SUID-AFRIKAANSE NATUURUNIE - SOUTH AFRICAN NATURE UNION.
Foon : 23-3159, Posbus 9552 Phone: 23-3159 : P.O. Box 9552,
JOHANNESBURG. JOHANNESBURG.

National Conference and special general meeting of the South African Nature Union in collaboration with the Department of Sport and Recreation

on

THE PLANNING OF PUBLIC RECREATION

THE DEPARTMENT OF WATER AFFAIRS AND PUBLIC RECREATION

By

J.P. Kriel, Chief Engineer, Planning and Design, Department of Water Affairs.

---

1. INTRODUCTION.

The Department of Water Affairs is the Government body responsible for the development of the water resources of the Republic of South Africa and the allocation of water for irrigation and industrial and domestic use. In addition the Department is also entrusted with the task of preventing the pollution of our public streams and open water surfaces. At first glance these onerous duties appear to be much more akin to a plain job of work than to recreation, unless one is inclined to the view that such work is of such absorbing interest that it should be recreation in itself. Hard work there certainly is, but the activities of the Department impinge on recreation to such an extent that this aspect must be taken into account in the planning of its work.

2. WATER RESOURCES OF SOUTH AFRICA.

Being a relatively dry country, South Africa is singularly devoid of lakes and other natural inland open water surfaces. Perennial streams are found in only a small portion of the Republic and many large rivers flowfor only a part of the year. Even when perennial the flow in our streams during the dry season drops to a fraction of the average river discharge.

2/ .....

The average rainfall for the Republic is about 475mm. (18.7 inches). The mean annual runoff which reaches our rivers and streams is about 20 million morgen-feet per annum about 9 percent of the rainfall, the balance returning to the air, by direct evaporation and evapo-transpiration from plants. This high loss is due to the nature of our climate, which causes the gross evaporation from a free water surface to be very high, varying from about 45 inches in the South and east to as much as 120 inches in the north-west along the lower Orange River.

Another characteristic of our climate is also the extended droughts which occur from time to time, and have the effect of making our rivers very erratic, the total runoffs during dry years being a small proportion of the average annual figure. In addition to this variation of runoff with time, there is also a great variation with locality, the runoff in dry areas with a rainfall of about 5 inches per annum amounting to only about 0.4 percent of the rainfall but increasing to 80% or more of the rainfall where this reaches 100 inches per annum. About 75 percent of the total runoff originates from 32 percent of the Republic's surface area in a zone about 250 miles wide extending north-eastwards from East London. Another 10% comes from 4% of the total area in the southern and south-western coastal strip, while only 15 percent comes from the large drier area north and west of the high-rainfall zones, comprising 64% of the Republic's surface.

It has been estimated that, because of the climatic characteristics just described, only about 8 million morgen-feet per annum of the total runoff of the Republic can be beneficially used. Of this about 40 percent is already utilized, and at the present rate of growth the full quantity available will be required shortly after the end of this century. The period for which adequate supplies can be

3/ .....

assured will be greatly extended if more efficient use is made of the available water. From the fore-going it is evident that waste of water cannot be countenanced, and the recreational use thereof must be subordinated to essential requirements if the country is to prosper and thus create a social climate in which there is a need for further recreational facilities.

3. NATURE OF THE DEPARTMENT'S WORK.

Because of the nature of our rivers relatively large storage works are required to make the most use of the water which is available. The geographical distribution of the water supplies also makes it necessary to construct extensive canal systems and long pipelines to bring the water where it is needed. Much of the construction work is of a spectacular nature.

Over 200 major storage dams have already been built in the Republic, which places it among the 11 countries with most dams in the world, and many more are under construction. During the years 1963-1966 South Africa was fourth in the list of about 60 member countries of the International Commission on Large Dams as regards the number of large dams built during the period. More than half the total number of large dams in the Republic have been constructed by the Department of Water Affairs in its efforts to make water available where required.

Pollution control is not a spectacular part of the Department's work as compared with the construction of large projects, but it plays an essential role in ensuring the purity of our water resources. In the Water Act No. 54 of 1956 provision is made for protecting our rivers, open bodies of water and even the sea from pollution by industrial and municipal effluents or any other cause. Fortunately this legislation was enacted at a stage in our development before the gross pollution which

has occurred in many other countries had taken place, thereby preventing our streams from becoming the equivalent of open sewers and our beaches from becoming useless for leisure and enjoyment, as has happened in certain other parts of the world.

4. COMPATIBILITY OF DEPARTMENT'S WORK WITH RECREATION.

The construction of water projects is often of a spectacular nature and of great interest to the general public. The work site during construction is however, not safe for casual visitors, and strict control is essential. In spite of this, facilities are generally made available for the public to watch progress of the work from a safe distance, thereby making it possible for them to take an interest in and obtain pleasure from the impressive works that have to be executed. To many people such projects hold a hint of romance as they serve as a symbol of man's pioneering urge and his conquest of the challenge of nature.

From the nature of things major water schemes are often built in out-of-the-way places, where few facilities for recreation are available. For many years the Department's policy has been to provide recreational facilities for its employees construction schemes. This often has the effect of stimulating sporting activities in the surrounding areas by promoting competition in sporting events.

Although dams are conceived and built primarily for utilitarian purposes they create lakes and bring a land-water environment to regions which have not previously had water for recreational purposes. This undoubtedly is the major contribution which the Department of Water Affairs can make to the recreational needs of the country. Very often these dams are built at relatively inaccessible locations, but access must be provided for construction and this also serves to open up the area for

the general public. Apart from the enjoyment to be obtained from making use of the body of water formed by dams, roads for access frequently open up wilderness areas of great natural beauty which is an added attraction. With improved roads and transport people tend to go further afield in their search for open-air recreation and now visit dams not previously readily available for such purposes. As the need for water supplies increases the position also arises where less favourable sites often closer to population centres are utilized. The overall result is that the number of visitors to dams are steadily increasing.

There is a serious problem of safety connected with the use of irrigation canals for recreation, as was also found by the United States Bureau of Reclamation (1)

(1) Recreational Uses of Hydro-electric Reservoirs-1963. Civ. Eng., Aug. Vol. 33 No. 8 pp. 38 - 41.

Their main attraction is that they bring greenness and fertility to arid areas and thereby cause pleasure to the beholder.

The recreational benefit of pipelines is generally indirect by bringing water to supply needs for swimming baths and the showers after sporting activities.

Polluted water is not suitable for recreation, and by safe-guarding the quality of water, pollution control plays a very important part in promoting the use thereof for this purpose. Unfortunately this activity of the Department cannot eliminate the incidence of bilharzia, although properly designed canals and pipelines do decrease the danger of this scourge in areas where it is endemic.

5. AVAILABLE DAMS.

On the attached map the positions of 106 of the major dams in the Republic are shown. It will be evident that a

considerable number of them are close enough to major population centres or to important travel routes to be valuable from the point of view of recreation. The total surface area when full of all the reservoirs formed by the dams is in excess of 700 square miles and they have a combined shoreline of over 2000 miles. The latter distance is greater than the length of the Republic's coastline. The great potential of the reservoirs for recreation is evident from these figures, but it must be remembered that fluctuating water levels as the reservoirs are inevitably drawn down during dry periods inhibit their usefulness for recreation to a considerable degree.

6. IMPORTANCE OF STORAGE RESERVOIRS FOR OUTDOOR RECREATION.

A few years ago the Outdoor Recreation Resources Review Commission in the United States of America (1) stated that most people seeking outdoor recreation "want water - to sit by, to swim and to fish in, to ski across, to dive under and to run their boats over. Swimming is now one of the most popular outdoor activities and is likely to be the most popular of all by the turn of the century. Boating and fishing are among the top ten activities. Camping, picnicking and hiking also high on the list, are more attractive near water sites." This statement largely applies to South Africa as well and clearly illustrates the important part that dams constructed for utilitarian purposes can play in public recreation. This is confirmed by the popularity of Hartebeestpoort dam and the Rand Water Board Barrage in the Vaal River for outdoor activities of the population of the Pretoria- Rand- Vereeniging complex.

7./ . . .

(1) Recreational uses of hydro-electric reservoirs. 1963. Civil Engineering Vol. 33 No. 8, pp. 38-41. Aug.

7. GROWING NEED FOR RECREATIONAL USE OF RESERVOIRS.

Data about actual recreational use of our storage reservoirs

7/ .....

are not available, but figures of visits to the Kruger National Park show the growing demand for outdoor recreation. In 9 years from 1955 to 1964 the number of visitors increased nearly threefold from 79,900 to 216,700, the percentage of the population making these visits increasing from 2.8% to 6.7% (2). It can be accepted that this trend in outdoor activities will continue, and that beneficial use of our reservoirs and their surrounding areas for recreation will be essential to satisfy the growing demand for such facilities.

Similar trends for the use of reservoir areas are evident from figures for the United States. Visitor days to dams of three of the most important agencies responsible for the construction and operation of dams in the United States are as follows for the year 1962:

Corps/ .....

(2) Report of the Commission of Inquiry into the alleged threat to animal and plant life in St. Lucia Lake. 1964 - 1966. Government Printer.

Corps of Engineers	127 million	Increased eight-fold from 1950 to 1962.
Bureau of Reclamation	27 million	Most of the reservoirs of the Bureau are far off the beaten track.
Tennessee Valley Authority	45 million.	Increased from 7 million in 15 years since 1947.

These figures are about equivalent to a visit by every person in the United States during the year. A spectacular dam like Hoover Dam in the Colorado River attracted 45 million visitors to the Lake Mead recreation area between 1935 and 1962 and the annual number of visitors is now believed to be running at about four million.

8. ECONOMIC VALUE OF RECREATIONAL USE OF RESERVOIRS.

Up to 1962 the U.S. Corps of Engineers had spent about

8/ .....

6000 million U.S. dollars on its flood control projects. If the number of visitor-days during 1962 had been charged for at a rate of 50 U.S. cents it would have provided an income of 63.5 million dollars for the year. Capitalized at 6 percent interest this could have financed a construction cost of just over 1000 million dollars a substantial proportion of the total construction cost of the reservoirs visited. Due to the smaller population of South Africa and the distances to many of the dams from the main population centres it is not expected that the recreational value of the reservoirs will be so high, but in many cases it will be well worth considering. In general charges for use of the visitor facilities merely cover the cost of providing them, their operation and maintenance with no provision for making a contribution to the capital cost of the project. There is no reason why this should not be done, however, and even if the Government decides not to make such a charge, the potential value of the recreational opportunities should be taken into account in assessing the economic viability of storage projects.

9. ACCESSIBILITY OF WATER BODIES.

Formerly the Department of Water Affairs acquired servitudes of storage of government dams. This meant that land owners retained full ownership rights over their land down to the water's edge and often prevented the public from making use of the recreational facilities created or charged unrealistic fees for permission to do so. Since about 1960, however, the policy has been adopted to purchase outright the land required, including a buffer strip above the high flood level. This gives the government full control of the reservoir and its shore area, so that it can be made available for public recreation. The provision of access by the public has also been regularised.

10. CONTROL OVER RECREATIONAL USE OF GOVERNMENT RESERVOIRS.

According to provisions of Article 56 of the Water Act No. 54 of 1956, the Minister of Water Affairs has full control of a Government Water Work, including the areas that may be flooded. The Department of Water Affairs as such, however, is not legally concerned with the provision of recreational facilities and the establishment of nature reserves. Its functions are primarily limited to the conservation and utilization of water resources for agricultural, municipal and industrial use. Because of this it was felt that the provision of recreational facilities and the establishment of nature conservation projects should be the responsibility of bodies whose sphere of activities include such matters.

About 1963 the four administrators of the Provinces unanimous decided to request the Government to transfer certain powers for the establishment of recreational resorts and the development of nature reserves, the protection of fauna and flora and similar matters to the Provincial Administrations as they have the legal powers to undertake such activities.

The Government agreed in terms of article 69 of the Water Act, to this request of the Administrators, subject to the clear condition that only subservient powers for the development of such activities be delegated to the Provinces, the understanding being that the delegation will always be subject to, and will not detract in any way from, the statutary functions of the Department of Water Affairs with regard to the control and utilization of the stored water in State reservoirs and the surrounding government land that may be required for this purpose.

Inaccordance with the accepted policy the necessary powers have already been transferred to the respective Provincial authorities or requests therefor are under consideration, in respect of the following dams.

NATAL.

Ngagane

Hluhluwe

Midmar

Wagendrift

ORANGE FREE STATE.

Hendrik Verwoerd dam on Orange River

P.K. le Roux dam on Orange River.

Erfenis

Kalkfontein

Rustfontein

Krugersdrift

Oppermansdrift

TRANSVAAL

Loskop

Roodeplaat on Pienaars River

Hartebeespoort

Ebenezer

Boskop

Vaal Dam

In the case of the dams of the Orange River Project the Advisory Council for this project also concerns itself with the proposals for recreational use.

In order to give effect to the requirements of article 56 of the Water Act, the Department of Water Affairs promulgated on the 1st May 1964 regulations in terms of paragraphs (b) (c) and (j) of article 70 of the Water Act with regard to State dams and the surrounding State land. A copy of the regulations are attached hereto and they are designed to provide proper control over such matters as access, speed limits, parking, trading, reserved areas, fire, hygiene, camping and accommodation, safety, protection of fauna and flora, use of the body of water and many other relevant matters.

In view of this it can now be said that the stage has been cleared for making the best possible use of the recreational potential of all storage reservoirs and other water works falling under the control of the Department of Water Affairs.

11. CONTROL OVER INLAND WATER AREAS OTHER THAN GOVERNMENT DAMS.

Under Section 164 (bis) of the Water Act the Minister of Water Affairs may declare any inland water area, including river estuaries to be a Water Sport Control Area, and may then promulgate regulations for the proper control of recreational activities within the area. In this way provision is made for the orderly development of all bodies of water within the Republic for public enjoyment. In this respect the Department of Water Affairs also has a role to play in the field of public recreation.

12. CONCLUSION.

In his opening address at a previous special meeting of the S.A. Nature Union, viz. in July 1961, the Prime Minister, the Hon. B.J. Vorster, who was then Deputy Minister of Arts, Education and Science, said that recreation with tourism were very important to the economy, that the demand would increase in future and, quoting directly, that "recreation (with Nature) is absolutely essential in our complex modern way of life, in fact we must recognise that public recreation is as basic as public health, education or social services."

While the Department of Water Affairs is primarily concerned with one of the basic needs of the Republic, the provision of water, it is happy also to be able to contribute, because of the nature of its work, to the general well-being of the population by creating opportunities for healthy outdoor recreation.

12/ .....

ANNEXURES.

(1) Map Reg. No. 26717/50 revised 1967, showing principal storage dams.

(2) Regulations No. R654 framed in terms of paragraphs (b), (c) and (j) of Section 70 of the Water Act, dated 1 May 1964.

PRINCIPAL STORAGE DAMS

REGION Nº1.
1 LOSKOP
2 HARTEBEESTPOORT.
3 N'JELELE.
4 MARICO BOSVELD.
5 RUST DER WINTER.
6 OLIFANTSNEK.
7 BRONKHORSTSPRUIT.
31 ALBASINI.
32 STERK RIVER.
33 KROMELLENBOOG.
34 EBENEZER.
35 OHRIGSTAD.
36 BOSPOORT.
37 BUFFELSPOORT.
38 BON ACCORD.
39 LINDLEYSPOORT.
40 KLEIN MARICO.
41 RIETVLEI.
63 PIENAARS RIVER.
64 MAPOCHS.
65 WITBANK.
87 KLASERIE RIV.
89 ROOIKRAAL
90 NWANEDZI
93 KOSTER
99 GLEN ALPINE
100 PHALABORWA
102 KLIPVOOR
104 HELDORLET
111 VAALKOP X
113 MAGOEBAS X

REGION Nº2.
8 LONGMERE.
9 LOUWS CREEK.
70 NOOITGEDAGHT.
73 KLIPKOPJES.
101 MALELANE
112 KAFFERSKRAAL X

REGION Nº3.
10 VAALDAM.
11 VAALHARTZ WEIR.
12 RAND WATER BOARD BARRAGE.
13 KALKFONTEIN.
14 KAFFIR RIVER.
42 BOSKOP.
43 RUSTFONTEIN.
44 MAZELSPOORT.
45 MOCKES DAM.
66 SCHOONSPRUIT.
67 KOPJES. X
68 ALLEMANSKRAAL.
69 ERFENIS.
75 SCHWEIZER RENEKE..
76 KLERKSDORP.
77 KLIPDRIF.
107 OPPERMANSDRIF X
108 KRUGERSDRIF X

REGION Nº4.
15 BUCHUBERG.
16 VAN WYKSVLEI.
17 BRANDVLEI.
18 EGMONT.
19 SMARTT.
46 LEEURIVIER.
78 NEWBERRY.
105 HENDRIK VERWOERD X
106 P.K.LE ROUX X

REGION Nº5.
20 CLANWILLIAM.
21 BULSHOEK.

REGION Nº6.

REGION Nº7.
47 VOGELVLEI.
48 STEENBRAS.
49 WEMMERSHOEK.

REGION Nº8.
22 BRANDVLEI.
50 STETTYNSKLOOF.
51 KINGNA.
52 NUY.
82 DUIVENHOKS.
94 BUFFELJAGTS
95 KORENTE-VETTE. X

REGION Nº9.
23 KAMANASSIE.
24 BELLAIR.
25 VERKEERDE VLEI.
26 CALITZDORP.
53 BEAUFORT WEST.
54 FLORISKRAAL.
72 LEEU GAMKA.
80 OUKLOOF.
86 STOMPDRIF
98 PRINSRIVER
114 GAMKAPOORT X

REGION Nº10.
55 CHURCHILL DAM

REGION Nº11.
56 BEERVLEI.
71 TWEERIVIEREN

REGION Nº12.
81 GROENDAL.

REGION Nº13.
27 LAKE MENTZ.
28 VAN RYNEVELDS PASS.
79 BLYDE RIVER. C.P.

REGION Nº14.

REGION Nº15.
29 GRASSRIDGE.
30 LAKE ARTHUR
57 COMMANDODRIFT.

REGION Nº16.
58 ROOIKRANTZ.
59 LAING DAM.
109 NAHOON

REGION Nº17.
60 WATERDOWN.
92 LUBISI (GAMATA)
110 GUBU

REGION Nº18.

REGION Nº19.
61 UMGENI (NAGLE)
62 SHONGWENI.
89 MIDMAR
96 HENLEY

REGION Nº20.
74 NGAGANE
83 MNYAMVUBU
85 BUSHMANS RIV.
115 SPIOENKOP X

REGION Nº21.
84 PONGOLA POORT (J.G. STRYDOM)
91 HLUHLUWE
97 PONGOLA WEIR
103 USUTU RIVER

X IN AANBOU
UNDER CONSTRUCTION

DRAINAGE REGIONS

1. LIMPOPO
2. KOMATI RIVER
3. VAAL RIVER
4. ORANGE RIV.
5. OLIFANTS RIV.
6. WESTERN
7. SOUTH WESTERN
8. BREEDE RIVER
9. GOURITZ RIV.
10. OUTENIQUAS
11. GAMTOOS RIV.
12. ALGOA BAY
13. SUNDAYS RIV.
14. GT. BUSHMANS R.
15. GT. FISH RIVER
16. AMATOLA
17. GT. KEI RIVER
18. TRANSKEI
19. NATAL
20. TUGELA RIV.
21. ZULULAND

MAP OF THE REPUBLIC OF SOUTH AFRICA SHOWING PRINCIPAL RIVER SYSTEMS, IRRIGATED AREAS, AND STORAGE DAMS.

Irrigated Areas
Storage Dams- 5

Miles 100 50 0 100 200 Myl
1:5,000,000

Drawn in the Office of the Secretary for Water Affairs, Pretoria
Geteken in die Kantoor van die Sekretaris van Waterwese, Pretoria

(Amended 7-9-62) (Amended 2-6-67) (Amended 21-6-1960) (Amended 19-4-68)

REG. Nº 26717/50.

Collection Number: A1132

Collection Name: Patrick LEWIS Papers, 1949-1987

PUBLISHER:

Publisher: **Historical Papers Research Archive, University of the Witwatersrand, Johannesburg, South Africa**
Location: **Johannesburg**

LEGAL NOTICES: