INSPIRED DIALOGUE

*Of Tolerance, Active Community Involvement, Foresight, Development Strategies & Democratic Values*

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# Clean Water Action Plan Strategy (CWAPS) - a blueprint for addressing water quality and availability nationwide

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Access to clean water is a key factor in ensuring sustainable ecosystems and healthy communities in all regions in Nigeria. This new approach will help the Government initiatives and commitments toward providing safe drinking water, and will highlight the broad significance of clean water to populations in the country. This project addresses a range of issues, including urban and rural health and the empowerment of communities to address their environmental conditions in a sustainable manner. States Governments have a variety of approaches and interventions directly or indirectly relevant to meeting the Priority Development Goals. This approach will consolidate those efforts and effectively targets clean water as a key to creating healthy communities.

This proposed project is in collaboration with ZENON and other European Water Company to urgently improve water management in Nigerian cities: - the program focuses on three inter-linked priorities:

**1.** Introduction of effective urban water management strategies in all cities and the Ecosystem Approach to Human Health. In Abuja, Kaduna or any state, a new water utility to create a water loss unit to detect and repair leaks, replace old pipelines, and account for water through audits and monitoring of meters. Protecting freshwater resources from the growing volumes of urban wastes teaching people how to maintain their own **water** supply and sanitation system while preventing pollution of their aquifer through community-based environmental management. Enhancing local capacity for urban **water** management through information sharing, training, and public awareness and education campaigns. The program will established **water** education classrooms to impart information on **water**, sanitation, and hygiene, as well as helping people to change their behaviour and adopt attitudes that promote sustainable use of **water**. With a Government support "Managing **Water** for Nigerian Cities" will attract significant parallel funding from other donors, including the



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World Bank and the states governments, increasing the scope and outreach of the program. In addition, the project will generate wide political support with concrete commitments from local governments, and will establish a network of city managers and professionals addressing urban **water** issues. In rural areas, women play a vital role in agricultural production, as well as in household food security, child care, and heath. Nevertheless, women are not involved in the planning and implementation of water resource management projects which limits their food production and leads to distortions in consumption patterns and malnutrition for them and their children. The water management strategies will increase women's capacity to participate in and influence irrigation and water resources management. As a result, this project will help women diversify their agricultural production, provide better nutrition to their families, and improve their hygiene and promote sanitary living conditions.

The Ecosystem Approach to Human Health and the Eradication of Guinea Worm: These approaches encourage a much broader concept of disease prevention and health promotion by addressing the quality of a community's living and working environments, leading to changes in detrimental behaviour caused by poor environmental conditions. Using the eco-health approach will generate new information and record local knowledge about key health determinants found in the ecosystem.

Guinea worm disease is on the verge of eradication. However, Over half (73%) of the annual cases occur in 13 African countries with Ghana and Nigeria accounting for another 88% of the remaining cases. This project will provide communities with water filters and treatment materials for worm infested surface water sources; strengthening community capacity to survey for and contain the disease; and conduct education and training campaigns on hygiene awareness.

**2**. Water Engineering, drilling boreholes for commercial and domestic water users. Providing a complete service from an initial consultation and survey to water extraction, availability and treatment.

**Four Steps to Your Own Water Supply**

- Initial consultation and project viability.
- Feasibility study showing hydrological survey, water-well drilling location in relation to existing incoming main, budget costs of installation and payback. If favourable report, agree to test borehole.
- Obtain consent to drill from Environment Agency for water abstraction and drill test borehole to establish water quality, water volume and water treatment required if any. Project costs and payback reappraised and agreed.
- Proceed with borehole drilling and installation and license application.

**Sources**

- **Wells** - Most wells are aquifer fed where waters are provided from a relatively shallow underground stream.
- **Springs/Streams** - This type of system is usually the simplest and consists in the main of a protected collecting chamber to which feed waters are diverted before being delivered to a storage tank within the property.
- **Boreholes** - Boreholes extract water from far deeper levels than any other source. Using a rigid tube of 4'' (10 cm) or 6'' (15 cm) reaching down to the supply and a submersible pump at the base they can operate at depths in excess of 150' (50 m).
- All of the above sources would be protected from vermin and surface water contamination


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**3.** An ambitious project using ZeeWeed® membrane system that will treat 1.5 million gallons of waste water per day, with the possibility of future expansion. ***Cost*-value is affordable and the return-on-investment is great.** The ZeeWeed® based tertiary waste water treatment facility uses ZENON's ZeeWeed® membrane technology because of its performance and cost effectiveness, in addition to the fact that membranes provide potential benefits for future improvements to processes (enhancing quality of life for residents as well as improving surrounding environment). Using ZeeWeed® (OAKVILLE, Ontario Canada) membranes will produce a high level of water quality that will be able to meet increasingly stricter standards. The technology has been proven and is also being used in other parts of the world to augment additional drinking water supplies particularly in water short regions. ZENON's technology makes it easy to retrofit a plant by using existing tanks for the plant (non-membrane system) expansion, without disturbing ongoing plant operations. ZENON is a world leader in providing advanced membrane products and services for water purification, wastewater treatment and water reuse to municipalities and industries worldwide. With hundreds of installations in over 30 countries.

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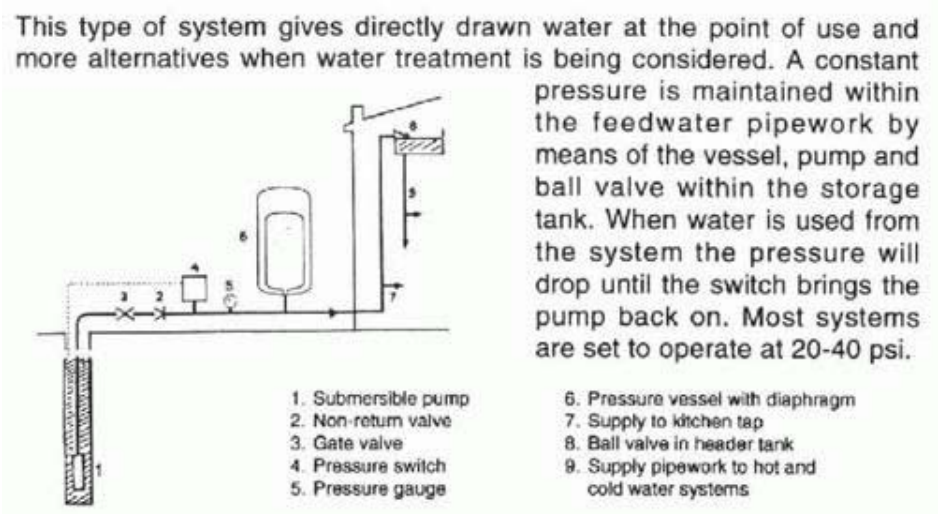
## PROPOSAL FEATURE PROJECT 1)

### Water Supply Plant

Quality water supplies throughout Nigeria can vary widely from very soft (acidic) to moderately hard (alkaline). Some supplies, depending on their location and source, will have other contaminants present caused by the local conditions. Regardless of location or the intended usage, all supplies must comply with water quality regulations. We have listings showing the permitted levels of contaminants allowed. Most supplies will provide water which falls within the regulations, however, on some, treatment may be required

A. Suspended Solids
B. Bacteria
C. Acidity
D. Iron/Manganese
E. Nitrates
F. Hardness

PRESSURE CONTROL SYSTEM



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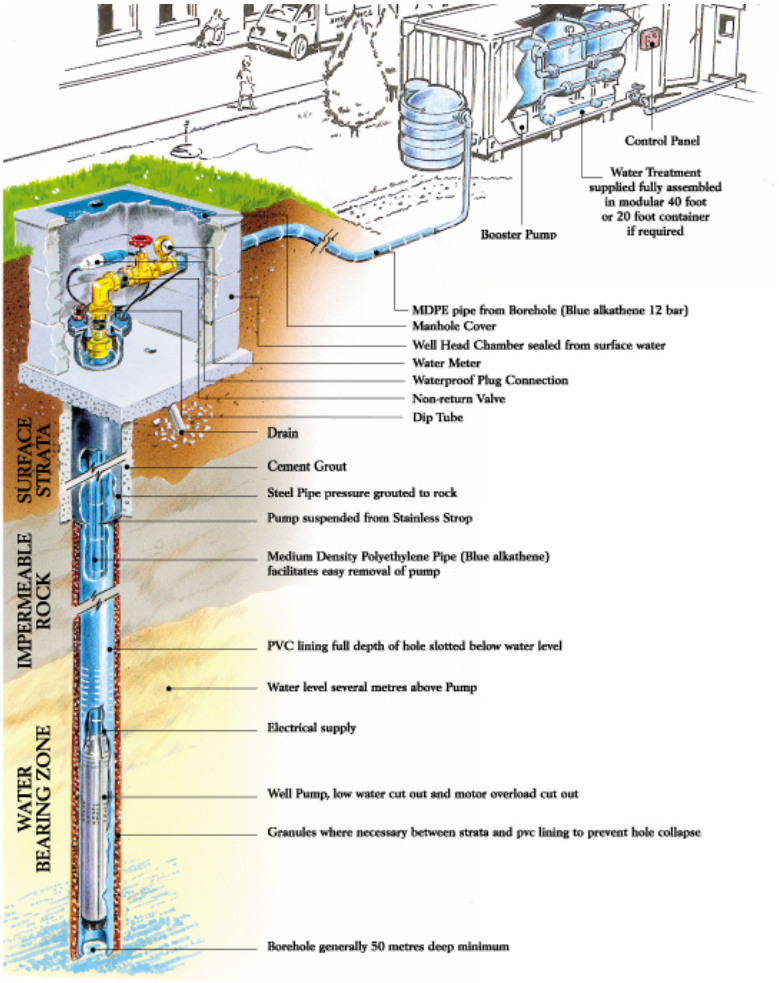


**A CASE STUDY - Water Supply Plant for 50 000 residences**

Total theoretical uninterrupted water supply 2800 $m^3$/hr., fully automated and require minimal supervision. Water supply increases with increased demand and decreases with decreased demand. Fully customizable to accommodate more residences and provide steady supply of fresh-clean water. Water source decentralization is the key to sustainable water supply as done in Europe and Americas.

***Cost*-value is affordable and the return-on-investment is great.**

A self-semi-automated system housed in a Building surrounding the water system plant (the size of the building must be (14mb x 100mb x 5mh), and the water source (Borehole) and the water tank (V = 5000 $m^3$). The system can supply 50 000 homes sufficiently uninterrupted.



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Due to good hydrological information, drilling is only done when satisfied that the chances of finding water are very high. Water boreholes are particularly more environmentally friendly

The fully customized constructed water tanks consist of corrosive resistance fittings throughout the installation from stainless steel pumps to phosphor bronze fittings or alkathene as opposed to galvanised fittings made with flaxy glass with thermo-plastic internal lining. The maximum working pressure is 150 psi (1 atm=14,7 psi), and temperature up to $48^0$C.

The reservoirs (tanks) are designed to meet Environmental Standards required, and also all S-100WQA requirements. All equipments, materials, tanks and automatic systems have special warranty and meet highest quality international standard.

Water Tanks

Control Facility

Maintenance costs need to be a minimum and lining the borehole the whole length and the use of the best quality electrics and non corrosive materials goes a long way to ensuring trouble free service for the lifetime of the borehole. Money spent on the highest specification is well spent.



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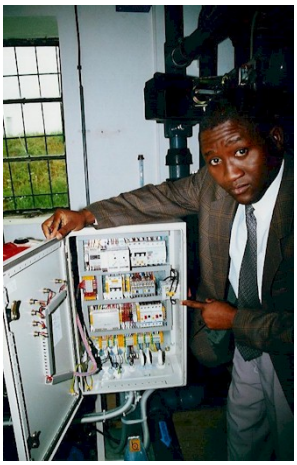
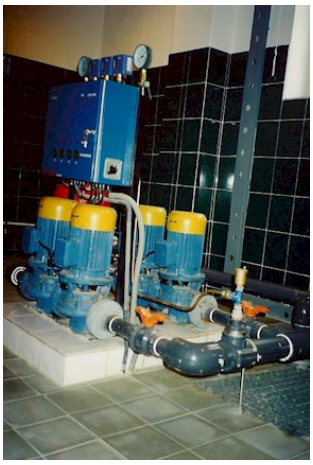
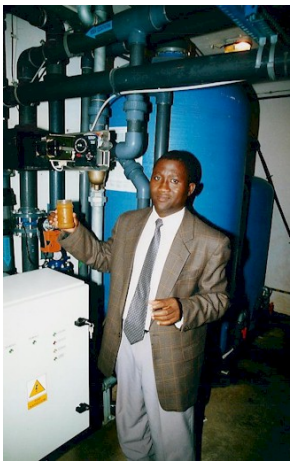
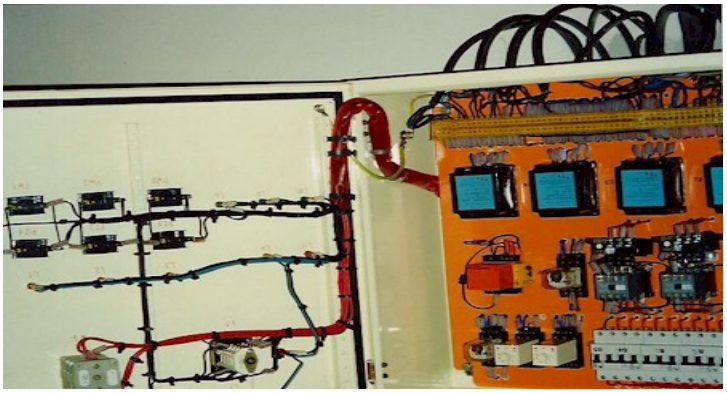

Electric Controls


Water Pumps


Water Testers


Automated System

No service to the borehole in the first five years and then only for routine examination of the motor and pump, and switches for automatic operations. In most cases the capital cost including running costs are recovered within 2 years or less.

**In the above case-study project, Dr Baba J Adamu and Dr Yusuf Ibrahim Jimeta are seen supervising the Project, in a city in Poland**

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## PROPOSAL FEATURE PROJECT 2)

**Wastewater Treatment Plant**

**Application**

*Conversion to a centralized municipal wastewater treatment plant from individual septic system*

**Capacity**

*369,900 GPD (1,400* $m^3$*/day)*

**System to be Installed**

Turnkey solution

**The Hypothetical Problem - ABUJA CITY AS A CASE STUDY**

The Town Abuja and the surrounding area is using individual septic systems to handle wastewater, trucking away waste sludge for further treatment. The town's major businesses and industries also trucked away their wastewater for treatment and disposal. The community is concerned about the number of septic tanks, undersized leaching beds and holding tanks. Wanting to protect the underground aquifer from contamination and add value to local properties, it is decided it would be beneficial to build a centralized wastewater treatment plant to handle the combined municipal sewage and industrial wastewater.



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The Government proposed a number of conditions for the new plant. It should be unobtrusive, affordable to construct and operate, able to accommodate future expansion, and should not negatively impact the surrounding environment. Since the treated effluent is to probably be fed to a sensitive cold water fish habitat, stringent effluent discharge parameters need be targeted. After a thorough review of the options available to the town, it is decided that ZENON's ZeeWeed® MBR Membrane Bioreactor is the best available technology, producing treated water of such high quality that could be discharged directly into a river.

**The Solution**

In order to blend the new plant with rural scenery, the exterior of the building would be designed to look like a dairy barn. To reduce the cost of ventilating the air space over the tanks, the barn structure would be open and a shallow breezeway would be created along a side wall to provide natural ventilation.

The facility would be expanded in phases. The first phase will be designed to accommodate the present needs of the local community of say 1,500; the second phase will allow for a higher future flow through the plant simply by adding additional membranes. A number of features will also be included to allow expansion beyond the second phase, which will serve approximately 2,500 residents or more.

The Average Daily Flow Rate of the first phase accommodated would be 227,200 GPD (860 $m^3$/day). The sewage treatment process will consists of an influent pumping station complete with an automatic fine screening system, ZeeWeed® membrane filtration, UV disinfection, effluent re-aeration chamber and outfall to a river. Phosphorous removal is achieved by alum addition ahead of the aeration tanks. A single basin aerobic digester chamber and six-month sludge storage and hauling facilities will also be constructed. The influent wastewater is pumped from a lift station through a fine screen to remove the large debris and non-organic matter from the plant feed. Alum is added to the raw sewage for chemical precipitation and removal of phosphorus, (in the case of waste water from a brewery).

A conventional aeration-de-nitrification process is used for biological treatment. Two ZeeWeed® membrane filtration trains are installed in independent bioreactor tanks. Each tank is baffled to create an anoxic zone where both the raw, alum-dosed sewage and the re-circulated mixed liquor from the aerobic zone enter and are mixed together. The mixed liquor then flows by gravity from the anoxic zone to the aerobic zone. Permeate for discharge is removed from the aerobic zone through the ZeeWeed® membranes. The mixed liquor within the aerobic zone is re-circulated by being pumped back to the anoxic zone of each unit. The effluent is passed through a double-bank Ultra-Violet Unit as a final precaution to ensure disinfection of the effluent which is then discharged directly into a River.

For more detail information and design, contact Dr. Baba Jibrin Adamu, Ph.D Engr., President & CEO of **iNetworks Canada 0803 – 475 9608**



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**SHORT BIO**


Dr Baba Jibrin Adamu
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**Dr. Engr. Baba J ADAMU:** was born in Kaduna (Unguwan Liman), Kaduna State, Nigeria. Dr. Baba Jibrin Adamu is the youngest son of the late Malam Alhaji Adamu Jibrin Imam, the former Chief Imam of Kaduna State Central Mosque located in Kano Road Kaduna. Dr. Baba J Adamu represented Kaduna State based on academic qualification to go on a scholarship program to study Civil Engineering up to Masters Degree in Poland in 1986. Having completed successfully his M.Sc in 1993, again based on academic excellence received a Polish Government Scholarship to continue to do Doctorate degree in Industrial Research and silo/bunker Technology. Dr. Adamu specializes in Silos and Security Bunker technology and completed his Ph.D in 2000 with Excellence. He then moved to Toronto, Canada in 2000, where is acquired various Certificates in IT, Management and Business at Humber College Institute of Technology and Advanced Learning, Toronto Ontario, as well as at the Banf Academy for Business, Calgary, Alberta, CANADA. He now lives and works in Canada as an Engineering/Security Consultant and as the President and CEO of iNetwoks Canada, a Managed Technology Solution company based in Toronto. As of this writing, dr Adamu is undergoing United Nations training on Global Terrorism, Law of Arm Conflict and UN working System through the United Nations Institute for Training and Research (UNITAR POCI), New York, USA.

Dr Adamu has tremendous experience in management of men and materials in private sector, good knowledge of international and Nigerian political, economic and social environment, high level of integrity, evidence of personal discipline as well as courage of conviction. He has a strong conviction for the respect for the rule of law, respect for human rights, beliefs in popular participation and consultation, knowledge and understanding of the working of the international system, voluntary service to the community, sense of history and lesson, competence in concepts and tools of development and respect for African value and cherished all Nigerian traditions. Dr Adamu is an expert both in Structural engineering and . In his own words:

"**W**here despair and hopelessness exist, those who have the ability to take action have the moral responsibility to take action to help those who live on the bare edge of survival. And democracy is more than the creed of our country, it is the inborn hope of our humanity, an ideal we must carry, a trust we must bear and pass along. And even after all these years, we have a long way yet to travel, that is why **We must all be involved ...**" - *Baba Jibrin Adamu, Ph.D Engr.*



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