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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. <i>2420</i>	Press -Mis.
<i>108-109</i>	
Dated <i>7-10-</i>	<i>1870.</i>

Not to be folded or roughly handled

No. 108. Read the following Proceedings from the Government of India, Public Works Department, (Irrigation,) dated Simla, 2nd September 1870, Nos. 356—65 I. :—

Revenue Report of the Irrigation Department, Punjab, for the year 1868-69.

Read—

Letter No. 2,538 A.—I., dated the 7th July 1870, from Joint-Secretary to the Government of the Punjab, Public Works Department, Irrigation Branch, and enclosures.

OBSERVATIONS.—The year in question was one of severe drought, both in the North-Western Provinces and Punjab, and there was great loss of crops in the districts unprotected by canals. The rainfall was only about half that of the previous year, and the supply of the rivers was also far below the average. It is, therefore, very creditable to the Canal Officers that, with a reduced supply of water, they should have succeeded in not only keeping the irrigated area up to the standard of former years, but in largely extending it. A summary of the operations was submitted to the Government of India nearly a year ago, and was published in the *Gazette of India* with an expression of the high satisfaction of His Excellency the Governor-General in Council at the results attained. The reports now received give a full and detailed account of the administration of the canals for the year in question and may still be read with interest.

2. It appears that the area irrigated by the Western Jumna and Baree Doab Canals together exceeded that attained in any former year by 66,000 acres; that the increase in gross receipts above the former maximum is about £44,800; and that the value of the produce of the irrigated lands cannot have been under the sum of four millions sterling. The last 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 under the canals, when those of surrounding unirrigated districts were afflicted with loss and suffering of various kinds.

3. The results obtained from the inundation canals in the southern district of the Punjab were not so satisfactory. Unlike the permanent canals, which are opened from the rivers where they issue from the hills, their supply is not capable of any control, but is liable to increase or diminish with every variation in the level of the rivers. The local rainfall is of little importance, since it is never sufficient to mature a crop; but a deficient rainfall on the hills, by lowering the floods below the ordinary level, affects them very injuriously. It would thus appear that the supply of many of these canals failed entirely at the height of the irrigation season, and though the returns do not exhibit a great falling off in the area of crops as compared with that of the former year, the season, on the whole, was a very unfavourable one. The frequent variations to which the courses of the Sutlej, Chenab, and Indus are subject, entail very high charges for maintenance, far higher on some of the smaller canals than the land revenue assessment, and combined with the fluctuation of supply, due to the change in the surface level, render the cultivation, as a whole, very precarious and uncertain and oppose a

*Proceedings of the Madras Government, Public Works Department,
7th October 1870.*

formidable obstacle to any real progress. It is to be hoped, however, that the measures now under consideration for placing the most important inundation canals in connection with a permanent work on the Sutlej near Ferozepoor will prove economically feasible, and that they will, moreover, afford the means of irrigating a vast extent of fertile land which now lies waste for want of water.

4. It may be useful to compare the results of the operations of the year under review with those of former years. Commencing with the *Western Jumna Canal*, it is found that the areas irrigated during the last four years have been as follows:—

1865-66	...	...	...	...	...	...	397,963
1866-67	...	...	...	...	...	...	447,171
1867-68	...	...	...	...	...	...	331,037
1868-69	...	...	...	...	...	...	486,878

showing an increase of nearly 50 per cent. on the area of 1867-68.

5. The gross and net direct receipts for these years were—

	Gross Revenue.	Net direct profit.
	RS.	RS.
In 1865-66	4,90,463	2,37,319
„ 1866-67	7,50,947	5,10,451
„ 1867-68	8,66,963	5,42,973
„ 1868-69	12,21,072	8,65,966

the amount last stated being 37.51 per cent. on the capital expended. The indirect additional income, namely, Rupees 3,72,563, as observed in the review of the previous year's report is not credited as a public works receipt, but merely exhibits the additional land revenue derived from the irrigated lands as it stood at the last settlement.

6. The areas of the principal crops irrigated under this canal have been as follow:—

	1865-66.	1866-67.	1867-68.	1868-69.
Sugarcane	34,028	19,773	27,209	38,908
Rice	51,517	62,071	39,455	34,883
Cotton	62,684	104,796	98,800	74,942
Indigo	1,477	1,805	1,315	888
Wheat	126,293	150,233	100,937	213,226

The falling off in rice is attributed to the prevalence of a belief among the cultivators that a double rate was to be charged. This is not to be regretted, since the water could be distributed with greater advantage to other crops. The increase of sugarcane is highly satisfactory, evincing general prosperity in the agricultural community along the canal at a time when other districts were suffering from drought and loss of property. The large increase in wheat is also to be regarded with satisfaction. Different kinds of millet and maize were irrigated to the extent of 39,144 acres as compared with 11,242 acres in 1867-68.

7. The maintenance charges per acre of crop irrigated have amounted to—

In 1865-66	...	...	...	...	10.05 Annas.
„ 1866-67	...	...	...	...	9.38 „
„ 1867-68	...	...	...	...	15.63 „
„ 1868-69	...	...	...	...	11.67 „

*Proceedings of the Madras Government, Public Works Department,
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and the proportion of khurreef to rubbee, to—

	Khurreef.	Rubbee.
In 1865-66	49.3	50.7
„ 1866-67	47.2	52.8
„ 1867-68	56.4	43.6
„ 1868-69	40.8	59.2

and the proportion of “flow” and “lift” (*tor and dal*) irrigation for the last two years is—

	Khurreef.	Rubbee.	Year.
	Tor-Dal	Tor-Dal	Tor-Dal
	per cent.	per cent.	per cent.
For 1867-68	95.5	90.10	93.7
„ 1868-69	91.9	53.47	69.31

The cause of the great falling off in the proportion of irrigation by “flow” should have been explained.

8. The following is a statement of the duty performed by the canal supply, or the number of acres irrigated per cubic foot:—

	Khurreef.	Rubbee.	Year.
	Acres.	Acres.	Acres.
1865-66	120.8	160.6	262
1866-67	108.6	147.1	250
1867-68	96.2	79.7	176.5
1868-69	92.0	159.0	251.0

Considering the small aid obtained from rain, the results of the last year are very satisfactory. They almost exactly correspond with the duty obtained from the Eastern Jumna Canal in the famine of 1860-61.

9. The statement of rainfall in 1867-68 and 1868-69, at several of the canal stations given by the Superintending Engineer in paragraph 43 of his report, does not, as regards the former year, agree with the figures given in the revenue report for that year.

It is said, however, that more attention will, in future, be paid to the registering of the rainfall, and that improved gauges are being introduced.

10. It appears that the Government are sustaining an annual loss of about Rupees 23,500, in consequence of its being necessary to continue an old agreement with the cultivators near the head of the canal to the effect that free irrigation should be given them on condition of their supplying labour gratis for the annual repair of the head works. This agreement was unfortunately allowed to remain in force at the last revision of the settlement, and it would appear that it cannot be interfered with till the next settlement which will not occur, it is understood, till 1879. The Chief Engineer also notices a remark by the Superintending Engineer to the effect that about Rupees 10,000 are lost by cultivators obtaining the water to percolated from the canal free of charge. No immediate action can be taken to obtain this sum on behalf of Government.

11. The small increase in fines, Rupees 335, over the amount collected from this source during the previous year, evinces good management and forbearance on the part of the Canal Officers, and also speaks well for the general conduct of the cultivators.

12. A large number of young trees in the canal fuel plantations have perished in the year under consideration. This has no doubt been partly caused by drought, but it may be surmised that sufficient attention has not been paid to this important subject; and in future when officers are newly posted to the canal, care should be taken to impress upon them the necessity of losing no time in making themselves acquainted with the condition of the plantations, and of satisfying themselves that a proper amount of attention is paid to them by the subordinates.

Barce Doab Canal.

13. The returns from this canal exhibit a considerable increase over those of any former year. The following are the amounts of the collections for the last four years:—

	RS.
1865-66	...
1866-67	...
1867-68	...
1868-69	...

While, as above remarked, this was a season of drought giving rise to an unusual demand for water, the supply available was lower than it had ever been before, and the success of the operations of the year is properly attributed to the care taken by the Executive Officers in distributing the water.

14. It would appear that a considerable quantity of water is given gratis to fill the village ponds, and that at times when rain was falling a large proportion of the supply was turned to waste down the escapes. It seems desirable that an experiment should be tried for storing such surplus water in reservoirs, and it may also be considered whether the surplus at the lower extremity of the canal might not be turned with advantage into the adjacent jungles to promote the growth of trees and grass in preference to being thrown into the Ravee.

15. The additional land revenue rate for the irrigated lands in the Goordaspoor District has for the first time been credited to the canal in the accounts now submitted; the increase under this head for the year being Rupees 31,213. It is understood that the arrears for the same year will be collected from the other two districts—Umritsur and Lahore—affected by the canal, and it may be expected that in the next year's report the so-called "indirect" returns will become an actual receipt to the credit of the canal.

16. The acreage irrigated and net direct returns during the last four years have been as follows:—

	Acre.	Returns.
1865-66	...	...
1866-67	...	...
1867-68	...	...
1868-69	...	...

the last being a return of 3.21 per cent. on the outlay. With the addition of the indirect profits the return becomes 5.43 per cent.

17. The maintenance charges are still high, being in Annas per acre—

1865-66	...
1866-67	...
1867-68	...
1868-69	...

while the duty obtained from the water has been—

	Khurreef.	Rubbee.	Year.
1865-66	...	...	...
1866-67	...	...	...
1867-68	...	...	...
1868-69	...	...	...

As it may be confidently anticipated that there will be a progressive reduction in the charges for maintenance, and an increase in the duty obtained from the water, till the standard which has been reached in the older canals from the Jumna has been attained, a corresponding increase of the canal receipts may be looked for.

18. This work has been an exceptionally expensive one in consequence of the unusually high rates that were paid in its construction, and of the extraordinary number of masonry falls which were required to adapt 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 returns now exhibited may be regarded with satisfaction, since considered in connection with the increase which as above-stated may be expected from improvements in the distribution of water, and a lowering of the annual charges for repairs, they furnish the Government with a secure financial starting point for the further improvement of the canal by the opening out of new branches, and by the extension of the main line to the fertile lands of the Montgomery District. Nevertheless there would appear to be ample scope for the development of irrigation in the three districts already traversed by the canals, since, of a total culturable area of three million acres, 850,000 acres are still uncultivated.

19. The areas of the principal crops raised during the last four years are given in the following statement:—

	1865-66.	1866-67.	1867-68.	1868-69.
Sugarcane	...	...	...	...
Rice	...	...	...	...
Cotton	...	...	...	...
Wheat	...	...	...	...

The falling off in rice and other khurreef crops is due to the supply falling short in May and June, in consequence of damage having been caused by river floods to the head works. It may be noticed that wheat has increased threefold in the course of four years, while the other crops show but little variation in the same period.

20. The proportion of khurreef to rubbee crops under irrigation during the same years has been—

	Khurreef to Rubbee.
1865-66	...
1866-67	...
1867-68	...
1868-69	...

21. The decrease in fines by a sum of Rupees 453 is very satisfactory.

Upper Sutlej Inundation Canals.

22. The operations on these canals were not satisfactory. The supply failed during the irrigation season, and the crops were lost over an area of 10,264 acres. The progress on these canals affords a great contrast to that on the Western Jumna and Baree Doab Canals, the increase in the area irrigated being inconsiderable, while the charges for maintenance are rather tending to increase than to diminish, as will be seen from the following figures:—

	1865-66.	1866-67.	1867-68.	1868-69.
Direct revenue	47,085	42,112	61,134	51,166
Charges	40,853	30,958	53,174	61,144
Profit...	6,232	11,154	7,960	...
Loss...	...	...	...	9,483
Area irrigated	57,389	51,675	78,248	66,584

It should be explained that the water-rate can only be regarded as a maintenance rate, and that it does not represent the value of the canal water. The rainfall for the year ranged from 9.9 to 6.2 inches between the northern and southern extremities of the canals, and by itself would be quite insufficient to mature any crop. The land revenue of the tract irrigated by the canals may thus be said to be almost entirely dependent on the canal water.

Lower Sutlej and Chenab Canals.

23. The present report shows an increase over the area irrigated during the previous year of 33,643 acres; but the greater part of this, namely 26,823 acres, are for fallow lands not entered in former reports.

The areas irrigated during the last four years have been—

	1865-66	1866-67	1867-68	1868-69
...	...	...	...	...
...	...	...	...	...
...	...	...	...	...
...	...	...	...	...

It should be remarked that the area above given for 1867-68 includes 25,059 acres of wheat cultivation assisted by the canal water, and which were then introduced into the returns for the first time. In the year under review the area of wheat was only 15,424 acres. Deducting this and the area of fallows from the amount above given, there would still remain an increase of upwards of 50,000 acres on the area irrigated four years previously, which, considering the numerous imperfections of these canals, is doubtless a satisfactory result.

24. The rainfall at different stations along these canals in 1868-69 ranged from 3½ to 10½ inches. The crops are thus almost entirely dependent on canal water. The areas of the most important crops, not including wheat during the last four years, have been—

	1865-66.	1866-67.	1867-68.	1868-69.
Indigo	30,521	37,320	37,631	60,076
Cotton	27,782	24,980	20,172	19,905
Sugarcane	4,018	3,207	3,422	3,330
Great millet	22,731	37,307	43,993	46,289
Rice	3,928	4,839	6,461	8,757

The increase of indigo is remarkable.

25. The Executive Engineer, Mr. O'Brien, has furnished a detailed account of the working of each of the canals, from which it would appear that the above increase of area has not been at all uniformly distributed. On the contrary there has been a great falling off on many of the canals. Thus, compared with the irrigated area of the previous year, there has been a decrease on the following canals:—

	Chenab.	Per cent.
Shahpoor Canal	...	33.3
Dourana Lungana	...	47.6
Wullee Mahomed	...	21.9
Secunderabad	...	14.7
Gujjoo hutta	...	21.0
Bucktoowah	...	5.4
Dhoondoo	...	3.4
Secunderwah	...	47.1
Belochanwala	...	34.9
	Sutlej.	
Mahomedwah	...	58.8
Sheekwah Shirkeah	...	12.72
Khanwah	...	29.35

On the other hand there was an increase of area on the following canals:—

	Chenab.	
Mutteethul	...	43.7
Khadul	...	19.2
Tahirpoor	...	66.2
	Sutlej.	
Dewanwah	...	Not given.
Sooltanwah Khoord	...	
Jamwah do.	...	
Jamwah Kalan	...	
Kabilwah	...	
Bahawulwah	...	278.5
Sooltanwah	...	
Abunwah Branch	...	
Jamrancewah	...	
Dewanwah	...	
Sirdarwah	...	
Bahawulwah	...	
Mobarickwah	...	
Shekwah Gurbeah	...	
Bahadurwah and Hafizwah	...	

26. No better illustration than the above could, perhaps, be given of the certain character of the cultivation under these canals; any improvement which may take place in one, is liable to be counteracted by a corresponding falling away another, and though the whole of the transactions of the year may leave a balance in favour of progress, this should not be allowed to disguise the fact that at the same time a large proportion of the agricultural community has incurred heavy

loss, or at least has been unable to secure any profit. The want of population in the Mooltan District is generally supposed to be a great obstacle to progress; but allowing this, it is evident that, if the cultivators on some of the canals can increase their cultivation in a single year 1 or 200 per cent., there is not likely to be anything to prevent those on other canals doing the same if they only had the requisite supply of water; and, considering the waste of power entailed by the precarious supply of the existing canals, and the very heavy expenditure required in many cases to maintain them, it does not appear surprising that the condition of the southern district of the Punjab is so backward compared with that of the districts nearer the hills.

27. According to the Executive Engineer, the value of the labour contributed by the cultivators for the clearance of some of the smaller canals has, in several cases, been upwards of Rupees 3 per acre, and in one or two others as much as Rupees 5, which must be regarded as an enormously high rate of payment for the mere chance of a good supply of water.

Indus Canal.

28. There was a considerable falling off in the area under irrigation in consequence of the river not rising up to the usual height. The following gives the area of the whole cultivation under the canals, and of the most important crops for the last four years:—

	1865-66.	1866-67.	1867-68.	1868-69.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Area irrigated...	100,000	144,652	171,981	107,160
Millets	Not Known.	61,162	59,752	40,107
Wheat		31,817	41,229	20,764
Cotton		22,555	28,361	16,644
Indigo		12,105	18,185	17,810
Rice		5,533	11,252	8,231

29. The discharge of the Indus is said to have been 17,805 cubic feet per second on the 19th December 1868, and 21,029 cubic feet on the 19th January 1869. It may be taken for granted that these observations were made at same point above the confluence of the Punjab and Indus.

30. It is observed that a water-rate has been levied for the first time in lieu of the share of the clearance formerly contributed by the land-holders. The Government of India have approved of the principle of this charge, but a separate report, explaining the arrangement fully, should be submitted.

31. The officer in charge of the Indus Canals may be required to attach to his future revenue reports, a statement similar to that furnished by the Executive Engineer of the Lower Sutlej and Chenab Division, explanatory of the condition of the supply of each canal during the season, while the latter officer may add to his otherwise complete report a tabular statement of the length of each of the canals, and the discharge and acreage under each, similar to that furnished for the Indus Canals at page 84 of the printed report. From this statement it would appear that there are fourteen canals on the Dehra Ghazee Khan District, ranging in length from 9 to 95 miles, their total length being 587 miles, and average 42, and their aggregate discharge during the khurreef season being 3,610 cubic feet per second.

32. The Government of India in the Resolution on the revenue report for 1867-68 remarked that some of the returns might be curtailed with advantage. The Chief Engineer asks for precise instructions on this point, and, in reply, he may be informed that the following paragraphs of the report, namely, Nos. 1, 2, 3, 4, 15, 16, 17, 78 to 83, 101, 103, 106, 107, 108, 109, 156, 166, 200, 201, 219 to 222, might have been partly or wholly omitted, as the information they contain is given in the Chief Engineer's review. Such information might, in future, be given in separate statements, which might be set aside after being incorporated in the Chief Engineer's report. It is also considered that the tabular statements attached to the report on the small [Delhi and Goorgaon works are unnecessarily elaborate, and that, unless the Punjab Government desires to retain them, statements Nos. 7, 8, 9, 10 and 11 may be omitted in future.

33. In conclusion, it is to be remarked that the care bestowed in the preparation of the present report is very creditable to the Chief and Superintending Engineers.

ORDER.—Ordered that a copy of these observations be forwarded to the Government of the Punjab in the Public Works Department for information and necessary attention. Also that the Resolution be published in the Supplement to the *Gazette of India* and copies forwarded to the Governments of Madras, Bombay, Bengal, and the North-Western Provinces; the Chief Commissioners of Oudh, the Central Provinces and Mysore and Coorg, and to the Home and Financial Departments for information; and further that copies of the revenue report and of the Resolution be transmitted to the Secretary of State for India for the information of Her Majesty's Government.

(Signed) J. C. ANDERSON, Colonel, R.E.,
Offg. Depy. Secy. to Govt. of India.

To the Secretary to the Government of Madras, Public Works Department.

No. 109. ORDER THEREON, 7th October 1870, No. 2,420.

IRRIGATION, No. 12.

COMMUNICATED to the Chief Engineer
for Irrigation and to all Superintending
Engineers.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Acting Chief Engineer for Irrigation.
.. Superintending Engineers.
To Major R. B. Kennedy.

11c

Govt. of India: Madras.

PUBLIC WORKS.

To

THE ACTING CHIEF ENGINEER FOR

IRRIGATION.

Ac., &c., &c.

Dated October 7th.

Recd.

Encl.

G. O., 7th October 1870, No. 2420.

COPY

No. 103-109

Revenue Report.—Proceedings of the Government of India reviewing the Revenue Report of the Irrigation Department, Punjab, for 1868-69, communicated to the officers concerned.

1870. 1047-
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GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
IRRIGATION.

To

THE GOVERNMENTS OF THE PUNJAB,
MADRAS, BOMBAY, BENGAL AND
THE NORTH-WESTERN PROVINCES;
THE CHIEF COMMISSIONERS OF
OUDH, THE CENTRAL PROVINCES
AND MYSORE AND COORG; AND TO
THE HOME AND FINANCIAL DE-
PARTMENTS.

Nos. 356—65 I.

Dated Simla, 2nd September 1870.

Received 26

Review of the Revenue Report of the Irriga-
tion Department in the Punjab for the year
1868-69.

No 2420-7-10-70
With an Order.

3-10-70.

152
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To the Chief Engr
for Engrs
150 A Engrs
Engrs at the Survey

Communicated to the Chief Engineer
for Irrigation and to all Superintending
Engineers -

No 2420

Sept 10/70-

Wm. 16/9/70

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Gabt. of {1870} Madras.

PUBLIC WORKS.

To The Dy Chief Engineer for
Irrigation

Dated

Recd.

E.O.

G.O. 7th Dec 1870. No 2420.

Nos. 108-109

Revenue Report. - Pro. Of the
Govt of India receiving the
Revenue ~~Dept~~ Report of the
Irrigation Dept., Pungaula,
for 1868/69, Com^d to the
Officers concerned..