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FIFTY-FIRST ANNUAL REPORT  
OF  
THE SANITARY ENGINEER  
TO GOVERNMENT  
OF MADRAS  
FOR 1940

PRINTED BY THE SUPERINTENDENT  
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DEPARTMENT OF COMMERCE

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1917

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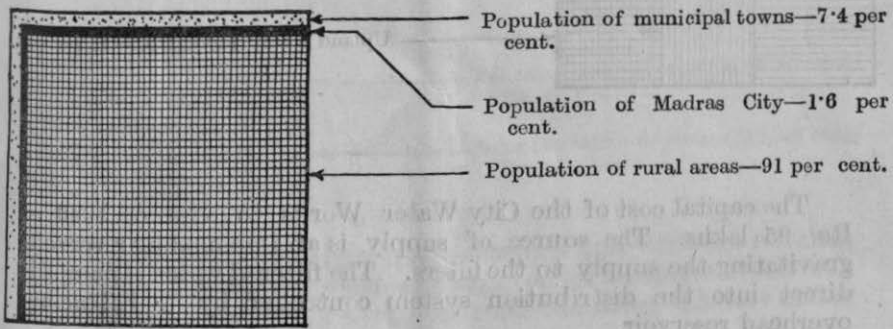
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# FIFTY-FIRST ANNUAL REPORT OF THE SANITARY ENGINEER TO GOVERNMENT, MADRAS, FOR 1940.

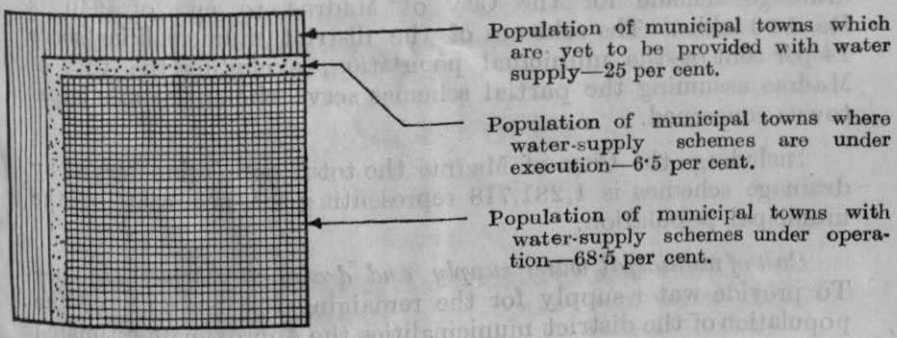
## 1. SUMMARY OF THE SITUATION.

*Municipal water-supply schemes.*—During 1940 two new water-supply schemes—Karur and Tiruppur—were brought in commission though the execution of the headworks at Tiruppur had not been completed. The total number of municipal water-supply schemes in operation during 1940 reached 45.

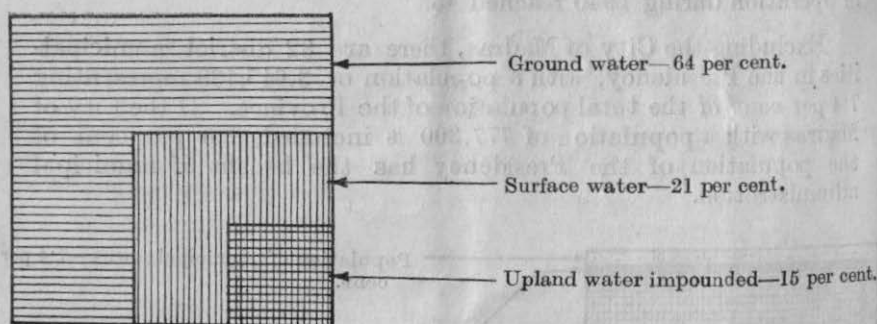
Excluding the City of Madras, there are 82 district municipalities in the Presidency, with a population of 3,645,138 representing 7.4 per cent of the total population of the Province. If the City of Madras with a population of 777,300 is included, 9.0 per cent of the population of the Presidency has the benefit of municipal administration.



The population served with water-supply in 45 district municipal towns is 2,496,939 representing 68.5 per cent of the municipal population excluding the City of Madras.



Including the City of Madras, the total population served with protected water supply, comes to 3,274,239 representing 74 per cent of the total municipal population of the Province. The cost involved in the installation of these district municipal schemes is Rs. 264 lakhs in round figures. Of these 45 schemes in operation, 8 have gravitational supplies while 34 are pumping and 3 are both by gravitation and by pumping according to the adequacy of the yield at the sources. Of these schemes in operation 64 per cent represents ground water sources, 15 per cent upland impounded sources and 21 per cent surface waters from rivers and canals.



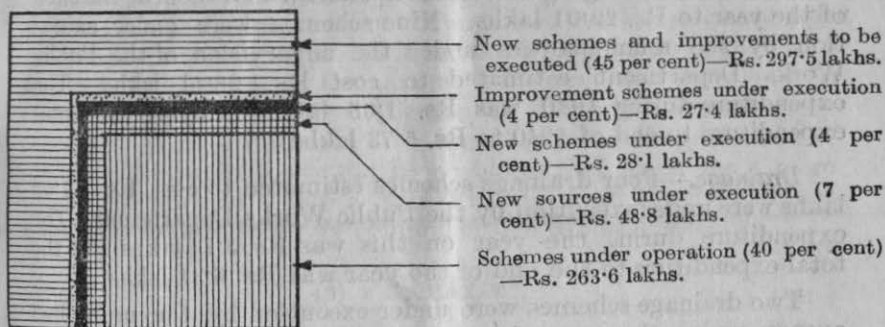
The capital cost of the City Water Works to end of 1940 is Rs. 95 lakhs. The source of supply is an impounding reservoir gravitating the supply to the filters. The filtered water is pumped direct into the distribution system controlled by a balancing overhead reservoir.

*Municipal drainage schemes.*—Only six municipalities have the benefit of drainage schemes of which three are but partial, serving but a portion of the population. The cost in the installation of these schemes is Rs. 63.0 lakhs. The cost of the drainage scheme for the City of Madras to end of 1940, is Rs. 1.90 lakhs. The schemes of the district municipalities serve 14 per cent of the municipal population, excluding the City of Madras assuming the partial schemes serve the entire municipal towns concerned.

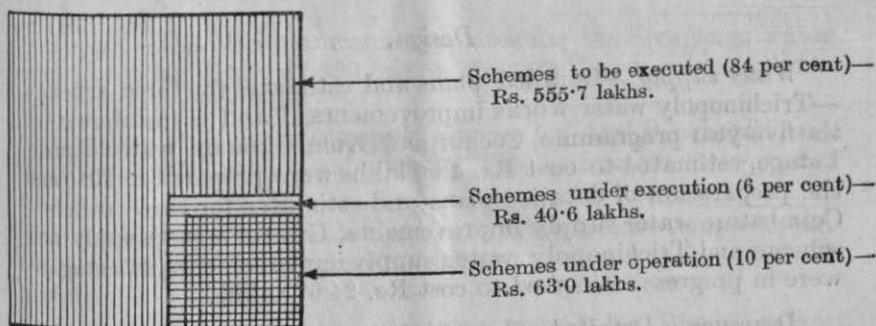
Including the City of Madras the total population served by drainage schemes is 1,281,718 representing 29 per cent of the municipal population.

*Cost of municipal water supply and drainage schemes ahead.*—To provide water supply for the remaining 31½ per cent of the population of the district municipalities the approximate estimated

cost is Rs. 402 lakhs inclusive of improvements to the existing schemes under consideration now.



To provide drainage schemes to serve 86 per cent of the municipal population, the probable cost is Rs. 596 lakhs of which schemes estimated to cost Rs. 40.6 lakhs are under execution.



Thus, for the major water-supply schemes and drainage schemes ahead of the district municipal towns, an expenditure of Rs. 998 lakhs approximately has to be incurred including schemes under execution at present.

*Panchayat water supplies.*—Eleven panchayats including two new schemes which were brought in operation in 1940—Sembiam and Tiruvellore—had been provided with protected water supply schemes though in some cases the supply is but partial. The cost involved in the installation of these schemes is Rs. 8.7 lakhs. No estimate however, has been prepared as to the work ahead so far as these panchayats are concerned of which there were 6,336 in the Province.

## 2. PROGRESS IN 1940.

### (a) MUNICIPAL SCHEMES.

#### *Execution.*

*Water supply.*—Excluding Karur and Tiruppur which are almost completed, twelve schemes of water supply were under execution

by the Public Works Department at an estimated cost of Rs. 76.67 lakhs. The outlay of expenditure during 1940 was Rs. 10.66 lakhs bringing the total expenditure on them at the close of the year to Rs. 29.01 lakhs. Nine schemes were under execution by the municipalities under the supervision of the Public Works Department estimated to cost Rs. 28.41 lakhs. The expenditure during 1940 was Rs. 1.65 lakhs bringing the total expenditure to end of 1940 to Rs. 5.73 lakhs.

*Drainage.*—Four drainage schemes estimated to cost Rs. 31.92 lakhs were under execution by the Public Works Department. The expenditure during the year on this was Rs. 3.14 lakhs and the total expenditure to the end of the year was Rs. 6.31 lakhs.

Two drainage schemes were under execution by the municipal agency under the supervision of the Public Works Department. Their estimated cost was Rs. 8.66 lakhs. The expenditure during the year was Rs. 64,000 and the total expenditure to the end of the year was Rs. 4.06 lakhs.

### *Design.*

*Water supply.*—Detailed plans and estimates for three schemes—Trichinopoly water works improvements, I and II instalments of the five-year programme, Cochin and Kumbakonam water supply, I stage, estimated to cost Rs. 4.96 lakhs were prepared in 1940 and the preparation of detailed plans and estimates for three others—Coimbatore water supply improvements, Guntur water-supply new scheme and Trichinopoly water supply improvements, III stage,—were in progress estimated to cost Rs. 24.67 lakhs.

*Drainage.*—Detailed plans and estimates for two drainage schemes—Virudunagar and Tuticorin—estimated to cost Rs. 25.46 lakhs were prepared and submitted for sanction. The general outline for the drainage scheme for Kumbakonam estimated to cost Rs. 22.17 lakhs was under preparation.

### *Investigations.*

*Water supply.*—The investigation of water supply schemes for Nandyal, Vizagapatam (Gosthani Source) I, stage and Rajapalayam were completed and reports thereon submitted. The estimated cost of these three schemes is Rs. 32.97 lakhs. The investigation of ten others were in several stages of progress during the year and the estimated cost of these schemes is Rs. 34.56 lakhs.

*Drainage.*—Alternative preliminary estimates for a drainage scheme for Masulipatam was sent, estimated to cost in total Rs. 52.80 lakhs.

Five investigations of drainage schemes estimated to cost Rs. 37.91 lakhs were in progress.



*Preliminary Reports.*

*Water supply.*—There has not been any demand from municipalities for a preliminary report for any new water-supply scheme nor was there any for drainage scheme. This is apparently due to the fact that excepting Cannanore, Tellicherry and Udipi, all the municipalities had obtained figures of costs for water-supply schemes. As regards lack of demand for drainage schemes, municipalities which have not been able to find funds for a more primary requirement like a safe drinking water supply, had not been keen to introduce any comprehensive drainage schemes.

## (b) PANCHAYATS.

*Water supply.*

*Execution.*—Six schemes estimated to cost Rs. 4.11 lakhs were under execution. The outlay during the year was Rs. 0.8 lakh and the total expenditure to the end of the year was Rs. 1.19 lakhs.

*Design.*—Detailed plans and estimates for the Sivaganga water supply costing Rs. 57,700 were prepared and submitted for sanction during the year.

*Investigation.*—A water-supply scheme for Arni Panchayat was investigated and report submitted. The estimated cost of the scheme was Rs. 84,000.

Water-supply schemes for Gobichettipalayam and Aruppukottai Panchayats were in progress during the year and their estimated cost was Rs. 6.36 lakhs.

*Preliminary report.*—A preliminary report for Bhadrachalam water-supply—a famous pilgrim centre—outlining two alternative proposals estimated to cost Rs. 1.19 lakhs was submitted for consideration.

*Drainage schemes.*

No drainage scheme worth mentioning is functioning in any of the panchayats in the Province. But the investigation of drainage schemes for Gobichettipalayam and Manaparai were in progress during the year. These schemes are estimated to cost Rs. 2.05 lakhs.

*Preliminary report.*—Reports for two panchayat drainage schemes—Kottaiyur (Ramnad district) and Polavaram (Vizagapatam Agency)—were submitted during the year. The estimated cost of these two schemes was Rs. 2.09 lakhs.

## 3. PROFESSIONAL SANCTIONS FOR SANITARY WORKS.

Plans and estimates for sanitary works should secure professional sanction of this department under G.O. No. 1605, P.H., dated 5th August 1925, for municipalities and G.O. No. 2283, dated 11th

September 1937, for panchayats. During the year plans and estimates for Rs. 9.18 lakhs for 42 works were professionally scrutinized and sanctioned against 30 works in 1939 estimated to cost Rs. 6.23 lakhs. Of these 29 were for water-supply schemes estimated to cost Rs. 6.67 lakhs, four for drainage schemes estimated to cost Rs. 93,900, three for medical institutions estimated to cost Rs. 23,900, four for markets and slaughter-houses estimated to cost Rs. 31,460 and two works including quarters for conservancy menials estimated to cost Rs. 1.01 lakhs.

In addition to the professional sanction given to sanitary works for local authorities, scrutiny of proposals for the water supply and drainage and sanitary fittings for the educational institutions which were received from the Director of Public Instruction were also scrutinized.

The preparation of plans, estimates and specifications for domestic and internal plumbing and sanitary equipment in hospitals and all other institutions and buildings—residential or otherwise—under Government, is entrusted to selected private firms on payment of 2½ per cent on the accepted tender for the execution of these works.

For the scrutiny of plans and estimates for the local authorities a centage of ½ per cent is levied and 2½ per cent for plans and estimates prepared on their behalf in this department. The centage charges are not, however, levied for the scrutiny of plans and estimates for the rural water-supply schemes proposed by the Collectors of districts or the Board of Revenue.

#### 4. GENERAL SANITATION AND TYPICAL DESIGNS.

One note-worthy feature during the recent times in this Province as in some others, was the sanitation of buildings under the water carriage system, though located beyond the sewer line.

There had been therefore a number of enquiries for the designs for septic tanks, sub-surface irrigation of tank liquor and for approval of such installations. As far as practicable this demand was met by preparing individual designs or by suggesting modifications to designs submitted by individuals. Typical designs to serve the varying local conditions have not, however, been perfected in the absence of adequate technical subordinate staff for draughtsmen's work. The question of sanction of additional staff was under consideration of Government during the year.

Typical designs for water supply and drainage which were in vogue for a long time past, had also to be brought up to date. Most of the old Sanitary Board type-designs in this respect had become obsolete. During the year, six new designs were prepared but many more are yet to be revised and brought up to date. A good deal of work in this direction is ahead.

## 5. WATER WORKS IN OPERATION.

(a) *Significant facts in their maintenance.*—In the past, it had been brought to notice that in the maintenance of the water works in operation, there had been considerable deterioration. The main reason for this is the want of competent Municipal Engineers in immediate charge of the works. Secondly, the technicians in charge of filtration plant are not specially qualified in the technique of the process involved. Thirdly, there is a general feeling of complacency among our municipal administrators that everything is in order in the management and maintenance of the water works so long as the water runs in the taps. Over and above these disabilities, another grave disability exists. It is, the lack of essential information such as the report on the scheme cost of completion and subsequent improvements and, above all, the plans of the works in charge of maintenance of the Municipal Engineers. In reply to the notes of inspection of the works by the officers of the department, only non-committal and laconic replies are received. It would seem desirable that the inspection notes by the officers of this department are given the status of a statutory requirement by appointing officers of this department as statutory inspectors of works under section 38 of the Madras District Municipalities Act. In that case, the notes of inspection would go to the notice of Government who would be in a position to exercise their rights in compelling the municipalities to rectify matters. The Government also have got an interest in the matter as a moiety of the cost of these schemes is borne by them in most cases and more than half in some others.

(b) *Rate of water supply per head per day.*—A graphical representation is attached (Appendix I). The Madras City had been consuming 23·3 gallons per head per day against 25 gallons provided for in the design. This rate of supply for the city is lower than the normal consumption. In point of fact, the city had been consuming as much as 38 gallons per head per day during years of plenty.

Trichinopoly comes next which consumes as much as 22·2 gallons per head per day, while the rate of supply as contemplated in the scheme was but 15 gallons. Dindigul has been consuming only 2·2 gallons per head per day against 10 gallons which was intended to supply. This is due to the fact that year in and year out, for a long past, the situation in Dindigul has been growing from bad to worse in that the existing source has been practically depleted of its ground storage. Kumbakonam which consumes 2·1 gallons is but a partial scheme. A new source of water supply for Salem is under execution. So also for Adoni and Cuddapah. Saidapet consumes but 2·7 gallons per head per day against 15 gallons provided. It is not due to the lack of adequacy of supply at the source. The scheme had been designed in 1928 to serve a prospective population of 25,000.

The scheme was executed in 1937. The present population of Saidapet is 40,629.

The conditions are extremely favourable for the growth of algæ in the storage reservoirs. In some cases like Adoni, Cocanada, Ellore, Chidambaram and Salem the trouble developed so badly that the quality of supply was materially affected. With the co-operation and assistance of the Director of King Institute, Guindy, appropriate algacides were applied and the trouble was kept under some control. Time is come when a full time algæologist should be available in this Presidency to apply in good time algacides as and when necessity arises. This aspect of the question deserves special notice.

## 6. WATER WORKS FINANCE—RATE OF TAXATION.

With a view to economizing space during the present international crisis, a tabular statement as originally intended is not furnished. However, a summary of the situation is given. Thirty-eight municipalities were maintaining the water works at a profit aggregating to Rs. 5.20 lakhs. Seven municipalities were running the works at a loss amounting to Rs. 1.47 lakhs. Thus, the net profit in running the forty-five municipal water works was but Rs. 3.73 lakhs.

Nine panchayats were running the works at a loss of Rs. 12,500. Only one was working at a profit of Rs. 2,500. Thus, in running eleven panchayat water-supply schemes the total loss was Rs. 10,000. Kosigi panchayat did not furnish any statistical particulars. The basis of working out the cost of supplying water varied with local bodies. Some took the cost of fuel excluding the salary of the staff, while others the fuel and the staff. But none of them took into account the depreciation on the machinery. The basis of figures given in Appendix II for supplying a million foot gallons includes the cost of fuel, sundries, repairs, establishment, Mechanical Expert's inspection charges, interest on capital outlay and sinking fund, taking the life of each class of plant into consideration. It would be desirable that the municipalities concerned maintain these figures on a uniform basis so that the figures they furnish for the consolidated Municipal Administration Report and the figures furnished by this department in the administration report may be co-ordinated. The introduction of the tap-rate system as against the metered service connections has tended to improve the income from municipal water works but it has not gone to the extent to which it was expected. The reason therefor is not far to seek. The basic principles of the tap-rate system had not been appreciated and even if appreciated, had not been given effect to. Whatever might be the location of a house with reference to the pressure obtainable in the main from which a service is tapped, the screw down ferrule should be throttled so as to give a uniform flow throughout the

distribution area in the house services. What happens now is, places unfortunately located on the high pressure mains draw water to the prejudice of the high-level areas. This not only depletes the supply involving waste of water but the general reduction of the quantity available for consumption elsewhere. Again, the tendency still persists of opening public fountains where there is no need. This again results in the wastage of water. The waste which takes place in an ordinary public fountain may well serve at least fifty house services. If the municipalities appreciate these points they could improve their finance to some extent. The water-works finance of each of the municipalities has yet to be studied individually when occasions arise, and some co-ordinated policy recommended.

## 7. GENERAL REVIEW.

The Sanitary Engineer to Government was a member of the following committees during the year :—

- (1) The Committee appointed to devise methods for the disposal of the waste from the tanneries.
- (2) The Committee constituted to report on a comprehensive scheme of rural water supply.
- (3) The Expert Committee appointed by the Corporation of Madras to report on the disposal of sewage, particularly on the installation of an activated sludge plant for treating the sewage from the Kilpauk area.

The Sanitary Engineer is a member of the Water and Sewage Purification Committee, which has been reorganized under orders of Government. The Government also decided to retain the Experimental Filter Station at Kilpauk under the management of the Director of King Institute, Guindy.

The Sanitary Engineer continued to be a Special Councillor of the Corporation of Madras during the year.

The Sanitary Engineer was appointed as Inspector of all works in the Corporation of Madras other than the roads for which grant-in-aid is being paid by Government.

*Sanitary Engineering Service—Organization.*—The subject of the proper organization of this department had always been a thorny question and it continued to engage the attention of Government during the year. Eventually Government have been pleased to issue orders in G.O. No. 5972, P.H., dated 19th December 1940, placing the Sanitary Engineer under the Chief Engineer like any other Superintending Engineer of the Public Works Department. This organization did not however come into effect during the year under review.

The statutory rules governing the qualifications of officers, terms and conditions of employment underwent revision during

the year. The Sanitary Engineering branch was merged in the Madras Engineering Service and it was made permissible to transfer the officers of the Madras Engineering Service to this branch for appointment.

The reorganization of the Madras Municipal Engineering Service was under consideration of Government during the year.

*Execution of water-supply and drainage schemes.*—The policy laid down by Government in G.O. No 2186, P.H., dated 15th June 1938, underwent a slight modification during the year. The Municipal Engineers were ordinarily allowed to execute water-supply and drainage schemes subject to certain limits as under:—

Grade of Municipal Engineers.	Maximum cost of schemes they should be allowed to execute.
	RS.
Grade I .. .. .	1,00,000
Grade II .. .. .	50,000
Grade III .. .. .	25,000
Grade IV .. .. .	20,000

Sri A. V. Raman continued to hold the post of the Sanitary Engineer to Government during the year excepting for a period of four months from 22nd April 1940 to 22nd August 1940 when he proceeded on leave.

Sri T. S. Subramanya Ayyar, the Senior Deputy Sanitary Engineer, held charge of the current duties of the post of the Sanitary Engineer from 22nd April 1940 to 15th May 1940 when Sri Rao Bahadur N. Govindaraja Ayyangar, a permanent Executive Engineer of the Public Works Department, relieved him.

Sri T. S. Subramanya Ayyar continued to be Deputy Sanitary Engineer (Southern Circle) and Sri K. Harihara Ayyar, Deputy Sanitary Engineer (Northern Circle), throughout the year.

Sri D. Gopalakrishnamachar held the post of the Personal Assistant to Sanitary Engineer throughout the year.

Sri A. K. S. Ayyar, who was appointed under the emergency powers as Mechanical Expert, continued to hold the post. None of the foregoing officers were permanent in their posts. All continued on a temporary basis.

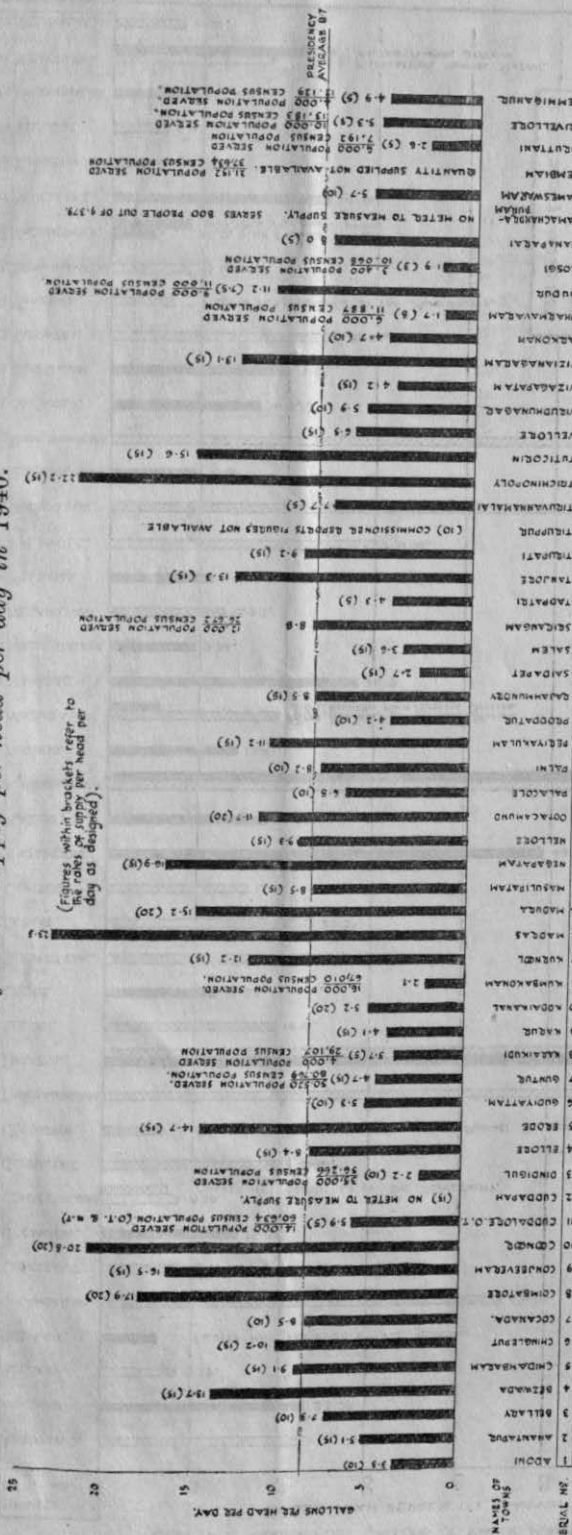
The report of the Mechanical Expert on the inspection, condition of plant and other details is attached hereto as Appendix III.

MADRAS,  
27th June 1941.

A. V. RAMAN,  
Sanitary Engineer to Government.

APPENDIX I.

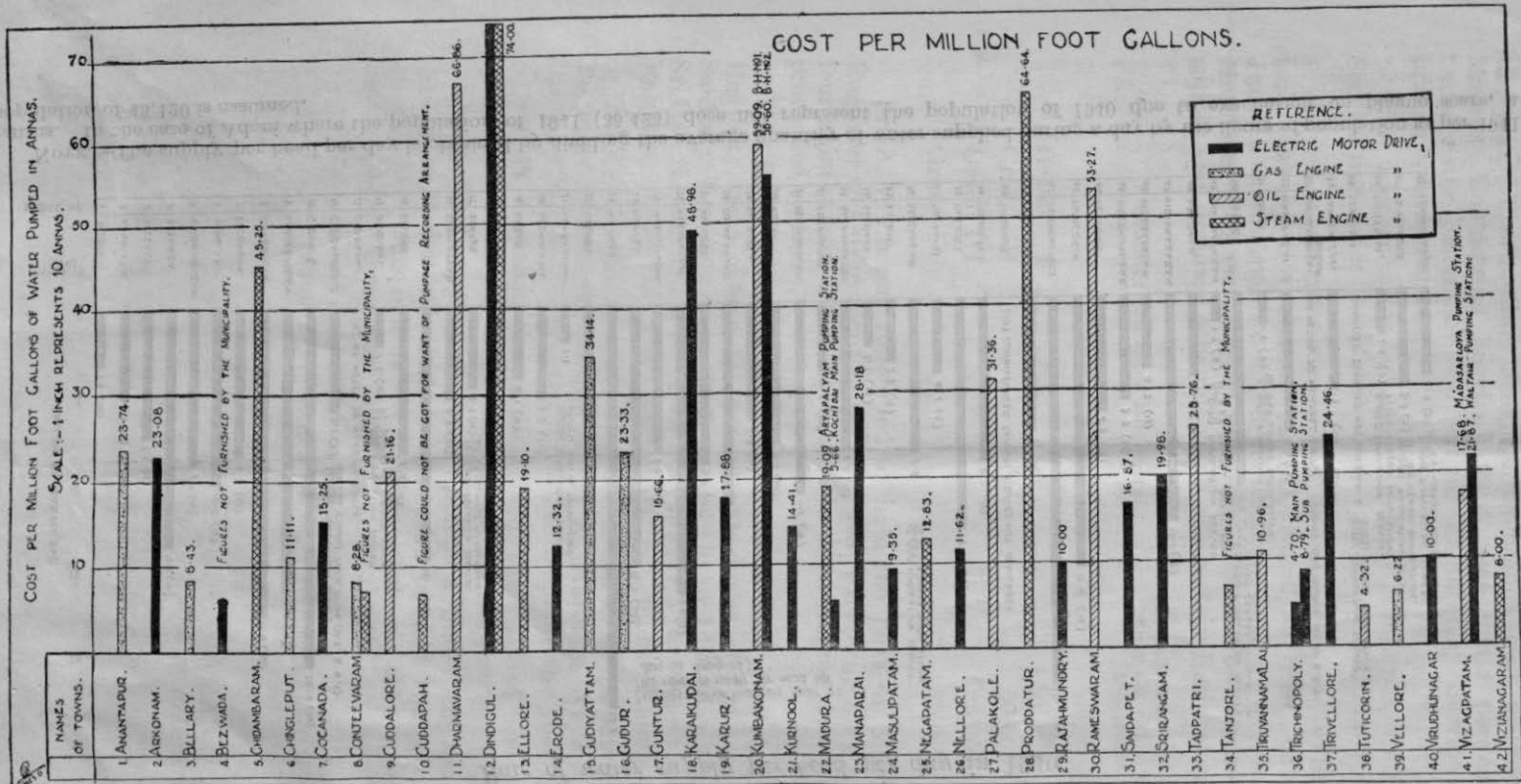
Rate of water supply per head in 1940.



NOTE.—The supply per head per day is obtained by dividing the average quantity of water supplied during a day by the figure of population as per 1941 census. In the case of Adoni where the population of 1941 (35,425) does not represent the population of 1940 due to evacuation on plague scare, a population of 43,120 is assumed.

GOVT. PRINTING OFFICE, MADRAS

# APPENDIX II.



NOTE 1.—The cost per million foot gallons of pumpage is inclusive of cost of fuel or energy, lubricants, sundries, repairs, renewals, establishment charges, mechanical expert's inspection charges, interest on capital outlay, at 3 per cent simple interest and sinking fund annual contribution carrying 3 per cent compound interest considering the life of plants, 15, 25, 25 and 35 years for electrical, gas, oil and steam plants respectively.

NOTE 2.—(1) Tiruppur is not included as the work is incomplete.  
 (2) Kosigi and Yemmiganur are not included.



## APPENDIX III.

## Report of the Mechanical Expert on the pumping plants in municipal and panchayat boards water works for 1940.

Serial number.	Station.	Cost per million foot gallons pumped in annas.	Daily average number of hours pumping.	Maximum number of hours of pumping on a day.	Minimum number of hours of pumping on a day.	Remarks.
<i>Municipalities.</i>						
1	Anantapur .. .. .	23.74	9.70	14.50	6.42	Arrangements for replacing the gas plants by electrically driven sets are in progress.
2	Bellary .. .. .	8.43	34.99	48.00	2.50	(Gas plant.) Running cost low as the daily average number of hours run of both the units is about 48 hours. Plant is in bad condition and requires immediate attention and stand-by units to be provided.
3	Bezwada .. .. .	..	21.86	24.00	14.00	(Electrical plant.) Particulars not yet received.
4	Chidambaram .. .. .	45.25	18.22	23.50	11.50	(Steam plant.) Running cost is high since plant was old. The steam plants are being replaced by electrically driven sets.
5	Chingleput .. .. .	11.11	33.50	45.50	24.00	(Gas plant.) Running cost low though the plant is very old. Partial electrification is in progress. Existing gas plant is in bad condition, requiring immediate renewals.
6	Cocanada .. .. .	15.25	12.68	20.50	10.00	(Temporary electrical plant.) Replacement of old steam units by electrical sets is in progress. Running cost of temporary electrical unit is high due to the retention of the steam units and the staff required for the same as the steam sets are off and on put on commission.

Report of the Mechanical Expert on the pumping plants in municipal and panchayat boards water works for 1940—cont.

Serial number.	Station.	Cost per million foot gallons pumped in annas.	Daily average number of hours pumping.	Maximum number of hours of pumping on a day.	Minimum number of hours of pumping on a day.	Remarks.
<i>Municipalities—cont.</i>						
7	Conjeeveram (steam) .. ..	12.54	31.70	38.50	16.00	Running cost low due to long daily number of hours run, and interest on capital and sinking fund annuity not have been included. Both the steam and gas plants are being replaced by electrically driven sets.
7-A	Conjeeveram (gas) .. ..	8.28	10.10	18.50	4.50	Running cost low though plant is old.
8	Cuddalore.. ..	21.16	12.52	15.50	6.50	(Oil engine plant.) Running cost is high due to the average daily number of hours run being only 15.5. One of the units is thrown out of commission for renewal of vertical shaft and bearings.
9	Cuddapah.. ..	..	16.27	..	..	(Steam plant.) Figures not furnished. The plant is old and there is no water meter. Electrically driven pumping sets have been installed and are expected to be run in July 1941 when the existing steam plants would be thrown out of commission.
10	Dindigul .. ..	74.00	12.98	24.00	3.00	(Electrical and steam plant.) The high running cost is due to three electrical small units and one small steam unit being run each for 3¼ hours per day. Proposal for electrifying the steam unit is in progress.
11	Ellore .. ..	19.10	17.44	20.50	16.00	(Steam plant.) Running cost though high is not bad for the old units, and low number of hours of daily run. Electrical units are proposed to be installed and tenders have been called for.

12	Erode .. .. .	12-32	22-57	24-00	12-00	(Electrical plant.) The low running cost is due to large size of plants and long number of hours of daily run.
13	Gudiyattam .. .. .	34-14	9-33	14-75	5-75	(Gas plant.) The high running cost is due to low daily number of hours run and inefficiency of pumps.
14	Guntur .. .. .	15-66	13-67	16-00	8-00	(Oil engine plant.) The running cost should be considered low enough for an oil engine plant run for about 13½ hours per day.
15	Karaikudi.. .. .	48-98	2-63	5-00	1-00	(Small electrical plants.) The high running cost is due mainly to the very low daily number of hours run and small size of plant.
16	Karur .. .. .	17-88	4-06	6-50	2-25	(Electrical plant.) The high running cost is due to low daily number of hours run.
17	Kumbakonam (bore hole No. 1).	59-09	5-60	13-50	4-50	(Oil engine.) The high running cost is due to low daily number of hours run on the one hand, poor pump efficiency, small size pump, and too large a size engine on the other.
18	Kumbakonam (bore hole No. 2).	55-60	3-04	3-58	2-25	(Electrical plant.) High running cost is due to very low daily number of hours run and very small size of pumping unit.
19	Kurnool .. .. .	14-41	20-13	24-00	0-17	(Electrical plant.) The running cost may be taken to be near about the average when purchasing electric energy at the usual rates.
20	Madura (Arapalayam) .. .. .	19-09	14-31	21-00	4-00	(Steam plant.) Running cost low enough for the age of the plant.
20-A	Madura (Kochadai) .. .. .	5-66	15-13	24-00	11-73	(Electrical plant.) The low running cost is due mainly to the large size of plant and about 15 hours daily run.
21	Masulipatam .. .. .	9-35	16-92	24-00	10-92	(Electrical plant.) The low running cost is due to large size pumping unit and long hours daily run.

Report of the Mechanical Expert on the pumping plants in municipal and panchayat boards water works for 1940—cont.

Serial number.	Station.	Cost per million foot gallons pumped in annas.	Daily average number of hours pumping.	Maximum number of hours of pumping on a day.	Minimum number of hours of pumping on a day.	Remarks.
<i>Municipalities—cont.</i>						
22	Negapatam .. .. .	12.83	22.55	24.00	16.50	(Steam plant.) The low running cost is due to long number of hours of daily run and high efficiency of the type of steam engines, though very old. Proposal to electrify the station has been made to further reduce the running cost.
23	Nellore .. .. .	11.62	11.10	15.00	7.00	(Electrical plant.) The running cost not high for the low daily number of hours of run.
24	Palacole .. .. .	31.36	11.99	15.50	8.50	(Oil engine plant.) The high cost is due to low daily number of running hours and fall in efficiency due to countershaft drive, and low speed of pumps.
25	Prodattur .. .. .	64.64	14.14	20.00	12.00	(Steam plant.) Type of plant highly inefficient and proposal for electrification is in progress.
26	Rajahmundry .. .. .	10.00	14.67	19.00	10.50	(Electrical plant.) The running cost is not high.
27	Saidapet .. .. .	16.87	3.86	6.00	1.00	(Electrical plant.) The high running cost is due to low daily number of running hours.
28	Srirangam .. .. .	19.98	16.50	16.50	16.50	(Electrical plant.) The high running cost is due to small size of plant.
29	Tadpatri .. .. .	25.76	10.85	14.25	7.75	(Oil engine plant.) The running cost is due to low daily number of running hours and poor efficiency of pumps.

30	Tanjore .. .. .	..	23-09	24-00	19-50	(Steam plant.) <i>Figures not yet received.</i>
31	Tiruppur .. .. .	..	..	..	..	(Electrical plant.) <i>Regular pumping not commenced.</i>
32	Tiruvannamalai .. .. .	10-96	9-73	13-50	5-25	(Oil engine plant.) Running cost is quite economical for oil engine and low daily number of hours run. The overhead gears require replacement. This is being attended to.
33	Trichinopoly (main pumping station).	4-70	47-63	57-25	43-00	(Electrical plant.) The admirably low running cost is due to long number of daily hours run, large size of plant and the lowest rate of supply of energy.
33-A	Trichinopoly (sub-pumping station).	8-79	16-70	18-25	12-50	(Electrical plant.) The running cost is nearly double that of main pumping station as the plant is small, and the daily number of hours run is low.
34	Tuticorin .. .. .	4-32	23-91	24-00	19-75	(Oil engine plant.) The running cost is lowest of all as the plant is highly efficient, large in size, and long number of hours daily run.
35	Vellore .. .. .	6-22	11-74	24-00	4-00	(Gas plant.) The running cost is low for the daily number of hours run.
36	Virudunagar .. .. .	10-00	8-85	17-00	3-00	(Electrical plant.) The running cost is low enough for the daily number of hours run.
37	Vizagapatam (Waltair pumping station).	21-87	11-71	16-00	6-00	(High lift station. Electrical plant.) The high running cost is due to low daily number of hours run and small size plant.
37-A	Vizagapatam (Mudasarlova pumping station).	17-68	19-88	24-00	13-00	(Oil engine plant.) The high running cost is due to low daily number of hours run and low efficiency of pumps.
38	Vizianagram .. .. .	8-00	40-32	48-00	24-70	(Steam plant.) The low running cost is due to long number of hours of daily run and high efficiency of the steam engine units though very old.

*Report of the Mechanical Expert on the pumping plants in municipal and panchayat boards water works for 1940—cont.*

Serial number.	Station.	Cost per million foot gallons pumped in annas.	Daily average number of hours pumping.	Maximum number of hours of pumping on a day.	Minimum number of hours of pumping on a day.	Remarks.
<i>Panchayat Boards.</i>						
1	Arkonam .. .. .	23.08	5.73	9.00	3.50	(Electrical plant.) The running cost is high since average number of daily pumping hours is only 5.73.
2	Dharmavaram .. .. .	66.86	4.00	..	..	(Kerosene oil engine plant.) High running cost is due to kerosene oil fuel, bad condition of plant and only four hours daily run. Proposal to install crude oil engines and centrifugal pumps have been submitted.
3	Gudur .. .. .	23.33	9.60	12.50	8.00	(Gas plant.) The high running cost is due to low daily number of hours run. Plant in bad condition.
4	Manapparai .. .. .	28.18	6.61	14.50	3.00	(Electrical plant.) The high running cost is due to low daily number of hours run.
5	Rameswaram .. .. .	53.27	4.86	13.50	3.00	(Oil engine plant.) The high running cost is due to low running hours and low efficiency of pump.
6	Tiruvallur .. .. .	24.46	7.70	24.00	3.50	(Electrical plant.) The running cost is high as the plant is small and the daily number of hours run is low.

*Running cost of pumping plants in municipal drainage pumping stations for the calendar year 1940.*

1	Bezawada	..	..	..	..	..	..	..	..	(Electrical plant.) Figures not yet received.
2	Madura	..	..	..	..	6.72	19.04	..	..	(Steam plant—Main sewage pumping station.) The low running cost is due to long number of hours of daily run and highly efficient type of engines though old.
3	Rajahmundry	..	..	..	..	..	..	..	..	(Electrical plant.) Not regularly started yet.
4	Vellore	..	..	..	..	32.20	13.90	..	..	(Gas plant.) The high running cost is due to low daily number of hours run on the one hand and low efficiency of countershaft drive and pumps on the other. The station is proposed to be electrified shortly.

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No.	Description	Quantity	Rate	Amount
1	Oil for engine	100	1.00	100.00
2	Grease for engine	50	2.00	100.00
3	Coal for engine	1000	1.00	1000.00
4	Water for engine	1000	1.00	1000.00
5	Oil for engine	100	1.00	100.00
6	Grease for engine	50	2.00	100.00
7	Coal for engine	1000	1.00	1000.00
8	Water for engine	1000	1.00	1000.00
9	Oil for engine	100	1.00	100.00
10	Grease for engine	50	2.00	100.00
11	Coal for engine	1000	1.00	1000.00
12	Water for engine	1000	1.00	1000.00
13	Oil for engine	100	1.00	100.00
14	Grease for engine	50	2.00	100.00
15	Coal for engine	1000	1.00	1000.00
16	Water for engine	1000	1.00	1000.00
17	Oil for engine	100	1.00	100.00
18	Grease for engine	50	2.00	100.00
19	Coal for engine	1000	1.00	1000.00
20	Water for engine	1000	1.00	1000.00



# Government of Madras

EDUCATION AND PUBLIC HEALTH DEPARTMENT

(Public Health)

## G.O. No. 3810, 3rd September 1941

Administration Report—Sanitary Engineering Department—  
For the year 1940—Reviewed.

READ—the following papers :—

### I

Letter from the Chief Engineer (Buildings and Roads), dated 5th July 1941, No. 3415, Ad./41-3.

### II

Letter from E. H. CHAVE, Esq., B.Sc., Chief Engineer, Public Works Department (Buildings and Roads), to the Secretary to Government, Education and Public Health Department, dated 26th July 1941, No. 3415-Ad./41. C.R.

I forward herewith a note showing the stages of the several Water-supply and Drainage Schemes in progress, executed by or under the supervision of the Public Works Department during the year under review.

2. The Sanitary Engineer has already sent a copy of his report to the Superintendent, Government Press, Madras.

### ENCLOSURE.

#### SANITARY ENGINEERING DEPARTMENT.

#### *Water-supply schemes.*

1. *Karur Water-supply Schemes.*—The revetment to the Karur channel, hand railings to foot bridges and fencing the headworks were completed. Except for the supply and erection of an automatic water-level indicator, all items were completed and handed over to the Municipality.

2. *Srirangam Water-supply Scheme.*—The construction of the R.C. Elevated Service Reservoir was practically completed, except for R.C. fixing of pipe connexions, ladders and floats.

3. *Trichinopoly Water-works—II instalment.*—About 800 feet of 14" feeder mains were laid and jointed.

4. *Negapatam Water-works—Renewal of Pumping main.*—Order for the supply of pipes and specials was placed on Messrs. The Mysore Iron and Steel Works, Bhadravathi. The site for laying and jointing pipes and specials was handed over to Messrs. Gannon Dunkerly & Co., Ltd., on 24th March 1941.

5. *Bodinayakanur Water-supply Scheme—Gravitation main.*—About 36,000 feet of pipe line were laid and jointed. Masonry of break pressure tanks and sluice chambers were nearly completed. The balance of laying and jointing of gravitation main and construction of masonry works in connexion with river crossings were in progress. The R.C. slab roof of the service reservoir was completed. About 42,000 feet of 12" main and 400 feet of 8" main were laid. 700 feet of 10" main were hydraulically tested.

6. *Kodaikanal Water-works—Improvements to Storage Tank.*—All the works were completed.

7. *Construction of a well at Odukkam—Dindigul water-works.*—All the works were completed.

8. *Arkonam Water-supply Scheme.*—An estimate for certain additional items of work proposed by the Sanitary Engineer was prepared and approved by the Chief Engineer. The Water-works have been functioning since 2nd November 1939.

9. *Gudiyattam Water-supply Improvements.*—Work on improvements to the town distribution system and works at Head works were completed.

10. *Wallajah Water-supply Scheme.*—Delivery of pipes and specials commenced in March 1941. Surplus pipes available at Mettur and Coimbatore were obtained and transported to site. Laying and jointing pipes, constructing a suction well and laying a siphon pipe connexion were commenced in February 1941.

11. *Calicut Water-supply Scheme.*—Construction of V notch chamber was completed. Work on the quarters for the staff at Headworks was in progress.

12. *Pollachi Water-supply Scheme.*—Laying and jointing of pipes for the distribution system to about 52,000 running feet were completed. Construction of fountains sluice valve pits for the town distribution system and R.C. Reservoir work were in progress.

13. *Salem (Mettur) Water-supply Scheme.*—Pumping main from Mettur to Nangavalli was completed in all respects with the exception of fitting up some valves. About 4,500 tons of pipes and 53 tons of specials for the gravitation main from Nangavalli to Salem were passed at Badravathi and a major portion of them was received at site. 2 miles 2 furlongs in the 20" main reach and 1 mile 1½ furlongs in the 18" main reach were laid and jointed. Trench excavation for another 1½ miles ahead in both reaches was almost completed. The western reservoir at Hasthampatti was completed and concreting was done in the eastern reservoir.

14. *Mettupalayam Water-supply Scheme.*—R.C. reservoir, fencing round the service reservoir, head works and approach road were completed. The work in the off-take channel suction well pump-house, watchman's quarters and latrine was in progress. Agreement for laying and jointing pipes was under preparation.

15. *Tiruppur Water-supply Scheme.*—Excavation for gallery extension reached a level of about 1,069'00 (20 feet below ground level). As sub-soil water-level was rather high, further work was

proposed to be resumed only towards the end of April 1941. The room on top of the suction well was completed. Masonry platforms were completed for most of the additional fountains and pipe connexion given for three numbers.

16. *Coonoor Water-supply Scheme improvements (Ralliah Dam Construction).*—Removal of peaty soil in contours between 1,666 and 1676 was completed. Clearing of silt was in progress.

17. *Vellore Water-supply improvements (Palar Scheme).*—Agreement for the supply of pipes and specials required was under preparation. The selection of tenders for laying and jointing was also made.

18. *Karamadai Water-supply Scheme.*—The revised estimate for the work was sanctioned in G. O. Ms. No. 157, P.H., dated 15th January 1941. Arrangements were made with the District Health Officer for the quality test of water.

19. *Valparai Water-supply Scheme.*—The revised estimate for the work was called for from the Additional District Board Engineer.

20. *Improvements to Bezwada Water-supply.*—Rearrangement of distribution system. Laying first half of the Scheme 14" main, removing the 8" main on the Masulipatam-Hyderabad road and relaying it on the Bandar canal road, remain to be done. Second half of the scheme 3" x 7" pipes and several other specials were received.

21. *Adoni (Hagari) Water-supply Scheme.*—All the works connected with the scheme were completed.

22. *Sembiam Water-supply Scheme.*—The whole scheme was completed.

23. *Saidapet Water-supply Scheme (Main Scheme).*—The scheme was completed.

24. *Saidapet Water-supply Scheme (Extension to Mambalam, Mettupalayam, Little Mount, Guindy, etc.).*—Construction of 17 additional fountains was almost completed.

25. *Tiruvallur Water-supply Scheme.*—The whole scheme excepting the extension to Periyakuppam village subsequently sanctioned in G.O. Ms. No. 6029, P.H. dated 23rd Decembr 1940 was completed.

26. *Cuddapah Water-supply (Emergency) Scheme.*—Erection of motors and pumps was completed. The pumping main was almost completed except the connecting lengths of about 20 feet at the engine shed and 100 feet at the reservoir end. The linking main will be completed as soon as the by-pass specials are laid. The concrete portion of the low level reservoir was almost completed. Construction of quarters for the Electrical Foreman and Assistant Electrician was in progress.

27. *Voyalpad Water-supply Scheme.*—The suction well was sunk to the required depth and masonry and cement plastering of the steining wall was completed.

28. *Cocanada Water-supply Improvements Scheme.*—Part II Scheme—The R.C.C. gauge board for the service reservoir was

completed. Revised working drawings submitted by the selected contractor Messrs. Jewell Filter & Co. were defective. They were returned and fresh ones were called for. The agreement with the firm was not therefore concluded. Finally the firm withdrew their tender and new proposals have been called for from the Sanitary Engineer.

#### *Drainage Schemes.*

29. *Srirangam Drainage Scheme.*—Open drains to the value of Rs. 4,000 were constructed in the South-East block. A major portion of the machinery for the pumping plant for station No. 2 and a portion of the stoneware pipes and specials for the intercepting sewers in the South-East block were obtained.

30. *Negapatam Drainage Scheme.*—The overflow drains in all the blocks were almost completed. Masonry in the main building of pumping station No. 2 was finished to terrace level and all masonry on wells and manholes and R.C. compound wall on three sides were completed. Erection of pumping plant for block No. 1 and all intercepting sewers and manholes, etc., were completed.

31. *Coimbatore Drainage Scheme.*—Stoneware pipes and specials for A block were received from Tiruvallur. Twenty-seven manholes were constructed and 6 more were in progress. About 480 feet of 9" sewer were laid and jointing work was in progress in about 400 feet more. A consignment of 1,000 Nos. of 6" pipes was also received for B block.

32. *Salem Drainage Scheme.*—Tender documents for the execution of the 5th instalment of the scheme were under revision.

33. *Bezwada Drainage Scheme.*—Construction of culverts over hill drain No. 4 within railway limits and the improvements to the earthen drain lower down remained to be done. The Madras and Southern Mahratta Railway Company have undertaken the construction of culverts as a contribution work.

34. *Thiruppattur Drainage Scheme—III & IV Instalments.*—Both works were completed.

35. *Rajahmundry Partial Drainage Scheme.*—The works on intercepting drains and laying sewage farm were completed. Construction of motor pump house and the storm water drains was almost completed.

#### **Order—No. 3810, P.H., dated 3rd September 1941.**

The report on the administration of the Sanitary Engineering Department was reviewed and published until last year, along with the report of the Director of Public Health. The Government have decided that, from this year, the report should be published separately as is done in other Provinces.

2. The number of municipal water-supply schemes in operation during the year under review was 45. Eleven panchayats had a protected water-supply, though in some, the supply was only for portions of the areas within the jurisdiction of the

panchayats. Of the 45 municipal schemes, 8 are gravitational, 34 pumping and the remaining three both gravitational and pumping. During the year, 12 municipal schemes were under execution by the Public Works Department and 9 by Municipal engineers under the supervision of the Public Works Department.

3. Only six municipalities have drainage schemes in operation. In three of these cases the scheme is only for portions of the municipality. No drainage scheme is in operation in any of the panchayats in the Province. During the year, four drainage schemes were under execution by the Public Works Department and two by Municipal Engineers under the supervision of the Public Works Department.

4. Paragraph 5 (b) of the report refers to the need for a full time algæologist. The Government have since sanctioned the employment of an algæologist.

5. The Chief Engineer is requested to make proposals separately regarding the suggestions made by the Sanitary Engineer.

(By order of His Excellency the Governor)

E. C. WOOD,  
*Secretary to Government.*

To the Chief Engineer, Public Works Department (Buildings and Roads).  
 „ the Surgeon-General.  
 „ the Director of Public Health.  
 „ the Inspector-General of Police.  
 „ the Director of Veterinary Services.  
 „ the Director of Public Instruction.  
 „ the Inspector of Municipal Councils and Local Boards.  
 „ the Examiner of Local Fund Accounts.  
 „ the Commissioner, Corporation of Madras (through the Mayor).  
 „ the Director, King Institute, Guindy.  
 „ all Executive authorities of Municipalities (through the Commissioners of Municipal Councils concerned).  
 „ all Presidents of District Boards.  
 „ the Local Administration Department.  
 „ the Secretary, Madras Legislature.  
 „ the Librarian, Secretariat Library.  
 „ the Director of All-India Institute of Hygiene and Public Health, Calcutta (with C.L.).  
 „ the Government of India, Department of Education, Health and Lands (with C.L.).  
 „ the Public Health Commissioner with the Government of India (with C.L.).  
 Press.

