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WATER SUPPLY AND IRRIGATION DEPARTMENT

ANNUAL REPORT FOR 1948

BY

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ANNUAL REPORT OF THE WATER SUPPLY AND IRRIGATION DEPARTMENT FOR THE YEAR 1948.

All Government water supply work in Cyprus is in the hands of the Water Supply and Irrigation Department whose activities cover the whole range of water supply including the search for new sources, irrigation, and the provision of water for domestic purposes. During the year progress on irrigation works has been maintained at the pace set by the Ten-Year Programme of Development, both as regards gravity schemes and the drilling of boreholes for pumped supplies. Although substantial progress has also been made in the supply of piped water to villages for domestic use it is unfortunately necessary to record once again that in this sphere progress has been severely retarded through lack of pipes of which some 3,500 tons are still on order from the United Kingdom.

2. GRAVITY IRRIGATION : The policy of carrying out many small schemes rather than a few big ones has been continued. Each scheme belongs to a village or to a group of cultivators within a village and after construction of the works by the Water Department the management and cost of maintenance become the responsibility of the beneficiaries. Technical advice continues to be given gratis by the Water Department in deserving cases but repair works are carried out only upon full repayment of costs. The total number of gravity irrigation schemes of all types completed in 1948 was 68, commanding in all some 32,450 donums of which 3,670 can be irrigated perennially.

3. Perhaps the most popular and successful form of gravity irrigation work is the small weir-channel-tank scheme usually serving an area of 40 or 50 donums. A weir or headworks diverts perennial water from a spring, stream, or chain of wells into lined channels and thence into a masonry tank or small reservoir not unlike a swimming pool where it can be stored during the night or for short periods when it is not immediately wanted. More channels lead the water from the tank to the small but intensely cultivated plots of land. If the source of the water is a spring the flow is frequently concentrated by excavation and tunnelling into the rock from which it issues. Some 20 schemes of this type have been completed during the year, commanding 1,100 donums of perennial irrigation.

4. A more expensive type of scheme for which there has also been considerable demand is that which utilizes the ordinary winter and spring flow of the larger rivers. A weir of relatively large dimensions diverts water into channels which may be several miles long and which lead to the irrigable land perhaps one or two thousand donums in extent. The water is not usually flood water but rather the steady winter and spring flow which persists in gradually diminishing volume until April or May. The crops grown are usually cereals. Five schemes of this type have been completed during the year commanding 2,500 donums.

5. Conservation works to lengthen the season of irrigation sufficiently to permit of summer crops being grown in the type of scheme described in the preceding paragraph have been attempted with success in a number of places, the last, that at Petra, having been completed during the year under review at a total cost of £9,700 of which half represents the cost of the dam and the remainder the distribution channels. Some 250 donums can be irrigated in summer and about 2,750 in winter.

6. Flood irrigation is practised chiefly in the Mesaoria but also in other places throughout the Island. Flood discharges which usually last for short periods from a few hours to a few days are diverted from the rivers by weirs and led to the cultivable lands by earth channels. The largest scheme of this kind in the Island, commanding about 18,000 donums in the lower Pedias catchment, has been completed this year.

7. An interesting " sub-surface dam " has been successfully constructed at Kivisil. A thin concrete wall 20 feet deep below the bed of the Pouzi stream has this summer brought a flow of 200,000 gallons per day to the surface at a place where in other years the stream was completely dry from May onwards.

8. The eastern Mesaoria reservoir works were unfortunate this year in that owing to the exceptionally low rainfall the flow in the Pedias and Yialias rivers was insufficient for the needs of the flood irrigators above the Kouklia reservoir and no water was available for storage. Revenue was thus low amounting to only £853 from all sources against an expenditure on maintenance of £1,649 which is higher than usual owing to the necessity of carrying out additional repair works at a cost of £500. A total of 2,106 donums of land was leased for winter cultivation and 433 for summer cultivation. Grazing licences were issued in respect of 7,303 sheep and goats.

9. Domestic Water Supply : The keen demand in villages for new domestic water schemes is far in excess of anything that can be carried out with the available quantities of pipes. Until deliveries from the United Kingdom improve, the situation will continue to be an embarrassment to the Water Supply and Irrigation Department which in present circumstances can carry out only a fraction of the work wanted. During the year only 538 tons of pipes were received while at the end of the year outstanding orders amounted to some 3,500 tons.

10. Nevertheless, in spite of the shortage of materials, 29 villages have received new piped supplies of water in 1948. In some cases, where water has been brought from a distance, only the main pipe line with a storage tank has been installed, the usual distribution system to fountains in different parts of the village having been omitted for the present. By this arrangement less pipes are used than would be required for a complete scheme and the villagers are relieved of the necessity of making long journeys for water by animal or on foot. Investigations for many new schemes have been proceeding and this part of the work is in advance of construction.

11. At Aghirda a somewhat experimental tunnel is being driven into the south side of the Kyrenia range with a view to providing water for Geunyeli village. In the early stages a sudden flow of 400,000 gallons per day led to unjustified optimism but within a week the discharge had diminished to 10,000 gallons per day and has now, after five months, become as little as 800 gallons per day although the tunnel has penetrated 475 feet into the hill. This is an illustration of the uncertain behaviour to be expected in underground water extracted from the foothills of the Kyrenia range.

12. Work on the Gaidhouras and Prastio scheme, estimated to cost £18,000, is temporarily held up owing to lack of pipe joints. The necessary asbestos-cement pipes arrived in Cyprus at the end of July but there is still no news of the cast iron joints having been despatched from the United Kingdom.

13. Drilling for Water : More boreholes have been drilled this year than ever before and more underground water is being pumped to the surface and used for perennial irrigation. Applications for new wells to be drilled under the Subsidized Drilling Scheme continue to come in and in spite of the greatly increased drilling output the Water Department is having difficulty in keeping pace with the keen demand. Present policy is to concentrate most of the available machinery on boreholes for private persons under the Subsidized Drilling Scheme rather than to proceed with prospecting work. When the waiting list of applicants shows signs of being overtaken then more attention will be given to the search for new sources of supply.

14. There are now eleven drilling rigs in operation as against seven at the end of 1947. Of the additional four, two are new, the third is an old one made more or less serviceable with parts taken from an abandoned and otherwise useless machine and the fourth was taken over on loan from the Army at the end of December. A total of 117 boreholes have been drilled by the department during the year, the average depth being 182 feet. About 70% have this year yielded more than 1,000 gallons per hour and are therefore considered " successful " and the total quantity of water the new boreholes are capable of producing, exceeds 7,000,000 gallons per day, a quantity sufficient to irrigate some 7,000 donums in summer or three times that area in winter.

	No. of Boreholes Drilled.					
	1943	*1944*	*1945*	*1946*	*1947*	*1948*
For private individuals	25	34	56	61	35	92
For Government ..	20	23	16	3	17	25
For War Department	10	4	—	19	15	—
Totals	55	61	72	83	67	117
Aggregate footage drilled	7,964	9,115	12,785	11,686	12,171	21,397

15. Tests of some 36 new boreholes in the Western Mesaoria, all successful without exception, show that boreholes in this area can generally be relied upon to yield from 1,500 to 12,000 gallons per hour. Another water-bearing area which is showing promising results and in which the demand for new wells is second only to the Western Mesaoria is the Kondea–Avgorou district where 14 out of 15 new boreholes have been successful and each yielded from 1,000 to 7,500 gallons per hour. Twenty boreholes in the foothills of the Kyrenia range demonstrate uncertain prospects in this area. Half have been successful and half unsuccessful and in no case has the test yield exceeded 4,000 gallons per hour. In the Karpas peninsular 7 new boreholes have been drilled without a single success showing that most of that part of the Island is definitely unfavourable as regards underground water.

16. Miscellaneous : Miscellaneous activities in the department occupy a considerable proportion of the time of the technical staff. In Nicosia three water supply systems, viz. the Government House—English School, the Government Offices and Hospital, and the supply to the Prison and the houses of Government Officers, are all managed by the department. Personnel of the department exercise technical control over the water supply works of the Nicosia Water Administration which provides water chiefly to that part of Nicosia within the old city walls. The maintenance of the Larnaca water supply is supervised by staff of the department. A comprehensive report on the underground water situation in the Famagusta area and proposals for a new town supply were prepared at the request of the Famagusta Municipality. Water measurements are carried out regularly for the Limassol Municipality at springs that may one day be used for a new town supply. Preliminary investigations for irrigation and water supply works have been carried out in many places, in particular in the three Paphos Chiftliks where irrigation works costing some £50,000 are contemplated.

17. Legislation : A new law, the Water (Domestic Purposes) Village Supplies Law, 1948, has been brought into force during the year and provides powers for a Village Water Commission, with the approval of the Governor,

to acquire rights to the use of privately owned water for village domestic use. Modifications of the Irrigation Divisions (Villages) Law, 1938, and of the Government Waterworks Law, 1928, are under consideration for the purpose of facilitating the better use of irrigation water and encouraging the execution of schemes.

18. FINANCIAL : The following is a summarized statement of the expenditure of the department in 1948.

	Government		Village or Private Contributions	Totals
	Colonial Development and Welfare Grants	Cyprus Funds		
	£	£	£	£
Gravity Irrigation Schemes ..	22,608	68,084	29,586	120,278
Village Water Supplies	10,664	10,664	20,862	42,190
Subsidized Drilling	5,485	6,479	3,503	15,467
Prospecting for Water	—	2,750	—	2,750
Departmental Charges	—	25,987	—	25,987
	38,757	113,964	53,951	206,672

19. Included in the above are Personal Emoluments from all votes (£19,033), Payment of Labour (£79,392), Travelling and Subsistence Charges (£1,413), and the purchase of two new drilling rigs (£5,485).

20. Village contributions towards the cost of gravity irrigation works vary from 1/5 to 1/3 according to the type of work, the lower fraction being for flood-irrigation schemes and the latter for perennial irrigation. Payment by the villagers is made in cash, in free labour (capitalized in the above statements) or by Government loans at low rates of interest. Village domestic water schemes are paid for half by Government and half by the village, the village contribution being either in cash or by Government loan. Boreholes under the Subsidized Drilling Scheme are carried out for private irrigators at a fixed price to them of £32. 10*s*. per borehole and the balance, which on the average amounts to about £100, excluding depreciation of plant, is paid by Government. Municipalities or private individuals requiring boreholes for purposes other than irrigation are charged the actual cost in full.

21. STAFF AND LABOUR : The Assistant Water Engineer, Mr. A. Cawley, continued to act as head of the department, that is, as Water Engineer, until the new substantive holder of the post, Mr. I. L. Ward, arrived in the Colony on 25th July. On 6th November, the Assistant Water Engineer left the Colony on transfer to Nigeria and the expatriate staff was then once again depleted to one officer, the Water Engineer. The Cypriot staff at the end of the year was comprised of the following :—

Superintendent of Waterworks	1
Senior Inspector of Water Supplies	1
Inspectors of Water Supplies	5
Technical Assistants	8
Temporary Technical Assistants	3
Foremen	65
Clerical and Miscellaneous	19

The average number of labourers employed was 804 of which 14% were "skilled". The monthly averages were as shown :—

January	870	April	880	July	1,000	October	690
February	810	May	850	August	900	November	680
March	860	June	930	September	700	December	480.

22. In gravity irrigation and village water supply works the 48-hour week has been the practice but in drilling for water a 44-hour week and bonus system has been introduced and has proved itself popular with the drilling crews and successful from Government's point of view in that the output per drilling machine has increased while the cost per foot of borehole has remained almost unchanged.

23. DEMAND FOR IRRIGATION AND WATER SUPPLY SCHEMES : Although the demand for gravity irrigation works has remained at a very high level during the year there have been signs that it may now have reached its peak. On the other hand applications for village domestic supplies and for boreholes to provide pumped irrigation water have never been so numerous as in 1948.

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Attached to this report are the following :—

Table 1 : Irrigation Schemes completed in 1948.
Table 2 : Irrigation Schemes in hand at the end of 1948.
Table 3 : Village Water Supply Schemes.

TABLE 1.

IRRIGATION SCHEMES COMPLETED IN 1948.

Location	Nature of Construction	Donums commanded		
		Winter	Summer	Total
Agridhaki	Spring, masonry channels, tank	—	15	15
Agridhia	Weirs, channels, tanks	—	30	30
Akrounda *	Lining channels	—	—	—
Alaminos *	Lining channels	—	—	—
Alekhtora	Additional channels	—	—	—
Alithinou	Springs, channels, tanks	—	40	40
Anatoliko (Paphos)	Springs, weir, masonry channels	—	80	80
Angastina *	Repairs to channels	—	—	—
Anglisidhes *	Lining channels in masonry	—	30	30
Armenokhori	Spring, channels, tank	—	30	30
Arminou	Spring, masonry channels, tank	—	60	60
Arsos (Limassol)	Weirs and masonry channels	—	120	120
Asha	Weir and channels	800	—	800
Athalassa *	Repairs to weir	—	—	—
Ayios Amvrosios (Kyrenia)	Weir and channels	200	—	200
Ayios Ermolaos	Weir and channels	400	—	400
Ayios Yeoryios Kafkallou	Weir, masonry channels, aqueduct and tank	—	250	250
Ayios Isidhoros	Spring, channels, tank	—	30	30
Ayios Nikolaos *	Repairs to tank	—	—	—
Ayios Pavlos	Weir and channels	—	60	60
Ayios Theodhoros (Limassol)	Weir and channels	—	30	30
Ayios Theodhoros Soleas	Weir, masonry channels, tank	—	150	150
Ayii Vavatsinias	Weir, masonry channels, tank	—	210	210
Dhierona	Weir, masonry channels, aqueduct	—	80	80
Exometokhi (Yerondas) *	Repairs to channels	—	—	—
Eylenja *	Repairs to channels	—	—	—
Gastria *	Repairs to channels	—	—	—
Gourri	Weir, masonry channels, aqueduct	550	250	800
Kaimakli *	Repairs and improvements	—	—	—
Kalavasos	Repairs and improvements	—	—	—
Kalokhorio Klirou	Storage dam, masonry and earth channels	1,200	300	1,500
Kalokhorio (Limassol)	Weir, channels, tank	—	50	50
Kato Lefkara	Weir, masonry channels, aqueduct	500	20	520
Kato Moni	Spring, masonry channels, tanks	—	30	30
Kato Mylos	Masonry channels, aqueduct	—	120	120
Kithasi	Weir, masonry channels	—	200	200
Kiti (Kokkines) *	Repairs to weir	—	—	—
Kiti (Stephanaki) *	Repairs to weir, channels	—	—	—
Kivisil	Sub-surface dam & masonry channels	—	60	60
Kokkini Trimithia *	Repairs to spring, channels, tank	—	80	80
Kornos	Repairs to weirs	—	—	—
Kouklia(Famagusta)*	Repairs to embankments	—	—	—
Kouris *	Repairs to weir	—	—	—
Lagoudhera	Spring, masonry channels, tank	—	40	40
Livadhia (Larnaca)	Anti-flood works	200	—	200
Livadhia (Nicosia)	Springs, masonry channels, tanks	—	50	50
Louvaras	Masonry channels	—	15	15
Lymbia	Raising of dam and repairs to channels	200	50	250
Mandria (Limassol)	Weir, masonry channels, tank and piped aqueduct	150	100	250
Mia Milea	Channelling	2,000	—	2,000
Mitsero	Weir, aqueduct, masonry and earth channels	700	—	700
	Carried forward	6,900	2,580	9,480

* Repairs and improvements.

Location	Nature of Construction	Donums commanded		
		Winter	Summer	Total
	Brought forward	6,900	2,580	9,480
Mousere	Spring, masonry channels	—	30	30
Ora (Larnaca) ..	Weir, masonry channels	180	20	200
Orga (Kyrenia) ..	Spring and tank	—	15	15
Palekhori Orinis ..	Weir, masonry channels	—	80	80
Paleomylos	Weir, aqueducts, masonry channels	—	50	50
Pano Arkhimandrita	Masonry channels	—	80	80
Pedieos	General improvements	18,000	—	18,000
Petra	Storage dam, masonry and earth channels	2,500	250	2,750
Platani	Weir, channels	—	80	80
Phterykha	Spring, masonry channels, tank ..	—	50	50
Potami	Spring, masonry channels, aqueduct, tank	—	40	40
Pyrga *	Repairs and improvements to channels	—	—	—
Sarandi	Masonry channels, tank	—	15	15
Terra	Spring, weir, masonry channels ..	—	300	300
Theletra	Masonry channels	—	80	80
Tseri	Repairs to intake (silt trap)	—	—	—
Vatili	Weir and channels	1,200	—	1,200
	Totals (Donums)	28,780	3,670	32,450

* Repairs and improvements.

TABLE 2.

IRRIGATION SCHEMES IN HAND AT THE END OF 1948.

Location	Nature of Construction	Donums commanded		
		Winter	Summer	Total
Agros	Springs, weirs, masonry channels, tanks	—	60	60
Alona	Springs, weirs, masonry channels, tanks	—	100	100
Ayios Ioannis Agrou	Masonry channels, tank	—	60	60
Chakistra	Spring, pipeline, tank	—	120	120
Khandria	Springs, weirs, masonry channels, tank	—	50	50
Kyperounda ..	Springs, masonry channels, tank ..	—	70	70
Mandria (Paphos) ..	Infiltration gallery (tunnelling) ..	800	200	1,000
Palekhori Morphou ..	Masonry channels	—	40	40
Pano Lefkara ..	Weirs, aqueduct, masonry and earth channels	1,500	50	1,550
Platanistasa ..	Weir, masonry channels, tank ..	—	200	200
Polystipos	Springs, masonry channels, tank ..	—	80	80
	Totals (Donums)	2,300	1,030	3,330

TABLE 3.

VILLAGE WATER SUPPLY SCHEMES.

A.—COMPLETED IN 1948.

1. Ayios Epiphanios (Dagh)
2. Ayios Theodhoros (Limassol)
3. Ayios Isidhoros
4. Ayios Yeoryios (Limassol)
5. Akapnou
6. Arakapas
7. Axylou
8. Episkopi
9. Evretou
10. Chakistra
11. Kambos
12. Karpasha
13. Kato Mylos
14. Kalokhorio (Limassol)
15. Khrysokhou
16. Mamonia
17. Moutayiaka
18. Omodhos
19. Paleometokho
20. Panagra
21. Pendalia
22. Phlamoudhi
23. Pretori
24. Politiko
25. Saramas
26. Stroumbi
27. Styllos
28. Terra
29. Vasa (Limassol).

B.—IN HAND AT THE END OF 1948.

1. Ayios Athanasios
2. Ayios Mamas
3. Athienou
4. Dhora
5. Dhiorios
6. Gaidhouras
7. Geunyeli
8. Kato Platres
9. Melounda
10. Mesayitonia
11. Monagri
12. Moutoullas
13. Patriki
14. Perapedhi
15. Pelendria
16. Petrophani
17. Peyia
18. Platani
19. Prastio (Famagusta)
20. Prodhromos.