Volume 2 Issue 23

REPUBLIC OF KENYA

WEEKLY Newsletter

April 15 -21 2024

KEWI Team's Insightful Trip to Germany: Enhancing Water and Wastewater Technologies

KEWI CEO Dr. Leiro Letangule EBS, (4th from right) accompanied by a delegation from KEWI during a tour to Germany.

The team is in Germany for a comprehensive understanding of the German water management framework and innovative treatment technologies.

BY FAIZAH JEPKORIR

In a remarkable stride towards technological advancement and innovation, a delegation from the Kenya Water Institute (KEWI) embarked on an enriching exposure tour to Germany from June 15th to 22nd, 2024. The team, led by the CEO Dr. Leiro Letangule EBS, Board Member Fridah Gacheri, and Principal Technologist Ms. Bernaddatte Maundu, participated in the Technical Seminar on Water and Wastewater Technologies facilitated by the Bavarian State in Germany (bbw).

The primary goal of the trip was to gain insights into technological advancements and innovative solutions in water and wastewater management. The delegation sought to acquire knowledge on the best practices and explore potential collaborations with German firms. The trip included an extensive program designed to provide a comprehensive understanding of the German water management framework and innovative treatment technologies.

HIGHLIGHTS

KEWI Team's Insightful Trip to Germany: Enhancing Water and Wastewater Technologies

Dr. Leiro Letangule while visiting Ujeta Company, a manufacturer of drinking water portable units in Germany

The delegation's activities began with a cultural program in the Greater Munich area, providing a backdrop for understanding the local context of water management. This was followed by visits to several leading companies and facilities. At UJETA GmbH, the delegation explored innovative filter technologies developed by UJETA, a manufacturer of portable drinking water units. At HUBER Technology, the team examined advanced water and wastewater, and sludge treatment technologies, highlighting the importance of instrumentation and automation in enhancing treatment processes. The visit to Urban drainage and Environmental Analysis in Nuremberg provided insights into urban water and wastewater treatment management and environmental analysis techniques.

Clearfox's industrial and municipal wastewater treatment plant, known for its advanced treatment solutions, was another significant stop on the tour. At Klaro GmbH, the team explored small-scale and decentralized wastewater treatment plants, learning about their efficiency and sustainability. Wilo SE in Hof, a global leader in pump and pumping systems manufacturing, showcased its solutions for water supply and sewage disposal, through production of innovative, reliable, efficient and quality pumps and accessories showcasing the critical role of automation in manufacturing and production of quality goods for sustainability and economic growth.

The State Office of the Environment (LFU) in Hof focused on Germany's water management framework, offering a comparative perspective on regulatory and operational practices. An official visit to the Bavarian State Ministry of Economic Affairs, Regional Development, and Energy aimed at discussing potential collaborations and policy frameworks to support technological innovation in water management.

The tour's alignment with KEWI's strategic goals was evident in several areas. The knowledge gained from this trip will contribute to capacity building, enhanced collaborations and partnerships, as well as resource mobilization and consultancy services. The focus on instrumentation and automation in water and wastewater treatment

KEWI Team's Insightful Trip to Germany: Enhancing Water and Wastewater Technologies

KEWI's team at Klora, the manufacturer of wastewater treatment products

technologies emerged as a key lesson, highlighting the importance of these advancements in improving efficiency and sustainability.

The delegation's engagement with German companies and institutions fostered a collaborative environment, setting the stage for future partnerships. KEWI's strategic goals, including capacity building, good governance, and professional approaches, are well-supported by the insights and connections made during this tour. The collaboration with WILO, UJETA and HUBER Technology, among others, signifies a step forward in KEWI's mission to enhance water management practices in Kenya.

"The exposure tour to Germany has been an incredible learning experience," said Dr. Leiro Letangule. "We have gained invaluable insights into advanced water and wastewater treatment technologies that will significantly benefit our efforts in Kenya. The potential collaborations and partnerships formed during this trip will help us enhance our water and wastewater management through application of Best practices and contribute to sustainable development," he added.

The tour to Germany was a resounding success, providing valuable knowledge and fostering collaborations that align with KEWI's strategic goals. Visits to leading water and wastewater treatment facilities, along with cultural and technical insights, highlighted the importance of global cooperation in water management. This trip demonstrated KEWI's commitment to innovation and sustainability, laying the groundwork for future advancements in Kenya's water and wastewater sectors.

Extra information by Principal Technologist Ms. Benarddette Maundu

Smart Water Metering Collaboration between KEWI & Safaricom

BY EMMANUEL ODUORY & BRITNEY MOKEIRA

KEWI and Safaricom team pose for a group photo after a meeting on smart water metering collaboration

Advancement in smart water technologies is poised to avail tools that have the potential to accelerate the realization of Sustainable Development Goal 6, which focuses on ensuring access to clean water and sanitation for all. In an exemplary move towards this goal, Safaricom is partnering with the Kenya Water Institute (KEWI) to enhance smart water metering solutions. This collaboration aims to equip various stakeholders with the knowledge and tools needed for effective water management.

The KEWI Research Division, under Mr. Nelson Kwamini, convened today at KEWI to finalize the development of a Memorandum of Understanding for this significant collaboration with Safaricom. The meeting highlighted the mutual commitment to addressing non-revenue water a critical issue in the water sector. By implementing smart water metering technology, the collaboration aims to significantly reduce water loss, thereby improving efficiency and sustainability in water usage.

The partnership is set to leverage advanced technologies, including the development of a data center, the Internet of Things (IoT), Artificial Intelligence (AI), and mobile-based data collection tools. These technologies are expected to provide robust solutions for water management, enabling real-time monitoring, data analysis, and predictive maintenance. Such innovations will not only support Safaricom's clientele but also benefit other water utilities by facilitating the sustainable adoption and application of smart water metering systems.

During the meeting, Safaricom representatives, led by Mr. Wycliffe Khisa, highlighted the necessity of integrating new smart water technologies within the water ecosystem. This integration aligns with KEWI's core mandate of conducting research, providing consultancy, and offering training. The collaboration is anticipated to bridge the skills gap between academia and the water industry, enhancing the practical application of theoretical knowledge. Furthermore, the use of Big Data in this initiative is expected to maximize revenue generation and build capacity in managing non-revenue water.

As part of the collaboration, KEWI is designated as the technical center of excellence to facilitate training on smart metering. This will be achieved through offering short courses, organizing symposiums, and hosting conferences. The development of a comprehensive smart metering curriculum is already at an advanced stage, reflecting the partnership's commitment to fostering sustainability and productivity within the non-revenue water value chain.

By combining Safaricom's technological prowess with KEWI's expertise in water management, the initiative is expected to make substantial contributions to sustainable water management practices. The collaboration will not only enhance the efficiency of water utilities but also ensure that more people gain access to clean water, thereby contributing to the achievement of SDG 6.

CS Njeru Leads Government Agencies in Planting Trees at Itare Dam Catchment Area

21/06/2024

Cabinet Secretary for Water Sanitation and Irrigation Mr Zacharia Njeru, EGH has expressed optimism that Kenya will accomplish its target of planting 15 billion trees by 2032 is achievable with sustained and concerted efforts by all Kenyans.

CS Njeru Made the remarks today at Itare Dam catchment area, Kuresoi, Nakuru County where he oversaw planting of 30, 000 seedlings.

He lauded Nakuru county residents and the local leadership for supporting H.E President William Ruto's national tree growing and ecosystem restoration campaign saying it that attainment of 30 per cent forest cover is achievable and will go along way in mitigating climate change effects.

"It is our responsibility as Kenyans to ensure we have a country values restoration and maintenance its ecosystem and has conservation plans for the sustainable supply, retention and conservation of water towers for the current and future generations"

The CS asked the both the National Government Officers Governors, elected leaders, county administration, organizations and all Kenyans of good will to emulate the president and set aside special days for tree planting in their respective counties where the leaders guided members of the public in tree planting activities.

He thanked stakeholders who contributed seedling, schools and local residents who turned up in large numbers to support the tree planting exercise.

Principal Secretary State Department of Water and Sanitation Mr Julius Korir,CBS and his counterpart in the State Department For Environment & Climate Change Eng. Festus Ng'eno,CBS who accompanied CS Njeru expressed similar sentiments and extolled the local residents for taking forest conservation seriously adding that after plating the seedlings there was need to nurture them to maturity.

Kuresoi South MP Hon Alfred Mutai confessed that he used to eke a living from felling trees but said he had now reformed and become an afforestation champion to speed up realization of the ambitious government initiative to plant more trees in the local ecosystems.

The CS said the stalled Itare Dam estimated to cost Ksh. 35 billion which stalled in 2018 will be revived to solve water shortages in Nakuru and some parts of Kericho Counties. He said the Ministry is prioritizing the project's revival while working on other stopgap measures to ensure the populous county and adjacent areas have sufficient water supply.

The CS was also accompanied by Water Secretary Eng SAO Alima, Secretary Administration Stephen Kihara, CEOs of Water Agencies, Nakuru Deputy Governor H.E Hon. David Kones, Bomet County Commissioner Dr Omar Ahmed, Senior Deputy County Commissioner Were Simiyu representing County Commissioner Loyford Kibaara, Women Representative Hon Liza Chepkorir Chelule, Local MP who included Hon Kipkosgei Tonui, Kuresoi South, Hon Charity Kathambi Chepkwony, Njoro Constituency.

The lawmakers said the need for collaborative efforts between the government and the private sector in the exercise was now more critical than ever to increase the country's forest cover and combat climate change.

TRAINING

Empowering Tomorrow's Leaders: Thermosyphon Water Heating Systems Installation at Kisumu Campus

BY JEFFERSON SUMANCHA

In a transformative stride towards sustainable energy practices, the Kenya Water Institute (KEWI) recently conducted a practical demonstration of the installation of thermosyphon water heating systems at its esteemed Kisumu campus. This groundbreaking initiative not only signifies KEWI's commitment to environmental stewardship but also serves as a catalyst for equipping students with practical skills and technical knowledge essential for the burgeoning renewable energy sector.

The implementation of this technology provided students with a unique opportunity for hands-on learning and practical application of theoretical concepts. Under the guidance of experienced instructors and renewable energy experts from the institute, students actively participated in every stage of the installation process, from site assessment and system design to assembly and testing.

Engaging in such real-world projects not only solidified students' understanding of heating systems but also instilled confidence in their ability to tackle complex technical challenges. One of the most significant outcomes of the practical demonstration was the boost in students' confidence in installing thermosyphon water heating systems. By actively engaging in the installation process, students not only mastered the technical aspects of system setup but also developed critical thinking and troubleshooting skills essential for successful implementation.

Beyond installation proficiency, the practical demonstration equipped students with the technical knowledge of understanding the intricacies of water heating systems. Through interactive workshops and role-playing exercises, students honed their presentation skills, learned effective sales techniques, and gained insights into customer needs and preferences. By bridging the gap between technical expertise and sales acumen, students are better equipped to serve as ambassadors for renewable energy solutions, driving adoption and market penetration in the wider community.

The demonstration not only nurtured technical proficiency and salesmanship skills but also inspired a culture of innovation and entrepreneurship among students. Encouraged to think creatively and explore alternative applications of renewable energy technologies, students are primed to become future innovators and industry disruptors.

By fostering an entrepreneurial mindset, KEWI empowers students to identify market opportunities, develop innovative solutions, and embark on entrepreneurial ventures in the renewable energy sector. Whether as startup founders, consultants, or industry leaders, graduates of KEWI emerge as catalysts for positive change, driving innovation and sustainable development in Kenya and beyond.

The practical demonstration is a significant milestone in the journey towards sustainable energy adoption and youth empowerment which provide students with hands-on experience, technical expertise, and entrepreneurial skills.

RESEARCH

Flood Risks in Metropolitan Satellite Towns: The Impact of Storms on Urban Onsite Sewer Facilities

A flooded estate in Kenya's capital, Nairobi. Poor sewer systems have worsened sewer management in metropolitan towns whenever flooding occur.

BY ERIC WAMITI

In the rapidly expanding satellite towns of Machakos County, urban sprawl has given rise to new residential estates such as Ruai, Kamulu, Joska, Malaa, Mlolongo, Sabaki, Athi River, and Syokimau. With their numerous residential buildings and burgeoning populations, these areas are emblematic of the region's vibrant growth.

However, beneath this fa-

The immediate effects of sewer flooding are dire. Contaminated water spreads across communities, leading to the outbreak of waterborne diseases such as cholera, dysentery, and typhoid. Residents, already struggling with the physical and financial burdens of flood damage, now face the added risk of serious illness. But the risks extend beyond immediate health concerns. Flooded sewage systems can lead to long-term environmental degradation. Contaminants from raw sewage can seep into the soil and groundwater, affecting the quality of water sources for years.

The economic implications are also significant. Flooding disrupts daily life, leading to lost working hours and reduced productivity. Businesses, especially small and medium enterprises, suffer

RESEARCH

Flood Risks in Metropolitan Satellite Towns: The Impact of Storms on Urban Onsite Sewer Facilities

from operational interruptions and property damage. For a region touted as a growth hub, these economic setbacks are a stark reminder of the costs of unplanned urban expansion.

Amid these challenges, there are also opportunities for transformation. The crisis presents a compelling case for national and local authorities to prioritize the development of a comprehensive sewage infrastructure. Implementing a centralized sewer system would not only mitigate future flooding risks but also improve overall public health and environmental quality. Such infrastructure investment will stimulate economic growth, ensuring sustainable development for these burgeoning towns.

Although the national and local authorities have made short term interventions like deploying emergency measures such as mobile water quality testing and treatment units and public awareness to curb the current health crisis, there is a need for long term strategic planning and wastewater infrastructure investment.

The national and local authorities should collaborate and bring together all the technical expertise and resources required to design and implement an effective sewage management system. This would include constructing centralized treatment plants and expanding sewer networks to cover all residential areas. Additionally, enhancing flood management infrastructure, such as drainage systems and retention basins, can mitigate the impact of heavy rains.

Innovative solutions, such as green infrastructure, can also play a role. Constructed wetlands, vegetated landscaping that can absorb rainwater and protecting heavy storm drainage with gabions reduce runoff, and filter pollutants, thus integrating natural processes into urban planning. These measures not only address the immediate sewer issues but also promote sustainable living and resilience against future environmental challenges.

The crisis in Nairobi and Machakos Counties satellite towns highlights the urgent need for comprehensive urban planning and infrastructure development. As these communities continue to grow, addressing their wastewater management challenges is not just a matter of convenience but a critical public health and environmental imperative. By taking decisive action now, the authorities can turn this crisis into an opportunity for building resilient, sustainable, and thriving urban environments for the future.

Quote of the Week

"Leadership is not about being the best. It is about making everyone better"

Simon Sinek

EDITORIAL TEAM

Editor

Dorine Eva Irungu

Writers:

Eric Wamiti

Faizah Jepkorir

Britney Mokeira

Emmanuel Oduory

Pius Kimani

Jefferson Sumancha

Damaris Jondiko

Photographer

Pius Kimani

Designer

Pius Kimani

Application of Remote Sensing and Geographical Information Systems (GIS) In Water Quality Monitoring

BY DAMARIS JONDIKO

Clean and safe water is an important natural resource needed for life hence water quality is key. Poor water quality poses a danger on economic and environmental resources. Fresh water is scarce as 3% is fresh water and 97% is saline water hence water should be used sustainably.

Water is also a basic human right as per the Kenyan constitution. Human activities such as industrial and agricultural activities contribute to water pollution on the scarce water sources. Therefore need to curb the pollution menace that changes the physical, chemical and biological parameters of water quality deeming water not portable. Polluted water also increase the burden of water related and communicable diseases and raise the economy of scale of operation and maintenance of water supply treatment plants and the costs are transferred to the consumers.

In situ measurements and laboratory water quality analysis of water samples of the different water quality parameters give only accurate results for only a point and time in space and sampling process is cumbersome and testing takes time hence delay the identification of contaminants and do not give either the spatial or temporal view of water quality in wide space.

Therefore, real time monitoring programs using Remote Sensing (RS) and GIS are needed to monitor the threats involved with pollution of water and provide the effective action at all levels. The remote sensing and GIS techniques are effective, cheap and valuable tools in monitoring water quality parameters real time in saline and fresh water bodies (lakes, river, ground water, and reservoir) compared to in situ where tests are restricted to selected sampling points.

The synoptic view provided by satellite remote sensing and the analysis capability provided by GIS offer a technologically appropriate method for studying various features related to water resources. Satellite remote sensing is an obvious source of data for mapping and map revision because of their repetitive nature to cover a wide area at relatively low cost.

GIS-first data collection platforms functions as an advanced water quality technology by helping pinpoint contamination sources , optimize treatment processes, offer timely alerts, and ensuring consistent access to safe and available drinking water for all.

Using spatial data analysis by visualizing and cross referencing separate data sets from the environment eg industrial, agricultural and sewage sites pollution sites identified and tracked on a single map. GIS enabled systems can compare current and past pollution patterns and this helps identify recurring problem areas allowing proactive solutions set up. Sensors can also be integrated with GIS system which uses the data from the sensors of contaminants in water and generate spatial data that can be used to determine the pollution pathway. The spatial data can also be stored in cloud and used by various stakeholders to get the best solutions collaboratively.

GIS technology enables comprehensive analysis of water management issues and helps in the development of effective solutions based on data analysis hence contribute to a better management of the water resources.

Student Spotlight of the Week: From KEWI Student to Award-Winning Innovator in Automated Irrigation

BY FAIZAH JEPKORIR

Gerald Magak Okeyo's journey towards becoming a trailblazer in automated irrigation began during his studies in plumbing and pipe fitting at the Kenya Water Institute (KEWI). His path took a transformative turn when he met Madam Virginia Nanetia, a lecturer who saw potential in him and encouraged him to join the institute's Innovation Club. Her mentorship opened up a world of possibilities, igniting Gerald's passion for sustainable water management.

During his time at KEWI, Gerald embraced several leadership roles that showcased his versatility and commitment. He served as a project manager, technical expert, innovator and educator, quality assurance leader, and policy advisor. These roles not only honed his technical skills but also prepared him for future challenges in water management and innovation.

Gerald's breakthrough came with his innovative project: an automated irrigation system using an Arduino board. This system addresses critical issues of water waste and insufficient irrigation in agriculture, particularly relevant in the context of climate change and water scarcity. The automated irrigation system minimizes water wastage by providing precise water delivery, reduces energy consumption through optimized irrigation schedules, improves crop health and productivity, promotes eco-friendly farming practices, and allows farmers to adjust irrigation schedules and settings remotely based on data analysis.

Gerald's dedication and hard work in developing his automated irrigation system led him to compete in several prestigious competitions. At the Water Services Providers Association (WASPA) event held at Sarova Whitesands Hotel, Gerald's project was declared the winner, showcasing its effectiveness and potential. He also participated in the Vijana na Agribusiness competition at the Kenyatta International Conference Centre (KICC), where he won a prize for his innovative approach to irrigation. Additionally, Gerald presented his project at the Sarit Centre under the Homabay County Agricultural Booth, receiving positive feedback and encouragement from industry professionals and the public alike.

In a world where water sustainability is crucial, Gerald's expertise in innovation is invaluable. The importance of automated irrigation systems cannot be overstated. By using sensors and smart technology, these systems conserve water, optimize crop yields, and ensure sustainable agricultural practices. They are invaluable in the face of climate change and increasing water scarcity. Gerald's journey has not only shaped his career but also contributed significantly to advancing agricultural practices in his community.

Currently, Gerald is at home, doing small jobs while seeking scholarships or funding to continue his studies. His journey from a KEWI student to an award-winning innovator exemplifies dedication, leadership, and an unwavering commitment to solving water challenges. His story serves as an inspiration to many, demonstrating that with passion and perseverance, remarkable achievements are possible.

Round up of The Week's Events

KEWI members of staff and students during a Tree planting exercise at Itare Dam Catchment area in

Round up of The Week's Events

KEWI's delegation during a working tour in Germany.

Long - Term Programmes

Diploma in Water Engineering Technology (DWET) Diploma in Wastewater
Diploma in Water, Sanitation Engineering Technology (DWSET)
Diploma in Water Resources Management Technology (DWRTM)
Diploma in Irrigation and Drainage Engineering Technology (DIDET)
Diploma in Information Communication Technology (DICT)-KNEC
Diploma in Water Laboratory Technology (DWLT)
Certificate in Wastewater and Sanitation Engineering Technology (CWSET)
Certificate in Water Resources Management Technology (CWRMT)
Certificate in Information Communication Technology (CICT)- KNEC
Certificate in Water Laboratory Technology (CWLT)
Certificate in Water Engineering Technology (CWET)
Drilling Operations and Management (DOM)
Plumbing and Pipe Fitting (PPF)
Water Operators Course (WOC) in:

- Water Supply
- Meter Reading
- Sewerage Operations

Short - Term Programmes

Use of Earth Observation Tools and GIS for Water Resources Management
Entrepreneurship and Financial Management for Water Managers
Operation and Maintenance of Water Supply Networks
Metering and Installation of Water Supply Networks
Leak Detection & Repair techniques
Drilling Operations and Management (DOM)
Operation & Maintenance of Pumping Stations
Pump Selection, Installation and Maintenance
Plumbing, Pipe Fitting and Solar Water Heating
Instrumentation for Water and Wastewater Systems
Water Governance, Management and Technology
Application of GIS for Water Utilities Mapping
Drilling Operations and Management
Water Quality Sampling and Testing
Microbiological Water Quality Assessment
Integrated Water Resources Management
Non-Revenue water
Water Management
Customer Care

Vision

A Technical Centre of Excellence in Training, Research, Innovation and Consultancy in the water, Sanitation and Irrigation Sector.

Mission

T o offer Competency-Based Training, Research, Innovation, Consultancy and Outreach Services in the Water, Sanitation and Irrigation Sector for sustainable development.

Core Values

Good Corporate Governance
Professionalism
Customer Focus
Innovativeness
Inclusivity
Patriotism
Integrity

GET IN TOUCH WITH US

The Director,
Kenya Water Institute,
P.O. Box 60013-00200 Nairobi
TEL: +254 722-207757
Email: info@kewi.or.ke
Website: www.kewi.go.ke

For enquiries about our TVET programs
Contact the Registrar, Admissions Office.
Phone: 0735339206
Email: admissions@kewi.or.ke

KEWI Nairobi Campus
P.O. BOX 60013—00200
Tel: 0722207757
Email: info@kewi.or.ke

KEWI Chiakariga Campus
P.O. BOX 12—60215
Tel: 0729009104
Email: chiakariga@kewi.or.ke

KEWI Kitui Campus
P.O. BOX 1514—90200
Tel: 0707566395
Email: kitui@kewi.or.ke

KEWI Kisumu Campus
P.O. BOX 7825—40100
Tel: 0746212708
Email: kisumu@kewi.or.ke

OTHER SERVICES OFFERED

Water Quality Laboratory Services
Drilling and Test Pumping Services
Ground water Assessment Services
Conferencing Services
Troubleshooting of pumps boreholes and distribution systems
Repair of pumps boreholes and distribution systems

Your feedback is crucial for our improvement

 **communications@kewi.or.ke**  **@kewi_kenya**  **Kenya Water Institute**  **www.kewi.go.ke**