

NESPAK IN *Federal Republic of Nigeria*

NESPAK established its Regional Office in the Federal Republic of Nigeria's Capital, Lagos in 1973. The Company got its first breakthrough in Nigeria by securing Water Supply Schemes from Soba, Saminaka and Zonkwa Dams Project in 1974.

NESPAK launched joint ventures with the Associated Consulting Engineers (private) Limited by setting up its subsidiary company, the Engineering and Consultancy Associates Nigeria Limited (ECAN) in 1975, which was co-shared by a Nigerian citizen, Alhaji Muhammad Armya'u. ECAN with the active participation of NESPAK handled many consultancy contracts during the Company's 22 years of operations in Nigeria.

After the death of Alhaji Armya'u, administrative and financial problems emerged, which finally led to the closure of the NESPAK's Regional Office in Lagos in 1996. NESPAK carried out a total of 26 projects worth US\$ 965 million during 22 years of its business operations in the Federal Republic of Nigeria. NESPAK's major area of consultancy services in Nigeria had been the water resources development and the road construction.

Currently, NESPAK is rendering consultancy services for the project, Kano River and Hadejia Valley Irrigation Schemes, Dams Safety and Rivers Training in Hadejia Jama'are River Basin in Nigeria. NESPAK is also providing technical assistance for Dam Safety Assurance and Training of Dam & Reservoir Assistance Operation Department and River Basin Development Authority Staff under the Transforming Irrigation Management. Both the projects were awarded by the Nigeria's Federal Ministry of Water Resources in 2016 and 2018 respectively.

Portfolios of important projects carried out by NESPAK in Nigeria are given in the following pages.



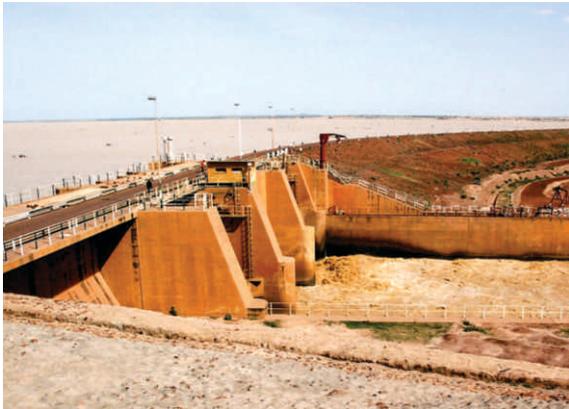
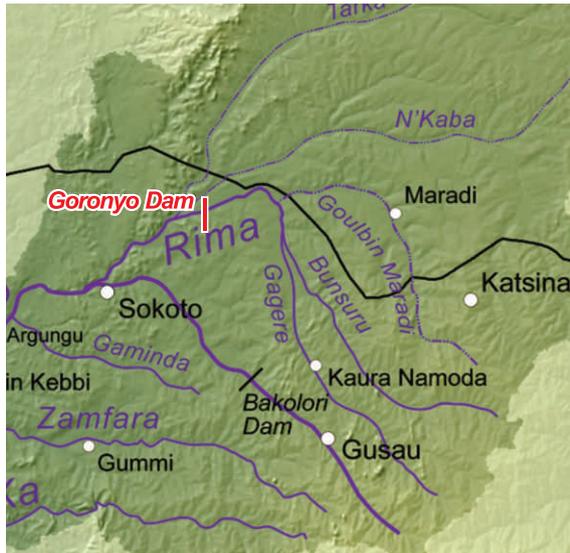
Goronyo Dam Project

Project Status: Completed in 1984

Scope of Services: Design Review, Construction Supervision

Project Cost: US\$ 303 million

Client: Sokoto Rima Basin Development Authority, Nigeria



This project involved the construction of a dam across Rima River in the Sokoto State for the purpose of flood regulation, irrigation and water supply.

The Goronyo Dam is a sand-fill structure with a height of 21 metres and a total length of 12.5 kilometres. Having the storage capacity of 976 million cubic metres, the dam comprised three homogenous sections i.e., the main and secondary dams and saddle dyke.

A 200 km² reservoir was created due to the construction of the dam. The reservoir provided an annual regulated flow of 425 million cu. m to double the rice cultivated riverine areas from 40000 hectares to 80000 hectares.

Two residential complexes namely Keta Senior Residential Complex and the New Rimawaj junior residential units were also built in the surrounding areas of the dam.

Ikara Dam Project

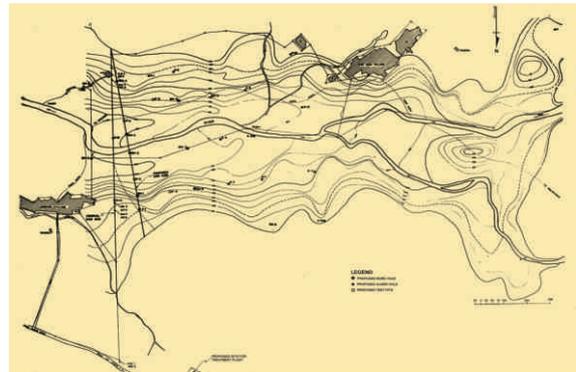
Project Status: Completed in 1979

Scope of Services: Geological & Geotechnical Studies

Client: Government of Nigeria

NESPAK rendered services through ECAN for the Ikara Dam which was an essential part of the Ikara Water Supply Scheme.

The project is located in the Savanna Region of Northern Nigeria which lies 48 kilometres east of the main road from the Kaduna State to the Kano State. The dam lies in a broad shallow valley with relief variation from elevation 99m in river valley to elevation of 118m in the highest area.



The dam involved the construction of 1800m long, 16m high earth-fill embankment and a spillway forming a reservoir up to about 2500m upstream. The main flow section of the river is about 7 to 12m broad with 2m high banks.

Sokoto Water Supply Project

Project Status: Completed in 1991

Scope of Services: Design Review, Construction Supervision

Project Cost: US\$ 73 million

Client: Skoto Water State Board, Nigeria

The purpose of this project was to supply potable water to Sokoto, the capital of the arid Sokoto State. The project





involved the construction of a weir, raw water intake structure, 110000 cu. m/day water treatment plant, five ultramodern computerised pumping/booster stations, five standby 3MW power houses, six welded steel elevated/ground reservoirs of capacity up to 7000 cu. m and 80 km long transmission and distribution pipelines of sizes varying from 200mm to 1100mm.

The water treatment plant components included equipment for aeration, flocculation, rapid gravity filtration, chemical dosing chlorination and wastewater recycling.

Fune Water Supply Project

Project Status: Completed in 1985

Scope of Services: Detailed Design, Construction Supervision

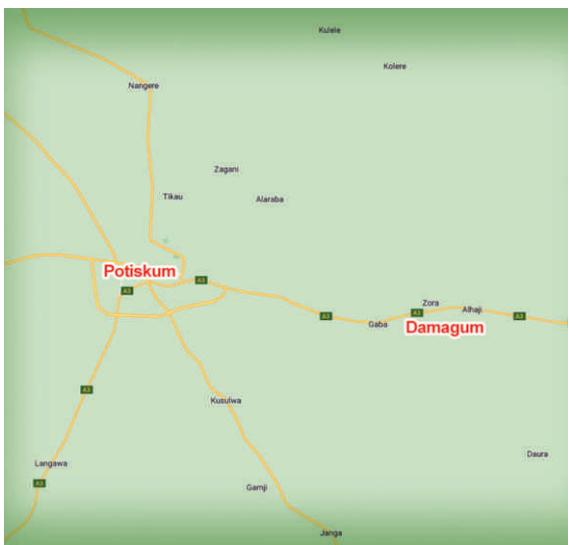
Project Cost: US\$ 49 million

Client: Borno State Water Board, Nigeria

This project involved the construction of a weir (Phase-I) and a dam (Phase-II) across River Gokwoli, water treatment works, transmission mains and distribution system for Potiskum and Damagum towns and nearby villages.

Raw water was drawn from weir and dam reservoirs through wet type intake structures and pumped by turbine pumps through 400mm dia, 6 km long transmission main from the weir and 450mm dia & 1462 km long ductile iron (DI) main from the dam to a modern treatment plant at the Damagum Town.

Water from treatment works was pumped by four centrifugal pumps through 300mm (Phase-I) and 450mm dia (Phase-II) 30 km long DI mains to the service reservoir in Potiskum Town and through a third main to an elevated tank in the Damagum Town.



Biu Water Supply Project

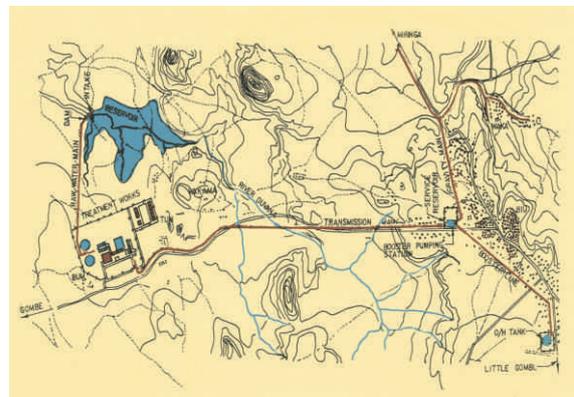
Project Status: Completed in 1990

Scope of Services: Feasibility Study, Project Planning, Detailed Design, Tender Documents, Construction Supervision

Project Cost: US\$ 22 million

Client: Borno Water State Board, Nigeria

Located in Biu Town in the Southern Borno State, this project comprised an 18m high earth-fill dam with a crest length of 300m and 11.1 million cu. m reservoir across River Duvana. Raw water from the reservoir was pumped by two centrifugal pumps each installed at the intake structure near the upstream top of the dam through 450mm dia, 4.74 km long ductile iron transmission main to a modern treatment plant.



Water from treatment works was pumped by two centrifugal pumps to a service reservoir. Water was then boosted to two overhead tanks in the low-level and high-level areas in the Biu Town.

Saminaka Water Supply Project

Project Status: Completed in 1982

Scope of Services: Feasibility Study, Tender Documents, Construction Supervision

Project Cost: US\$ 15 million

Client: Government of Nigeria

This project entailed the construction of a modern water supply system for the Saminaka Town and its suburbs in the Kaduna State. The source of water was the River Karami flowing on the western side of the Saminaka Town. An ogee type 340 ft. long weir was built across the river to store water during the low-flow periods. Three open shaft split case centrifugal pumps were installed at a dry intake built on the upstream side of weir to pump raw water to the treatment works. Water from treatment works was then pumped by three centrifugal pumps through a 12" transmission main to directly feed the Saminaka Town Distribution Network.

Lafia Water Supply Project

Project Status: Completed in 1982

Scope of Services: Feasibility Study, Project Planning, Detailed Design, Tender Documents

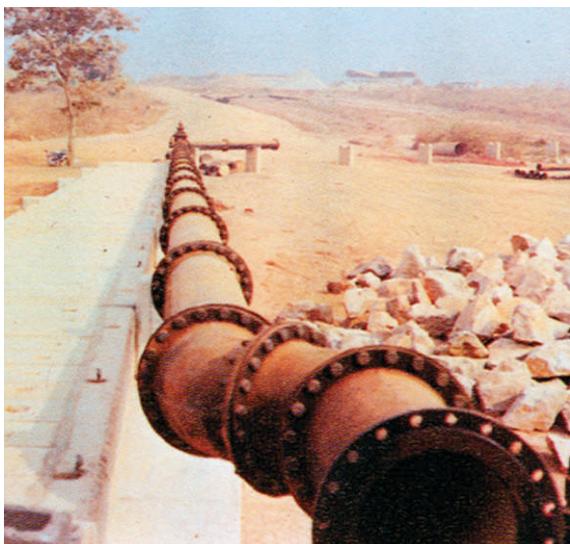
Project Cost: US\$ 24 million

Client: Plateau State Water Board, Nigeria



Designed for the Lafia Town, the capital city of Nasarawa State, this project was based on surface water from River Amba flowing on the western side of the city. A 5.6m high dam with a storage capacity of 6 million cu. m was constructed across the river along with an intake structure near the upstream toe. Raw water was drawn from the reservoir through intake structure and pumped by two 280 HP turbine pumps to the treatment works.

Water from treatment works was pumped by three 250 HP centrifugal pumps to 22700 cu. m/day service reservoir located in the Lafia Town. Low and high level zones were fed from the service reservoir and three overhead tanks.



Zonkwa Water Supply Project

Project Status: Completed in 1983

Scope of Services: Feasibility Study, Tender Documents

Project Cost: US\$ 8 million

Client: Government of Nigeria

This surface-water-based supply system was aimed at providing drinking water to Zonkwa, Madauci and Zongan Katab Towns in Kaduna State.

The source of water was an earth-fill dam across River Karami flowing on the western side of the Zonkwa Town. Reservoir created behind the dam was tapped through an intake structure constructed on the upstream side. Raw water was pumped by three vertical spindle centrifugal pumps to water works for treatment.



Treated water was then pumped to a 0.5 MG tank constructed over a tower at Madauci which balanced supply to Zonkwa fed directly from the transmission line. Water for the Zongan Katab System, which was 15 miles from Zonkwa, gravitated from Madauci Tank through the break pressure tank.

Tomas River Irrigation Project

Project Status: Completed in 1977

Scope of Services: Feasibility Study, Detailed Design

Client: Government of Nigeria

This project was aimed at the development of 39000 hectares along the left bank of the Tomas River. The proposed gravity system included 22.5 km long main canal supplying water directly to 14 distributaries. Three night storage reservoirs fed from the main canal and supplying water to three branch canals with a total length of 12 kilometres were designed. A distribution network having a total length of 22 kilometres distributaries with all associated structures were also designed for the Tomas Irrigation Project.



Mubi-Mayobani-Bazza Highway Project

Project Status: Completed in 1981

Scope of Services: Detailed Design, Tender Documents, Construction Supervision

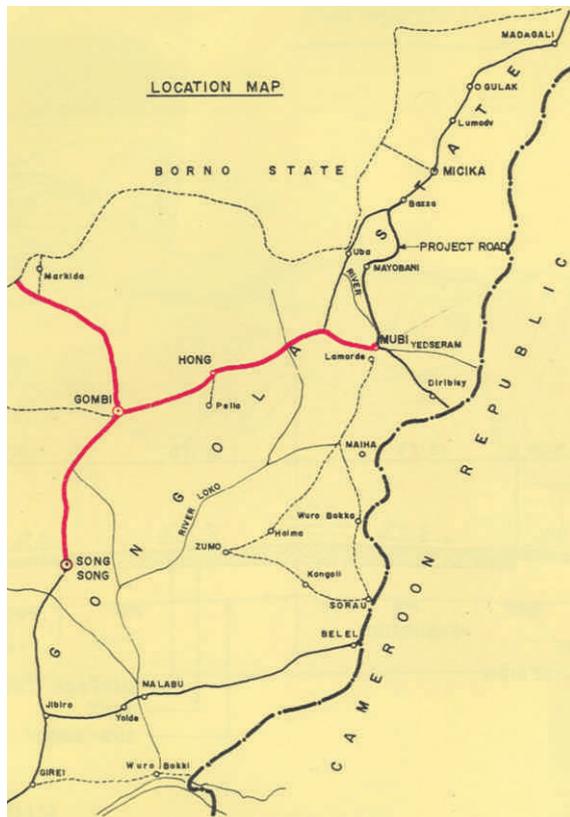
Project Cost: US\$ 18 million

Client: Ministry of Works, Nigeria

The detailed design of the Mubi-Mayobani-Bazza Highway was awarded to NESPAK through an international competition in 1979. NESPAK also provided construction supervision services for the project through a separate contract in 1987.

For the design purpose, aerial photography of different routes was carried out, providing basis for the selection of the alignment which was transferred to the ground for detailed surveys. Investigations pertaining to water availability, soils, materials and hydrology were also carried out.

The geometric design was then undertaken, employing international standards and computations pertaining to curvature, grades, cross-sections, quantities and estimates were carried out using computer. Pavement and structural designs were executed through sophisticated methodology.



Darazo-Basirka Road Project

Project Status: Completed in 1981

Scope of Services: Construction Supervision

Project Cost: US\$ 6 million

Client: Ministry of Works, Survey & Transport, Nigeria



NESPAK in association with ACE-Pakistan and ECAN provided consultancy services for this road project which is located at 110 kilometres from the Bauchi State towards the Northeast of Nigeria. The supervision for the 17 km long road included quality control and materials testing, checking of works as per drawings & specifications, verification of the contractor's monthly bills and the preparation of the monthly progress reports. The Darazo-Basirka Road was designed by M/s Ove Arup and Partners.

