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Annual Report of the Board of Public Health Works for Sind

For the year 1940-41.

G.16a(3)

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ANNUAL REPORT OF THE BOARD OF PUBLIC HEALTH WORKS FOR SIND FOR THE YEAR 1940-41.

The Board of Public Health Works for Sind was established on 30th June 1936, shortly after Sind was separated from the Bombay Presidency on 1st April 1936, and constituted into a separate province.

2. The personnel of the Board consists of four *ex-officio* members and two non-official members nominated by Government. During the year under report, the personnel is shown in Appendix I.

3. It is not an executive branch but is purely consultant. The constitution, functions and powers of the Board are given in Appendix II. The Board's executive functions are carried out by the Consulting Public Health Engineer to Government.

4. The duties of the Consulting Public Health Engineer to Government are to examine the schemes technically, to investigate the details on site, to inspect works under execution and to advise local bodies in respect of their sanitary schemes. All Public Health schemes carried out from loan funds are scrutinised by the Consulting Public Health Engineer to Government for the Board, in respect of their technical details, and the schemes are administratively approved or recommended to Government for approval by the Board before construction is undertaken.

5. During the year under report, the scheme for Kambar Drainage estimated to cost rupees one lac has been approved by the Board of Public Health Works for Sind and technically sanctioned by the Consulting Public Health Engineer to Government of Sind in June 1940. This scheme was approved by the Board by circulation and no meeting of the Board was held during the year under report.

6. The schemes (total cost Rs. 44,71,744) which have been approved by the Board of Public Health Works for Sind so far, and are either in progress or awaiting execution, are tabulated in Appendix III. The Schemes (total cost Rs. 10,07,550) that had already been approved before Sind was constituted into a separate province are also shown therein.

7 The Consulting Public Health Engineer to Government of Sind, himself or through his assistant, inspected all the Public Health Works carried out by the local bodies in the province, or for which schemes were required to be prepared. Before preparing detailed plans and estimates for any Public Health Scheme, it is very necessary to carry out a large amount of preliminary work in order to prepare an outline of the scheme and to work out its rough cost, for the local body, to decide whether it would suit their requirements and be within their resources to finance. It has generally been observed that many local bodies, although desirous of improving their water-supply and drainage systems, either do not carry-

out the schemes due to want of funds or take years to find out funds to finance their Public Health Schemes, as they hesitate to tax the people for the facilities afforded. Even a major municipality like Hyderabad, has not been able to raise a loan to finance the most important scheme of the Rapid Filtration Plant, although Government had actually granted permission to the Municipality to raise a loan to complete the scheme in the year 1939. It has been withdrawn now, but it is regretable that the Hyderabad Municipality did not carryout this scheme to supply filtered water to the city of Hyderabad, which continues to receive muddy water from the river Indus.

8. A short report on the Public Health Works proposed to be done by the various local bodies in Sind is given below.

Karachi Municipal Corporation.

Water-supply.—The present source at Dumlotte cannot supply more than 8 to 9 million gallons per day and the maximum will be about 10 million gallons per day if tapped to the utmost. This will provide about 21 gallons per head per day for the present population which is increasing rapidly due to Karachi being an important sea and air port and its climate being temperate. The Karachi Municipal Corporation have carried out various experiments by sinking 800′ deep bore holes and constructing an underground barrier etc. to augment their supply from the existing source, but the results have not been satisfactory. The other source in the neighbourhood *viz.* Hub River has also been investigated by the Karachi Municipal Corporation. However, it is not found fit for development to meet the future heavy demand of Karachi, which is rapidly extending in all directions.

The Karachi Municipal Corporation have accordingly decided to obtain water from the river Indus and a preliminary report on this scheme has been submitted by them to Government. As soon as this is approved, a detailed scheme will be prepared and work executed as early as possible to avoid a serious crisis due to shortage of supply which is becoming keener every day. The estimated cost of the 1st stage is Rs. 170 lacs and the final cost of the scheme will be about Rs. 340 lacs.

In the meantime the work of Improved Pressure Scheme of distribution system for obtaining a better distribution (cost Rs. 27.35 lacs) is under execution and is likely to be finished by the middle of 1942.

Drainage system.—The Karachi Municipal Corporation have been carryingout improvements to their drainage system by extending lines to localities and quarters as they develop. But with an increased water supply after the Indus scheme is completed, their drainge system will also need to be overhauled to meet the situation and the Karachi Municipal Corporation will require to take this question in hand early next year.

Hyderabad Municipality.

Two schemes were sanctioned in the year 1931, for the city of Hyderabad. One is for a partial drainage scheme Stage I and the other for providing Rapid Filteration Plant. Neither of these Schemes has been carried out by the Municipality, nor is there any likelihood of these being taken up in hand in the near future, unless the Hyderabad Municipality make a determined effort to improve their financial condition, so that they are in a position to finance both these Schemes. It is essential in the interest of the health of the City to carry out both the schemes as early as possible.

Sukkur Municipality.

The Municipality has been advised to complete as early as possible the scheme of improvements to their water-supply distribution system which is in progress since the year 1937. An additional reservoir is under construction as advised by the Consulting Public Health Engineer. The capacity of the present reservoir being 3,71,656 gallons only is hardly sufficient for 2 hours supply. With the addition of the new reservoir it will increase to about 9,48,656 gallons, *i.e.*, nearly 6 hours supply.

The Municipality has been further advised to construct an additional pure water tank at the pumping station on Bunder Road below Landsdown Bridge, where their purification works are installed, as the existing tank (capacity 78,000 gallons) is too small to meet the requirements. The filteration plant and the electric pumping plant will also need extention, and the Municipality has been advised to take the matter in hand, so that the work can be done as the demand increases.

Drainage.—The Municipality has been advised to carry out atonce the drainage scheme for disposal of sullage water from Vaspur Farm which has grown sick and which is quite inadequate for the purpose, and also to pump sullage water from the Duba hollow in Old Sukkur quarter. It is contemplated to the start the first part of the scheme as early as possible and to do the second part as soon as funds permit. The Municipality has also been advised to prepare schemes for drainage of sullage water from Nao-goth, Wari-tar, Garibabad Quarters etc., and to carry out improvements to the existing drainage pumping station so as to carry the sullage water far off to a proposed sullage farm below the Barrage, instead of pumping it into the river above the Barrage which is a source of nuisance.

Larkana Municipality.

The drainage scheme for Larkana is already sanctioned. The Municipality was advised to carry out a part of this scheme, if the whole could not be done at once due to want of funds.

The Administrator of the Municipality is very keen to execute the partial scheme of converting the existing sullage farm into a drainage pumping station, and lying a rising main from the pumping station to the new sullage farm so that the sullage water could be pumped to

the new farm situated far away from the town and thereby remove the nuisance at present caused by the existing sullage farm, which is quite close to the town. The existing sullage farm has grown sick and is too small for the purpose, with the result that water stagnates, smells and becomes a source of breeding mosquitoes, which is a danger to the health of the town.

The land for the new sullage farm has been acquired, but due to international situation, the pumping plant cannot be had, hence even the partial scheme cannot be finished at present. It will, therefore, have to be taken in hand when times get normal.

JACOBABAD MUNICIPALITY.

The Municipality have not yet started the work of drainage scheme, which was sanctioned in the year 1937. They are however trying to improve their water supply and as advised by the Consulting Public Health Engineer they are sinking a trial bore near the town on the other side of the Railway Station to get potable water. If this bore is found to yield a good quantity of potable water, it will solve the problem of augmenting the present source of supply from 3 wells sunk on the bank of Nurwah situated about 3 miles away from the town. This arrangement will be more economical, as the extension of the existing source will need duplication of 3 miles of the raising main, which will be very costly; besides the pumping of water from a long distance will also be avoided.

Drainage.—With the increased supply of water, it will be essential to provide drainage as early as possible for disposal of sullage water. The Municipality have, therefore, been advised to carry out the scheme in suitable parts if whole cannot be done due to want of funds.

MIRPURKHAS MUNICIPALITY.

The special staff appointed by the Municipality for preparation of Schemes of water-supply and drainage of their town did not finish the work. It is proposed now to prepare the preliminary schemes in the office of the Consulting Public Health Engineer to Government.

KOIRI MUNICIPALITY.

The preliminary schemes for water-supply and drainage estimated to cost Rs. 96,000 and Rs. 1,17,400 respectively prepared in the office of the Consulting Public Health Engineer to Government have been sent to the Municipality for approval. When they are approved by the Municipality detailed plans and estimates will have to be prepared by the special staff to be appointed for the purpose or through Government agency.

SHAHDADPUR MUNICIPALITY.

The survey work in connection with the preliminary scheme of drainage for Shahdadpur is in hand. Special staff could not be secured hence it is being done by the office of the Consulting Public Health Engineer. The preliminary report will be prepared on completion of the survey work.

GARHI YASIN MUNICIPALITY.

The financial position of the Municipality is too poor to carryout any regular drainage scheme. It has been advised therefore to purchase motor trucks fitted with a tank and necessary pump for emptying sullage water from the collecting cess-pits into the tank and discharging it on to the sullage farm to be situated for away from the town.

The Tatta Municipality, Umerkot Municipality, and Ratodero Municipality have not been able to do anything in the matter of improvements to water-supply for the former two, and drainage for the latter one, as their financial position is poor to carry out any regular scheme.

9. The expenditure incurred by the local bodies during the year 1940-41 on improvements and maintenance of Public Health Works amounts to Rs. 20,19,759.

10. The statistical information regarding the finances and technical working of the water-supply and drainage installations in the province is included in the Report *vide* Appendix IV. It gives useful data regarding the working of the existing plant and also enables comparison with that of other Municipalities, in order to find out ways and means of effecting improvements to reduce the working costs as far as possible.

Conclusion.—Due to the international situation, it has not been possible to carry out any new schemes to a large extent as besides the price of materials being high, it is very difficult even to procure them. It is also true that due to the financial position of the local bodies it has not been possible for them, to propose improvements to their Public Health Schemes. It is necessary, for the proper sanitation of each town and village, that the people should be willing to tax themselves, to provide the water-supply and drainage facilities.

I would wish that each important town having a population of 10,000 souls or more, should have its own regular piped supply system for water and a proper drainage system for the disposal of sullage and storm water in the interests of the health of the inhabitants.

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind,
and
Consulting Public Health Engineer to Government of Sind.

APPENDIX I.

PERSONNEL OF THE BOARD OF PUBLIC HEALTH WORKS FOR SIND FOR THE YEAR 1940-41.

President.

1. G. F. S. COLLINS, Esquire, C.I.E., O.B.E., M A. (Oxon.), I.C.S., Revenue Commissioner for Sind and Secretary to Government, Revenue Department. (From 1st April 1940 to 14th April 1940)
2. C. B. B. CLEE, Esquire., C.I.E., I.C.S., J. P., officiating Revenue Commissioner for Sind and Secretary to Government, Revenue Department. (From 15th April 1940 to 14th July 1940.)
3. G.F.S. COLLINS, Esquire, C.I.E., O.B.E., M.A. (Oxon.), I.C.S., Revenue Commissioner for Sind and Secretary to Government Revenue Department (From 15th July 1940 to 14th November 1940).
4. I. H. TAUNTON, Esquire., B. A. (Cantab.), I.C.S., Secretary to Government, Revenue Department and Revenue Commissioner for Sind, (From 15th November 1940 to 31st March 1941).

Official Members.

5. A. GORDON, Esquire, B.Sc. (Eng.), (Glas.), C.I.E., I.S.E., J. P., Chief Engineer in Sind and Secretary to Government, Public Works Department. (From 1st April 1940 to 6th October 1940).
6. W. KIRKPATRICK, Esquire, B.E., B.A., M. Inst., C.E., I.S.E., C.I.E., Chief Engineer in Sind and Secretary to Government, Public Works Department. (From 7th October 1940 to 31st March 1941.)
7. Lt.-Col. N. BRIGGS, M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.H. (Eng.), I.M.S., Director of Health Services and Inspector-General of Prisons, Sind.

Non-official Members.

8. SAYAD KARARO SHAH ALLAHANDO SHAH, President, District Local Board, Nawabshah.
9. SETH HARBHAGWANDAS PESSUMAL BAJAJ, President, Shikarpur Municipality, Shikarpur.

Official Member and Secretary.

10 N. H. MENESSE, Esquire, O.B.E., I.S.E., Consulting Public Health Engineer to Government of Sind.

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind,
and
Consulting Public Health Engineer
to Government of Sind.

APPENDIX II.

Memorandum showing the constitution, functions and powers of the Board of Public Health Works for Sind, as per Government Resolution, General Department, No. 181-G.B., dated the 30th June 1936.

I—CONSTITUTION.

President.

(*i*) The Revenue Commissioner for Sind.

Members.

(*ii*) The Chief Engineer in Sind and Secretary to Government, Public Works Department.

(*iii*) The Director of Health Services and Inspector-General of Prisons, Sind.

(*iv*) The Consulting Public Health Engineer, Sind (Executive Engineer, Karachi Buildings Division).

(*v*) and (*vi*) Non-officials—to be appointed by name for a period of two years at a time and to be eligible for re-appointment.

The Consulting Public Health Engineer, Sind, shall also be the Secretary of the Board.

2. The headquarters of the Board will be at Karachi.

II.—FUNCTIONS OF THE BOARD.

1. The Board will be the advisers of Government on all general questions of sanitary policy, including the formulation of the principles to be followed for the healthy and orderly growth of inhabited areas and the preparation and submission to Government of type designs for that purpose; and will also be consulted by Government regarding large individual scheme of sanitary improvements.

2. The Board will ordinarily report to Government upon such matters as may be referred by Government for their opinion, but will be free on their own initiative to address Government regarding any matter which they consider to be of importance. The responsibility for taking action on their recommendation will rest with Government.

3. Consideration of measures for effecting progress in sanitation in the province and giving help and advice to local bodies on public health matters.

4. Scrutiny of public health improvement schemes, and of their financial aspect (*i.e.* their cost and adequacy and suitability to population) with a view to recommending their being undertaken by or on behalf of local bodies with or without help from Government.

III.—Powers of the Board.

1. Granting approval to the preliminary investigation of sanitary schemes without any limit of cost.

2. Granting approval to preparation of detailed plans and estimates.

3. In the case of projects which are proposed to be executed by a local body through the agency of the Government, Public Works Department, the Board shall be competent to give administrative approval for works costing not more than Rs. 50,000. In the case of works costing more than Rs. 50,000, the administrative approval of Government shall be obtained.

In the case of works proposed to be executed by a local body through its own agency, the Board shall be competent to give administrative approval without any limit of cost.

4. All cases which are administratively approved by the Board shall be reported to Government with a brief description of the work and the agency through which they are proposed to be executed by the local bodies concerned.

5. Granting preliminary approval to sanitary schemes to be carried out from provincial revenues up to any amount.

6. Sanctioning non-recurring grants up to Rs. 10,000 in each case from such sums as may be placed at the disposal of the Board by Government for minor sanitary schemes.

IV—Meetings.

There will ordinarily be two meetings in a year at Karachi. One more meeting may be held as occasion arises, or business may be conducted, if feasible, by the circulation of proposals, and if the Chairman or the majority of the members of the Board ask that any particular question should be discussed at a meeting, a meeting shall be held as soon as possible, on a date to be fixed by the Chairman.

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind,
and
Consulting Public Health Engineer to Government of Sind.

APPENDIX III.

Statement showing Public Health Schemes which have been approved so far by the Board of Public Health Works for Sind and are either in progress or awaiting execution.

Serial No.	Name of Project.	Estimated cost.	Agency of execution.
		Rs.	
1	Improvements to Sukkur water-supply distribution system.	3,92,500	Sukkur Municipality.
2	Laying water-supply distribution mains in Lyari and other quarters at Karachi.	93,805	Karachi Municipal Corporation.
3	Duplication of conduit between Sydenham and Curry Reservoirs—Laying 36″ Dia. C.I. pipe line for the purpose.	1,23,034	Do.
4	Extension of water mains along Kumbharwara Road up to the new site of Miran Naka in Lyari quarters, Karachi.	9,490	Do.
5	Jacobabad drainage and improvements to present water-supply.	5,72,525	Jacobabad Municipality.
6	Extension of water mains in Jamshed Quarters, Karachi, between Mohatta and Alumal Roads.	22,884	Karachi Municipal Corporation.
7	Larkana drainage ...	4,00,000	Larkana Municipality.
8	Improved Pressure Scheme of the Karachi Water-Supply Distribution System.	27,31,535	Karachi Municipal Corporation.
9	Extension of water mains in Ranchore Quarters, Karachi.	25,971	Do.
	Carried over ...	43,71,744	

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STATEMENT No. III—*contd.*

Serial No.	Name of project.	Estimated cost.	Agency of execution.
		Rs.	
	Brought forward	43,71,744	
10	Drainage for Kambar Town.	1,00,000	Through a special staff to be appointed by the Municipality or failing this through a specialist to be appointed for the purpose, or through the Public Works Department.
	Total ...	44,71,744	
	II. Projects approved by Public Health Board before 1936-37:—		
11	Hyderabad Drainage, partial scheme 1st stage.	7,27,950	Hyderabad Municipality.
12	Rapid Filteration Plant for Hyderabad Water-supply.	2,79,600	Do.
	Total ...	10,07,550	
	Grand total ...	54,79,294	

The work for item No. 1 which was started in 1937 is nearing completion. There has been some unavoidable delay as some of the old pipes which are in good condition are to be re-used for the improved distribution system. The old pipes are being removed now and they will be re-laid after they are tested, cleaned and painted. It is expected that the whole work will be finished by the middle of 1942.

2. Works Nos. 2, 3, 4, 6, 8 and 9 pertaining to Karachi Municipal Corporation have been completed except items 8 and 9 which will be completed by the middle of 1942.

3. Work No. 5 namely Jacobabad Drainage Scheme has not been started as yet. It is not possible to do so due to prices having gone high on account of the international situation. The Jacobabad Municipality has however been advised to sink an experimental bore in the vicinity of the town to augment the water-supply and carry out drainage scheme in stages as funds permit.

4. Regarding Larkana Drainage Scheme (item No. 7) the land for the new sullage farm has been acquired and the Municipality have been advised to carry out partial scheme for the present disposal of sullage to the new farm. But due to the international situation the pumping plant cannot be obtained and hence it has to be held in abeyance.

5. The Kamber Drainage (item No. 10) will be started as soon as the times get normal and funds are arranged by the Municipality.

6. The work of items Nos. 11 and 12 has not been started as yet. It is regretable that the Municipality did not even carry out the important work of item No 12 *viz.*, Rapid Filteration Plant Scheme although the sanction for raising loan to finance this scheme had been granted by the Government. It has been withdrawn now.

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind
and
Consulting Public Health Engineer to Government of Sind.

APPENDIX IV.

Statistical information regarding the finances and technical working of the water-supply and drainage installations in the Province of Sind.

STATEMENT No. I.

Statement of operations of various water works in the Province of Sind for the year 1940-41 :—

Particulars	Karachi	Hyderabad (Sind)	Sukkur.	Jacob-abad.	Rohri.
1	2	3	4	5	6
Population.					
1. By census of 1941 in Municipality.	3,59,497	1,27,521	66,442	21,649	14,721
2. By census of 1941 in Cantonments.	27,163	7,172	...	...	...
3. Inhabitants drawing their supply from mains.	3,86,660	1,24,000	62,000	21,649	12,700
Consumption of water.					
4. Metered supplies-in million gallons—					
(*a*) Cantonments and Military.	132·34	62·10	...	...	...
(*b*) Trade ...	46·36	35·39	...	...	...
(*c*) Domestic (bungalows, etc.)		...	...	1·208	...
(*d*) Buildings ...		...	...	...	...
(*e*) Karachi Port Trust	94·84	...	...	...	...
(*f*) Railways ...	190·18	0·27	...	...	...
Total, metered supplies in million gallons.	463·72	97·76	...	1·208	...
5. Un-metered supplies in million gallons.					
(*a*) Domestic (assessment or ferrule).	2,495·75	726·73	277·88	74·84	6·0
(*b*) Stand posts ...		205·50	21·33		28·0
(*c*) Buildings ...		78·61	3·37		·002
(*d*) Municipal purposes (Roads watering, irrigation and flushing, etc.)	Watering of roads is done by sub-soil water	220·10	29·33		15·00
Total, unmetered supplies in million gallons.	2495·75	1230·94	331·91	74·84	49·00

STATEMENT No. I.—*contd.*

Particulars.	Karachi.	Hyderabad (Sind).	Sukkur.	Jacob-abad.	Rohri.
1	2	3	4	5	6
6. Total quantity supplied during the year (items 4 and 5) million gallons.	2959·47	1328·70	331·91	76·05	49·00
7. Daily average supply million gallons.	8·11	3·64	0·19	0·21	0·13
8. Maximum daily average in any one month million gallons.	10·17	4·55	1·20	0·36	0·22
9. Consumption per head per day for Municipal purposes and buildings, etc. in gallons.	0·97	6·60	1·44	...	...
10. Consumption per head per day for trade alone in gallons.		0·80	No separate account is kept by the Municipality.	...	...
11. Consumption per head per day for domestic purposes in gallons.		21·95	13·22	9·6	10·2
12. Total consumption per head per day (items 9, 10 and 11) in gallons.	20·97	29·35	14·66	9·6	10·2
13. Hours of daily supply ...	6½	16½	16 in Summer 13 in Winter	6	9
14. Total hours of pumping during the year.	...	7,566	5,419	7,200	3,285
Lift of Pumps (in ft.)					
15. From river to settling tanks ft.	...	32′ (Gidu Lift).	20′	...	67
16. From filtered water pumps to town distribution ft.	...	111′ (Fort Lift).	64·42′	60′	...
17. Total, lift feet ...	...	143′	84·42	60′	67′
18. Total, water horse-power hours during the year in million.	...	...	...	...	...
Supply connections.					
UNMETERED.—					
19. Number of connections made during 1940-41.	Private 256 Municipal 36	19	36		22
20. Total, number of connections.	9,920	5,210	2,382	64	221

STATEMENT No. I.—*contd.*

Particulars.	Karachi.	Hyderabad (Sind).	Sukkur.	Jacobabad.	Rohri.
1	2	3	4	5	6
METERED.					
21. No. of house connections made during 1940-41.	...	2	...	...	...
22. Total number of house connections.	91	12	...	3	...
23. No. of trade connections made during 1940-41.	2	1	...	...	...
24. Total number of trade connections.	272	22	...	1	...
Total number of metered connections (items 22 and 24).	363	34	...	4	...
Annual charges and cost of water supplied.					
25. Maintenance charges ...	3,33,340	1,31,667	78,977	10,274	5,763
26. Interest and Sinking Fund...	6,18,324	23,249	14,081	7,613	...
27. Total charges ...	9,51,664	1,54,916	93,058	17,887	5,763
28. Cost per 1,000 gls. per 100 ft. lift. As.	...	...	...	...	...
29. Cost per 1,000 gls. maintenance charges As.	1·8	1·58	3·81	2·2	1·9
30. Cost per 1,000 gls. interest and sinking fund charges. As.	3·34	0·28	0·68	1·6	...
31. Total charges per 1,000 gls. (items 29 and 30) As.	5·14	1·86	4·49	3·8	1·9
Income from water works.					
32. UNMETERED—					
(*a*) Water rate recovered (assessment or ferrule)	3,72,973	1,42,621	37,309	180	5,481
(*b*) Amount credited to water works for water used for Municipal purposes.	...	...	19,000	16,863	...

STATEMENT No. I.—*concld.*

Particulars	Karachi.	Hyderabad (Sind).	Sukkur.	Jacobabad.	Rohri.
1	2	3	4	5	6
(*c*) Buildings and other receipts.	3,40,218	8,187	43,403	...	...
Total ...	7,13,191	1,50,808	99,712	17,043	5,481
33. METERED—					
(*a*) Sale of water by meter,	3,40,178	53,502	...	844	...
(*b*) Meter rent	763	45	...	...	...
Total ...	3,40,941	53,547	...	844	...
34. Total income (items 32 and 33).	10,54,132	2,04,355	99,712	17,887	5,481
Income and working charges.					
35. Receipts per 1,000 gls. supplied through meter. As.	11·76	8·8	...	11·2	...
36. Receipts per 1,000 gls. supplied through assessment rating. As.	4·6	1·96	4·6	...	1·79
37. Receipts per 1,000 gls. supplied on total consumption. As.	5·70	2·46	4·81	3·8	1·79
38. Profit or loss per 1,000 gls. supplied.	0·56 (Profit).	0·50 (Profit).	0·32 (Profit	Nil.	0·11 (Loss).
39. Profit or loss on year's working.	1,02,468 (Profit).	49,439 (Profit).	6,654 (Profit).	Nil.	282 (Loss).

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind
and
Consulting Public Health Engineer to Government of Sind.

STATEMENT No. 2.

Statement showing total demand, amount recovered, remissions and arrears of various water works in the Province of Sind during the year 1940-41.

Names of water-works.	Total demand.	Total amount recovered.	Total amount of remissions.	Arrears on 31st March 1941.		Remarks.
				Total amount.	Percentage on total demand.	
1	2	3	4	5	6	7
	Rs.	Rs.	Rs.	Rs.	Rs.	
1. Karachi	11,68,617	10,54,132	9,860	1,04,625	9·03	
2. Hyderabad (Sind) ...	2,31,250	2,04,386	2,569	24,439	10·60	Rs. 144 received in excess.
3. Sukkur	63,701	56,309	3,279	412	6·50	Rs. 7 received in excess.
4. Jacobabad... ...	995	844	...	150	15	
5. Rohri	5,554	5,481	...	73	1·3	

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind
and
Consulting Public Health Engineer to Government of Sind.

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STATEMENT No. 3.

Statement, showing number and size of all connections; also number and size of metered connections for the year 1940-41 :—

Name of water works.	Size of connections.																Total No.	Remarks.
	⅜″	½″	¾″	1″	1¼″	1½″	2″	2½″	3″	4″	5″	6″	7″	8″	9″	10″	12″	
METERED—																		
Karachi				1						1								2
Hyderabad (Sind) ...		20	4				3		2	2	2	1						34
Sukkur																		
Jacobabad				4														...
Rohri																		4
UNMETERED—		8,943	505	90														...
Karachi ...		238=	13=	5=														9,794+ 126=9920 (Municipal connections).
Hyderabad (Sind) ...		9181	518	95														
Sukkur		5175	33	2														5,210
Jacobabad		2,310	63	7		2												2,382
Rohri		1		8		42	13											64
		215	6															221

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind
and
Consulting Public Health Engineer to Government of Sind.

STATEMENT No. 4.

Annual maintenance accounts of water works in the Province of Sind during 1940-41 :—

Particulars.	Karachi.	Hyderabad. Sind.	Sukkur.	Jacobabad.	Rohri.
1	2	3	4	5	6
I.—ESTABLISHMENT.—	Rs.	Rs.	Rs.	Rs.	Rs.
(*a*) Pumping ...					643
(*b*) Workshops ...					...
(*c*) Settling tanks and filters.					...
(*d*) Inlet chambers, wells and grounds, etc.				3,027	...
(*e*) Distribution ...		25,344	8,778		...
(*f*) Clerical Staff ...					168
(*g*) Menial ...				444	...
(*h*) Office accommodation.				...	...
(*i*) Rent				...	...
II.—FUEL, LUBRICANTS AND STORES.—					
(*a*) Fuel (coal, fuel, oil or Electrical energy).		76,239	34,425	2,822	3,660
(*b*) Lubricating oil ..		...		439	
(*c*) Waste		662		190	50
(*d*) Packing ...			7,703	162	54
(*e*) Petty stores ...	3,33,340	3,127		762	239
III.—INTAKE.—					
(*a*) Training river ...		...	13,155	...	237
(*b*) Cleaning channels and wells.		...	10,626 Capital outlay.	...	
IV.—SETTLING TANKS AND FILTERS.—					
(*a*) Cleaning settling tanks and wells.		1,750	...	...	...
(*b*) Cleaning and renewing inter beds.		...	...	...	...
(*c*) Purchase of sand ...		...	...	...	...
(*d*) Purchase of bleaching powder.		5,536	4,290	Potasuim permanganate. 115	...

STATEMENT No. 4.—*contd.*

Particulars.	Karachi.	Hyderabad (Sind.)	Sukkur.	Jacobabad.	Rohri.
	Rs.	Rs.	Rs.	Rs.	Rs.
V.—DISTRIBUTION.—					
(*a*) Pipes and fittings ...		3,888	...	886	199
(*b*) Standposts or hydrants.		9,325	...	...	105
VI.—REPAIRS.—			...	...	...
(*a*) to tanks ...			...	250	120
(*b*) to buildings ...		1,254	...	1,000	...
(*c*) to machinery ...			...	...	288
(*d*) to rising main ...			...	...	...
(*e*) to tools and plant ...		4,542	...	100	...
VII.—WATER ANALYSIS.—		...	...	77	...
VIII.—COST OF WATER.—		...	...	...	...
Canal departmental dues ...		...	...	...	...
Total ...	3,33,340	1,31,667	78,977	10,274	5,763
Interest and Sinking Fund charges.	6,18,324	23,249	14,081	7,613	...
GRAND TOTAL ...	9,51,664	1,54,916	93,058	17,887	5,763

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind
and
Consulting Public Health Engineer to Government of Sind.

STATEMENT No. 5.

Statement showing costs, initial and of subsequent extensions and improvements chargeable to capital, 1940-41.

Serial No.	Water works installations.	Initial capital cost.	Cost of subsequent extensions.	Expenditure during the year.	Total.	Remarks.
1	2	3	4	5	6	7
		Rs.	Rs.	Rs.	Rs.	
1	Karachi	74·94 lacs.		13·39 Lakhs.	88·33 Lakhs.	
2	Hyderabad (Sind)	23,48,804	...	13,807	23,62,611	
3	Sukkur	5,67,757	1,69,916	10,626	7,48,299	
4	Jacobabad	2,56,583	...	...	2,56,583	
5	Rohri	5,000	20,100	...	25,100	

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind
and
Consulting Public Health Engineer to Government of Sind.

STATEMENT No. 6.

Details of pumps, filters, tanks, reservoirs, mains and other details of water works in the Province of Sind for 1940-41:—

Particulars.	Karachi.	Hyderabad (Sind)	Sukkur.	Jacobabad.	Rohri.
1. *Floor levels*—					
Unfiltered stations R.L....	...	...	193·58	...	194
Filtered stations R. L. ...	...	..	193·38	...	...
2. Highest water level during the year R. L.	...	63·2	198·50	...	198
3. Lowest water level during the year R. L.	...	43·9	182·00	...	182
4. Particulars of plant.—					
Unfiltered station ...	...	*Gidu lift* Mather and Platt Co. Electric pumps 105 H. P.-2 steam engines.	Three centrifugal pumping sets running on Electricity capacity of each 45,000 gallons per hour against total head of 34·58 feet.	...	No filteration undertaken. Water pumped directly from river to water tank and distributed in town.
Filtered station ...	...	Mather and Platt Co. Electric pumps 200 H. P. and 125 H. P. One steam engine of 100 H. P. and 2 of 80 H. P. Worthington and Simpson.	Three centrifugal pumping sets running on Electricity capacity of each set 45,000 gallons per hour against total head 100 ft.	...	...
5. Capacity of pumps—					
Unfiltered station G.P.M. ...	*Gidu lift* 4588 Fort Lift 3,900.	2,250	...	...	400

STATEMENT No. 6 —*contd.*

Particulars.	Karachi.	Hyderabad (Sind.)	Sukkur.	Jacobabad.	Rohri.
Filtered station G.P.M. ...	...	...	2250	...	...
6. *Number of.*—					
(*a*) Rising mains ...	2	2	1	1	1
(*b*) Leading mains ...	...	3	5	1	1
(*c*) Distribution mains ...	...	30	5	2	3
7. *Length and size of*—					
(*a*) Rising mains ...	2050′ of 12″ 334′ of 15″	1080′ of 18″ 1120 of 14″	2100′ of 15″ dia:	5″	5″
(*b*) Distribution mains ...	146·05 miles from 36″ to 4″.	55,991′ varying from 24″ to 3″	15,744′ from 18″ to 3″	5,000′ from 9″ to 3″	6″ to 3″
8. Number of settling tanks.	...	8	3	...	1
9 Size of settling tanks ...	...	2 Nos. 200′ × 100′ × 14′ 6 Nos. 228′ × 262′ × 6′	2 Nos. 82·25 × 36·25′ × 12·50 1 No. 54′ × 32′ × 10·62′	...	16′ × 10′ × 5′
10. Capacity of settling tanks in gallons.	...	1,69,40,000 gallons.	5,80,585	...	5,000 gallons.
11. *Number of*—					
(*a*) Slow sand filters ...	...	...	...	...	...
(*b*) Patterson filters ...	...	...	6	...	...
(*c*) Mechanical filters...	...	...	...	...	...
12. Size of—					
(*a*) Slow sand filters.	...	...	...	...	...
(*b*) Patterson filters ...	...	...	5 of 18 × 10 & 1 of 18 × 12·5	...	...
(*c*) Mechanical filters ...	...	...	...	...	...
13. Number of clear water reservoirs.	...	1	1		
14. Size of clear water reservoirs.	...	140 × 115 × 12	60 × 28 × 7·42	...	...
15. Capacity of clear water reservoirs. gallons.	...	12,07,500	77,910	...	...
16. Number of service reservoirs.	3	3 (1 low and 2 high)..	3	2	4

STATEMENT No. 6.—*concld.*

Particulars.	Karachi.	Hyderabad (Sind.)	Sukkur.	Jacobabad.	Rohri.
17. Size of service reservoirs.	Temple 202′ × 147′ × 10·5′ Curry 241′·5′ × 197′ × 10′-6″. Sydenham 300′ × 294′ × 10′-6″	L.S.R.— 102′ × 112′ × 10·5′ H.S.R.— 50 and 64″ Dia:	1 of 64·5′ × 55·5′ × 20′ 2 of 30′ × 8′ × 7·5′	1 of 23′ × 25′ × 8′ 1 of 28′ × 23′ × 8′	2 of 16′ × 8′ × 8′ 2 of 8′ × 8′ × 4′.
18. Capacity of service reservoirs in gls.	11·5 million gallons.	11,50,000	3,71,656	60,000	16,000
19. Number of Public stand posts.	1 street service.				
One tap ...		104	66	2	51
Two taps ...		68	18	20	6
Three taps ...		...	4	168	
Four taps ...		...	2	...	...
W. N. Cocks ..	4 bathing Ghats.	4	...	...	...
Bib cocks ...		72	124	...	...
Push cocks ...	3 stand posts.	...	...	190	...
Wall fountains ...		...	...	...	...
Other types ...		...	...	...	...
Total ...	8	248	214	380	57
20. Number of fire hydrants.	2,562	189	157	29	...
21. Number of road watering posts or stand-posts.	...	13	9	1	4
22. Number of cattle troughs.	...	43	3	10	12

N. H. MENESSE,
Secretary, Board of Public Health Works for Sind
and
Consulting Public Health Engineer to Government of Sind.

STATEMENT No. 7

Detailed estimate of expenditure incurred on Public Health Works during the year 1940-41.

Serial No.	Name of place.	Water works original and special repairs.	Water works Maintenance.	Drainage works.	Other works.	Total.	Remarks.
1	2	3	4	5	6	7	8
		Rs.	Rs.	Rs.	Rs.	Rs.	
	... ...	13,30,000	3,33,340	46,000	...	17,18,340	

...ind.

STATEMENT No. 8.

Comparative statement of fuel consumption, working expenses and receipts of various water works in the Province of Sind during the year 1940-41.

L (IV) 2791—4

Serial No.	Name of place (water works)	Class of work gravitation or pumping.	Fuel consumed.	Fuel consumption per 1,000 gallons.	Price of fuel per ton or 40 gallons of oil.	Total average lift.	Fercentage of charges.					Per 1,000 gallons.		Per head per annum.			Remarks.
							Establishment.	Fuel.	Oil and waste.	Repairs to Machinery.	Other charges.	Total working cost.	Total receipts.	Total working cost.	Total receipts.	Total profit or loss.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
												As.	As.	Rs.	Rs.		
1	Karachi ...	No Lift.	Coal 3,705 tons. oil 235 tons.	...	Coal 26-2-0 Oil 79-0-0 per ton.	...	11·69	9·22	2·14	1·64	75·31	5·14	5·70	2·46	2·73	0·27 profit.	
2	Hyderabad	Pumping	9,75,670 units.	·74	0-0-10 Rs. 9·8 per ton.	143	16·36	49·20	2·44	32·00	...	1·86	2·46	1·25	1·65	0·40 profit.	
			3,724 Mds. of fuel.	·36													
3	Sukkur ...	Do.	4,38,620	1·32 units	0-1-0 per unit.	84·42	9·4	37·0	8·30	—45·3—		4·49	4·81	1·50	1·61	0·11 profit.	
4	Jacobabad	Do.	...	...	...	60	19·41	15·76	8·70	—56·13—		3·80	3·80	13·12	13·12	...	
5	Rohri ...	Do.	43,929	·89	0-1-4 per unit.	67	14·07	63·50	5·95	4·13	12·35	1·9	1·79	·45	·43	·02 loss.	

N. H. MENESSE,
Consulting Public Health Engineer to Government of Sind
and
Secretary, Board of Public Health Works for Sind.

STATEMENT No. 9.

Statement showing capital cost, details of income and expenditure of water works in the province of Sind, during the year 1940-41.

	Particulars.	Karachi.	Hyderabad (Sind).	Sukkur.	Jacobabad.	Rohri.
1	Description of plant ...	Steam and oil engines	Electric motor and steam engines.	Worthington Simpson centrifugal pumps running on electricity.	18 H. P. size.	Electric Pump Parkinson Ruston 13 B.H.P.
2	Initial capital cost in lakhs.	74·94	23·49	5,67,757	2,43,000	·05
3	Total cost of works in lakhs.	88·33	23·63	7,48,299	2,56,583	·25
4	Number of inhabitants drawing their supply from mains.	3,86,660	1,24,000	62,000	21,649	12,700
5	Hours of supply daily.	6½	16½	16 in summer 13 in winter.	6	9
6	Quantity supplied during the year in million gallons.	2,959·47	1,328·7	331·91	76·05	49·00
7	Total W. H. P. hours per annum in millions.	...	...	...	...	...
8	Maximum daily average during any month in million gallons.	10·17	4·55	1·2	0·36	0·22
9	Average daily supply for the year in million gallons.	8·11	3·64	0·91	0·21	0·13
10	Maximum supply per head per day in gallons.	26·30	36·7	19	16·63	17·3
11	Average supply per head per day in gallons.	20·97	29·35	14·66	9·6	10·2
12	Total lift (average) ...	...	143	84·42	...	67
13	Quantity supplied during the year in million gallons.	2,959·47	1,328·7	331·91	76·05	49·0
14	Fuel consumed ...	Coal 3705 tons oil. 235 tons	9,75,670 units of electricity 3,726 Mds. of fuel.	4,38,620 units of electricity.	...	43,929 units of electricity.
15	Fuel consumption per million gallons.	2,982 lbs.	740 units electricity 360 mds. of fuel.	1,321 units.	...	897 units of electricity.

STATEMENT No. 9 —*contd.*

	Particulars.	Karachi.	Hyderabad (Sind).	Sukkur.	Jacobabad.	Rohri.
16	Cost of fuel per ton ...	Rs. as. p. Coal 26-2-0 Oil 79-0-0	..	0-1-0 per unit	...	0-1-4 unit
17	Cost of establishment per million gallons. As.	602	304	422	736	265
18	Cost of fuel or electric energy per million gallons. As.	640	As. 915	As. 1661	592	1196
19	Cost of oil and waste per million gallons. As.		46	As. 373	332	112
20	Cost of other charges per million gallons. As.	3,818	As. 595	As. 2034	As. 2112	233
21	Cost of repairs to machinery per million gallons. As.	85				77
22	Total charges per million gallons.	Rs. 321·6	Rs116·25	Rs280·63	Rs235·75	Rs. 117·7
23	Maintenance charges per 1000 gallons supplied.	1·80	1·58	3·81	2·2	1·9
24	Interest and sinking fund charges per 1,000 gallons supplied.	3·34	0·28	0·68	1·6	...
25	Total (Maintenance and interest and sinking fund per 1,000 gallons supplied.)	5·14	1·86	4·49	3·8	1·9
26	Maintenance charges in thousands	333·34	131·667	78·977	10·274	5·76
27	Interest and sinking fund charges in thousands.	618·324	23·249	14·081	7·613	...
28	Total income in thousands.	10,54,132	204·355	99·712	17·887	5·48
29	Profit or loss on maintenance in thousands.	720·792	72·688	20·735	Nil.	0·28 loss
30	Profit or loss on maintenance and interest and sinking fund in thousands	102·468 profit.	49·439	6·654	Nil.	282 loss
31	Profit or deficit percentage on total cost of works.	10·8 profit.	31·90	7·1	Nil	49 loss

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