total.	Direct.	Indirect.	Total.
During year.	To end of year.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Loss.	Loss.	Loss.
...	...	21,866	3,89,112	85,863	87,606	1,743	Loss.	Rs.	Loss.	47	Loss.
1870-71	...	12,993	3,67,246	53,571	1,25,425	71,854	Loss.	Rs.	Loss.	20-28	Loss.
1869-70	...	15,530	3,54,253	48,176	1,11,880	63,704	Loss.	Rs.	Loss.	188	Loss.
1868-69	...	4,783	3,38,723	51,394	1,23,979	72,585	Loss.	Rs.	Loss.	2174	Loss.
1867-68	...	2,05,946	A 3,33,940	854	43,172	42,318	Loss.	Rs.	Loss.	33-06	Loss.
1866-67	...	1,627	A 1,27,994	477	50,013	49,536	Loss.	Rs.	Loss.	29-20	Loss.
1865-66	...	1,26,367		572	3,55,893	3,55,321	Loss.	Rs.	Loss.	39-20	Loss.
1864-65	...										
		3,89,112		2,40,907	8,97,968	6,57,061	Loss.				

A.—Increase in Capital account due to inclusion of the outlay on the embankments of the Dehra Ghuzee Khan District.

The inclusion of receipts and charges in the gross instead of in the net accounts for the greater portion of the difference between the receipts and expenditure from 1867-68 to 1870-71, as compared with the receipts and charges of subsequent years.

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Interest Account of the Indus Canals.

Interest Account of the India Company.

	CHARGE FOR INTEREST.	DIFFERENCE BETWEEN NET DIRECT LOSS AND CHARGE FOR INTEREST.			DIFFERENCE BETWEEN NET DIRECT AND INDIRECT PROFITS AND CHARGE FOR INTEREST.		
		Net direct loss.	Difference.		Net direct and indirect profits.	Difference.	
			More.	Less.		Money.	Less.
	Rs.	Rs.	Rs.	Rs.	Rs:	Rs.	Rs.
1870-71	18,362	1,743		20,105			
1869-70	17,712	71,854		89,566			
To end of 1868-69 ...	57,022	5,83,464		6,40,486			
Total ...	93,096	6,57,061		7,50,157			

Abstract of the heads of receipt from Indus Canals during 1869-70 and 1870-71.

	WATER-RATES.	SALES OF TIMBER AND GRASS.	FINES.	SUNDRIES.	TOTAL.
	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	85,048	363	76	376	85,863
1869-70	52,547	352	669	3	53,571

Abstract of the charges for working expenses of the Indus Canals during 1869-70 and 1870-71.

Abstract of the ...

1870-71.

ESTABLISHMENT.					REPAIRS.	WORKS.	TOOLS AND PLANT.	PLANTA- TIONS.	TOTAL.
Direction.	Construc- tion.	Fees.	Total.						
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	18,293	30,522	...	48,815	35,846	...	2,539	406	87,606
1869-70 ...	4,282	29,123	2,627	36,032	86,741	1,000	955	697	1,25,425

... of the SHAHPOOR CANALS.

Abstract of financial results of the SHAHPOOR CANALS.

Capital outlay	...	{ To end of 1869-70. During 1870-71	...	...	Rs. 20,571	Rs. 20,571
Revenue	...	{ Receipts (direct) Charges	...	...	Rs. 5,013 4,230	Rs. 783
Net profit						
Percentage of net profits to Capital outlay.						

Expenditure on Canals not under operation.

	SIRHIND CANAL.		PESHAWUR PROJECT.		TOTAL.	
	During year.	To end of year.	During year.	To end of year.	During year.	To end of year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	4,77,711	10,40,163	4,965	4,965	4,82,676	10,45,128
1869-70	4,02,042	5,62,452	...	...	4,02,042	5,62,452
1868-69	...	1,60,410	...	...	...	1,60,410

General Abstract of the financial results of the Irrigation Works under Government of the Punjab to end of 1870-71.

	CAPITAL OUTLAY.			REVENUE ACCOUNT, 1870-71.						CHARGE FOR INTEREST, 1870-71.	PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY, 1870-71.			PERCENTAGE OF NET REVENUE ON CAPITAL OUTLAY, 1869-70.			
	During 1869-70.	During 1870-71.	To end of 1870-71.	Direct receipts.	Working expenses.	Net receipts.	Add indirect receipts.	Total net direct and indirect.	Direct.		Indirect.	Total.	Direct.	Indirect.	Total.		
Western Jumna Canal ...	Rs. 1,51,776			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs. 1,29,872				35-82	
Baree Doab "	2,68,449	5,78,045	1,26,02,503	7,33,558	3,77,965	3,55,593						6,01,223	2-95			286	
Delli and Goorgaon Works	839											9,192				L4-06	
Upper Sutlej Canal ...	41,220	54,248	5,61,547	57,398	1,04,467	— 47,069						25,514	L9-22			L6-09	
Lower " "	17,506	10,661	1,11,495	1,34,168	1,87,658	— 53,490						5,042	L4-53			L58-73	
Indus Canals ...	12,993	21,866	3,89,112	85,863	87,606	— 1,743						18,362	L-47			L20-28	
Shahpoor Canal ...		20,571	20,571	5,013	4,230	783							L7				
Total ...	4,92,783											7,89,205					
Canals under construction	4,02,042	4,82,676	10,45,128									28,122					
Total ...	8,94,825											8,17,327					

(16)

Interest account of all the Irrigation Works in the Punjab from commencement to end of 1870-71.

IRRIGATION WORKS.	CHARGE FOR INTEREST AT 5 PER CENT.			DIFFERENCE BETWEEN NET DIRECT REVENUE AND CHARGE FOR INTEREST.				DIFFERENCE BETWEEN NET DIRECT AND INDIRECT REVENUE AND CHARGE FOR INTEREST.			
	During 1869-70.	During 1870-71.	To end of 1870-71.	Net direct revenue.		Difference between net direct revenue and charge for interest.		Net direct and indirect revenue.		Difference between direct and indirect revenue and charge for interest.	
				1870-71.	To end of 1870-71.	1870-71.	To end of 1870-71.	1870-71.	To end of 1870-71.	1870-71.	To end of 1870-71.
Western Jumna Canal ...	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Baree Doab "	1,22,283	1,29,872	30,80,125	...	...	...	...	...	...	...	...
Delhi and Goorgaon Irrigation Works	5,87,800	6,01,223	60,05,528	3,55,593	22,51,652	-2,45,630	-37,53,876				
Upper Sutlej Canal	9,150	9,192	1,84,759	...	...	...	...				
Lower " "	23,454	25,514	2,32,608	-47,069	-2,76,471	-72,583	-5,09,079				
Indus Canals	4,165	5,042	36,528	-53,490	-4,39,848	-58,532	-4,85,583				
Shahpoor "	17,712	18,362	93,096	-1,743	-6,57,061	-20,105	-7,50,157				
	...	...	...	783	783	783	783				
Canals under construction	7,64,564	7,80,205	96,32,644	...	...	...	...				
	8,020	28,122	36,142	...	...	28,122	36,142				
TOTAL	7,72,584	8,17,327	96,68,786	...	...	...	...				

(17)

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4/7/72

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Pres. 1 Feb 7/72 L.H. 15

Abstracts prepared on same principle as those of the North Western Provinces.

Exception.

Cause of exception.

Memo. to accompany the abstract of financial results of the Irrigation Works under the Government of the Punjab, from commencement to end of 1870-71.

These abstracts have been prepared on the principles described in the Note on the North Western Provinces Returns, except that in the case of establishment debitable to Capital on canals in operation, the charge has been apportioned since 1864-65 up to at 13 per cent. of the outlay on works, instead of at 10 per cent. as in the case of the North Western Provinces. The difference is due to the establishments in the Punjab having, through various causes, been found somewhat more expensive than those in the North Western Provinces. In the case of additions, extensions and improvements to canals under operation, as in the remodelling project of the Western Jumna Canal, the actual outlay of the distinct establishment appointed for the purpose, whether such establishment was for survey or for work, has been debited to the Capital Account. The same principle has been followed in the case of the establishment for remodelling the Ganges and other Canals. The charges for Direction and Account have been apportioned in proportion to the actual outlay; and in the case of new projects under construction, such as the Sirhind Canal, the whole cost of the special Superintending Engineers appointed to the charge of the work has been debited to the Capital Account.

WESTERN JUMNA CANAL.

Western Jumna Canal—an old Mahomedan work.

Success of Canal.
Exception.

Capital outlay.

Cost of Establishment.

2. This is an old Mahomedan work, re-opened, and, in some places, re-aligned, by the British Government since 1820. It has consequently been in operation for more than 50 years. Although originally constructed without much reference to the slope or water-sheds of the tracts through which it passes, it has proved very successful in almost every point of view. The chief exception to complete success has been the amount of swamping in some villages bordering it, and consequent extension of the efflorescence called "reh," but it may be hoped that these evils will disappear on the execution of works of remodelling recently sanctioned.

3. The Capital outlay by the British Government up to end of 1870-71 on the work has amounted to Rs. . . . Including interest previous to the work having been brought under operation, the charge would amount to Rs. . . . The original cost of the work is not known, but it may be estimated as having amounted to Rs. . . , so that for the purpose of producing the percentage of the net direct profits, the Capital outlay may be taken at Rs. . . . It may be added that extensions and improvements are being made to the project, involving an eventual additional expenditure of Rs. . . , but the large returns derived from the scheme fully justify such an outlay. The length of the Canal is . . . miles with an aggregate of . . . miles of distributary channels.

4. The cost of establishment employed in the restoration of the work cannot be accurately told, but it is estimated to have amounted to about 15 per cent. of the total outlay.

(4)

14. The indirect revenue of the canal is shown as having amounted to Rs. for 1870-71. The aggregate of such receipts to end of 1870-71 is Rs. The amount has been thus arrived at—

Net indirect revenues.

BAREE DOAB CANAL.

15. This work has been constructed entirely by the British Government. Commenced in 1849-50, its aggregate length is miles, with miles of rajbuhas or distributaries. Its cost per mile has been expensive, being at the rate of Rs. per mile, compared with Rs. of the Ganges Canal. The increased cost has told upon the Revenue receipts, but the exceptionally expensive cost of the project is due to the unusually high rates that were paid in its construction, and of the extraordinary number of masonry falls which were required to adopt the bed to a proper slope, the fall of the country along the canal being about 200 feet in the first 13 or 14 miles from the head. The aggregate Capital outlay up to end of 1870-71 has been Rs. 1,26,02,503, which may be thus abstracted

Baree Doab Canal.

Cost excessive.

Causes.

(5)

Receipts from canal increasing.

16. The receipts from the canal show a tendency to considerable increase. The details are as follows:—

	WATER-RATES.	MILL RENTS.	SALE OF CANAL PRODUCE.	TRANSIT DUES.	FINES.	SUNDRIES.	TOTAL.	AREA IRRIGATED.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Acres.
1870-71 ...	6,92,276	23,054	12,345	806	2,054	3,023	7,33,558	279,210
1869-70 ...	6,66,651	9,664	3,933	...	1,074	4,117	6,85,439	233,927
1868-69 ...	7,54,218	11,407	5,328	...	4,458	6,066	7,81,507	299,835
1867-68 ...	6,43,993	13,854	10,299	...	4,911	14,358	6,87,415	262,455
1866-67 ...	5,58,325	6,546	9,147	...	3,333	7,393	5,84,749	228,427
1865-66 ...	4,25,256	3,291	7,448	...	4,192	27,407	4,67,594	175,979
1864-65 ...	4,63,300	1,479	11,974	...	13,907		4,90,660	192,683
1863-64 ...	3,22,216	688	6,243	1,996	20,116		3,51,253	134,362
1862-63 ...	3,08,864	640	3,536	1,124	9,001		3,23,165	126,016
1861-62 ...	2,97,637	554	2,557	6	5,173		3,05,932	122,972
1860-61 ...	2,17,980	602	3,513	608	4,173		2,26,876	89,756

Cause of increase.

17. The increase in the area irrigated has, of course, produced a proportionate increase in the revenue, but it may be mentioned that per cent. of the increase is due to an increase in the water-rates, which are now assessed at the following rates.

Navigation receipts insignificant

18. The receipts from navigation have been trifling. It is due to

Cause of this

19. While the direct receipts have almost trebled in 1870-71 as compared with 1860-61, the working expenses have increased only from Rs. 2,63,051 to Rs. 3,77,965 within that period. The increase has been but little less than 50 per cent. The details are as follows:—

	REMISSION AND FREE GRANTS.	WORKS.	REPAIRS.	ESTABLISHMENT.	PLANTATIONS.	TOOLS AND PLANT.	PROFIT AND LOSS.	TOTAL.	PERCENTAGE OF WORKING EXPENSES TO GROSS RECEIPTS.	
									Baree Doab.	Ganges Canal.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
1870-71 ...	3,300	...	1,45,490	2,13,565	11,961	3,111	538	3,77,965	51.5	45.4
1869-70 ...	...	...	1,72,271	1,55,331	6,996	5,800	...	3,48,576	50.8	49.3
1868-69 ...	986	14,999	1,73,889	1,99,309	9,162	9,535	100	4,07,980	52.2	52.5
1867-68 ...	2,858	...	1,92,973	2,00,342	11,570	10,449	107	4,18,299	60.8	58.2
1866-67 ...	...	...	1,33,502	1,76,261	7,340	...	...	3,17,103	54.2	49.9
1865-66 ...	...	...	1,53,874	1,87,886	13,299	...	...	3,55,059	75.9	55.5
1864-65 ...	...	...	2,49,251	1,45,130	25,145	...	...	4,19,526	85.5	80.7
1863-64 ...	...	...	2,44,335	1,28,770	A	...	...	3,71,105	105.6	72.3
1862-63 ...	...	...	1,93,455	1,85,513	A	...	...	3,78,968	117.2	115.6
1861-62 ...	...	...	1,33,560	1,53,630	A	...	...	2,87,190	93.8	54.7
1860-61 ...	...	...	1,20,851	1,42,200	A	...	...	2,63,051		

A A.—Included under Repairs.

20. The greater portion of the increase has, it will be seen, occurred under the head Establishment. The causes operating to an augmentation of charge under this head in the case of the Western Jumna Canal have also operated in the case of the Baree Doab Canal. Continued attention is being paid to a diminution of the outlay, but, as explained in the case of the Ganges Canal, reductions require much consideration, and an increase of charge is in many cases unavoidable.

21. Compared with the Ganges Canal the working expenses of the Baree Doab are somewhat excessive, but in the eleventh year of its existence the expenses of the former formed 55 per cent. of its receipts, whereas in the case of the Baree Doab it forms only 51.5 per cent.

22. The net profits of the canal, though encouraging, are small, forming but 2.95 per cent. of the Capital outlay. If the charge for interest previous to the canal having been brought under operation was debited to Capital, the results would be as follows:—

	CAPITAL OUTLAY ON CONSTRUCTION.	ADD NET CHARGE FOR INTEREST PREVIOUS TO CANAL HAVING BEEN BROUGHT UNDER OPERATION.	TOTAL.	PERCENTAGE OF NET PROFITS ON CAPITAL OUTLAY.
	Rs.	Rs.	Rs.	
1870-71 ...	...	...	...	...
1869-70 ...	...	...	...	...
1868-69 ...	...	...	...	...
1867-68 ...	...	...	...	...
1866-67 ...	...	...	...	...
1865-66 ...	...	...	...	...
1864-65 ...	...	...	...	...
1863-64 ...	...	...	...	...
1862-63 ...	...	...	...	...
1861-62 ...	...	...	...	...

Increase of working expenses chiefly under establishment.

Cause.

Comparison with Ganges Canal.

Net profits.

Returns from Baree Doab encouraging.

Indirect profits.

23. The canal has just been 11 years in operation, and earns now as much proportionally as the Ganges Canal did in the eleventh year of its existence. There is, therefore, every reason to hope that, notwithstanding the expensive nature of the Baree Doab Canal, the direct profits from it will reach a sum sufficient to pay the interest on the work, and leave a sufficient margin to redeem the payments made for interest while it was working at less than 5 per cent.

24. The indirect profits from the canal have amounted to Rs. ... during 1870-71, or Rs. ... in the aggregate. The amounts have been arrived at

Interest account.

25. The interest account of the canal, excluding charge for interest, previous to the canal having been brought under operation, shows a net deficit of Rs. 37,53,876. To clear this account within a reasonable period, it will be necessary for the canal to earn, under the head Direct Receipts, a net profit of 8 per cent. If the indirect profits were included, the interest account would show a net deficit of Rs. ...

Has been reduced by inclusion of receipts from Huslie Canal.

26. It has to be added that the net profits shown as reducing the interest account, includes a sum of Rs. 5,58,320 earned from the old Huslie Canal, now forming a portion of the Baree Doab Canal, and earning on an average about Rs. ... per annum. The reason for including the Huslie Canal with the Baree Doab is

DEHLI AND GOORGAON IRRIGATION WORKS.

Description of works.

27. These works are comprised in the natural lake called the Nujufgurb Jheel, into which the drainage of nearly the whole of the surrounding country falls. From this lake lead off irrigation channels to the adjacent fields, and on it, on the drying up of some of the water, cultivation is carried on, a rate of ... annas per acre being levied on land so cultivated. The Capital outlay on the works up to end of 1870-71 has amounted to Rs. ... the net direct loss in working to

Results of outlay.

end of 1870-71 to Rs. , and the charge for interest in addition to that loss to Rs. But if the estimated enhancement of the land revenue on the lands be added, the result is a net profit of Rs. during 1870-71, and an aggregate net profit to end of that year of Rs.

28. On the subject of these works, the Superintending Engineer in paras. 63, 64 and 68 of his Report for 1869-70 writes as follows :—

“Year by year money is expended on these works which have the appearance of being unremunerative, because the profit is shown in the land revenue, instead of being credited to the works to which it is really due.”

“The new settlement, the preliminary operations of which have commenced, will put this to right, as well as admit of a fair rate being charged for the irrigation due to the bunds instead of the present insignificant ones, which are for crops, Rs. 0-6-5 per acre, and for grass, Rs. 0-3-2 per acre, rates which cannot possibly remunerate Government for the expenditure on the works.”

“The works are entirely dependent upon rain, so that comparisons between the two consecutive years are of but little use, for in years when the receipts are smallest, the benefits conferred on the people are generally the greatest, as, without the bunds, neither the people nor their cattle could exist in seasons of drought.”

29. On the subject of these canals the Chief Engineer in para. 20 of his Report for 1869-70 writes as follows :—

“The new land revenue settlement lately commenced will, it is pointed out by the Superintending Engineer, enable us to show what these works really pay, which is impossible at present. These little works confer benefits on that parched tract which cannot be estimated in figures, the years in which the receipts are least being, as observed by the Superintending Engineer, those in which, without them, the country must be deserted by cattle and men.”

INUNDATION CANALS.

30. There are four distinct series of such canals, viz. :—

The Upper Sutlej Canals, 3 in number, and aggregating 147 miles in length.

The Lower Sutlej and Chenab Canals ... 34 ditto and 632 ditto.

The Indus Canals ... 13 ditto and 554 ditto.

50 1,333

31. The whole of the Lower Sutlej and Chenab Canals and the Indus Canals, excepting one 11 miles in length, were constructed prior to the occupation of the country by the British, and were in working order on annexation. The Capital outlay on the series to end of 1870-71 by the British Government has been—

	Rs.
Upper Sutlej ...	5,64,547
Lower Sutlej and Chenab ...	1,34,168
Indus Canals ...	3,89,112
	<u>10,87,827</u>

Remarks by Superintending Engineer on apparent unprofitableness.

Remarks by Chief Engineer on subject.

Inundation Canals.

Constructed chiefly by Native Chiefs.

Capital outlay.

Loss to Government.

and the net direct loss to Government has been—

	1870-71.	TO END OF 1870-71.	DITTO INCLUDING INTEREST.
	Rs.	Rs.	Rs.
Upper Sutlej ...	47,069	2,76,471	5,09,079
Lower Sutlej and Chenab ...	53,490	4,39,848	4,85,533
Indus ...	1,743	6,57,061	7,50,157
	<u>1,02,302</u>	<u>13,73,380</u>	<u>17,44,819</u>

Nominal only.

Since the account excludes the large indirect receipts.

But if the indirect returns be taken into account the results is a large profit, as follows :—

	1870-71.	TO END OF 1870-71.	DITTO AFTER DEDUCTING INTEREST.
	Rs.	Rs.	Rs.
Upper Sutlej ...			
Lower Sutlej and Chenab ...			
Indus ...			
Total ...			

The indirect returns have been arrived at as follows :—

CANALS UNDER CONSTRUCTION.

32. These are—

	ESTIMATED COST.	PROBABLE NET DIRECT PROFITS.
	Rs.	
Sirhind Canal ...	...	
Peshawur Project ...	...	

33. These are exclusive of remodelling projects connected with existing canals.

GENERAL REMARKS.

Rs.

34. Excluding the Irrigation Works under construction, the total Capital outlay on canals under operation up to end of 1869-70 has amounted to

And to end of 1870-71 to

Or if interest charges previous to the canals having been brought under operation were included as Capital outlay, the figures would be to end of 1869-70

Ditto ditto to end of 1870-71

The gross direct Revenue for 1870-71 has been

And the working expenses to per cent. of the gross direct receipts, or

Leaving a net Revenue of

If the indirect receipts were added, the net Revenue would be

And the percentage of net Revenue on Capital outlay to end, 1869-70, would be—

Direct.	{	On Capital outlay, excluding interest ...	{	Excluding Western Junna.
		On Capital outlay, including interest ...		Excluding ditto.
Direct and Indirect.	{	On Capital outlay, excluding interest ...	{	Excluding ditto.
		On Capital outlay, including interest ...		Excluding ditto.

The aggregate charge for interest from the period the canals were brought under operation to end of 1870-71 has been

The aggregate net direct Revenue to the same period has been

Leaving a balance of interest charges to be cleared off of

But if the indirect Revenue be included, the balance is reduced to

The aggregate area under irrigation during 1862-63 was acres

During 1869-70

And during 1870-71

35. These results, like those mentioned in the North Western Provinces, are full of encouragement, but they do not adequately represent the value of these great undertakings in time of drought. Thus the value of the produce of the irrigated lands from the canals in the Punjab during the year of drought, 1868-69, is estimated to amount to four millions sterling. This amount, though not strictly accurate, is still based on the detailed measurements of the different crops irrigated, and on the market prices of grain and other produce, and is sufficiently true to convey a fair impression of the profits which have been reaped by the cultivators when those of surrounding unirrigated districts were afflicted with loss and sufferings of various kinds.

2/12/79
2/12/79

*Memorandum to accompany the abstract
of financial results of the Irrigation
Works under the Government, North
Western Provinces.*

Information given in statements.

These abstracts give the total Capital outlay on each Irrigation work to end of 1870-71, the Revenue receipts and charges up to the same period, the percentage of net revenue on Capital outlay, the Interest Account showing the net profit or loss on each Irrigation work, arrived at after deducting the net receipts from the charge for interest after the canal was brought under operation, and a detail of the Revenue receipts and charges for the last two years, 1869-70 and 1870-71.

Capital outlay.

2. The outlay shown under Capital includes, except in cases where it is specially mentioned, the expenditure from first to last on works of construction, including establishment and tools and plant as well as charges for the survey and maturing of the projects. In cases where canals have been brought under operation, but which have not yet been completed, or to which additions and improvements are being made of the nature of Capital, the whole of such expenditure is shown as Capital outlay, the charge for work establishment being fixed at 10 per cent. of cost of work. The charge for interest while the canals were under construction has not been debited to the Capital Account, but in this explanatory Memorandum it will be shown how the charge affects the net result.

Revenue receipts.

Direct receipts.

3. The particulars under Revenue receipts are divided into two heads, Direct and Indirect Revenue. Under Direct receipts are shown the assessments for the year for water-rates, and the actual realizations under the head Navigation fees, mill-rents, produce from canal plantations, fines for non-observance of canal laws, and sundries. The assessments for the year, not the actual realizations of the year, under water-rates are shown in order to bring out the correct result for each year, especially in famine years, when a considerable portion of the earnings were generally realized in the following year. But it may be added that, as a rule, the difference between the actual realizations and the assessments are not so great as to affect the net results to any considerable extent. On the 1st April 1871 the un-realized earnings of the canals in the North Western Provinces amounted only to £5,184, the whole of which has been recovered during 1871-72.

Indirect receipts.

Ch.
3/7/72

P. W 331/72
From 1st Feb 1872 to 1st Dec 1872

5. Under the head Working expenses is included all charges for repairs and maintenance of Irrigation works, establishment in supervising the same, including a proportionate share of the charges for Direction and Account, the cost of collecting the direct canal revenue, consisting of the salaries of the Officers employed in making the assessments, the charges for conservancy and ward, and fees to Village Officers for realising the revenue from the villages concerned; the charges on account of maintenance of plantations, and the value of remissions of water-rent and free grants.

6. The percentage of net revenue on Capital outlay of any one year has been calculated in the Capital outlay, excluding interest, at the end of the preceding year. Thus the net Direct Revenue of 1870-71 of the Ganges Canal amounts to Rs. 10,42,896, and the Capital outlay at end of 1869-70 to Rs. 2,40,24,382. The former amounts to 4.34 per cent. of the latter, and this percentage has been taken as the net profit of 1870-71.

7. The Interest Account, showing the difference between the aggregate net receipts from the canal and the charge for interest, has been produced by calculating, from the period the canals were brought under operation, the charge for interest for each year at 5 per cent. of the capital at the end of the preceding year. Thus the Capital outlay at the end of 1869-70 for the Ganges Canal was Rs. 2,40,24,382. Five per cent. on this gives Rs. 12,00,219, and this amount has accordingly been shown in the account as the charge for interest for 1870-71. The same course has been followed for arriving at the interest for the period when the canals were under construction, for although in this latter case it would be proper to get at the interest charges on the *monthly* expenditure, yet, considering the lapse of time between the period during which the canals were under construction and the present time, it would be almost difficult, if not impossible, to ascertain the *monthly* outlay. Moreover, the charge for interest has been calculated at 5 per cent., whereas it would be proper to calculate it at 4½ per cent. only, so that the difference in the *rate* would make up, in the generality of cases, for the differences that would be produced were the interest calculated on the *monthly* expenditure at 4½ per cent., and the interest calculated on the yearly outlay at 5 per cent.

8. In the cases of canals under construction, and not brought into use, the whole of the executive establishment with the supervising establishment, consisting of Superintending Engineers with their Assistants and Office establishment, has been debited to the Capital Account. For Direction, consisting of Chief Engineer, with Assistant and Office establishment, and for Accounts, the charges have been divided in proportion to the outlay from Capital and Revenue, respectively. And in cases where canals have been brought under operation, but on which Capital outlay is still incurred, the same rule is observed on the division of the charges for Direction and Account; but in the case of the Work establishment, the charge to be debited to Capital is fixed at 10 per cent. of the outlay on Works, the balance of the charge being debited to Revenue as represent-

Working expenses.

Percentage of net Revenue on Capital outlay how calculated.

Interest Account how made up.

Charges for establishment how apportioned.

ing the portion of the outlay to be charged to that head on account of supervision for repairs and maintenance, and for assessment charges.

9. With these preliminary remarks explanatory of the manner in which the statements are prepared, such points as call for elucidation in the case of each canal will now be dwelt upon.

GANGES CANAL.

Ganges Canal; its Capital outlay.

10. Brought under operation in 1855-56, the length of the canal is 654 miles, and its distributaries 3,069 miles. The Capital outlay, excluding charges for simple interest for the period the canal was under construction, to end of 1870-71, has amounted to Rs. 2,42,78,162. Including simple interest, amounting to Rs. , the Capital charge has aggregated Rs.

11. The Capital outlay on the canal may be thus abstracted—

	WORKS.			ESTABLISHMENT.				GRAND TOTAL.
	Main Canal and branches.	Rajbhas.	Total.	Work.	Direction.	Remodelling.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Outlay to end of 1854-55, when canal was brought under operation ...	1,32,27,052	1,71,071	1,33,98,123	14,98,841	2,48,313	...	17,47,154	1,51,45,277
Outlay from 1855-56 to end of 1868-69 ...	30,67,371	41,67,661	72,35,032	7,23,592	1,81,098	1,50,717	10,55,407	82,90,439
Outlay during 1869-70 ...	4,13,145	1,06,241	5,19,386	51,939	22,049	47,516	1,21,504	6,40,890
" " 1870-71 ...								2,53,780
Total ...								2,43,20,386
Deduct sum included above chargeable to Lower Ganges Canal								52,224
Net chargeable to Ganges Canal ...								2,42,78,162

Percentage of charges for establishment.

12. For the period the canal was under construction, and not brought under operation, the charge for establishment formed about 13 per cent. of the outlay on works. From 1855-56 to 1868-69 the charge for establishment, excluding the portion rendered necessary by remodelling works, formed 11.2 per cent. In 1869-70 it was 14.2 per cent., and in 1870-71 per cent. But it has to be mentioned that the charges for establishment shown when the canal was under construction, represent the charges for *permanent* establishment only, the outlay on *temporary* establishment having, under the rules then in force, been charged *direct* to works; it is impossible at this distance of time to ascertain the charges on account of the latter class of establishment charged direct to works.

Revenue Account receipts.
Increase.
Famine years, 1860-61 and 1861-62.

Increase of water-rates

13. The direct receipts, it will be observed, have risen from Rs. 48,600 in 1855-56, to Rs. 6,45,114, and Rs. 7,05,800 in the two famine years 1860-61 and 1861-62. The income of 1862-63 was Rs. 5,32,278, and of 1863-64, Rs. 7,77,390, when an increase of the water-rates in the succeeding year led to an increase in the revenue to Rs. 9,88,455. Increase of water-rates, combined with an increase of the area irrigated, led to a gradual augmentation of the receipts, until in

the year of drought, 1868-69, the earnings amounted to the unprecedented sum of Rs. 24,41,560. The step thus gained in the extension of irrigation was not lost to any appreciable extent, for, although the two succeeding years, 1869-70 and 1870-71, show the receipts to have amounted to Rs. 18,91,384 and Rs. 19,11,612, respectively, yet in 1866-67 and 1867-68 the receipts were only Rs. 15,33,729 and Rs. 13,63,524. Like the years following the famine of 1860-61 and 1861-62, the drought of 1868-69 shows that any abnormal extension of irrigation leads to a permanent increased revenue in succeeding years.

14. Two causes were in operation to bring an increase of revenue.—One, an increase in the water-rates; and the other, increase of area under irrigation. On this latter point reference is solicited to the following figures:—

Years.	Area under irrigation.
1870-71	
1869-70	780,406
1868-69	1,078,399
1867-68	533,456
1866-67	634,734
1865-66	573,129
1864-65	566,517
1863-64	449,788
1862-63	205,605
1861-62	377,322

15. The increase in the water-rates has been but slight, the average charge per acre irrigated having been Rs. 2.25 per acre in 1870-71, against Rs. 1.54 per cent. in 1862-63. The large increase in the revenue is thus mainly due to an increase in the area brought under irrigation.

16. The greater portion of the receipts from canals are, of course, from water-rates. But a considerable source of profit may fairly be expected from Navigation receipts. The following abstract shows, however, that the receipts from this source have not yet assumed the magnitude which may be anticipated, and are, in fact, less than what they were in 1861-62:—

	WATER-RENTS.	MILL-RENT.	FINES.	NAVIGATION.	SUNDRIES.	PRODUCE FROM CANAL PLANTATIONS.	TOTAL.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71	...	...	...	...	...	...	...
1869-70	17,57,573	20,637	13,266	33,796	5,648	60,464	19,11,612
1868-69	22,65,320	25,793	13,984	38,784	8,769	88,910	18,91,384
1867-68	12,38,491	26,907	6,425	35,218	10,762	45,721	24,41,560
1866-67	14,06,030	25,603	9,125	38,119	8,869	45,983	13,63,524
1865-66	12,68,748	23,884	5,129	20,949	10,338	34,456	15,33,729
1864-65	8,95,042	15,096	3,677	43,662	4,978	26,000	13,61,504
1863-64	6,93,134	16,769	1,929	35,376	26,182	...	9,89,153
1862-63	4,51,360	12,946	1,326	46,834	19,812	...	7,73,390
1861-62	5,99,370	18,832	7,894	55,724	23,980	...	6,32,278
							7,05,900

Year of drought, 1868-69.

Increase of area under irrigation.

Increase of water-rates.

Navigation receipts.

Cause of stationary nature of Navigation receipts.

Cause of large Navigation receipts in 1860-61.

Hinderance to traffic another cause of small Navigation receipts.

Receipts from mill-rents.

17. The chief cause that has resulted in a decrease of the Navigation receipts and made the income under this head of a stationary character, is the opening of the East Indian Railway, and the failure of the Navigation Company in 1862, leading to a great reduction in the number of boats plying the canal. In 1861-62, the number of boats plying on the canal was 2,463. In 1862-63, on the failure of the Company, the number was reduced to 1,252. In 1867-68 it was 450; in 1868-69, 488; in 1869-70 it was 487; and in 1870-71

18. The famine of 1860-61, before the complete opening of the East Indian Railway, led to a large number of boats plying on the canal during and subsequent to the famine period in conveying grain between Cawnpore and the large towns bordering on the canal. This accounts to a great extent for the comparatively large receipts during 1861-62, but the primary causes have already been adverted to, on which point the following extract from the Chief Engineer's Report for 1862-63 will be of interest:—

"83. The Company to which nearly all the boats on the canal belonging to Government were sold in the early part of 1860, has, after many narrow escapes and a precarious existence of three years, at length dissolved itself; its premature dissolution has frustrated the expectations which were entertained at one time of its realizing large profits and encouraging the growth of traffic on the canal, and we have to recommence operations with all the difficulties to contend against, which appeared when the navigation of the canal was in its infancy."

"86. The chief source of revenue in the Navigation Department is, however, derived from the rafting of sleepers, but as the distances to which the sleepers have to be conveyed are yearly getting shorter, the profits from this source are not so great as they formerly used to be."

19. Another hinderance to traffic has been caused by some of the bridges on the canal having been so low as to prevent the boats being sufficiently loaded to make them remunerative. The defect is now being remedied, and with the appointment of a Traffic Manager to the sole business of looking after this branch of the Department, it is expected that the receipts will ere long form a not inconsiderable portion of the income from the canal. The salary and expenses of the Traffic Manager's Department amount, it may be added, to Rs. per annum, being about per cent. of the Navigation receipts.

20. The fees charged for boats plying on the canal are as follows:—

21. Like the Navigation receipts, the income from water-power, or mill-rents, has shown no material increase. On this point the Chief

Engineer of Irrigation Works, in para. 24 of his Report for 1869-70, writes as follows:—

"The return from water-power is very small in comparison with the enormous amount available, equal to 30,000 horse-power on the whole canal. The employment of this power to its full extent must depend upon the general advancement of the country; but the time seems ripe for the cautious introduction of a few improved processes, and it is under consideration to erect a hydraulic cotton press at some convenient point on the canal, and to put a turbine at the tail of the canal at Cawnpore, where there is a demand for motive-power, which it is proposed to let out to any one who wants it, and to allow of its application to any purpose, excepting grinding corn in competition with the Government mills already established. By this means expenditure on buildings on account of Government will be avoided, and public or individual enterprise will be encouraged."

22. The produce from Canal plantations on the Ganges Canal yields now per cent. of the gross receipts, and has amounted during the last three years to an average of Rs. per annum. The expenses in keeping up the plantations have amounted to an average of Rs. per annum. It may be added that two-thirds of the receipts are derived from the sale of firewood and charcoal, and that the balance, one-third, is obtained by the sale of fruit.

23. The working expenses of the canal have formed, during 1870-71, a little more than 45 per cent. of the gross receipts. Comparing the outlay year by year, and canal by canal, the results are as follows:—

Produce from Canal plantations.

Working expenses.

	WORKING EXPENSES, GANGES CANAL.					PROPORTION BORNE BY WORKING EXPENSES TO GROSS REVENUE.				COST OF WORKING EXPENSES PER ACRE OF LAND IRRIGATED.			
	Remission of revenue.	Establishment.	Repairs.	Maintenance of plantations.	Total.	Ganges Canal.	Eastern Jumna.	Western Jumna.	Baree Doab Canal.	Ganges Canal.	Eastern Jumna.	Western Jumna.	Baree Doab Canal.
	Rs.	Rs.	Rs.	Rs.	Rs.					Rs.	Rs.	Rs.	Rs.
1870-71 ...					8,68,716	45.4	32		51.5				
1869-70 ...	8,184	4,68,140	4,26,334	29,292	9,31,950	49.3	27	30.08	50.8				
1868-69 ...	1,585	4,18,726	3,40,452	33,459	7,94,222	32.5	24.6	29.08	52.2				
1867-68 ...	4,928	3,57,094	3,97,760	34,201	7,93,983	58.2	29.3	37.4	60.8				
1866-67 ...	5,615	3,27,542	4,04,316	26,404	7,63,877	49.9	21.8	33.9	54.2				
1865-66 ...	6,784	3,84,199	3,40,050	19,730	7,50,763	55.	28.9	51.6	75.9				
1864-65 ...	...	3,62,863	4,24,420	20,400	8,07,683	80.7	36.5	40.8	85.5				
1863-64 ...	...	2,50,521	3,09,022		5,59,543	72.3	40.3	36.1	105.6				
1862-63 ...	...	2,60,521	3,55,017		6,15,538	115.6	39.5	48.6	117.2				
1861-62 ...	...	1,64,867	2,21,490		3,86,357	54.7	45.1	55.07	93.8				

High percentage borne by working expenses to gross revenue.

24. From this table it will be seen that the percentage borne by the working expenses to gross receipts on the two Canals—the Ganges and the Baree Doab—are considerably in excess of the percentages of the two older established Canals—the Eastern and Western Jumna. This is mainly due to the area under irrigation in the two former, and to the consequent receipts not having reached their proper limits. It is possible that the charges for working expenses may be curtailed, but the necessity for keeping the canal in proper order will prevent any marked diminution under this head. In fact, the only way in which a reduction in the proportion can be looked for is by an increase in the receipts. There is every probability of such an increase at an early date, for, if during 1868-69 the canal was capable of irrigating acres of land yielding a gross direct return of Rs. 24,41,560, it may safely be anticipated that at no distant period what was earned in an exceptional year will be the normal revenue of the canal. The working expenses will not call for any appreciable increase, so that the small proportion borne by the charges under this head during 1868-69 will, there is every reason to hope, be the normal rate, and percentage decrease as the area commanded by the canal is increased, until it is reduced to what experience has shown to be the average rate for the Eastern and Western Jumna Canals. On the subject of these expenses the Chief Engineer, in para. 20 of his Report for 1869-70, writes as follows:—

"The excessive slope and velocity of the Ganges Canal cause a large expenditure in repairs, especially of the masonry falls, which have been subject to very severe action; but as the slope is reduced and the heavy silt deposit in the lower divisions of the canal obviated the cost of repairs will diminish while the irrigation returns are certain to increase. This conclusion may be come to from the history of the works on the Eastern Jumna Canal, and while the expenditure on the Ganges Canal will bear a favourable comparison with the expenditure on other new works constructed on similar conditions like the Baree Doab Canal, it will doubtless in time approach the standard of working expenses of the Eastern Jumna Canal."

Increases in charges for Establishment.

25. The table of working expenses shows that the charges for establishment have increased from Rs. 1,64,867 in 1861-62, when the canal earned Rs. 7,05,800, to Rs. 4 in 1870-71, when the direct receipts from the undertaking were nearly three times as much, or Rs. 19,11,612. The establishment charges have thus risen about proportionately with the increased receipts, but the increases which it was absolutely necessary to give to all the grades in the Department, and the revision of establishment required to place the management of the canal on an efficient footing, have made the increase more than it otherwise would have been. The attention of Government is being continually paid to the best way in which a reduction in this charge can be effected, but the vast interests at stake, and the absolute necessity of continued scientific assistance being given to every portion of the canal, both in order to admit of its being kept in proper repair, as well as to the

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economical distribution of water and the settlement of conflicting claims connected with the assessment of water-rate, and the conservancy and ward of the works, render any reduction of charge which is not well considered injudicious and imprudent.

26. The charges for repairs have been almost stationary, except in 1864-65 and 1869-70, in which two years the outlay amounted to Rs. 4,24,420 and Rs. 4,26,334, respectively. During 1869-70, the increased outlay is due to the opportunity having been taken of the closure of the canal to effect the repairs of the falls, and to put the other works on the Northern and Meerut Divisions into thorough order. The extraordinary sup- ply run during 1868-69 to meet the famine de- mand which could not be intermitted for a single day, caused the damage to the falls, and 1869-70 has thus had to bear the burden due to 1868-69 while it shared in none of the profits.

27. From working at an absolute direct loss from 1855-56 to 1859-60, the net direct profits of the canals on the Capital outlay, excluding charges for interest for the period the canal was under con- struction, has risen steadily from* 1.54 per cent. in 1860-61, to 4.34 per cent. in 1870-71. In the famine year 1868-69, the net direct profits were 7.21 per cent. These percentages have been cal- culated on the Capital outlay, excluding charge for interest previous to the period the canal was brought under operation. Including such charge, the percentage would be as follows:—

Charges for repairs almost stationary.

Net profits.

* In 1862-63 the canals were worked at a loss of .41 per cent. This was due to a serious injury to one of the masonry falls and to the bunds at the head of the canal having given way by severe floods.

	CAPITAL OUTLAY.		PERCENTAGE OF NET PROFITS ON TOTAL CAP- TAL OUTLAY AT END OF SUCCEEDING YEAR.			
	Outlay in construc- tion to end of previous year.	Add charge for simple interest while the canal was under construction.	Total.	Direct.	Indirect.	Total.
	Rs.	Rs.	Rs.			
1870-71	2,40,24,382					
1869-70	2,34,35,716					
1868-69	2,28,25,462					
1867-68	2,23,06,264					
1866-67	2,19,55,759					
1865-66	2,17,17,308					
1864-63	2,12,98,202					
1863-66	2,08,19,633					
1862-63	2,02,25,484					

28 The simple interest account, calculated from the period the canal was brought under operation, shows an aggregate charge of Rs. 1,60,65,862, of which, Rs. 57,31,636 have been repaid from the net direct profits of the canal, leaving Rs. 1,03,34,226 to be still repaid. To admit of this

Interest Account of Ganges Canal.

being repaid within a reasonable period of ten years, it will be necessary that the net direct pro- fits of the canal should be increased from 4½ per cent. to about 8½ per cent. That this can be done is evidenced by the results of 1868-69, in which the net direct profits amounted to 7½ per cent. If the indirect profits were included, the simple in- terest account would show

EASTERN JUMNA CANAL.

Particulars about Eastern Jumna Canal.

29 The Eastern Jumna Canal is 130 miles in length with distributary channels having an aggregate length of 606 miles. Its total Capital outlay, excluding charge for interest for the period previous to the canal having been brought under operation, has been Rs. 19,73,320. The work is a restoration of a disused canal, which is thus described at page 937 of Thornton's *Gazette of India*—

"The construction of this canal is attributed to "Ali Mardhan Khan, Minister of the Emperor "Shah Jehan, a nobleman to whose wealth and "public spirit the execution of various great works "is ascribed by popular tradition. The canal is "conducted, with considerable knowledge of hy- "draulics, along the crest of the high ground be- "tween the Jumna and the Hindun, so as to admit "of its water being thrown, for the purposes of "irrigation, over the country on both sides. There "are, however, scarcely any traces of lateral offsets "or of bridges; whence it has been supposed that "the great difficulty of preserving it from the "ruinous effects of torrents in the upper part of "the course, caused it at an early period to be al- "lowed to lapse into ruin. Its general course is in a "southerly direction, nearly parallel to the Jumna, "and on an average, about fifteen miles east of it. "Near Delhi it flows into the valley of the Jumna, "and passing partly through the grounds of a royal "preserve, re-joins the Jumna opposite the city. "The length of the main branch is 135 miles. It "was by direction of the Supreme Government, "cleared out, put in thorough repair, and re-opened "in the beginning of 1830, for the various pur- "poses of irrigation, of affording water-power, and "of navigation."

30. The Capital outlay of the Eastern Jumna Canal may be thus abstracted—

	WORKS.	ESTABLISHMENT.			GRAND TOTAL.
		Work.	Direction	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.
To 30th April 1830 before opening of Canal ...	3,11,239	1,26,756	...	1,26,756	4,37,995
From ditto to end of 1868-69	13,28,516	1,32,851	14,167	1,47,018	14,75,534
During 1869-70 ...	23,285	2,828	1,109	3,937	32,222
During 1870-71 ...					27,569
Total ...					19,73,320

31. The charges for establishment on this canal previous to its having been brought under operation, form about 40 per cent. of the outlay on works, and forms an unfavourable contrast to the corresponding charge on the Ganges Canal. It is impossible at this distance of time to trace the cause of the high charge. After the canal was brought under operation, during which it happens that the bulk of the Capital outlay was spent, the charge for Work establishment has been limited to 10 per cent. of the outlay in construction.

High charge for Establishment.

32. The following abstract shows how steadily the receipts of the canal have been increasing :—

Revenue receipts.

YEAR.	RECEIPTS.						AREA OF LAND IRRIGATED.
	Water-rates.	Mill-rent.	Produce from Canal plantations.	Fines.	Sundries.	Total.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Acres.
1870-71 ...	...	...	...	...	...	...	...
1869-70 ...	5,83,842	6,905	12,687	7,626	584	5,66,367	...
1868-69 ...	5,99,580	9,048	5,181	11,005	636	6,11,644	251,067
1867-68 ...	4,61,724	8,853	9,817	2,143	609	6,23,150	271,101
1866-67 ...	5,32,465	7,716	11,793	4,803	590	4,83,146	182,544
1865-66 ...	4,13,799	7,305	20,314	1,984	519	5,57,367	239,555
1864-65 ...	3,21,791	8,732	6,761	1,625	519	4,45,252	160,355
1863-64 ...	2,53,004	7,151	3,316	1,023	528	3,39,458	225,266
1862-63 ...	2,04,758	6,514	3,283	477	512	2,65,022	181,331
1861-62 ...	2,38,604	5,914	3,888	1,546	580	2,15,571	181,232
1860-61 ...	2,61,195	...	...	...	...	2,50,532	231,311
			14,902			2,76,097	261,327

33. The water rates have been increased from Rs. per acre in 1860-61 to Rs. acre in 1870-71.

The receipts from Navigation on this canal are trifling—scarcely amounting to an average of Rs. a year. The cause of this is due

34. With the exception of the charge for Establishment, the increase in which is due to causes similar to those explained in the case of the Ganges Canal, the working expenses of the Eastern Jumna Canal call for no special comment. Their aggregate has increased but slightly—scarcely Rs. 70,000 within the last 11 years, during which period the revenue of the canal nearly doubled, viz., from Rs. 2,76,097 to Rs. 5,66,367, whereas the expenses are now only half as much as they were in 1860-61. The details of the working expenses by heads of charge are as follows :—

Working expenses.

	Remission of revenue.	Establishment.	Repairs.	Maintenance of Canal plantations.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.
1870-71 ...	...	...	...	...	...
1869-70 ...	95	1,00,323	56,021	8,732	1,80,955
1868-69 ...	360	90,373	55,180	8,141	1,65,171
1867-68 ...	494	80,812	53,684	6,473	1,54,054
1866-67 ...	15	71,137	47,830	2,675	1,41,463
1865-66 ...	...	73,599	52,029	3,358	1,21,657
1864-65 ...	...	67,802	51,379	1,626	1,28,986
1863-64 ...	...	59,610	47,150	...	1,23,807
1862-63 ...	...	63,491	21,690	...	1,06,760
1861-62 ...	...	66,757	46,295	...	85,181
1860-61 ...	...	66,577	47,188	...	1,13,052
					1,13,765

Net profits.

Interest account.

Results of Doon Canals.

Cause of unfavourable results.

35. The net profits of the canal have steadily risen this year to 19·8 per cent. of the Capital outlay, excluding charge for interest for the period previous to the canal having been brought into operation. Including such charge, the percentage is . . . But as the percentage is calculated on the Capital outlay by the British Government only, the profits are necessarily high. But assuming that the canal when originally constructed cost about Rs. 20 lakhs, which is over than under the mark, being at the rate of Rs. 15,000 per mile of main canal, the net direct profits from the canal would still amount to about 10 per cent. of the total capital.

36. The Interest account calculated upon the Capital outlay of the British Government only, shows that the aggregate charge for interest after the canal was brought into operation to end of 1870-71 has amounted to Rs. 23,22,454. The net direct profits of the canal during this period have, however, amounted to Rs. 42,60,590, so that, by the operations of the works, the Government have benefitted to the extent of Rs. 19,38,136. If the indirect profits were included, the total gain to the State would have been Rs.

DOON CANALS.

37. The results show that the net direct profits have amounted to 3·35 per cent. of the Capital outlay, showing a gradual increase over the operations of preceding years; that the working expenses absorb one-half of the gross profits; that the excess of interest over net profits has amounted to Rs. 3,38,896. If indirect profits be included, the excess is reduced to Rs.

38. In para 51 of his Report on Irrigation works for 1868-69, the Chief Engineer writes as follows :—

“No considerable profit can be looked for from the Doon Canals owing to the absorbent soil, the moist climate, and the sparse population. But without the canals, the Doon would be deserted, for the inhabitants of the villages depend upon them for drinking water.”

39. Again, in para 36 of his Report for 1869-70, the Chief Engineer says :—

“But, as has been explained often before, the value of these works cannot be judged by these financial results alone. Without them there could be no population or cultivation in the Doon at all. And this low return from the whole system of works does not prove that no such works in the Doon can be directly remunerative. The older and better situated canals, like the Raipoor Canal and the Beejapoor Canal, give returns of over 6 and 7 per cent. on their own cost, but the general percentage is reduced by the cost of the works in wilder parts of the country which have to precede the breaking up of the land for cultivation, and from which no great returns can be expected for many years.”

40. The details of the working expenses and the receipts, with the area irrigated for the last four years, are as follows:—

Receipts and expenses.

	RECEIPTS.					EXPENSES.					Percentage of expenses on receipts.	Area irrigated.
	Water-rates.	Mill-rent.	Miscellaneous.	Forest.	Total.	Remission of revenue.	Establishment.	Repairs.	Forest.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
1870-71	...				43,113							Acres.
1869-70	...	22,720	13,783	1,479	302	38,284	141	15,500	8,445	241	21,658	57.2
1868-69	...	25,131	11,946	1,110	518	38,705	192	15,347	9,591	241	24,327	63.6
1867-68	...	23,178	13,624	1,491	445	38,738	238	15,360	9,668	109	25,375	65.6
												11,989

41. The area under irrigation has shewn some increase during 1870-71. The water rates charged are Rs. per acre, against Rs. in 1863-64.

42. It may be added that measures are in progress for securing a more certain supply of water in some of the water-courses which will, it is expected, add much to the revenue.

ROHILKHUND CANALS.

43. The Capital outlay of these canals now stands at Rs. 6,03,104. They are being worked at a loss, the aggregate of such losses, including charges for interest, having amounted to Rs. 2,54,979 to end of 1870-71. The loss is stated to have been occasioned by it having been declared illegal to charge water-rate on canal-water taken from natural streams. The increased cost of establishment, on the other hand, due to the Revenue Account having been debited with charges for Survey establishment employed in connection with the extensive projects for new canals in Rohilkhund, has augmented the deficit. On estimates being passed, the cost of the Survey and other establishments connected with the new works which have hitherto been charged to Revenue, will be transferred to Capital.

44. The loss in these works must be continued to be incurred until the new canals are constructed.

These new works consist of a scheme for the irrigation of the Bareilly and Shahjehanpore Districts, and for the relief of the former from the pestilence and misery created by the dams which everywhere obstruct the numerous rivers which intersect this region and intercept its drainage.

The receipts and working expenses for the last few years are shown in the following abstract:—

Results of Rohilkhund Canals.

Cause of unfavourable results.

Cannot be avoided until new canals are constructed.

Description of new works.

Receipts and charges.

RECEIPTS.										EXPENSES.			AREA IRRIGATED.
Water- rates.	Mill- rents.	Forest produce.	Sundries.	Total.	Establish- ment.	Repairs.	Total.						
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Acres.				
1870-71 ... { Rohilkhund...													
{ Bijnour ...													
1869-70 ... { Rohilkhund...	23,746	40	1,264	218	25,268								
{ Bijnour ...	1,459	11	59	110	1,639	55,857							
1868-69 ... { Rohilkhund...	34,733		1,104	507	36,344	1,268	13,715	69,602	45,433				
{ Bijnour ...	2,758		125	143	3,026	31,171	511	1,782	1,376				
1867-68 ... { Rohilkhund...	13,507		1,085	172	14,764	1,710	10,728	41,809	70,803				
{ Bijnour ...	2,279	10	80	272	2,641	21,380	708	2,114	3,052				
						262	15,588	36,863	31,011				
							7,344	7,606	1,656				

Charges for Establishment.

45. If the charges for establishment on account of surveys were excluded, the amounts given above on account of working expenses and the net results would be as follows:—

	WORKING EXPENSES.	NET LOSS.	PERCENTAGE OF NET LOSS ON CAPITAL OUTLAY.
	Rs.	Rs.	
1870-71	...		
1869-70	...		
1868-69	...		
1867-68	...		

AGRA IRRIGATION WORKS.

46. These works consisted of bunds for storing up water, and of cuts or canals for leading it off for the inundation of land, have been virtually abandoned on sanitary grounds.

Results of Agra Irrigation Works.

BUNDLEKHUND IRRIGATION WORKS.

47. The first outlay on these works, which consist of large lakes or reservoirs, most of which were constructed antecedent to British rule, is not known, the amount shown as Capital outlay on the works representing merely the outlay since 1866-67. The operations under Revenue have resulted in a direct loss of Rs. 20,586 to end of 1870-71, or if interest charges be included, the loss is augmented to Rs. 29,070. The loss is to a great extent nominal only, as the landholders have a prescriptive right to free irrigation, owing to the value of such irrigation having been included in the assessment rates of their land. The estimated value of the irrigation shown as indirect profits in the returns is Rs. so that the loss is Rs. . Arrangements will be necessary, either by reduction of working expenses, or by increase of revenue, to cover the deficit, and measures to this end will have to be taken into consideration.

WORKS IN COURSE OF CONSTRUCTION.

48. These are the Lower Ganges, Eastern Ganges and Agra Canal, and the Bundlekhund

Bundlekhund Irrigation Works.

Works in course of construction.

Irrigation Works. Their estimated cost, with estimated net profits, are as follows:—

	Estimated cost. Rs.	Estimated net profits. Rs.
Lower Ganges Canal		
Eastern "		
Agra "		
Bundlekhund "		

GENERAL REMARKS.

49. Excluding the Agra Irrigation Works, and the Irrigation Works under construction, the total Capital outlay on canals under operation up to end of 1869-70 has amounted to ...	2,71,46,309
And to end of 1870-71 to ...	2,74,74,113
Or, if interest charges previous to the canals having been brought under operation were included as Capital outlay, the figures would be to end of 1869-70 ...	
Ditto, ditto, to end of 1870-71 ...	
The gross direct revenue for 1870-71 has been ...	25,52,457
And the working expenses to 46 per cent. of the gross direct receipts, or ...	11,56,814
Leaving a net revenue of ...	13,95,643
If the indirect receipts were added, the net revenue would be ...	
And the percentage of net revenue on Capital outlay to end of 1869-70 would be—	
Direct. { On Capital outlay excluding interest ...	
{ On Capital outlay including interest ...	
Direct and Indirect. { On Capital outlay excluding interest ...	
{ On Capital outlay including interest ...	
The aggregate charge for interest from the period the canals were brought under operation to end of 1870-71 has been ...	1,90,77,568
The aggregate net direct revenue to the same period has been ...	1,00,58,533
Leaving a balance of interest charges to be cleared off ...	90,19,035
But if the indirect revenue be	

50. These figures represent the value of the canals in the North Western Provinces, and the return they bring into the State Treasury. But they have a value which cannot be adequately expressed in sums of money. During 1868-69 they were the means of preserving a large revenue to the State, direct and indirect; they conferred incalculable blessings on the people; preserved the crops and the cattle, and admitted of the land revenue being maintained. On these points, the following extracts from reports submitted to the Government of India on the subject will be perused with much interest:—

"The effect of Canal irrigation upon the famine of 1868-69 is a lesson which has sunk into the hearts of the people, who had, indeed, cause to be thankful for the help of the Ganges and the Eastern Jumna Canals in securing life and property. And whilst old canals produced food, new canals afforded the most complete and economical famine relief of any public works in these Provinces." (Para. 18 of Resolution of Government, North Western Provinces, No. 1111 I, dated 17th April 1871).

"The untold benefits to the country in maintaining plenty, where there would otherwise have been starvation and want, have also been gratefully acknowledged. The Doab, in fact, become a granary, supplying plentifully the wants of the surrounding country as well as its own, and warding off misery, want and depopulation from among districts." (Para. 6 of ditto).

Extract paras. 64 to 66, and 71 to 74 of Report by Chief Engineer for 1868-69.

"At the first symptom of danger, a Circular was issued on 9th July 1868, instructing Superintending Engineers to spare no exertion or expense to maintain full supply of water in canals under their charge; to impress upon Executive Engineers the special necessity of preventing waste as far as possible; and to enjoin the extension of irrigation to the largest possible areas of food-corps.

"This instruction was shortly followed by further orders, directing attention specially to the extension of food and fodder-crops to the utmost. Officers were enjoined to observe engagements for irrigation of higher-class crops to the last moment; but it was laid down as a principle, that the first object in view was to secure wide areas of food-crops for man and beast, whereby the lives of cattle might be saved, upon whose labour agriculture depends, and the dispersion and unsettlement of large masses of the agricultural community averted.

"The gain to Government, it was said, even in a monetary point of view, would be far greater than the canal revenue that could be attained by limiting the use of water to the higher-class of crops. Encouragement was given to the Officers in charge of the head-works of the several canals, who were strenuously labouring to keep up supply as the rivers fell, and detailed instructions were issued for the care and maintenance of all weak points in the channels, that breaches should not result from the pressure of high supply. So well were these instructions

carried out, that, without necessity having arisen for Superintending Engineers to exercise the discretionary authority entrusted to them of stopping the watering of higher-class crops, the breadth of lower-class cereals was increased from 2,786 acres in 1867-68, to 85,281 acres in 1868-69, and this was done without a single breach of banks of such importance as to be deserving of report having occurred throughout the canals which were running brimful."

71. "The irrigated tracts of the Doab were the heart of the Province, from which surplus food flowed out by the railways westward to the Cis-Sutlej States, in which there was no harvest to reap; and southwards, by never-ending trains of carts and camels to Bundlekhund, Ajmere and Rajpootana, where no grain was even sown. Under Providence, a famine was averted by the combined action of railways and canals.

72. "The following abstract of a voluminous statement compiled from information as to yield, furnished by the Collectors of Districts, shows approximately that the value of the food-crops produced by canal irrigation amounted to five millions sterling:—

	Acres irrigated.	Maunds produced.	Value at current market rates in pounds sterling.
			£
Sugar	97,553	2,009,329	1,056,385
Wheat	597,936	7,916,186	2,635,505
Barley	257,509	2,680,006	436,250
Rice	111,020	1,142,152	387,146
Maize	42,122	353,547	82,699
Millet	93,369	690,693	170,108
Pulses	73,354	601,574	173,532
Total	1,272,862	15,393,487	4,991,625

73. "But, besides producing food for the support of human life, canal irrigation created sustenance for cattle which was produceable by no other means; and at a crisis when wells failed in well-irrigated districts, and herbage and fodder depended on abundant water, the cattle of the Doab were saved, strong to labour in the work of the following harvests; whilst elsewhere those harvests also were reduced by the want of cattle which had been swept off by the drought.

74. "And lastly, canal cultivators became rich, whilst others suffered, because they realised both large crops and high prices: the payment of land-revenue was assured, the breaking up of communities, the unsettlement of the social system of the country, the loss and dispersion of property, which famine entails, were averted, and a vast sacrifice of life prevented, which, but for the extension of canal-irrigation, must have occurred in 1868-69, as it had occurred in the same Districts

in 1837-38. I trust these results may be pondered by those who recommend dependence on the irrigation to be obtained from wells in a year of serious drought."

Extract from Resolution by Government, North Western Provinces, No. 1271 I—C, dated 22nd September 1869.

"The Reports by Lieutenant-Colonel Brownlow and Lieutenant Marindin on the backwardness of the people to apply for water in the expectation of rain, and on the despair with which, at the last moment, they rushed to secure it, are also highly significant. How far the experience of the past and the present seasons may leave any lasting impression on the cultivators, remains to be seen. His Honour the Lieutenant Governor is not sanguine that the lesson will be remembered, or will lead, in the absence of any immediate fear of failure in the monsoon, to a uniform early resort to the canal for water on account of the inferior autumnal grains."

Memorandum to accompany the abstract of financial
results of the Irrigation Works under the Go-
vernment, North Western Provinces.

CL.
1/7/72

P. W. 331/72
From 1st Feb/72 to 1st Dec/72

No 309
Public Works Department

Proceedings of the Madras Government
Under date the 1st Feb/72
Read the following

From The Govt. of India - H. E. No 19 of 16th January/72
From The Controller of P. W. Works " " " 2607 of 24th " " "

Ordered that
the following letter
be sent. —

187
J. W. Ogle
No 310 49

To The Secretary to the
Government of India.

Sir,

With reference to
the Communications from
the Government of India
marginally noted I am
directed to return herewith
the ~~for~~ statements show-
ing the financial results
of the Irrigation works
in this Presidency to the
end of 1870-71; which was
received with the first
mentioned letter. The
results for the year 1870-71
which were absent from
the

No 3. A. J. P. W. L. Accounts.
No 19. " — do — do —

N.

The printed forms have now
been inserted and the figures
generally have been checked.

2 I am to invite
attention to the remarks
of the Controller of Public

Works Accounts contained No 2099 A. 11th Nov^r 1871.
in the letters enclosed, ad- 2607. 24th Jan^y 1872.
dressed to this Government

the copies of which accom-
panying the Statement of
remunerative works for the
year 1870-71 explains some
of the difficulties met with
in arriving at correct re-
sults and in exercising
a check over the returns
furnished by the Superin-
tending Engineers or the
Revenue

Revenue Authorities, while
the second describes the
nature of the manu-
script entries made in
the abstract Statements
as well as the corrections
and alterations con-
sidered necessary and
further reports with refer-
ence to the enquiries made
by the Government of
India in the 3^d para
of their letter of the 8th
Instant No 8 A J, re-
lative to the principles
on which the receipts
under the head Revenue,
and the Charges under
Capital

Capital and Revenue are obtained, as well as in regard to the apparent discrepancy between the aggregate outlay on all irrigation works shown in the remunerative statement and the annual expenditures on Repairs Agricultural.

3 As respects the first enquiry I am to observe that this Government will not be in a position to afford the required information till the receipt of a report from the Revenue Board to whom reference has been made regarding the

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the returns furnished by Collectors, and I am to point out in reference to the second that as shown by the Controller the outlay in the remunerative statement under the head Annual Road working expenses includes merely expenditure on the larger irrigation works of the Presidency, while the charge shown in the Public Works Account covers the maintenance of every irrigation work which has come into the hands.

Land & Public Works

Officers

In conclusion
I am desired to state that
owing to the limited time
allowed for the submission
of the returns and to the
absence of the Acting Chief
Engineer for irrigation

in town, the Memorandum
attached for an accompa-
niment, if possible, can-
not be furnished.

Yours faithfully,
Wm. D. D.

Wm. D. D.

has been 1/2/72 into copy of a letter
from the Controller: 2607 of 1872
a. 1. 1. 1.
S. C. D. 20/3/72

Nos 331 & 388

Govt. of 1872 Madras.
PUBLIC WORKS.

To
The Secretary to the Govt.
of India

Dated

Good

Encl.

G. O. 1st Secy 1872, No 309-310.

Nos. 15-16-17 & 18

Irrigation Works. Paper on
the statement showing
the principal results of
the Irrigation Works under
the Madras Govt. for the
year 1871.

Forwarded with remarks,
statement showing the principal
results of the Irrigation Works
under the Madras Presidency for
the year 1871.