LAKE KARIBA

Rhodesians Worldwide



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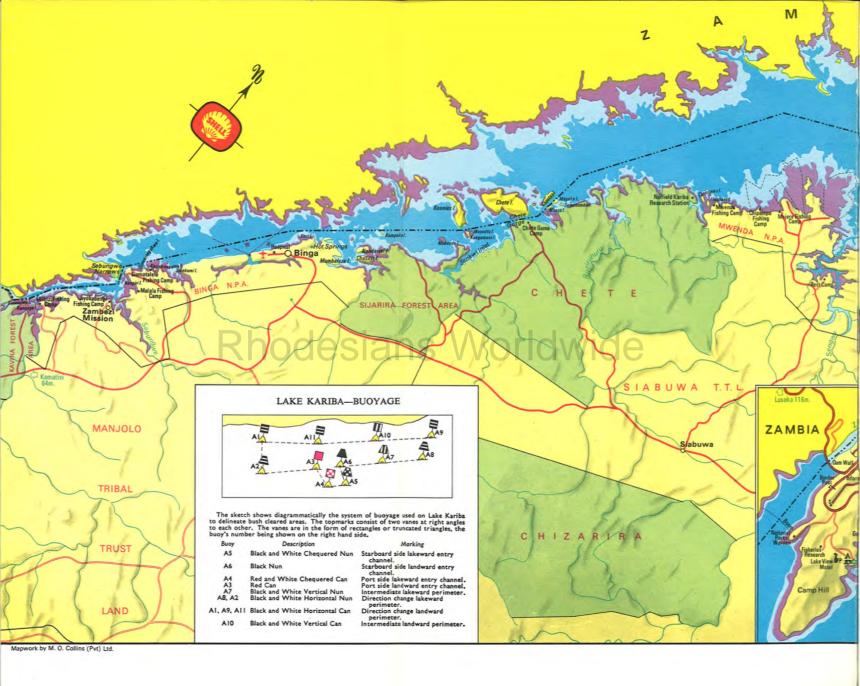
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All prices quoted are in Rhodesian currency.

MAP : OVER INSIDE COVERS

souvenir guide book





Souvenir Guide in pictures and story

LAKE KARIBA

COMPLETE MAP OF THE LAKE OVER INSIDE COVERS FRONT AND BACK



A ROUNDABOUT PUBLICATION, researched, written, designed, edited and published by Sarum Imprint (Pvt.) Ltd.; with many original photographs and others kindly contributed by the Rhodesia National Tourist Board; with due acknowledgement to Shell Rhodesia Ltd. for the use of their area map; to Frank Clements' "Struggle with the River God" (Methuen) used for reference and quotation; to the Central African Power Board for advice and material kindly made available; to Alex Deere, District Officer at Kariba, for generous assistance and advice; and printed by Mardon Printers.

Kariba — inland sea

THE great Lake and its surroundings, except for the south-eastern end where civilisation has encroached, are as wild and raw as the fish-eagle's cry. The loneliness of these unchanging escarpment lands is, for the most part, unbroken except for sparse settlements of Batonka people who see themselves as a part of this unchanging Africa where the elephant and lion walk, the buffalo roam in herds of hundreds and the wart-hog scuttle across their path. The days are silent in the heat as they were a thousand years ago—the sunsets blaze and the dawns shimmer, the camp-fires smoulder and round them men huddle and talk together as they have done since history's beginnings—only the Lake is new with the fish it has nurtured by the million.

The Lake is steadily becoming more of an inland sea. It has waves, beaches, jelly-fish, plankton and shrimps and, more recently, the remarkable spectacle of gulls and terns diving for sardines. Merely to look at it, to voyage across or along it is a glorious experience.



The very word Kariba (a corruption of the Shona "Kariwa") implies menace, doom and terror. All traditional stories behind the name refer to a rock or rocks thrust out of swirling waters (now 200 feet below the lake surface) which caused canoes or people venturing too close to be sucked down for ever into a bottomless whirlpool. "Riwa" is that part of a trap which falls upon and crushes its victim and this well describes the ruthlessness of the river god. It was the Batonka practice to propitiate the river god by tossing gifts into the swirling waters.



The Dam wall by floodlight with three of the floodgates open. (Photo: R.N.T.B.)

What to do at Kariba

 $K\mbox{ARIBA}$ is a lake-land; and though at various resorts there are pools to swim in, trampolines for limbering up, tennis courts, chip-and-putt, with other traditional holiday amenities, Kariba's unique fascination is its water and water-side activities.

Excursions by boat offer game-viewing, fishing and just lazing. Camping and caravaning delight the bush-lovers; air-trips give you a birds-eye view of Africa in the raw and scenic drives present fantastic views of the Lake and reveal how the township was scraped out of the hillside when you could still look down into the awesome depths of the gorge and work on the dam began.

The Dam Wall

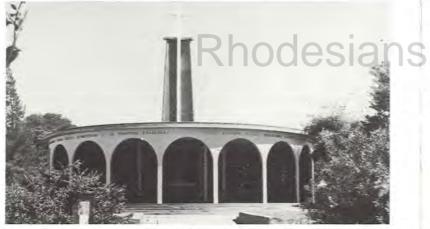
A drive to the dam wall is recommended for a wonderful view of the downstream turmoil in the gorge, when the gates are open, and some appreciation of the dam-building achievement described on pages 20 to 43. You are allowed on to the car park at the Rhodesian flank of the dam wall but permission must first be obtained from the Immigration Officer at the border post at the entrance to the wall, open daily from 6 a.m. to 6 p.m. from 1st April to 30th September and from 6 a.m. to 7 p.m. from 1st October to 31st March.

Kariba Township

Kariba township, 1 200 feet high on a hill overlooking the Lake, is reached by a fully-tarred highway which winds its way upward with frequent magnificent views of vast expanses of the Lake. Dominating the township is the Roman Catholic Church of St. Barbara, built by the Italian builders of the dam in memory of those who lost their lives in the dam's construction.

This striking open-air Church, designed by Igor Leto (winner of a design competition open to all the staff of Impresit), presents an allegory of a working partnership between nations. The colours red, white and green (the colours of Italy's flag), and red, white and blue (at that time the colours of Rhodesia) are featured on the walls and statues. Around the perimeter are carved the figures of St. Catherine of Sienna (for Italy), of St. Joseph for carpenters and simple workmen, St. Barbara for the underground builders and workers, and St. George for England.

Kariba has an airport, hospital, post office, its own school, clubs, shops, banks, sporting facilities and over seventeen miles of macadamised roads. Along the shoreline hotels, boatels, motels, caravan and camping sites accommodate thousands of tourists from all over Rhodesia and beyond her borders.



Count all the human victims of the Kariba project, from the African bearer snatched by a crocodile during an early survey expedition in the 1930's to the Italian welder accidentally electrocuted in 1959, and they amount to perhaps 300—less than a month's traffic toll in a modern metropolis. They are commemorated by a plaque in the Italian-built church of St. Barbara, high on Kariba's hill with the inscription Ad memorium omnium Karibae defunctorum. The open-air design o the church is practical in extreme heat, attracting cool breezes from the Lake.



When first Italian, British and French engineers began to bring their wives to live at the dam site from 1955 on, families were housed in portable housing units called terrapins. But, starting only 48 hours after their two-year contract was signed, Richard Costain built, in 19 months, enough houses on the terraced hillsides to make Kariba the sixth largest town in the then Federation of the Rhodesias and Nyasaland (bigger even than Nyasaland's capital). Since everything from bulldozers for terracing to door-knobs and sinks had to be transported over 200 miles of still largely primitive roads, their achievement was remarkable. These are the houses (which, at the height of occupation accommodated 10 000 people) you see still perched on the hillsides today.



This fresh-water lake has many islands, some still inhabited by animals, but many completely empty of life other than birds, snakes and insects.

tree most conspicuous although the weird baobab is also plentiful. Dozens of footpaths leading into the hills and along the water's edge offer pleasant walks in the winter months. By the mouth of the Msuna River is a giant, lone baobab, 4.57 m (15 ft.) in diameter and over 1 000 years old.

Besides fishing, the favourite sport, the many miles of calm waters make boating a popular pastime too. Boats with outboard motors can be hired at reasonable rates, experienced African pilots assisting newcomers in the art of catching their first tigerfish, or giant vundu, which may weigh up to 46 kg (100 lb.), or the bream (tilapia), Hunyani salmon, purple mudsucker, yellowfish, n'kupi, chessa, cornish jack, bottlenose and others.

You can take a spectacular boat trip upstream to the point where the current of the mighty Zambezi river pours into the Lake. There are numerous islands, each rich in birdlife, with the ever-present fish-eagle, perched on a treetop or hovering over the water, ready to dive for fish. Hippos and crocodiles are nearly always around the islands but buck and kudu can be seen on two of the larger islands. There are many picnic



The lonely cry of the fish-eagle is unmistakable. (Photo: R.N.T.B.)

spots on the Rhodesian islands which the guide will indicate.

Another journey six miles downstream to the Devil's Gorge is worth while. Due to the steep sides picnicking is rather hazardous but this is compensated by the sheer grandeur and tranquility of the 18-mile gorge.

WARNINGS: for important Lake-going precautions. See page 41.

This is a big lake. When there are mists all sight of shore can be lost. Passagemaking at night is dangerous as there are no navigating lights and islands, floating trees and rocky outcrops provide hazards without warning. No motorboat should set out without more than sufficient fuel for the outward and return journey and some navigational aids such as a compass and map, if not a chart. You can be fined for excessive speed on the Lake.

The Lake has two dangerous enemies to man—the crocodile and bilharzia. Never swim under Kariba weed (a favourite hide for crocodile) and beware of bilharzia, a serious disease carried by a certain variety of snail, particularly near habitation. It is generally considered safe to swim in the middle of the Lake.

There are no difficulties for visitors bringing their own boats for cruising in these waters. Most of the hotels at Kariba have launching facilities, and these are also available in Andora Harbour.

FISH INDUSTRY

Lake Kariba was seen to offer a vast new fishing industry for the lake-shore inhabitants. Since trees don't rot but petrify under water the fish-feeding grounds of the future had to be cleared of trees and shrubs and this gargantuan task was undertaken at a cost of over \$4 000 000. Three hundred and fifty square miles were cleared to ground level-enormous Baobabs with a girth of 50 ft. or more, dense riverine forests of acacias and acres of thickly tangled bush were cleared to ground-level by a specially developed ball-and-chain method. Mammoth 8-ft. steel balls linked by battleship chain were dragged by groaning, shrieking bulldozers, flattening everything in their path. Once flattened the trees and scrub were windraked and burnt. Fifty acres a day were cleared in this way and thus clear fishing waters were secured and later stocked with 750 000 fish fingerlings a year until 1963. Fishing camps marked on the map on the inside covers (e.g. Nematombo, Mudzimu, Nyamhunga, Dandawa) are commercial camps where the Lake's produce is dried ready for collection by central marketing organisations. There are no tourist amenities there, though occasionally a rudimentary store.





PYLON STORY

At dawn or sundown a drive along the power-line clearing near the resorts often reveals a marvellous selection of game. Through 900 miles of rugged bush and forest a 100-yard-wide corridor was cleared across which now stride 4 271 gaunt pylons supporting the grid carrying power from Kariba to industrial centres north and south of the dam. The cutting of the corridor, transportation and erection of these pylons, each standing up to 122 ft. high and weighing 71 tons, and the mounting of the cables across so great a mileage, was in itself a saga. When both stages are in full production the power-houses will eventually produce electricity at 1/2 cent a unit generating cost.

LEFT: Although many miles of the Lakeshore were cleared of trees for commercial fishing there are many areas where the petrified trees remain as silent reminders of the past. tree most conspicuous although the weird baobab is also plentiful. Dozens of footpaths leading into the hills and along the water's edge offer pleasant walks in the winter months. By the mouth of the Msuna River is a giant, lone baobab, 4.57 m (15 ft.) in diameter and over 1 000 years old.

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The Lake Access Road

THE Lake Access Road (see the maps on the inside of the covers) stretches 312 miles through almost uninhabited country from Karoi at the eastern end to the main Wankie/Victoria Falls road at the western end. It gives access to the almost undeveloped southern side of the Lake and is the only means, by land, of reaching:

- (a) Matusadona Game Reserve: 108 miles from Karoi, or 204 from the Wankie road, take the turn-off north—20 miles will bring you to the Game Reserve. Turnings are signposted.
- (b) Bumi Hills: 132 miles from Karoi, or 180 from the Wankie road, take the turn-off north—40 miles will bring you to Bumi Hills. Turnings are signposted.
- (c) Binga: 220 miles from Karoi, or 92 miles from the Wankie road, take the turn-off north-12 miles will bring you to Binga.
- (d) Msuna-by-the-Lake: 270 miles from Karoi, or 40 miles from the Wankie road, will bring you to Msuna-by-the-Lake.
- (e) Chizarira Game Reserve: turn south about 160 miles from Karoi, or 150 from the Wankie road (about 15 miles west of the Siabuwa Store), at the Muchena River. Ten miles up the escarpment brings you to the game reserve, which is almost totally undeveloped but offers magnificent game. Four-wheel-drive is essential and there are no facilities.

The Lake Access Road runs parallel to the Lake with only rare glimpses of the great stretch of water some 30 miles to the north. Except for the Wankie end which is tarred this road is good gravel, sometimes corrugated, but in dry weather rarely impassable. It is not suitable for caravans and smaller cars should drive with caution. It is definitely not recommended in the rainy season.

There is no guaranteed supply of fuel although there is a pump midway at Siabuwa Store. Petrol is usually available at Bumi and Binga but as both are off the main road it is essential to carry enough fuel for the whole journey. Supplies of drinking water and some provisions are also advisable—in the event of a breakdown there may be a wait of a couple of days before the arrival of the next vehicle.

Generally speaking the road is rough but passable with care. It connects the two great tourist centres of Kariba and Victoria Falls and when tarred will provide quick, easy access to some of the finest game reserves in Africa.



The Sanyati Gorge has many moods, none more peaceful than in the quiet of the evening.

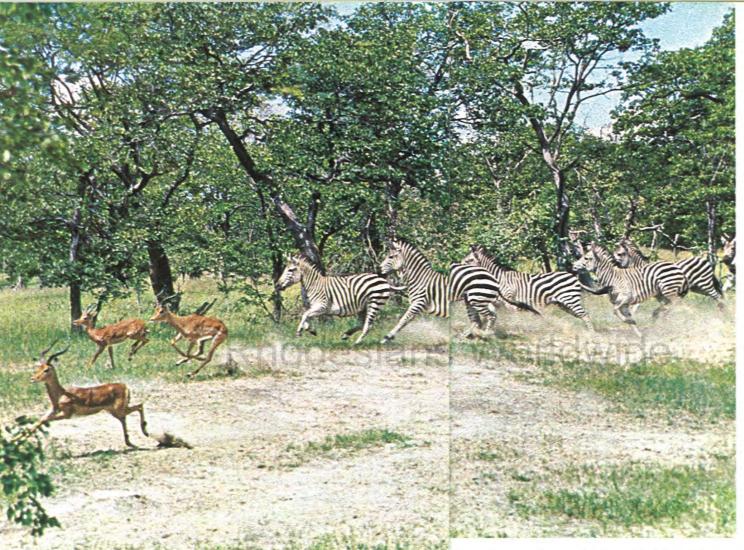
Matusadona

MATUSADONA GAME RESERVE is one of Africa's newest, least developed but most interesting game reserves. It covers 540 square miles of almost unexplored country stretching south from the Lake to the natural barrier of the Matusadona Mountains, and west from the Sanyati to the Umi River near Bumi Hills.

Game can be viewed by car or from the Lake itself, a unique and comfortable means of game-viewing at close quarters.

Only the giraffe is missing from the extensive list of over seventy species of game living in this game reserve—elephant, lion, leopard and buffalo are spectacular, but equally widely distributed are impala, duiker, sable, waterbuck, zebra, kudu, bush buck, steenbuck and the occasional roan antelope, while the wild pig and the warthog scuttle through the grass.

A safari company operates in the Game Reserve, providing vehicles for game-viewing on land and boats for lake trips and fishing. Here they have their own comfortable camp featuring a friendly evening get-together round the fire. They offer an expert knowledge of game and fishing and provide a much sought-after vacation.



Game is plentiful around Lake Kariba. The various species happily share the same feeding grounds but are selective in their choice of vegetation. (Photo: R.N.T.B.)

The Government Rest Camp at Matusadona has a particularly beautiful setting amongst trees on the edge of the Lake, with an excellent ablution block (hot and cold water, showers, baths, toilets, etc.), firewood, and superb sunsets. Although chalets are planned none are yet built and camping arrangements are therefore entirely in the hands of the visitor. It is possible to reach Matusadona from the Lake Access Road running from Karoi to Wankie (the turn-off is 108 miles from Karoi). A good car is obviously advisable, both to reach the camp and to tour the area, but the dirt roads are in reasonable condition and should provide no formidable hazards. There is no charge either for entering the Reserve or for camping. Particular requirements for safety are the same as in all game reserves: stay in your car, do not provoke the animals, observe the speed limits and generally appreciate that this area is completely untamed.

There are no launching facilities along the shore but a car-top dinghy (or a small boat that is easily manageable) would undoubtedly be an asset and provide many hours of pleasure. The fishing is good and the Sanyati Gorge and Bumi Hills are both within reach.

Most of the commercial boat tours offered at Kariba include a brief visit to Matusadona, but it is an area in which it would be well worthwhile to spend a few days rather than a few hours.

The nearest source of fuel and provisions is at Bumi Hills (four miles by boat but 65 miles by road) so that it is essential that any visitor should be completely self-sufficient. You should report to the Game Warden on arrival.

The dam wall at Kariba holds back a phenomenal quantity of water (149 000 000 acre [feet) creating over 2 000 square miles of lake. It is the second largest man-made lake in the world. (Photo: R.N.T.B.)



Crocodiles by the thousand are hatched and bred in captivity from eggs collected from the warm sandbanks around Lake Kariba. By law, a high percentage of each hatch has to be returned to the Lake to maintain the balance of nature. In their natural state very few of the thousands hatched reach maturity—instead they are consumed by birds and fish. (Photo: R.N.T.B.)

See the baby crocodiles

CROCODILES are fairly plentiful in the Lake but they are shy creatures and therefore rarely seen at close quarters.

There are, however, two crocodile farms where they can be closely studied and visitors can handle the young ones although warned that, though only a few inches long, they can still inflict a nasty bite. Both these and the mature twelve-footers (or even larger), lying still but watchful in their walled pools, provide opportunities for unusual photographs.

The crocodile farm at Kariba can be reached by car (the turn-off on the main road to Kariba is signposted near the Airport) or by launch from Kariba. The latter provides opportunities for seeing game along the Lake shore, particularly elephant.

The crocodile farm at Binga has been in existence longer than the Kariba farm and therefore has more of the fully-grown creatures. It is reached from the Lake Access Road with a turn-off to the right, signposted Binga, some 220 miles from Karoi.



Earthquake and climate

WHEN Lake Kariba was complete an enormous new weight of water was placed on the earth's crust. This weight, estimated at 16 000 million metric tons, was then the largest load man had ever placed on the earth's crust at any one place. The creation of the Lake led to a depression of the land that could be measured as far back as 36 km from the Lake.

Seismic activity began in an area that was previously inactive, although there were isolated reports of earthquakes in the Binga area. These probably originated in one of the known active faults in the area.

The dam wall was sealed on 2nd December, 1958, and the first recorded earthquakes occurred in June 1959, when the water-level had risen 60 metres. A basal level of activity was established and this continued until July 1963 when there was a rapid increase in activity, culminating in the "earthquake swarms" of September to November 1963. By September 1964 it had returned to a fairly steady level. Almost all of the activity and the larger shocks occurred in and around the deep Sanyati Basin.

The creation of a new inland sea, with evaporation at the rate of about 75 in. a year, has only slightly affected the climate. Rain is now more gentle and storms less sudden and violent, lasting longer. Instead of tempestuous, torrential, concentrated falls, daily rains of less than 2 in. are now normal during the season (November to March), occasionally reaching 3.4 in. in one day. Generally speaking the air is slightly moister than before but, though clouds are continually forming over the Lake the effects of this humidity are dissipated quickly by the prevailing north-east winds blowing towards Botswana. Twenty miles from the Lake shore no appreciable climate difference is detectable. The Lake clouds, however, are a useful marker for approaching aircraft.

Average temperatures, varying from 10° °C. in July to 35°C. in October, are much as they have always been.

Operation Noah

FROM the very start Kariba was world news but no aspect of the operation gained wider coverage than the rescue operations dubbed Operation Noah.

As the waters rose at the sealing of the dam, the silence of the primeval lands was broken by the agitated buzzing of insects, the anxious chattering of the small-fry of the animal kingdom and the angry, desperate cries of the larger game beasts trapped on the many small islands formed by the encroaching man-made sea. Only a fraction of these animals had a chance of escaping death through drowning and starvation.

Every flood year, through aeons of time, thousands of animals had suffered a similar fate without making world headlines. But man's contribution to their plight in the year the dam began to fill aroused world interest and the Government was soon inundated with cables, letters and TV cameramen from all over the world.

Thousands of pounds were raised overseas to help rescue the doomed game: hundreds of thousands of nylon stockings were dispatched from all over the world to bind threshing legs without pain. The S.P.C.A. of Johannesburg offered a boat to lift the animals from the diminishing islands.

Soon game rangers were stationed in Kariba to help rescue trapped animals and time and again these brave men risked life and limb as they handled the desperate struggling beasts. The smaller game were caught in nets and transported over the water to dry land by boat. Elephants and larger game were driven into the water and assisted in their long swim ashore by ramming and pushing with poles.

It will never be known how many animals perished in the rising waters, but hundreds were saved and launched into new territory on dry land.





Two hundred and twenty miles downstream from the Victoria Falls, the mighty Zambezi River plunged furiously, until 1958, into a seemingly fathomless gorge. Eroded through the centuries the sheer rock walls towered four hundred feet above a massive flow of water suddenly confined to menacing narrows. This was the Kariba Gorge, an awesome place famed throughout primitive Central Africa as the unassailable domain of Nyaminyami, the wrathful river god, whose

rocky citadel thrust its impregnable fingers from the swirling waters at their deepest and darkest whirlpool.

Kariba Gorge gashed a wild surrounding plain as raw and undeveloped in 1955 as it was in Livingstone's time.* Today, vast tracts of these lands lie under lake waters and the river is contained by a massive concrete-arch dam wall, 420 ft. high, forming an inland sea to an area of 2 200 square miles, with a shoreline of 800 miles, a maximum depth of 390 ft. and a length of 175 miles.

And Nyaminyami? Many believe that he still slumbers deep in his submerged gorge, biding his time for revenge against those who dared to challenge his power.

PICTURE RIGHT: Kariba Gorge before damming. Along the line of this old river-bed runs the boundary between Rhodesia and Zambia.

The dam Builders's \five-year saga

WHEN the dam builders began their assault on the gorge in 1955, the only inhabitants for hundreds of miles around were the elephant, rhino and hippo, the tsetse fly, malaria mosquito—and the primitive Batonka people until then captive under tribal lore and untouched by civilisation.

Even today most Africans believe in their old ancestral spirits and many more centuries may pass before the African people are freed from their tribal fears and brutalities. "To them Nyaminyami is still as real as Jehovah was to the ancient Israelites."

By the French, Italian and British engineers who designed and built the dam the setback of unprecedented floods in 1957 and 1958 were officially designated unfortunate freaks. But to the Batonka and neighbouring tribes the floods were clear and inevitable manifestations of divine displeasure; and even the 1 500 Italian workers, as they battled against a succession of unforeseeable disasters, became obsessed with the feeling that they were fighting

* Though Livingstone is believed not to have visited Kariba in his 1855-58 travels, his diaries do refer to another gorge, further downstream, called Kariuwa.

against unknown forces. Thus the dam-building story of massive technical achievement may also be seen as a battle to the death between a primitive god and contemporary man.

Shorn of the saga of its construction, Lake Kariba today is perhaps "just another dam" though at the time of its completion it was the largest man-made lake in the world (now it takes second place to Bratsk in the U.S.S.R.). Yet the geographical position of this inland sea, set in the heart of a vast expanse of primeval country where game of all descriptions still immeasurably outnumbers man, has unique drama.

Early exploration

The final harnessing of the river crowned centuries of sporadic exploration and endeavour. From 1667 when explorer Manuel Baretto, Portuguese Captain-at-arms, described the middle reaches of the Zambezi as a country where "only birds can fly or serpents crawl", it seems doubtful if any of a long line of intrepid explorers up to 1877 (Selous) ever entered the gorge though many had heard of it from the Batonka people, ravaged through the intervening years by brutal slave raids.

Ever since Dr. Livingstone's unsuccessful efforts to establish the Zambezi's navigability, attempts have been made to exploit the river's massive power.

The gorge was first surveyed by Steer in 1891, reconnoitering a possible north-bound railway route to bridge the gorge at Kariba. Then, in 1898, an expedition led by Major A. St. H. Gibbons, attempting to navigate the river from its mouth up, was forced to dump overboard one of two boilers powering his 36-ft. dual launch-though on tribal advice he had attempted to propitiate the river god by tossing wine and calico into the angry waters swirling around Nyaminyami's rocks. Forty-four years later, jammed between two rocks, this jettisoned boiler was found by hydro-electric engineers in charge

of preliminary investigations for the dam.

Also in 1898, soon after Gibbons' abortive attempt, Sir Charles Metcalf pursued the idea of a railway bridge across Kariba Gorge but later sought a route by way of Wankie Coalfields.

In 1912 H. S. Keigwin, the then Native Commissioner at Sinoia (some 156 miles from Kariba), made a careful study of the gorge, commenting in his report: "The damming of the Zambezi at the Kariba Gorge where the river tears through a narrow, rockbound channel about some thirty yards wide, presents a scheme for the irrigation of the valley which would fire the imagination."

continued on page 27

Rhoesia

February 1958 and the flood-waters were rising (see page 39). The coffer dam technique provided areas of dry river-bed to make construction work possible.

TOP LEFT: The mass of water pours through the open dam gates into the gorge. TOP RIGHT: The dam wall by floodlight. BOTTOM LEFT: The complete Power House in the colourful Machine Hall. BOTTOM RIGHT: The Lake at sunset. (Material by courtesy of Central African Power Corporation.)









Statistically Speaking

At the time of its construction Kariba was the biggest man-made lake in the world. Today, at its normal operating level of 1 590 feet above sea level, it ranks second only to Bratsk in the U.S.S.R.

The cost of Stage 1, including the dam, south bank power/station and associated transmission system, was approximately \$156 000 000.

The double curvature arch dam has a maximum height of 420 ft.

At the crest, the wall is 2 025 ft. long.

Rhodesia and Zambia are linked by a 40-ft.-wide road across the crest.

The wall contains approximately 1 375 000 cu. yd. of concrete.

Six floodgates, each 30 ft. by 31 ft., are set into the wall.

With all six floodgates open at normal operating level over 300 000 cu. ft. of water (nearly 2 000 000 gal.) fall into the river below every second.

Kariba Lake is 175 miles long and, at its widest point, about 20 miles across.

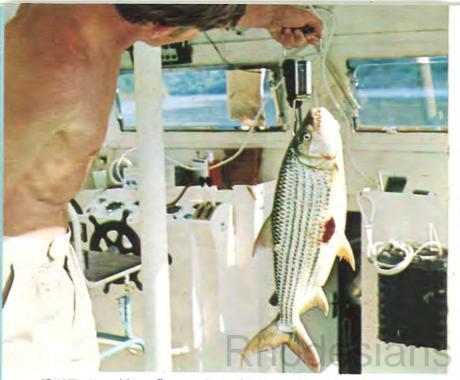
The Lake covers 2 000 square miles —an area about the size of Wales.

At its deepest the Lake is 380 ft. at normal operating level.

The weight of the water is 177 000 000 000 tons.



Kariba lake-side bounty



ABOVE: Tiger fishing offers many hours of sport.

BELOW: The Lake provides a magnificent playground and many visitors bring their own boats or hire them from local operators. (Photo: R.N.T.B.)



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From 1925 on, the Southern Rhodesian Government was considering the power potentials of the gorge. Costly hydro-electric surveys followed one upon another until, in 1946, a Hydro-electric Power Commission was appointed with a purse of \$164 000 to investigate the comparative potentials of Kariba and Kafue as sources of power. A measuring station to gauge Zambezi flow was set up at Chirundu and a camp established downstream from the eventual dam wall to collect data on river behaviour.

In 1951 the Commission reported Kariba to be the more suitable site and urged an immediate start. After further confirmation by an independent mission sponsored by Electricité de France, all comparative reports were put before André Covne, the brilliant French consulting engineer and expert on hydroelectricity. It was finally on his recommendation that, in March 1955, the then Federation of the Rhodesias and Nyasaland pressed the button for "all systems go" on the Kariba dam and hydro-electric project.

Decisions

Now matters began to move at speed.

Final technical considerations, award of contracts and financial underwriting, usually consecutive, were concurrent in the case of Kariba. Consulting engineers appointed were Gibb, Coyne and Sogei (a combination of London's Sir Alexander Gibb and Partners, Coyne and Bellier of Paris and S.G. d'Exploitations Industrielles). And, for an immediate start, a contract valued at \$3 118 000 was awarded to Cementation-Laing Ltd. for the construction of a diversion tunnel to be gouged out of the solid rock of the south bank. The Italian company Impresit, having successfully tendered in open world-wide competition, took over the main civil engineering responsibility for the construction of the dam in September 1956—a \$50 000 000 contract.

Finance

The scheme's estimated cost was \$160 000 000 for the first stage and \$228 000 000 for the completed project. The first stage actually cost \$155 216 222, nearly \$5 million less than estimated. First power from Stage 2 (Zambia) is due in 1974. A sum of \$57 200 000 was borrowed from the International Bank. The copper mining companies, whose urgent need for power motivated the whole Kariba scheme, contributed a loan of \$40 000 000 and other loans in terms of millions were made by the B.S.A. Company, the Standard Bank and Barclays Bank, the Federal Government, the Colonial Development Corporation and the Commonwealth Development Company of London.

Access roads

From the start in 1955, construction raced to beat the onset of the torrential December rains which, even in normal years, could isolate Kariba for four or five months at a stretch. If the vital access roads were not pushed through before the rains a year's setback in the building of the dam would inevitably result.

The first challenge, therefore, was the construction of viable access roads.

In the early forties the only approach to Kariba was along a winding bush track which, as it dropped 3 000 feet into the gorge, was used more by elephant, buffalo and rhino than it was by man. Heat and haze obscured every horizon, thorn and thicket imprisoned the traveller struggling to negotiate hillsides made treacherous by scree. Even in the stifling shade temperatures often hit 100° or 120° F.

When in 1955 consultant André Coyne paid his first visit to the site with Sir Malcolm Barrow (then Minister of Power) and J. H. R. Savory (Department of Irrigation) two lorries carrying camping equipment for their party of ten were bogged down five miles along the track from Makuti and were only rescued a week later by bulldozer.

The estimated cost of building the necessary 50-mile gravel road was as much as \$2 000 000. But time was a vital factor-an all-weather road to carry heavy traffic had to be completed. Experts said it could not be done but "Irrigation" Savory. well-versed in veld lore, knew that Africa's most skilled and cunning road-maker was the elephant. If he could ignore the official surveys and build instead along paths trodden by elephant for hundreds of years he undertook to give the Power Board on time the road they so desperately needed.

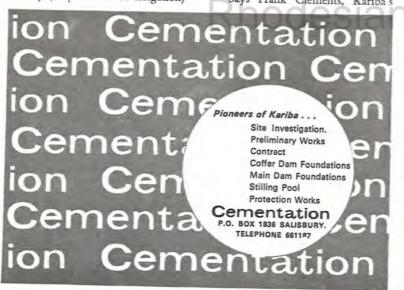
Says Frank Clements, Kariba's

first biographer: "With almost impudent gaiety the young engineers of the Irrigation Department went about their task, working as much as 150 hours overtime a month. In the army fashion which was still in the memories of most of them they "won" a large scraper which seemed to them to be inadequately employed at the new Kentucky Airport in course of construction at Salisbury. They went off to distant Nairobi and Lourenco Marques for machines. One Euclid was driven 825 miles from Mbeva in two days, a rate of progress which would be exceptional for a fast car, and was put to work on the third day. One suspects that it is almost shamefully that the official record states 'other plant was

hired'."

The road advanced. Each individual triumph over particularly difficult sections they marked by name—Camp Hill, Razor Edge, Kidney Hill, Puff Adder Ridge, Buffalo Nek, Rhino Nek. Each landmark had its own story to tell and is commemorated on Government Survey maps Nos. S.E. 35/4 and 1629 A 3. Further on "Savory's Folly" (a name which could triumphantly title the entire road) marked a stretch which "no road engineer could bear to look at—there was just no way through".

But this all-weather road just had to go through—and it did. With less than 48 hours to spare the old elephant path began to carry its burden of huge, heavily-laden trucks



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rumbling their way towards the gorge—and on 2nd December the first tempestuous rains fell.

The fine tarmac road you now follow by-passes much of this original gravel road but often you can detect traces of its tracks among the encroaching grass and tangled bush to right or left.

It was now that construction work on the dam itself began in earnest. Building the dam

The first task in the construction of the dam wall was the diversion of the river so that foundations for the wall itself could be excavated and constructed on the river-bed. Since the full-flood flow of the Zambezi would be too strong to be handled by a single diversion a number of partial diversions had to

be undertaken, construction work being carried out within a series of coffer dams.

To establish the stresses and strains which these coffer dams, and the finished dam wall, would have to withstand, an exactly proportionate model (with a dam wall 2 ft. high by 6 ft. wide) was constructed in Grenoble whereby intricate calculations were made with delicate strain gauges.

The next problem was to span the gorge, first by cable-way and soon afterwards by foot-bridge. This alone cost \$38 000 and came into use in May 1956.

The temporary road bridge, which would eventually be superseded by the road topping the dam wall itself, cost \$126 000 and was

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This view across the Lake gives some idea of the distances involved. There are many occasions when the far shore disappears in a heat haze. (Photo: R.N.T.B.)

FUEL BATTLE

The supply of petroleum products to the entire undertaking was the main concern of Shell. In mid-1955, when initial work on the project began, lorries up to five tons wound their hazardous way down the escarpment track. But to maintain continuity of supply a decanting depot was established at Makuti on the main north road where 3 000-gallon bulk lorries with 1 000-gallon trailers transferred loads to smaller lorriesbut even these found it difficult to negotiate the dips and gulleys and often had to be hauled out by tractors and bulldozers. In all, 11 000 000 gallons of Shell fuels were delivered to the dam site during construction. African transport drivers were specially trained in pairs to operate the vehicles. As the main contractors were Italian all fuel and lubricant containers were marked in both English and Italian. Shell produced two English/Italian dictionaries of engineering and automotive terms especially for Impresit.

F.I.B.



office in the Lake View Inn foyer

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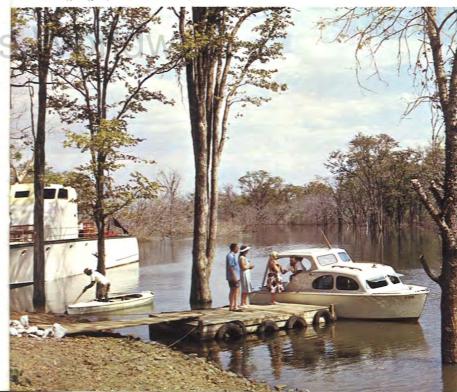
Enquiries phone: Salisbury 28881 Kariba 420

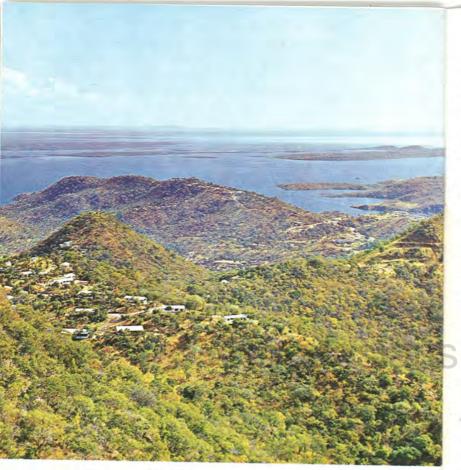


LABOUR RECRUITING

Much African labour for dam construction was recruited from Bechuanaland and Portuguese East Africa because unfounded rumours about working conditions at Kariba were slowing up the supply from Nyasaland, initially the main recruiting centre. Over and above their food, keep and housing an ordinary labourer could earn from \$12 to \$80 a month plus clothing and fares to and from their home. Recruiting films were prepared and shown to encourage enrolment and the African labour force at its zenith topped 7 000.

This camping and caravan site is in shady surroundings and inevitably has a landing-stage. (Photo: R.N.T.B.)





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MAIN CONTRACTORS FOR THE BUILDING OF KARIBA TOWN

continued from page 33

one bank to the other and was finally sealed on 2nd December. Then water began to be impounded behind the wall construction. This marked the birth of Lake Kariba, now 200 miles in length. The official completion date of the dam wall was 22nd June, 1959, and the dam was formally opened on 17th May, 1960, by Britain's Queen Elizabeth the Queen Mother. All six turbines were in operation by March 1962. Flood disasters

In November 1956 heavy rains began to fall a month earlier than usual and the Zambezi River began to swell with storm-waters from the catchment areas. By February 1957 the first flood warnings were received and early in March came the first fantastic onslaught.

A 15-mile-an-hour current tore through the gorge, the piers of the road bridge trembled, water rose 18 ft. in 24 hours when the Sanyati River spate joined forces with the Zambezi's. The coffer-dam was over-topped but, though the water rose above the road-bridge level, the bridge itself was saved for this year.

But in February 1958 the Zambezi flood-waters again swept down, this time with unprecedented fury and 50 per cent more volume of water than ever previously recorded. The road bridge which last year had been reprieved was carried away in one cataclysmic instant. The waters rose 110 ft, above low-water level and 10 ft. above the previous year's peak. Fifteen-foot waves cut swathes out of the river banks. Finally the coffer-dam was breached, the suspension foot-bridge too was swept away in the fury of the raging waters. The rain that half Europe gets in a month swept through that channel and the gorge was recaptured by the river flowing at the rate of 3 500 000 gallons a minute.

Floods of a magnitude which, it had been calculated, could only happen once in 10 000 years had chosen this crucial time to clear the fruits of men's labours from the field of operations.

In March 1958 the floods struck and the coffer dam was breached and inundated. (Compare photo p. 22.)





Andora Harbour provides shelter for many of the Government vessels used on the Lake. (Photo: R.N.T.B.)



Lake-going precautions

Lake Safety Control Stations provide radio coverage of the Lake from 6 a.m. to 7 p.m. on weekdays, and from 7 a.m. to 12 noon and 2 p.m. to 5 p.m. on Sundays.

They are situated at:

(a) Kariba;

b) Sinamwenda, 70 miles from Kariba;

(c) Binga, 110 miles from Kariba.

Kariba control station is open to visitors, and the duty controller will provide any information required. There is a large chart of the entire Lake which can be studied and, from the control stations, the north-east section of the Lake is visible.

Lake users are encouraged to obtain weather forecasts and up-todate navigational information from the duty controller before setting out on a trip.

Registration of Boats

All vessels over 5 tons and vessels used for the purpose of hire and reward must be surveyed, and private vessels under 5 tons must be registered with the District Commissioner, Kariba or Binga. Other privately owned boats registered elsewhere, and not used for hire and reward, may be used for short periods on the Lake.

Safety Precautions

Heavy squalls can rise quickly on the Lake. Where one part of the lake can be quite calm, another part can be very rough, and the following precautions should be taken:

With due acknowledgements to Shellgas of Rhodesia.



- (a) Consult the Lake Captain or Duty Controller (Telephone Kariba 289) before departing;
- (b) Each person should have a life-belt available;
- (c) Avoid night travel;
- (d) Let your hotel, motel, boatel or Lake Controller know where you are going and your expected time of return;
- (e) Carry sufficient fire-fighting extinguishers for the type and size of boat;
- (f) Have adequate pumping and bailing equipment;
- (g) Check for petrol leaks and that ventilation of fumes is adequate. Petrol fumes are heavy and remain in the bottom of a boat; a flame or spark will cause the fumes to explode;
- (h) Carry a flag to attract attention if in distress by day, and

a torch in case you are delayed on the Lake until after dark. The light should also be used at night, to be seen by an approaching vessel in time to avoid a collision;

- Most of the larger vessels are equipped with radio and will pass a message to the control station if you are in trouble;
- (j) It is better to spend the night in the shelter of an island than to risk a return passage through rough weather;
- (k) Proceed at dead slow speed in harbours and when passing vessels at moorings (you can be fined for excessive speed on the Lake);
- (1) The border between Zambia and Rhodesia runs through the Lake, but is not buoyed. Make sure you know where it is and keep as close to the Rhodesian side as possible.



Water-skiing is a favourite sport with long runs. Tuition is available at many of the Lake resorts. (Photo: R.N.T.B.)

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- SMELL OF GAS IN THE BILGES: Close the cylinder valves and ventilate boat. Remove pockets of gas by placing

Boating facilities at Kariba

The Ark Lake Services: 1½- to 2-hour lake cruises from unique "Lakequarium" harbour. Phone 366, Box 12, Kariba.

Cutty Sark Hotel L**: 1½ to 2hour lake cruises to Crocodile Farm, \$2.75 per person. Telephone 321, P.O. Box 80, Kariba.

Kariba Heights Hotel L**: Arrangements can be made by the hotel for the hire of boats. Telephone 364, P.O. Box 88, Kariba.

Lake Charters: Two boats for hire at \$22 per half-day including fuel and fishing-tackle. Full day, \$28 plus fuel. European skippers, gameviewing catered for. Telephone A. Hodson, Southern Cross Safaris. Telephone 321, Kariba.

Lake View Inn: Seven boats for hire at \$20 per day, \$12 per half-day (fuel extra); water-skiing \$3 per hour (includes skis—fuel extra); 20to 25-mile lake cruise \$2 per person. Telephone 411, P.O. Box 100, Kariba.

Lake Safaris (Buttevant): Six boats for hire from Mopani Bay. Three-day/two-night safaris for up to five people. Day trips, gameShell Diesoline in a shallow container and agitate.

- 3. FIRE ON BOARD: Shellgas cylinders float. Disconnect and throw overboard.
- 4. LEAKING CYLINDER: Hang cylinder over the side and let gas escape.

viewing, fishing, etc. One-hour trips \$2 a head. Telephone 352, P.O. Box 7, Kariba.

Rhodesian Safaris (1968) (Pvt.) Ltd.: All-inclusive Kariba fishing safaris from Salisbury; three-day safari with one client \$300 (\$100 for each additional day), with two clients \$350 (\$120 for each additional day), with three clients \$390 (\$140 for each additional day). Larger parties by special quotation. Telephone 27815, P.O. Box 191, Salisbury.

Venture Cruises Boatel: Thirty boats for hire from \$10 to \$20 per day (fuel extra); water-skiing \$4 per hour (skis \$1.25 per hour—fuel extra). Telephone 203, P.O. Box 3, Kariba.

Water Sports Incorporated: Three boats for hire; fishing \$20 per halfday, \$30 per full day, minimum of two persons, maximum of three (costs inclusive of European skipper, fuel, fishing-tackle and iced soft drinks on board); water-skiing \$12 per hour, game-viewing \$3 per head; sightseeing \$3 per hour. Telephone 321, P.O. Box 35, Kariba.

Information desk

HOW TO GET THERE

Lake Kariba can be reached by road and air.

Road: In Rhodesia the main road from Salisbury to Zambia is taken as far as Makuti, where there is a secondary road turning off to the left, which leads to Kariba. The road from Salisbury to Makuti, a distance of 180 miles, passes through Sinoia (72 miles) and Karoi (126 miles). From Makuti the road winds for 40 miles up to the Kariba Airport turn-off to the left, and continues another 10 miles to Kariba Township and another mile to the dam wall itself. Total distance from Salisbury to the wall—231 miles.

From Zambia the shortest route is via turn-off to the right from the main Kafue-Salisbury road, 11 miles north of Chirundu. The distance to the dam wall from the turn-off is 42 miles of secondary road.

Air: Air Rhodesia, the national airline, operates scheduled air services to Kariba daily, Monday to Friday, linking it with the country's main centres. Airline transport between the airport and resort hotels and motels is available at a nominal charge. A wide range of all-inclusive Flame Lily holidays, most of which include a visit to Kariba, is available from the principal centres of Rhodesia and from Malawi, South Africa, Mozambique and Mauritius. These holidays often include a launch or game-viewing cruise on the Lake.

BORDER FORMALITIES

Customs and immigration posts of Rhodesia and Zambia are situated on either side of the dam wall and are open 6 a.m. to 6 p.m. between 1st April and 30th September, and 6 a.m. to 7 p.m. for the other half of the year. Rhodesian Customs and Immigration authorities are on duty at the airport to deal with scheduled over-border flights.

Place names and their meaning

Binga—"the enclosure surrounding a chief's village" or "thick forest". **Bumi**—the word in Chizezuru means "wild dog".

Chirundu—"people following one another in a line or queue", probably referring to the crossing of the Zambezi River by bridge.

Kariba—a corruption of Kariwa meaning (in Shona) "a little trap". The Zambezi River narrows at the Kariba Gorge and the old people say that at one time there were two huge boulders on either side of the gorge which created a bridge. **Karoi**—contraction of the Shona word Kamuroyi, "little witch". At one time witches were given a form of trial by ordeal by immersion in the local river.

Makuti-"wet mist" or "a persistent drizzle".

Mana Pools—Mana means "four" and probably applies to the group of pools, an extension of the Zambezi River east of Chirundu.





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BANKS

Monday to Friday (except Wednesday) 8 a.m. to 12.30 p.m.; Wednesday 8 a.m. to 11.30 a.m.; Saturday 8 a.m. to 10.30 a.m.

POST OFFICE

Monday to Friday 8.30 a.m. to 1 p.m.; 2 p.m. to 4 p.m.; Saturday 8.30 a.m. to 12 noon.

AIRPORT

Arrivals: Monday to Saturday 8.40 a.m. Departures: Monday to Saturday 5.40 p.m.

HOSPITAL-OUT-PATIENTS

Every day except Tuesday 11 a.m. to 12 noon; every afternoon except Thursday 2 p.m. to 3 p.m.

CUSTOMS AND IMMIGRATION

October to March 6 a.m. to 7 p.m ; April to September 6 a.m. to 6 p.m

PUBLIC SWIMMING POOL

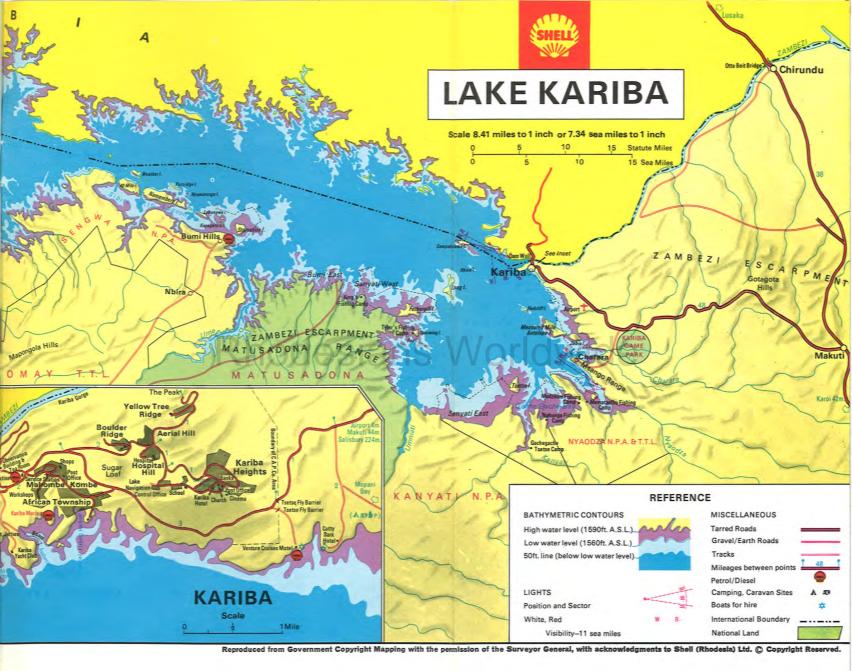
Daily (closed Wednesdays) 10 a.m. to 1 p.m., 3 p.m. to 7 p.m.; Thursday evenings 7.30 p.m. to 9 p.m.

KARIBA SERVICE STATION

Mondays and Tuesdays 8 a.m. to 12.30 p.m., 2 p.m. to 5 p.m.; Wednesdays 8 a.m. to 12.30 p.m.; Thursdays, Fridays and Saturdays 8 a.m. to 12.30 p.m., 2 p.m to 5 p.m.; Sundays 9.30 a.m. to 12 noon. Petrol Attendance: 24-hour service.

Kariba is a small modern township with tarred roads and most modern amenities. (Photo: R.N.T.B.)







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