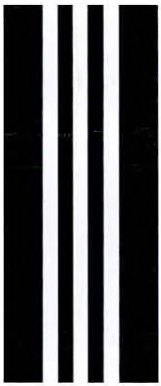


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CYPRUS

WATER SUPPLY AND IRRIGATION DEPARTMENT

WATER SUPPLY IN CYPRUS

ANNUAL REPORT FOR 1946

BY

C. RAEBURN, C.B.E., D.Sc.,

Water Engineer

WATER DEVELOPMENT
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WATER SUPPLY IN CYPRUS

ANNUAL REPORT FOR 1946

All Government water supply work in Cyprus is in the hands of the Water Supply and Irrigation Department whose activities cover the whole field of water supply : research, irrigation and the provision of water for domestic use and for industry. The Department was constituted in 1939 and the period of the war has been one of expansion with the accent on irrigation. Research has not been neglected but development of domestic water, except for service uses, has been and continues to be much retarded by a lack of pipes and other material.

2. **STAFF :** The expatriate staff consists of the Water Engineer who directs the Department and the Assistant Water Engineer who acts as his deputy and who has charge of research, long term investigational work and drilling. The senior Cypriot staff number eight : these officers are concerned with the management of various definite sub-divisions of the department's work, e.g. village domestic supplies, Eastern Mesaoria Irrigation Works, weirs and small conservation schemes, irrigation tanks, drilling, drainage, maintenance, etc. Working with them are a number of technical assistants and foremen numbering about 70, who are responsible for the actual construction and maintenance of works. An average of 1,250 workmen was employed during the year on daily and weekly wages. The greatest number employed was 1,359 during the month from 5th September to 2nd October, 1946. The expenditure on wages during that period was at the rate of £8,950 per month. 18 per cent. of these employees were classified as skilled workmen.

3. The development of free-flowing water for irrigation has once again been the primary occupation of the Department during the last year : domestic water supply work has been held up owing to lack of pipes : drilling for water has been actively continued and the aggregate footage is slightly in excess of last year's record. The interest of the farming community in the construction of new irrigation works has been very great and there has been no difficulty in securing substantial contributions towards the cost of the works. The schemes still tend, as was noted in last year's report, to contain a greater amount of masonry and to be more expensive but they are also more efficient and require less maintenance. The total area commanded by new works was 23,460 donums of which 4,431 donums were irrigated from perennial sources.

4. During the year, the expenditure from all sources on irrigation schemes has been £169,500 of which £50,700 has been provided in cash or labour by the beneficiaries. Of this sum £114,800 has been provided as a free grant by the British Government under the Colonial Development & Welfare Acts. Towards the end of the year, a new free grant of £95,000 was approved for this work. The free grants made for gravity irrigation schemes now total £579,450. The beneficiaries' contributions, when in cash, were normally found by a low interest, medium-term loan from the Public Loans Commissioners.

5. The irrigation works that are attracting most attention at present are the conservation projects. During 1945, the Lythrodhonda and Lymbia dams were completed and experience on these led to similar projects being undertaken at Galini, Kalokhorio (Klirou), Akrounda and Kophinou. These dams act first as large irrigation tanks giving a head to the water and enabling more distant areas to be watered : they enable water to be conserved for a final irrigation of cash crops and they trap and hold for use, run-off from summer rains.

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Sites for these dams have to be carefully selected and their catchment must be well protected by forest and not in active erosion. This careful selection will reduce silting to a minimum but it cannot altogether prevent it, and scouring of the silt through the low scouring gate will be necessary from time to time. Further sites for similar works have been chosen.

6. The other irrigation projects are perhaps less spectacular but are at least as important. They fall into two main classes—weir and earth canals, tank and masonry channels. The weirs are built across the river beds raising the water into canals, for watering cereals in winter and spring and, in many cases, fruit trees and olives and a variety of late spring and early summer crops. The most notable of these is the long weir across the Kouris River, west of Limassol which, with its canals, is now virtually completed and already in use for irrigating a large area in Kolossi, Erimi and Ypsonas villages. The second main class of irrigation work, that developing perennial water by tanks and lined channels, is seen mainly in the hills. These schemes provide water for intensive cultivation of pulses, vegetables, potatoes, fodders and fruit trees, mainly on terraced land.

7. Work has been done on a total of 58 schemes which will give irrigation this season. Many additional works have been put in hand. After meeting with still further difficulties from spalling clay-shales, the big chain-of-wells at Mandria which is designed to tap the subsurface flow in the deep gravels of the Xeros River, is within reach of completion. This is the most important perennial irrigation scheme yet undertaken by the Department. It will serve a large area of fertile land on the coastal plain east of Paphos. The infiltration gallery under construction in the valley of the Khrysokhou River above Polis has also made good progress and the works in the alluvium are complete. Appendix I lists the villages at which irrigation schemes have been brought into operation or additional areas brought under irrigation during the year. In general, the projects, though of considerable economic importance, present few new points of interest.

8. VILLAGE WATER SUPPLIES: The situation regarding the supply of pipes has shown no improvement during the year and the work has progressed but slowly. Towards the end of the year the headworks for the supply of the large village of Athienou were completed and the laying of the nine-inch diameter cement-asbestos main taking the water to the village can be started as soon as the pipes, now overdue, arrive. In all, just under £19,000 was spent on village water supplies. Schemes, some of them begun in 1945, were completed in thirty-six villages, thirteen schemes remain incomplete at the end of the year and preliminary investigations were undertaken in ten villages. There is little out of the ordinary to report in village water supplies during the year. Once again, it must be repeated, it seems certain that no considerable headway can be made with the scheme to provide domestic water to all villages in the Island until, at the earliest, the middle of 1948 when, it is hoped, the pipe situation will have eased.

9. EASTERN MESAORIA IRRIGATION WORKS: These functioned normally. The revenue from all sources was £2,153, almost the same as last year. The Kouklia Reservoir was not completely filled during the winter of 1945-46 and there was therefore less revenue from irrigation dues. There was no chargeable irrigation from Syngrasi Reservoir where the reservoir bottom is, under the control of the Commissioner, leased for farming on five year leases. In 1946, licences for grazing in the eastern Mesaoria reservoir lands were issued in respect of 6,243 sheep and goats against 6,687 in 1945 and 5,932 in 1944.

10. DRILLING : Demands on the six drilling rigs have continued unabated and the record number of 83 boreholes with an aggregate depth of 11,701 feet have been completed and 5 were still in progress at the close of the year. Forty-three bores were successful (yielding more than one thousand gallons per hour) and on test gave a total delivery of 4,340,000 gallons per day. The following table shows the numbers of boreholes drilled during the quinquennium, 1942-1946, for private individuals, for Government and for the War Department :—

		<i>No. of Boreholes Drilled</i>				
		1942	1943	1944	1945	1946
Private individuals	17	25	34	56	61
Government	18	20	23	16	3
War Department	16	10	4	—	19
Totals	51	55	61	72	83

A marked increase in the number of boreholes required by private individuals for irrigation and domestic use is apparent and to cope with this demand indents have been placed in the United Kingdom for the supply of two more drilling rigs, complete with tools, delivery of which is anticipated in 1947.

11. Of the 61 boreholes for private purposes, 33 were drilled under the Government subsidized scheme at a cost of £20 or £32. 10s. to the hirer and the remainder on repayment of the full cost plus departmental charges. Two areas from which there were numerous applications for boring have been well served, the Avgorou-Xylophagou area having 14 and the Western Mesaoria between Akaki and Morphou having 23 boreholes drilled during the year. Twelve holes were drilled at Mammari to serve as ventilation shafts for a chain-of-wells being developed as the hard rock above the aquifer rendered the sinking of hand-dug wells difficult. Four boreholes sunk at Arghaki, Kato Kopia and Kato Zodhia have proved the easterly extension of the Morphou-Syrianokhori aquifer by several miles and yields of between 5,000 and 9,000 gallons per hour were obtained.

12. Military requirements have been heavy in the Nicosia and Famagusta areas for camp purposes and near Famagusta and Xylymbou to serve Jewish Illegal Immigrants' camps. Particularly near Xylymbou new aquifers have given good yields.

13. PROSPECTING : In view of the considerable demand for private boreholes, Government prospecting has been on a reduced scale but drilling which has been continued near Dhikomo directly into the Trypa limestones, has proved good fissure supplies and there are prospects that the exploratory work still in hand may indicate the possibility of obtaining an adequate flow of water from an adit as at Sykhari further to the east. A borehole near Laxia on which work is still in progress has shewn that the aquifers of the Athalassa Sanatorium area extend at least a mile to the south and may form a valuable source of water supply for Nicosia. Mention has already been made of the tracing eastwards of the Morphou aquifers in a fertile area where pumped irrigation water will be of undoubted value. Pumping of wells to determine yield and for deepening has been carried out both for Government departments and for private individuals principally in the Nicosia, Famagusta and Kyrenia areas. The experimental observations commenced in 1945 on the evaporation and seepage losses from surface water-bodies near Syrianokhori have been continued throughout the year at quarterly intervals.

14. **ANTI-MALARIA WORK** : The drainage works in the Syrianokhori-Ghaziveran marshes consisting of open trapezoidal ditches with semi-circular concrete inverts, were completed during the year with the excavation and lining of a total of 33,750 feet length of drains, 15,476 feet having been made in 1946. Land drainage is now complete in summer during the anopheles breeding period and is also virtually complete in winter. The flow of water to the sea from five main drains at the end of the summer was found to be about 670,000 gallons per day. Consideration is being given to cultivating the drained land with perennial irrigation by water lifted from the drains. An experimental plot of 20 donums has been ploughed and a windmill erected to raise irrigation water through the small head required to put it on the land.

15. With the change in Government policy regarding malaria control from drainage to a campaign for the annihilation of the anophelene vector within a short period and considering the favourable results of that part of the campaign undertaken by the Medical Department in 1946, it has become necessary to review the Water Supply & Irrigation Department's attitude towards conservation of water particularly with regard to Kouklia Reservoir and to the possible construction of similar works. This has been begun but detailed planning awaits the successful completion of the annihilation plan.

16. **MISCELLANEOUS** : Further work has been done in connection with Limassol water supply in co-operation with the Municipal Engineer and a report with gaugings and estimates has been submitted. Much thought has been given to the problem of recharge of the aquifers underlying Famagusta which show a falling level and an increasing salinity. In addition to the customary difficulties which beset recharge, there is the further difficulty of finding an adequate, suitably disposed volume of water for use in this way.

17. **EXPENDITURE** : The total departmental expenditure in 1946, from all sources, was £202,127. The amount spent on Personal Emoluments, including War Bonus, was £15,974. Water supply work of one kind or another was undertaken in 127 villages out of a total of 647 in the Island.

18. As this will be the last Annual Report by the present writer on the work of the Water Supply & Irrigation Department, he would like to take the opportunity to thank the staff, field and office, for their continuous hard work since the inception of the Department in 1939. During the intervening years, the expenditure on water supply has increased ten fold. He would also wish to thank the District Commissioners and their staff for their constant co-operation in the work.

APPENDIX I.

IRRIGATION SCHEMES 1946.

No.	Place	Donums	
		Winter & Spring	Summer
1	Agridhia	—	80
2	Agros	—	213
3	Akrounda	—	100
4	Alithinou	—	40
5	Alona	—	265
6	Amiandos (Kato)	—	25
7	Anayia	260	—
8	Angastina	100	—
9	Aredhiou	800	—
10	Arodhes (Kato)	—	150
11	Apsiou	—	50
12	Ayios Ioannis (Agros)	—	50
13	Ayios Konstantinos	—	128
14	Ayios Nikolaos (Meletze)	—	10
15	Ayios Photios	—	15
16	Ayios Thomas	—	100
17	Ayios Yeoryios	—	120
18	Dhikomo (Pano)	—	5
19	Ephtagonia	200	100
20	Exometokhi	1,400	—
21	Galata	—	25
22	Galini	—	100
23	Kalopanayiotis	—	120
24	Kaimakli	1,000	—
25	Kambos	—	25
26	Kalokhorio (Klirou)	—	50
27	Kedhares	—	20
28	Kalavastos	2,000	100
29	Khandria	—	15
30	Kiti	300	—
31	Kophinou	1,500	—
32	Kritou-Terra	—	10
33	Kouris	5,000	—
34	Kyperounda	—	140
35	Lefkara (Pano)	—	50
36	Lefkoniko	100	—
37	Livadhia (Famagusta)	150	—
38	Melini	720	140
39	Mia Milea	2,500	—
40	Mosphiloti	—	100
41	Palekchori (Morphou)	—	30
42	Palekchori (Orinis)	—	85
43	Paramali	1,500	—
44	Pelendria	—	95
45	Platanistasa	—	130
46	Polis (Kastrapi)	—	200
	Carried forward	17,530	2,886

IRRIGATION SCHEMES 1946.—*continued.*

No.	Place	Donums	
		Winter & Spring	Summer
	Brought forward	17,530	2,886
47	Polystipos	—	75
48	Potami	—	30
49	Potamitissa	—	40
50	Psillatos	900	—
51	Silikou	—	140
52	Spilia	—	50
53	Sha	—	10
54	Statos	—	5
55	Thermia	100	500
56	Vavatsinia	—	15
57	Yenagra	500	—
58	Zoopiyi	—	80
59	Drilling	—	600
	Totals	19,030	4,431

APPENDIX II.

DOMESTIC WATER SUPPLY WORKS COMPLETED IN 1946.

<i>Village</i>	<i>Village</i>
1. Apostolos Andreas Monastery	19. Kambia
2. Episkopi (Paphos)	20. Photta
3. Alevga	21. Kato Amiandos
4. Potamitissa	22. Mallia
5. Dhrousha	23. Kharcha
6. Kourou Monastir	24. Tavros
7. Palodhia	25. Agridhia
8. Pano Platres	26. Prastio
9. Polis	27. Ardhana
10. Ayia Marina (Kelokedhara)	28. Kornos
11. Kithasi	29. Khrysokhou
12. Dhierona	30. Malounda (Famagusta)
13. Ayios Ioannis	31. Lemythou
14. Asha	32. Vouni
15. Khoulou	33. Linnatis
16. Kellia	34. Phasoula (Paphos)
17. Milea	35. Pakhyammos
18. Pano Amiandos	36. Lazania

DOMESTIC WATER SUPPLY.

(Preliminary Investigations).

<i>Village</i>	<i>Village</i>
1. Agros	6. Panagra
2. Ephtagonia	7. Peyia
3. Ayios Elias	8. Phterykha
4. Ayia Marina (Xyliaton)	9. Pano Arodhes
5. Klavdhia	10. Troodos

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DOMESTIC WATER SUPPLY WORK BEGUN IN 1946 AND STILL
IN HAND.

<i>Village</i>	<i>Village</i>
1. Philousa (Khrysokhou)	7. Kato Dhrys
2. Trimiklini	8. Livadhia
3. Ayios Mamas	9. Kaminaria
4. Asgata	10. Rizokarpaso
5. Athienou	11. Pretori
6. Androlikou	12. Klepini
	13. Ziyi