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MIL NADU ARCHIVES

ERNMENT OF TAMIL NADU

Public works DEPARTMENT

G.O. No. **B.P. No.**	1475 W / A 1475 W / B	**Press.** **Mis.**
Dated	13-6-1882	~~197~~ .

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13th June 1882, No. $\frac{1475}{\text{A}}$ W., Public Works.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 93-A.

Read—the following letter from Colonel W. S. TREVOR, R.E., Secretary to the Government of India, Public Works Department (Civil Works—Miscellaneous), tc the Secretary to the Government of Madras, Public Works Department, dated Simla, 6th May 1882, No. 161 M. :—

In reply to your letter, No. 3198 W., dated 31st December 1881, I am directed to state that in the letter, Nos. 381-94 M., dated 30th November 1881, from this Government, Local Public Works Departments were requested to prepare, under the orders of the Local Government or Administration, *lists of works suitable for purposes of famine relief*, and to take steps for the investigation of selected projects.

2. For the preparation of lists, such as those asked for by the Supreme Government, exhaustive enquiry does not appear to be a necessary preliminary. All that seems to be requisite is, that the Civil and Public Works Officers of each district or division should be called on to submit a list of works which could, in their opinion, be advantageously undertaken for purposes of famine relief. This list would only contain a brief general description of the nature of each work which it is proposed to undertake, and of the advantages derivable from its execution, and it does not appear to the Government of India that any special establishment is required for the preparation of such lists. Should it, however, be found necessary, in any particular case, to employ additional establishment for the purpose, it can be temporarily entertained according to the rules recently issued on the subject. From these lists the Local Government should have no difficulty in selecting and arranging works, in the order of their usefulness, for the special object in view, and for the ultimate advantage of the State.

3. All that the Government of India requires in the first instance is such a list of the most promising of the schemes recommended for adoption as that just described, containing a like brief general description of each project, accompanied by the remarks and recommendations of the Local Government, and by specific proposals for the establishment required, for such further detailed investigation as may be thought advisable.

4. Bearing in mind, however, that many years may elapse before the necessity arises for putting any of the works in hand, it is manifestly neither necessary nor advisable to draw up the first designs in great detail. All that is required is to collect and record clearly so much information as shall afford a rough approximate idea of the number of laborers, skilled and unskilled, for whom employment could be found on each work for some definite period, and of its probable cost at normal rates; and shall enable an Engineer, upon necessity arising, to lay it out on the ground, and set laborers at work upon it, without loss of time. In submitting the proposals for establishment mentioned in paragraph 3, this limitation of investigation must not be lost sight of. With regard to this establishment, I am to state that it must also be "temporary," as the Government of India stands pledged to Her Majesty's Secretary

of State to keep the permanent Engineer Establishment within the limits of present sanctioned strength.

5. That no such scheme of relief works can be devised, as could even approximately meet the requirements of such a famine as that of 1876—78, does not appear to the Government of India a valid argument against the preparation of the best scheme which the physical, agricultural, and commercial conditions of the country will admit. Indeed, the lamentable fact mentioned in paragraph 5 of your letter appears to this Government to prove conclusively that no arrangement could be worse than remaining in a state of unpreparedness and dependence entirely upon the inspiration of the moment for the plan of operations. Employment on the various minor and petty works scattered over the country is well calculated to afford relief to the distressed poor during the early stages of, what may ultimately prove to be, a severe famine. Such works, if properly supervised, may prove excellent auxiliaries for a time, but so far as the Public Works Department is concerned, reliance must be placed mainly on large earthworks in localities where the laborers can be properly organized, fed and looked after.

6. The main characteristic obviously desirable in works intended for the purpose of famine relief is that they shall afford a maximum of employment for unskilled labor. This characteristic is admitted in your letter under reply to be, as a general rule, markedly absent in "Steam Tramways" and "Light Railways," and the Supreme Government is therefore unable to approve of the suggestion that a general preliminary enquiry into the probable nature and cost of works best adapted for famine relief shall be mixed up with detailed and exhaustive examination of projects for "Tramways" and "Railways" which are "Protective" rather than "Relief" Works. The two lines of enquiry, as well as references on the two subjects of "Famine Relief" and "Protective Works," must be kept entirely separate.

No. 93-B.

READ—the following Note by Colonel R. H. SANKEY, C.B., R.E., Chief Engineer, Public Works Department, dated Ootacamund, 8th June 1882:—

The Government of India, in letter No. 161 M., dated 6th May 1882, lays down the principle that as regards works suitable for famine relief exhaustive enquiry is not necessary, and that all that is required are lists of such works as the Civil and Public Works Officers may consider could be advantageously undertaken for such purpose.

2. Looking upon this as a vital point, I trust I may be pardoned for submitting, with the utmost deference, the following observations for consideration.

3. The remarks which I have to offer have no reference to petty village works of all classes, repairs to the earthwork of tanks, clearances of channels, metalling lines of road or other similar operations, which, however individually extensive and suitable for famine works, can have the requisite data determined, quantities and cost run out, and execution undertaken by an expert Engineer without hesitation or delay. Those I allude to are chiefly large irrigation or water-supply works, navigable canals, storage reservoirs and the like, which in the main compose the lists of works most suitable for relief, when the intensity of famine has so increased as to necessitate the employment of the people in the largest convenient aggregations, with a view to economize the available supervision, which under such circumstances must be limited.

4. Nothing, I must submit, can be more dangerous than for Government to find itself in face of a severe famine with only lists of works, even supposing these to have been compiled by the most experienced Engineers, instead of being able to make the needful selection from thoroughly investigated and sanctioned projects. If there be one lesson more than another which has been taught by the experience of every single famine, and especially by the late calamity, it is I venture to think this—that no large original project should be put in execution, unless it has previously gone through all stages of professional test up to final sanction, precisely as in ordinary times.

5. The startling fact that in this Presidency alone during the late famine no less than 223½, out of a total outlay on works of 357¾ lakhs of rupees, were shown to have been expended on acknowledged infructuous work, and that even the residuum would on close scrutiny in all probability have proved to be much of the same character, should, it is thought, suffice to demonstrate the extreme hazard of having to depend at such times merely on lists of projected works.

6. That nothing short of the most exhaustive enquiries, can afford the slightest reliable basis for irrigation and water-supply works of all kinds, depending as they do on such factors as the available supplies of rivers, &c., is, I need hardly say, the conclusion, taught by long and dearly bought experience, of all right-minded Engineers; but as this is not in all probability so clear to others, I may here advert to some well-known facts in support.

7. In this Presidency we have as a striking example the Madras Irrigation and Canal Company's work, which, in consequence of the Bellary famine of 1853-54, was, although projected by quite the most experienced and successful hydraulic Engineers in India, commenced on insufficient data, and has, as well known, led to the most disastrous financial results. The leading facts connected with this undertaking are as follows:—

8. The first rough estimate amounted to 134½ lakhs.* Annual returns to the Company were estimated at 42½ lakhs, and to the Government on account of half water-rate at 33¾ lakhs; the expected area to be irrigated was taken at 1,350,000 acres. Works were commenced in 1860, and the Capital outlay to end of 1880-81 amounted to Rs. 1,61,09,370 and Revenue expenditure to Rs. 15,12,161. The total receipts to 30th June 1881 were Rs. 11,37,087. The area of irrigated land which in the famine year 1876-77 amounted to 90,372 acres and produced Rs. 2,47,434 had gradually decreased to 17,798 acres in 1880-81, producing only Rs. 61,519, which did not cover half the working expenses, and left untouched the interest on Capital outlay. This latter alone, as matters stand, amounts at 4 per cent. to nearly 6½ lakhs per annum. If eventually the works pay their working expenses, the dead loss to the State may be therefore taken in round numbers at the latter figure.

9. But the lesson thus taught had by no means the effect which might reasonably have been expected. In order to make good the defects which revealed themselves as the work advanced, four great storage reservoirs, known as the Mauri Kunawai, Muddak-Masoor, Moodaba and Luckawally, were projected.

10. As shown by me in a memorandum drawn up in 1878 for the information of the Government of India, the cost of the three last-named reservoirs would with all their needful accessories have amounted to between 3½ and 4 millions sterling to carry into execution!

11. However costly, the enquiries made were not sufficiently exhaustive, and the result is that these very projects stand enumerated among the projects suitable for famine relief (see items XV, XVI, and XVII, page 61 of Appendix V to the Report of the Famine Commission).

12. They are now, I hope, definitely and finally shelved, but it will be observed that these projects even more than comply, in point of detailed enquiry, with the tests considered sufficient under the present ruling of the Government of India. Several other works, *e.g.*, the Upper Godávari Navigation Scheme, upon which some 78 lakhs were expended without visible result, prove the same truth, that anything short of exhaustive enquiry must be fatal in a financial point of view.

13. In Bombay the same results have followed on hasty projection of works for famine purposes. After his visit to that Presidency in January 1873, Lord Northbrook issued distinct instructions that the Mutha project (estimated to cost 63½ lakhs) should be curtailed, the Taptee project suspended, and that no other large

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* Of this amount, it was estimated that 22½ lakhs would be spent on the Mauri Kunawai Reservoir and 41½ on the Bellary Canal Scheme, consequently only 70½ lakhs was at this time the estimated outlay on the Madras Irrigation and Canal Company's work as ultimately carried out. The two first-named works have not been carried out, nor are they likely to be so.

works were on any account to be undertaken, and no new projects for large works to be even prepared or investigated. till further experience had been gained of the results of irrigation in the Deccan, and their remunerative character proved?

14. Yet, on being suddenly called to deal with the late great famine, the Bombay Government appear to have felt themselves driven to commence work on a number of these half-digested projects, then ready to hand, as the only course open.

15. Thirteen of these, estimated to cost about 76 lakhs of rupees, were thus commenced for famine relief, and the result of this haste is now becoming apparent as may be observed from the following figures extracted from the last received Revenue Report: –

Name of Work.	Capital Outlay to date.	Total Deficit to date.
1. Huthmati Canal	RS.	RS.
2. Lower Panjhra River Works	5,07,114	1,87,878
3. Jamda Canals	4,83,125	2,14,057
4. Bhatodi Tank	9,96,510	6,41,894
5. Mutha Canal	3,67,988	1,46,160
6. Ekreek Tank	56,16,112	14,95,454
7. Maini Canal	12,94,904	6,68,339
8. Maday Tank	3,47,334	1,22,321
... ...	1,66,514	1,05,226
Total Outlay and Deficit ...	97,89,601	35,81,629

16. Taking the whole of the Bombay works in the aggregate, the area proposed to be commanded amounted to 280,000 acres, but only 24,000 was actually irrigated in 1879-80, and this again had fallen to 21,000 acres in 1880-81.

According to the Irrigation Report of 1879-80, the Capital account of all works amounted to Rs. 1,22,54,421, the actual receipts being only 0·67 per cent., including indirect revenue, and total debit balance to date Rs. 45,87,780.

17. In the Punjab haste in design has been followed by the same results. Here the Baree Doab Canal was originally projected to command 654,000 acres and to return 12¼ per cent. on Capital outlay, but shortly after opening the works in 1859 the volume of water obtainable from the Ravee for winter crops was found to be much below what had been calculated on. The total outlay on the work stood in 1878 at about 153 lakhs of rupees, and the net interest payable was calculated at less than 1 per cent.

18. The Agra Canal again in the North-West Provinces was originally calculated to command 375,800 acres, but subsequent experience showed that not much more than half the calculated discharge of the Jamna would be available in the dry season. Still the revised project gave a probable return of 10 per cent. on the Capital outlay. In 1878 the latter had amounted to 80 lakhs, but the net returns available for interest was only very slightly over 1 per cent.

19. In Lower Bengal the Orissa and Midnapore projects, which were the hasty outcome of the famine which devastated that tract of country in 1866, inculcate the same unvarying lesson. In 1878 the Capital outlay was about 248 lakhs of rupees, but instead of paying any interest there was a large deficit, as the returns did not nearly meet even the working expenses exclusive of interest.

20. As indicating the time which may, under certain circumstances, be necessary before a sound opinion can be expressed in regard to an irrigation work, I may instance the case of the Mauri Kunawai project in Mysore, in which I personally took the greatest interest, and which for many years has been strongly advocated by our leading Irrigation Engineer. Owing to the irregular action of the supplying river (the Hagari) no less than twelve years were devoted, between my own and the Madras Irrigation and Canal Company's officers' investigations, to determining the correct *régimé* of the river, the ultimate result being that, notwithstanding the advocacy of Sir Richard Temple and Mr. A. C. Elliott, both of whom wished to open it

as a famine work, the Mysore Administration would not undertake to construct the reservoir, as it was clearly proved that it would not pay.

21. It cannot be said that the disastrous financial results to which I have drawn attention are in any sense attributable to the want of professional knowledge or devotion on the part of the projectors, for not only are such men as Cotton, Cautley, Baker, Orr, Anderson, and numerous others recognized as great masters of their profession, but India, in regard to irrigation works, is *facile princeps*, having works which in magnitude and boldness of design surpass all the rest of the world.

22. The bad returns in the cases mentioned noted are no doubt almost entirely due to haste in design, and this again has been the result of an inadequate strength of establishment, which, while hardly ever sufficient to meet the current day-to-day requirements, has been notoriously incapable of coping with the demands during famine, both as regards prior preparation of projects and their eventual execution.

23. Quite lately, however, a marked and, it is to be hoped, very beneficial change has been effected in this Presidency, by the provision in our normal establishment scale of four project divisions, the duties connected with which are now being systematised, and, as will be seen from the proposals contained in my letter No. 466 I., lists of all sufficiently known irrigation projects have been scrutinised and arrangements made for the thorough and complete investigation of all, holding out any promise of success either as "Productive" or "Protective" Works.

24. But it need hardly be said that, looking to the labor involved in the investigations, some years must elapse before Government will be in possession of such thoroughly sifted and sanctioned projects as will place the matter of famine relief works on anything like a secure basis. If, as seems probable, the result of our investigations go to show that within certain tracts of country (those it is to be feared which are the most exposed to famine) there are few if any reliable projects available for relief on a large scale, it is manifestly better that this should be clearly established, rather than that works of the ruinous class of the Madras Irrigation and Canal Company's work should be heedlessly entered on.

25. If the principle in reference to famine relief works which I have above adverted to, and which have already met with acceptance by the Committee on the Madras Famine Code (of which I had the honor to be a member), are not firmly adhered to, I confess I should not regard the future without the gravest misgivings.

No. 93-C.

ORDER—dated 13th June 1882, No. $\frac{1475}{A}$ W., Public Works.

Ordered that the following reply be sent :—

(Here enter No. $\frac{1475}{B}$ W., dated 13th June 1882.)

(True Extract.)

Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation, with copy of letter to Government of India.

Exd. J. W. Fischer.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1882} Madras.

PUBLIC WORKS.

Dated June, 15th.

Recd. *Encl.*

G.O., 13th June 1882, No. $\frac{1475}{A}$ W.

JUNE.

Nos. 93-A—93-C.

Famine Relief Projects.

As to the necessity for complete enquiry being undertaken in reference to all —.

13th June 1882, No. $\frac{1475}{B}$ W., Public Works.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. 93-D.

Letter—from

Colonel R. H. SANKEY, C.B., R.E.,
Secretary to Government, Public Works Department,
Madras,

To

The SECRETARY to the GOVERNMENT of INDIA,
Public Works Department.

Sir,

No. 466 I., dated 13th June 1882.

With reference to your letter, No. 161 M., dated 6th May 1882, and in immediate connection with the subject of my letter marginally quoted, submitting a complete list of all the known projects for both "Productive" and "Protective" Works for this Presidency, I am desired by the Right Honorable the Governor in Council to forward the annexed memorandum by the Chief Engineer, dated the 8th instant, which he has considered it desirable to submit for the information of this Government, drawing attention to the necessity for a very complete enquiry being undertaken in reference to all famine relief projects, and especially those connected with Irrigation, Navigation, and Water Supply.

2. In my letter above quoted arrangements have been proposed which will, if approved, ensure so far as the present disposable establishment will admit, the thorough and systematic examination of all schemes which are considered to be in any way suitable for the important objects in view; and as this Government attaches great weight to the necessity for making exhaustive investigation in all such cases prior to sanction, I am to express a hope that the Government of India may be disposed to modify in this sense the instructions conveyed in their letter under reply.

3. The very exceptional circumstances of this Presidency in reference to hydraulic works are, I am to submit, such as must be fully weighed in deciding on new projects of the classes mentioned.

4. In no part of the world has the storage of the available water-supply been carried to anything like the same extent as in Southern India, where, including Mysore, there are not less than the enormous amount of 80,000 reservoirs, many of them of the largest size. To such an extent, moreover, had the principles of water storage been carried out, even before the introduction of British rule, that it may be fairly doubted whether it would be possible to construct ten completely new reservoirs of any magnitude without directly interfering with the legal rights, as regards water-supply, of the occupiers lower down in the drainages, where it might be proposed to carry out such new works.

5. Again, with reference to the flood waters which in most countries escape by rivers unused to the ocean, here the ancient inhabitants had entered on a system of turning such to account, which received its highest development in the Tanjore Delta works, where apparently not less than 800,000 acres were under rice cultivation prior to British occupation.

6. These principles of utilizing the river supplies to a greater extent than anywhere else have, under late scientific direction, as is well known, given Madras the unrivalled position which it occupies in the possession of great and remunerative irrigation works; but it must at the same time be clearly stated that what between the storage in reservoirs of all the upper waters and the utilization of the flood wave at the lower ends of the several rivers, the scope for intermediate works of a paying character has necessarily decreased; correctly stated, in fact, the great irrigated deltas and other tracts at the tail of the several drainages, are the highly favored gardens which to a great extent place under large contribution, if they do not exhaust the water-supply of the several catchment areas above them.

7. The schemes which have been submitted for completing the Kistna, Godávari, and other great works will, when carried out, in all probability leave but small room for turning the available remaining water-supply to payable account, and it is chiefly in view to the state of matters that the necessity for the most careful enquiry and scrutiny is here so indispensable for the schemes now almost without exception left for selection. In other words, the improvement of the tank systems throughout the Presidency (a matter now engaging the attention of Government), and the completion of the great delta and other irrigation works situated chiefly along the littoral tracts, will leave but small scope for projects of a remunerative character.

8. It is not, I am to observe, intended by these observations to exclude from view those works which, though yielding no direct return, may, as "Protective" schemes, be on other grounds most suitable for carrying out either prior to, or during the currency of, a famine; but here again, judging from the experiences of works undertaken during past calamities, it appears to His Excellency in Council that exhaustive enquiries are especially needed, as the amount of loss to the State, in such cases inevitable and acknowledged, should be known and stated in the most precise terms, so as to admit of the Government accepting, with a complete knowledge of the facts, its responsibility in recommending them for execution.

9. In conclusion, I am to state that the Government of India will be kept constantly informed of, the progress made in investigation of projects according to the scheme sent up for famine relief.

I have the honor to be,
Sir,
Your most obedient servant,

Colonel, R.E.,
Secretary to Govt., P.W.D.

OOTACAMUND,
13th June 1882.

Exd. C. Howarth.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Gobt. of {1882} Madras.

PUBLIC WORKS.

Dated June, 13th.

Recd. *Encl*

13th June 1882, No. $\frac{1475}{B}$ W.

JUNE.
No. 93-D.

Famine Relief Projects.

As to the necessity for complete enquiry being undertaken in reference to all—.

6

th June 1882, No. W., Public Works.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

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* Of this amount, it was estimated that 22½ lakhs would be spent on the Mauri Kunawai Reservoir and 41½ on the Bellary Canal Scheme, consequently only 70½ lakhs was at this time the estimated outlay on the Madras Irrigation and Canal Company's work as ultimately carried out. The two first-named works have not been carried out, nor are they likely to be so.

to be undertaken, and no new projects for large works to be even prepared or investigated, till further experience had been gained of the results of irrigation in the Deccan, and their remunerative character proved.

14. Yet, on being suddenly called to deal with the late great famine, the Bombay Government appear to have felt themselves driven to commence work on a number of these half-digested projects, then ready to hand, as the only course open.

15. Thirteen of these, estimated to cost about 76 lakhs of rupees, were thus commenced for famine relief, and the result of this haste is now becoming apparent as may be observed from the following figures extracted from the last received Revenue Report:—

Name of Work.	Capital Outlay to date.	Total Deficit to date.
	RS.	RS.
1. Huthmati Canal	5,07,114	1,87,878
2. Lower Panjhra River Works	4,83,125	2,14,057
3. Jamda Canals	9,96,510	6,41,894
4. Bhatodi Tank	3,67,988	1,46,460
5. Mutha Canal	56,16,112	14,95,454
6. Ekreek Tank	12,94,904	6,68,339
7. Maini Canal	3,47,334	1,22,321
8. Maday Tank	1,66,514	1,05,226
Total Outlay and Deficit ...	97,89,601	35,81,629

16. Taking the whole of the Bombay works in the aggregate, the area proposed to be commanded amounted to 280,000 acres, but ~~of this~~ only 24,000 was actually irrigated in 1879-80, and this again had fallen to 21,000 acres in 1880-81.

According to the Irrigation Report of 1879-80, the Capital account of all works amounted to Rs. 1,22,54,421, the actual receipts being only 0·67 per cent., including indirect revenue, and total debit balance to date Rs. 45,87,780.

17. In the Punjab haste in design has been followed by the same results. Here the Baree Doab Canal was originally projected to command 654,000 acres and to return 12¼ per cent. on Capital outlay, but shortly after opening the works in 1859 the volume of water obtainable from the Ravee for winter crops was found to be much below what had been calculated on. The total outlay on the work stood in 1878 at about 153 lakhs of rupees, and the net interest payable was calculated at less than 1 per cent.

18. The Agra Canal again in the North-West Provinces was originally calculated to command 375,800 acres, but subsequent experience showed that not much more than half the calculated discharge of the Jamna would be available in the dry season. Still the revised project gave a probable return of 10 per cent. on the Capital outlay. In 1878 the latter had amounted to 80 lakhs, but the net returns available for interest was only very slightly over 1 per cent.

19. In Lower Bengal the Orissa and Midnapore projects, which were the hasty outcome of the famine which devastated that tract of country in 1866, inculcate the same unvarying lesson. In 1878 the Capital outlay was about 248 lakhs of rupees, but instead of paying any interest there was a large deficit, as the returns did not nearly meet even the working expenses exclusive of interest.

20. As indicating the time which may, under certain circumstances, be necessary before a sound opinion can be expressed in regard to an irrigation work, I may instance the case of the Mauri Kunawai project in Mysore, in which I personally took the greatest interest, and which for many years has been strongly advocated by our leading Irrigation Engineer. Owing to the irregular action of the supplying river (the Hagari) no less than twelve years were devoted, between my own and the Madras Irrigation and Canal Company's officers' investigations, to determining the correct *régimé* of the river, the ultimate result being that, notwithstanding the advocacy of Sir Richard Temple and Mr. A. C. Elliott, both of whom wished to open it

as a famine work, the Mysore Administration would not undertake to construct the reservoir, as it was clearly proved that it would not pay.

21. It cannot be said that the disastrous financial results to which I have drawn attention are in any sense attributable to the want of professional knowledge or devotion on the part of the projectors, for not only are such men as Cotton, Cantley, Baker, Orr, Anderson, and numerous others recognized as great masters of their profession, but India, in regard to irrigation works, is *facile princeps*, having works which in magnitude and boldness of design surpass all the rest of the world.

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23. Quite lately, however, a marked and, it is to be hoped, very beneficial change has been effected in this Presidency by the provision in our normal scale of four project divisions, the duties connected with which are now being systematised, and, as will be seen from the proposals contained in my letter No. 4663 , lists of all sufficiently known irrigation projects have been scrutinised and arrangements made for the thorough and complete investigation of all, holding out any promise of success either as "Productive" or "Protective" Works.

Establishment

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24. But it need hardly be said that, looking to the labor involved in the investigations, some years must elapse before Government will be in possession of such thoroughly sifted and sanctioned projects as will place the matter of famine relief works on anything like a secure basis. If, as seems probable, ~~the result of our investigations go to show that~~ within certain tracts of country (those it is to be feared which are the most exposed to famine) there are ~~really no~~ reliable projects available for relief on a large scale, it is manifestly better that this should be clearly established rather than that works of the ruinous class of the Madras Irrigation and Canal Company's work should be heedlessly entered on.

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25. If the principle in reference to famine relief works which I have above adverted to, and which have already met with acceptance by the Committee on the Madras Famine Code (of which I had the honor to be a member), are not firmly adhered to, I confess I should not regard the future without the gravest misgivings.

No.

ORDER—dated 1882, No. W., Public Works.

Ordered that the following reply be sent :—

(Here enter No. W., dated , 1882.)

(True Extract.)

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

To the Chief Engineer for Irrigation, with copy of letter to Government of India.

Exd. J. W. Fischer.

20/2/82

7 11

th June 1882, No. W., Public Works.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

No. —W.

No.
Letter—from

Colonel R. H. SANKEY, CB, R.E.,
Secretary to Government, Public Works Department,
Madras,

To
The SECRETARY to the GOVERNMENT of INDIA,
Public Works Department.

466 I.

Sir,

No. 2 I., dated 13th June 1882.

With reference to your letter, No. 161 M., dated 6th May 1882, and in immediate connection with the subject of my letter marginally quoted, submitting a complete list of all the known projects for both "Productive" and "Protective" Works for this Presidency, I am desired by ~~His Excellency~~ the Right Honorable the Governor in Council to forward the annexed memorandum by the Chief Engineer, dated the 8th instant, which he has considered it desirable to submit for the information of this Government, drawing attention to the necessity for a very complete enquiry being undertaken in reference to all famine relief projects, and especially those connected with Irrigation, Navigation, and Water Supply.

2. In my letter above quoted arrangements have been proposed which will, if approved, ensure, so far as the present disposable establishment will admit, the thorough and systematic examination of all schemes which are considered to be in any way suitable for the important objects in view; and as this Government attaches great weight to the necessity for making exhaustive investigation in all such cases prior to sanction, I am to express a hope that the Government of India may be disposed to modify in this sense the instructions conveyed in their letter under reply.

3. The very exceptional circumstances of this Presidency in reference to hydraulic works are, I am to submit, such as must be fully weighed in deciding on new projects of the classes mentioned.

4. In no part of the world has the storage of the available water-supply been carried to anything like the same extent as in Southern India, where, including Mysore, there are not less than the enormous amount of 80,000 reservoirs, many of them of the largest size. To such an extent, moreover, had the principles of water storage been carried out, even before the introduction of British rule, that it may be fairly doubted whether it would be possible to construct ten completely new reservoirs of any magnitude without directly interfering with the legal rights, as regards water-supply, of the occupiers lower down in the drainages, where it might be proposed to carry out such new works.

12

5. Again, with reference to the flood waters which in most countries escape by ~~the larger class of~~ rivers unused to the ocean, here the ancient inhabitants had entered on a system of turning such to account, which received its highest development in the Tanjore Delta works, where apparently not less than 800,000 acres were under rice cultivation prior to British occupation.

6. These principles of utilizing the river supplies to a greater extent than anywhere else have, under late scientific direction, as is well known, given Madras the unrivalled position which it occupies in the possession of great and remunerative irrigation works; but it must at the same time be clearly stated that what between the storage in reservoirs of all the upper waters and the utilization of the flood wave at the lower ends of the several rivers, the scope for intermediate works of a paying character has necessarily decreased; correctly stated, in fact, the great irrigated deltas and other tracts at the tail of the several drainages are the highly favored gardens which to a great extent place under large contribution, if they do not exhaust the water-supply of the several catchment areas above them, ~~to the very sources of the several streams.~~

7. The schemes which have been submitted for completing the Kistna, Godávari, and other great works will, when carried out, in all probability leave but small room for turning the available remaining water-supply to payable account, and it is chiefly in view to the state of matters that the necessity for the most careful enquiry and scrutiny is here so indispensable for ~~all~~ the ~~intermediate~~ schemes now almost without exception left for selection. In other words, the improvement of the tank systems throughout the Presidency (a matter now engaging the attention of Government), and the completion of the great delta and other irrigation works situated chiefly along the littoral tracts, will leave but small scope for projects of a remunerative character.

8. It is not, I am to observe, intended by these observations to exclude from view those works which, though yielding no direct return, may, as "Protective" schemes, be on other grounds most suitable for carrying out either prior to, or during the currency of, a famine; but here again, judging from the experiences of works undertaken during past calamities, it appears to His Excellency ~~the Governor~~ in Council that exhaustive enquiries are especially needed, as the amount of loss to the State, in such cases inevitable and acknowledged, should be known and stated in the most precise terms, so as to admit of the Government accepting, with a complete knowledge of the facts, its responsibility in recommending them for execution ~~the heavy burthen which may very possibly have to be incurred.~~

9. In conclusion, I am to state that the Government of India will be kept constantly informed of the progress made in investigation of projects according to the scheme sent up for famine relief.

I have the honor to be,

Sir,

Your most obedient servant,

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

Colonel RE

OOTACAMUND,
th June 1882.
Exd C. Howarth.

alter

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1882) Madras.

PUBLIC WORKS.

Dated June,

Recd. *Encl.*

June 1882, No. W.

24

JUNE.
No.

Famine Relief Projects.

As to the necessity for complete enquiry being undertaken in reference to all —.

1475 A / 1475 B W.

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1882} Madras.

PUBLIC WORKS.

Dated June,

Recd. *Encl.*

G.O., June 1882, No. W.

JUNE.
Nos.

Famine Relief Projects.

As to the necessity for complete enquiry being undertaken in reference to all—.

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15 C No. 3047.

CAW

H.E. the Governor wishes to have this and my note printed in emergency by the press in [illegible] and to see this and the other letter with statements of Famine works to which reference is made before they go to the Govt —

I think it would be as well also for me to see the proofs

12/6/82

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selected projects.—

BUILDINGS AND ROADS.

To
S.a.w.

Please see that these instructions are attended to.

R.S.
13/6

3047

C.a.W.
Herewith prog for W's approval
The other paper on the same subject
is not ready yet [illegible]
[illegible]

O.S. [illegible]

To W
Submitted R.S. 20/6

No. 16 81

No. 161 M.

All communications should be addressed to the Secretary.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.
Civil Works.
Put the following [illegible] Miscellaneous.

To,
The Secy to the Govt. of Madras
Public Works Department.

Simla, 6th May 1882.

Sir,

In reply to your letter No. 3198 W dated 31st December 1881, I am directed to state that in the letter Nos. 381-94 M dated 30th November 1881, from this Government, Local Public Works Departments were requested to prepare, under the orders of the Local Government or Administration, lists of works suitable for purposes of famine relief, and to take steps for the investigation of selected projects.

2.

2. For the preparation of lists, such as those asked for by the Supreme Government, exhaustive enquiry does not appear to be a necessary preliminary.- All that seems to be requisite is, that the Civil and Public Works Officers of each district or division, should be called on to submit a list of works, which could, in their opinion, be advantageously undertaken for purposes of famine relief.- This list would only contain a brief, general description of the nature of each work, which it is proposed to undertake, and of the advantages derivable from its execution, and it does not appear to the Government of India, that any special establishment is required

for

for the preparation of such lists.- Should it, however, be found necessary, in any particular case, to employ additional establishment for the purpose, it can be temporarily entertained according to the rules recently issued on the subject.- From these lists the Local Government should have no difficulty in selecting and arranging works in the order of their usefulness, for the special object in view, and for the ultimate advantage of the State.-

3. All that the Government of India requires in the first instance is such a list of the most promising of the schemes recommended for adoption as that just described, containing a like brief general description of each project, accompanied by the remarks and recommendations of the Local Government, and by specific proposals for the establishment required,

for

for such further detailed investigation as may be thought advisable.

4. Bearing in mind, however, that many years may elapse, before the necessity arises for putting any of the works in hand, it is manifestly neither necessary nor advisable, to draw up the first designs in great detail. All that is required, is to collect and record clearly so much information, as shall afford a rough approximate idea of the number of laborers, skilled and unskilled, for whom employment could be found on each work, for some definite period, and of its probable cost at normal rates; and shall enable an Engineer, upon necessity arising, to lay it out on the ground, and set laborers at work upon it, without loss of time. In submitting the proposals for Establishment

mentioned

mentioned in para. 3, this limitation of investigation must not be lost sight of. With regard to this Establishment, I am to state that it must also be "Temporary," as the Government of India stands pledged to Her Majesty's Secretary of State, to keep the permanent Engineer Establishment within the limits of present sanctioned strength.

5. That no such scheme of relief works can be devised, as could even approximately meet the requirements of such a famine as that of 1876-78, does not appear to the Government of India, a valid argument against the preparation of the best scheme, which the physical, agricultural, and commercial conditions of the Country will admit. Indeed the lamentable fact, mentioned in para. 5 of your letter, appears to this Government

-ment to prove conclusively, that no arrangement could be worse than remaining in a state of unpreparedness and dependence entirely upon the inspiration of the moment for the plan of operations.- Employ-ment on the various minor and petty works scattered over the country, is well calculated to afford relief to the distressed poor, during the early stages of, what may ultimately prove to be, a severe famine.- Such works, if properly supervised, may prove excellent auxiliaries for a time; but so far as the Public Works Department is concerned, reliance must be placed mainly on large earthworks, in localities where the laborers can be properly organized, fed and looked after.

6.- The main characteristic obviously desirable in works, intended for the purpose of Famine

Famine relief, is that they shall afford a maximum of employ-ment for unskilled labor.- This characteristic is admitted in your letter under reply, to be as a general rule markedly absent in "Steam Tramways", and "Light Railways"; and the Supreme Government is therefore unable to approve of the suggestion, that a general preliminary enquiry, into the probable nature and cost of works best adapted for Famine Relief, shall be mixed up with detailed and exhaustive examination of projects for "Tramways" and "Railways" which are "Protective" rather than "Relief" works.- The two lines of enquiry, as well as references on the two subjects, of "Famine Relief" and "Protective Works" must be kept entirely separate.-

I have the honor to be,
Sir,
Your most obedt. servant,
W. Erwin Colonel R.E.
Secretary to the Govt. of India,

G.C. 3197/3198 of -31-12-81.

P.W.C. No 3047

Recd 12 May/82

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P. W. D.

Recd the following

Note by the Chief Engineer.

The Government of India in letter No 161. M d/6th May 1882 lays down the principle that as regards works suitable for famine relief exhaustive enquiry is not necessary, and that all that is required are lists of such works as the Civil and P. W. Officers may consider could be advantageously undertaken for such purpose.

2. Looking upon this as a vital point I trust I may be pardoned for submitting with the

utmost deference the following observations for consideration.

3. The remarks which I have to offer have no reference to petty village works of all classes, repairs to the earthwork of tanks, clearance of channels, metalling lines of road or other similar operations, which however individually extensive and suitable for famine works can have the requisite data determined, quantities and cost run out and execution undertaken by an expert Engineer without hesitation or

delay. Those I allude to are chiefly large irrigation or water supply works, navigable canals, storage reservoirs and the like, which in the main compose the lists of works most suitable for relief when the intensity of famine has so increased as to necessitate the employment of the people in the largest convenient aggregations with a view to economize the available supervision which under such circumstances must be limited.

4. Nothing I must submit can be more dangerous than for Government to find itself

in face of a severe famine with only lists of works, even supposing these to have been compiled by the most experienced Engineers instead of being able to make the needful selection from thoroughly investigated and sanctioned projects. If there be one lesson more than another which has been taught by the experience of every single famine and especially by the late calamity, it is I venture to think thi- that no large original project should be put in execution unless it has previously gone through all stages of professional test up to final sanction precisely as in ordinary times.

5. The startling fact that in this Presidency alone during the late famine, no less than 223½ out of a total outlay on works of 357¾ Lakhs of Rupees were shewn to have been expended on acknowledged infructuous work, and that even the residuum would on close scrutiny in all probability have proved

to be of the same character, should it is thought suffice to demonstrate the extreme hazard of having to depend at such times merely on lists of projected works.

6. That nothing short of the most exhaustive enquiries can afford the slightest reliable basis for irrigation and water supply works of all kinds, depending as they do on such factors as the available supplies of rivers &c, is I need hardly say the conclusion, taught by long & dearly bought experience of all right-minded Engrs:- but as this is not in all probability so clear to others I may here advert to some well known factors [illegible]

7. In this Presidency we have a striking Example the M. I. & C Co's work which in Consequence of the Bellary famine of 1853-54 was although projected by quite the most Experienced and successful hydraulic Engineer in India, commenced on insufficient data, and has, as well known, led to the most disastrous financial results. & the leading facts connected with this undertaking are as follows:-

8. The first rough estimate [*] amounted to 134½ Lakhs. Annual Returns to the Company were estimated at 42½ Lakhs and to the Government on account of half water rate

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(In a footnote)

[*] Of this amount it was estimated that 22½ Lakhs would be spent on the Mauri Kunawai Reservoir and 41½ on the Bellary Canal scheme consequently only 70½ Lakhs was at the time the Estimated outlay on the M I C Cos works as ultimately carried out. The two first named works have not been carried out nor are they likely to be so

at $33\frac{3}{4}$ Lakhs: the Expected area to be irrigated, was taken at 1,350,000 acres. Works were Commenced in 1860, and the capital outlay to end of 1880/81 amounted to Rs 1,61,09,370, and Revenue Expenditure to Rs 15,12,161. The total receipts to 30th June 1881 were Rs 11,37,087. The area of irrigated land which in the famine year 1876-77 amounted to 90,372 acres and produced Rs 2,47,434, had gradually decreased to 17,798 acres in 1880 81 producing only Rs 61,579, which did not cover half the working Expenses, and left untouched the interest on capital outlay. This latter alone as matters stand amounts at 4 per cent to nearly 6½ Lakhs per annum. If eventually the works pay their working Expenses the dead loss to the State may be therefore taken in round numbers at the latter figure.

9. But the lesson thus taught had by no means the effect which might reasonably have been

Expected. In order to make good the defects which revealed themselves as the work advanced, four great storage reservoirs known as the Manci Kunaway, Muddak, Masoor, Mordaba and Luckwally, were projected.

10. As shewn by me in a Memo: drawn up in 1878 for the information of the Government of India, the cost of the three last named reservoirs would

with all their needful accessories have amounted to between 3½ and 4 millions sterling to carry into execution!

11. However costly the enquiries made were not sufficiently exhaustive, and the result is that these very projects stand enumerated among the projects suitable for famine relief (see items XV, XVI, & XVII page 61 of Appendix I to the Report of the Famine Commission).

12. They are now I hope definitely and finally shelved but it will

be observed that these projects even more than comply in point of detailed enquiry, with the tests considered sufficient under the present ruling of the Government of India. Several other work, e.g. the Upper Godavari Navigation scheme upon which some 78 Lakhs were expended without visible result, prove the same truth that anything short of exhaustive enquiry must be fatal in a financial point of view

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on hasty projection of works for famine purposes.

After his visit to that Presidency in January 1873, Lord Northbrook issued distinct instructions that the Mutha project (estimated to cost 63½ lakhs) should be curtailed, the Taptee project suspended and that no other large works were on any account to be undertaken, and no new projects for large works to be even prepared or investigated, till further experience had been gained of the results of irrigation in the Deccan, and their remunerative character proved.

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recognised as great masters of their profession, but India in regard to irrigation works is "facile princeps", having works which in magnitude and boldness of design surpass all the rest of the world.

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R. H. Sankey Colonel R.E.

Chief Engineer, P.W.D.

Ootacamund
8th June 1882

(1a)

Famine Projects

I certainly would send this represent.n to the Govt of India for consideration

L.B. 8/6/82

A/

No 1475 W / A   P 18   33   B. R. Works

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT,

UNDER date the 13th June /82

Read the following :—

From

The Govt of India (H.E. No 161 M d/ 6th May /82)

Note by the Chief Engr P.W.D. d/ 8th June 1882.

Ordered that the following reply be sent.

H.E. No 1475 W / B d/ 13th June /82

R.S.

To, The Ch: Engr for I. with copy of letter to Govt of India.

S.C.P.S.W 8/7

Ex. Ed.

No. 1475 W / B dated 13th June 1882

To the Secretary
Works — India

C A W

No 466 dd 13 June 1882
printing and the
No. not to be filled in
in Madras

Seen
12th June /82

9/6/82

Sir

With reference to your letter No 161 M dated 6th May 1882, and in immediate connection with the subject of my letter marginally quoted submitting a complete list of all the known projects for both "Productive" and "Protective" works for this Presidency I am desired by H.E. the G in C to forward the annexed memorandum by the Chief Engineer (dated the 8th instant) which he has considered it desirable to submit for the consideration of this Govt.

of 50,000 Reservoirs many of ~~them~~ of the largest size, to which an extent moreover had the principles of water storage been carried out, even before the introduction of British rule, that it may be fairly doubted whether it would be possible to construct ten completely new Reservoirs of any magnitude without directly interfering with the legal rights as regards water supply of the occupiers lower down in the drainages where it might be proposed ~~to~~ to carry out ~~construct~~ such new works

~~Madras 42,000 Mysore 38,000 80,000~~

5 Again, with reference to the flood waters which in most countries escape by the larger class of rivers unused to the ocean, here ~~again~~ the ancient inhabitants had entered on a

system of turning such to account, which received its highest development in the Tanjore delta works, where apparently not less than 800,000 acres were under rice cultivation previous to British occupation

6 – These principles of utilizing the river supplies to a greater extent than any where else, begun under later scientific direction, ~~have~~ is as well known from Madras the unrivalled position which it occupies in the possession of great and remunerative irrigation works; but it must at the same time be clearly ~~stated~~ ~~that~~ what between the storage in reservoirs of all the upper waters and the utilization of the flood wave at the lower ends of the

several rivers, the scope for intermediate works of a paying character has necessarily decreased — recently ~~Stated~~ in fact the ~~great~~ irrigated deltas and other tracts ~~works~~ at the ~~tail~~ of the several drainages are to highly favored gardens which ~~to a great extent~~ place under large contribution if they do not exhaust the water supply of the several catchment areas above them, to the very sources of the several streams

7. The Schemes which have been submitted for completing the Kistna, Godavari, and other great works, will when ~~completed~~ carried out, in all probability leave but small room for turning the available remaining water supply to profitable account, and it is chiefly in view to

this state of matters that the necessity ~~for~~ for the most careful enquiry and scrutiny is here so indispensable for all the intermediate schemes now almost without exception left for selection. In other words the improvement of the tank systems throughout the Presidency (a matter now engaging the attention of Government) and the completion of the great delta and other ~~works~~ irrigation works situated chiefly along the littoral tracts, will leave but small scope for projects of a remunerative character

~~8. It is not I am to observe intended by these observations to~~ exclude from view those works which though yielding no ~~direct~~ return may as "Protective" Schemes be in

on other grounds not
suitable for carrying out
either prior to or during
the currency of a famine;
but here again judging
from the experiences of
works undertaken during
past calamities it appears
to H.E. the G. in C. that
exhaustive enquiries
are especially needed
on the amount of loss
to the State, in such
cases inevitable and
acknowledged, should
be known and stated
in the most precise
terms, so as to admit
of the Government accepting with a complete knowledge of the facts
its responsibility for
the heavy burthen, to which may very possibly have to be incurred
~~be entailed a [illegible]~~
~~a clear ascertainment~~
~~of all the [illegible]~~

10. In conclusion I am to state ~~that~~ the Govt. of India will be kept constantly informed of the progress made in investigation of projects according to the scheme sent up for Famine relief

SC D 9/10
8/7
9/6/82

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Govt. of (1882) Madras.

PUBLIC WORKS.

Special

Vasey 15-8-82

Dated

Recd.

Recd.

G. O. 13 June 1882, No. $\frac{1475\text{-W}}{a}$ $\frac{1475\text{W}}{B}$

Nos. 93A 93D

Famine Relief Projects

As to the necessity for complete enquiry being undertaken in reference to all —