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# WATER INSTITUTE

*Water for Development*

## Newsletter

Vol.No.1 Issue.No. 2

September 2021

WATER INSTITUTE TO IMPLEMENT NEW CURRICULUM FOR APPRENTICESHIP







## *Message from the Rector*

**Dr. Adam O. Karia, (PhD)**

I would like to take this opportunity to welcome you to our second Newsletter edition. I am Dr. Adam O. Karia (PhD), Rector of the Water Institute. I would like to convey my sincere appreciation and congratulations to the Newsletter Editorial Board for their tireless efforts and passion in accomplishing this priceless task. Likewise, a word of appreciation to all those who spared time and energy to write the articles and to our esteemed readers.

Our Institute established in 1974 as Water Resources Institute under the Ministry of Water and Energy in order to supply the middle level technical workforce needed to implement the Rural Water Supply Programme (1971-1991). Following reforms in the public sector, which were geared towards improving service delivery among interventions undertaken by the Government, some of Government functions were delegated to semi-autonomous bodies such as Executive Agencies. The RWRI being one of the Ministry of Water and Irrigation units, was transformed into an Executive Agency on the 22<sup>nd</sup> August 2008 with the new name of “Water Development and Management Institute” (WDMI) as amended by the Government Notice No. 216 published on July 08, 2016 to the name of Water Institute.

We are mandated to provide quality expertise in the water sector through training, consultancy and research under the Ministry of Water and NACTE guidelines. Our Institute (WI) is fully registered by the National Council for Technical Education (NACTE) and its Programs are fully accredited by NACTE. The Institute has Bachelor Degree and Diploma programs as listed on the academic program page. Also, the Institute offers ready and tailor made short courses, and currently there are about 52 courses in areas of water supply and resources planning, design, procurement, governance and management. Water Institute is

solely a technical training institution focusing on developing technical human capital that needed in the water sector. We also invite our stakeholders in need of advisory/consultancy services in areas of water resources development, management, and governance to communicate with us on matter related to our mandate. We would like to ask for your support and cooperation to our Institute as an organization that builds and produce professionals with the talent, skill and sense of duty to work and researching for the benefit of our nation and the world in general.

Once again, I would like to welcome all students who confided in us and joined our Institute for the Certificate, Diploma, and Degree programs. Our Institute has well-equipped laboratories, well-experienced Instructors, and a conducive learning environment and therefore, I would like to assure you that you chosen the right place to study and you will definitely fulfil your dreams. Similarly, I pray for a good health for all students and staffs.

## MKUTANO WA WADAU KUTENGENEZA MITAALA MIPYA KWA MLENGO UANAGENZI



### **Mhe. Mhandisi Anthony Sanga** **Katibu Mkuu Wizara ya Maji**

#### ***Neno kutoka kwa Katibu Mkuu Wizara ya Maji.***

Warsha hii ya Wadau kuanzisha Mitaala kwa Mlenzo wa *Apprenticeship* ilifanyika jijini Arusha, ambapo Katibu Mkuu wa Wizara ya Maji alisema amefurahi sana kujiunga na wadau mbalimbali wa Sekta ya Maji, haswa kwenye tasnia ya mafunzo kwaajili ya kujenga ujuzi kwenye uendeshaji wa miradi mbalimbali ya Maji. Pia alishukuru kwa kupewa nafasi ya kujifunza kuhusu *Apprenticeship* na kufungua warsha hii ambayo mafanikio yake yataleta tija kwenye uendeshaji na usimamizi wa miradi ya kwenye sekta ya Maji. Mhe. Mhandisi Anthony Sanga alisema: “Nimeambiwa kuwa mitaala inayoandaliwa ni ya *Diploma in Maintenance Engineering* na *Bachelor Degree in Sanitation Engineering*. Nakiri kufurahishwa na jitihada hizi za Chuo cha Maji zilizolenga kutatua changamoto ya kiutendaji kwenye sekta ya Maji. Kwa muda mrefu tumekuwa tukitafuta ufumbuzi wa changamoto za uendeleo wa miradi ya maji na moja ya chanzo kilichotajwa mara nyingi na

tafiti mbalimbali ni suala la ujuzi wa kazi (*skilled labour*). Hili kwa kiasi kikubwa kwa maelezo niliyoyasikia kutoka kwa Mkuu wa Chuo Dkt. Karia na Msimamizi wa Mradi wa Kujenga Ujuzi kutoka Shirika la Kazi Duniani Bw. Comoro, naona hii apprenticeship approach inaweza kuwa jawabu la tatizo hilo. “

Katika hotuba yake Katibu Mkuu wa Wizara ya Maji alisema Wizara inatambua umuhimu wa mitaala yenye ubora na yenye kuendana na mahitaji ya sekta. Hivyo nimefurahishwa kuona Chuo cha Maji kinaboresha mitaala ili kuendana na changamoto zilizopo na zinazoendelea

kujitokeza katika sekta ya maji. Kama Wizara tunatambua kuwa mafanikio ya hizi jitihada za Chuo zinahitaji kwa kiasi kikubwa ushirikiano wa kissekta, hivyo basi Wizara inaahidi pamoja na sekta zake zote kutoa ushirikiano wa hali na mali ili kufanikisha malengo tajwa kama yalivyoainishwa katika hotuba ya Mkuu wa Chuo, kwa maslahi mapana ya sekta na taifa kwa ujumla.

Mwisho wa hotuba yake aliwashukuru sana washirika wote kwa kukubali wito na kujumuika na Chuo cha Maji, pia aliwashukuru Shirika la Kazi Duniani kwa kudumisha ushirikiano na Serikali yetu haswa kwenye masuala ya kuboresha ujuzi, na mwisho ila sii kwa umuhimu aliwashukuru wawakilishi wa Wizara washirika Wizara ya Elimu na ya Kazi, bila kusahau wasimamizi wa mafunzo yaani NACTE na TCU, na pia wasimamizi kwenye utendaji yaani ERB.

# WARSHA YA WADAU KUPITIA MITAALA KWA MLENGO WA UANAGENZI (DODOMA)

## Neno kutoka kwa Mkuu wa Chuo cha Maji



kwa lengo la kuzikamilisha. Tumekuwa tukipokea maoni yenu mbalimbali yenye mlengo wa kuboresha utendaji na huduma zetu kwa sekta, kama wakala mwenye majukumu ya kutoa watendaji wenye weredi. Tumeyafanyia kazi na tutaendelea kuyafanyia kazi. Kwa muda mrefu Wizara imekuwa ikitafuta ufumbuzi wa changamoto za uendeleu wa miradi ya maji na moja ya chanzo kilichotajwa mara nyingi na tafiti mbalimbali ni suala la ujuzi wa kazi (skilled labour). Hili kwa kiasi kikubwa tunaamini limepata jawabu lake kupitia hii *apprenticeship approach* ambayo ndo iliyolengwa na mitaala hii mipya.

### Dkt. Adam O. Karia, (PhD) Mkuu wa Chuo cha Maji

Warsha hii iliyofanyika jijini Dodoma, na ililenga Wadau kupitia Mitaala kwa Mlengo wa *Apprenticeship*. Akifungua warsha hii Mkuu wa Chuo cha Maji Dkt. Adam O. Karia alisema amefurahishwa kuwaona wadau mbalimbali wa sekta ya Maji haswa kwenye tasnia ya mafunzo kwa ajili ya kujenga ujuzi kwenye uendeshaji wa miradi mbalimbali ya Maji. Pia aliwashukuru wadau hao kwa kuitikia wito kwa mara nyingine tena. Katika hotuba yake alisema “kupitia warsha hii tunategemea kutoka na mitaala ambayo utekelezaji wake utaleta mafanikio yenye tija kwenye uendeshaji na usimamizi wa miradi ya kwenye sekta ya Maji. Timu ya wataalam wa Chuo cha Maji kwa kushirikiana na baadhi yenu wadau wetu wameandaa mitaala ya programu mbili ambazo ni ya *Diploma in Operation and Maintenance of Water Systems Engineering* na *Bachelor Degree in Water Supply and Sanitation Engineering*. Hizi ndo tunakwenda kuzipitia na kuchambua siku ya leo,

Nafurahi kuwajulisha kuwa Wizara inatambua umuhimu wa mitaala yenye ubora na yenye kuendana na mahitaji ya sekta, na kazi hii ilipata baraka za Katibu Mkuu Mhandisi Anthony Sanga siku alipoifungua tarehe 13 Julai 2021 pale jijini Arusha. KM alikiri kuwa kama Wizara wanatambua kuwa mafanikio ya hizi jitihada za Chuo zinahitaji kwa kiasi kikubwa ushirikiano wa kissekta, hivyo basi aliahidi pamoja na sekta zake zote kutoa ushirikiano wa hali na mali ili kufanikisha malengo ya Chuo, kwa maslahi mapana ya sekta na taifa kwa ujumla.”

Mwisho wa hotuba yake Dkt. Adam O. Karia aliwashukuru washirika wote kwa kuendelea kukubali wito na kujumuika na Chuo cha Maji, pia aliwashukuru Shirika la Kazi Duniani kwa kudumisha ushirikiano na Serikali yetu haswa kwenye masuala ya kuboresha ujuzi, na mwisho kabisa aliwashukuru wawakilishi wa Wizara washirika, bila kuwasahau wasimamizi wa mafunzo yaani NACTE na TCU.



## HABARI KATIKA PICHA



**WARSHA YA WADAU KUANZISHA MITAALA KWA MLENGO UANAGENZI (ARUSHA)**



**WARSHA YA WADAU KUPITIA MITAALA KWA MLENGO WA UANAGENZI (DODOMA)**



ZILIVYOKUWA  
**SIKU**

**100**

**ZA RAIS SAMIA  
SULUHU HASSAN  
MADARAKANI NA  
DAWASA**



**RAIS SAMIA SULUHU HASSAN**



## ZILIVYOKUWA SIKU 100 ZA RAIS SAMIA SULUHU HASSAN MADARAKANI NA DAWASA

Miradi ya majisafi iliyojengwa kwa thamani ya jumla ya shilingi bilioni 16.51 imekamilishwa na Mamlaka ya Majisafi na Usafi wa Mazingira Dar-es-salaam DAWASA ndani ya siku 100 ya uongozi wa Rais wa Jamhuri ya Muungano wa Tanzania Mhe. Samia Suluhu Hassan.

Miradi hiyo inayohudumia maelfu ya wakazi wa mikoa ya Dar-es-salaam na Pwani ni sehemu ya jitihada kubwa zinazofanywa na serikali katika kufikisha malengo ya kufikisha maji kwa asilimia 95 ya wakazi wa mijini na 85 vijij jini. Miradi hiyo na gharama zake ni kama ifuatavyo:

Mradi wa Maji Mkuranga-Vikindu unahusisha ujenzi wa tenki la maji lenye ujazo wa lita milioni moja na nusu, kituo cha kusukuma maji na ulazaji wa mabomba kwa umbali wa kilomita 63.5. Gharama ya mradi ni sh 5.5 bilioni na unahudumia wakazi takribani 25,000. Mradi unahudumia wakazi wa mji wa Mkuranga na vitongoji jirani.

Mradi wa Maji TANCHOICE umehusisha ulazaji wa mabomba ya ukubwa mbalimbali kwa umbali wa mita 10,500. Gharama za mradi ni sh. 1.2 bilioni na unahudumia kiwanda cha nyama TANCHOICE na kambi ya SGR. Aidha mradi mwingine wa kijiji cha Soga uliojengwa kwa gharama ya Tsh 400 milioni umekamilika na unahudumia wakazi takribani 7200 wa maeneo ya Kongowe, Ugindoni, Kigero, Dangua, Vikuge na Soga.

Mradi wa Maji Pugu-Gongo la Mboto umehusisha ujenzi wa tenki la ujazo wa lita milioni mbili, ulazaji wa bomba kubwa kwa umbali wa kilomita 14.5 na ulazaji wa mabomba makubwa kwa wateja kwa umbali wa kilomita 50. Gharama ya mradi ni sh. 7.3 bilioni na mradi umekamilika na unahudumia wakazi wa maeneo ya Pugu, Gongo la Mboto, Chanika, Air Wing na Kinyerezi. Maunganisho yanaendelea kufikia wakazi wengi zaidi wa maeneo jirani.

Mradi wa Maji Mbwawa umehusisha ulazaji wa mabomba kwa umbali wa kilomita 25.7. Mradi umegharimu kiasi cha sh. 11 bilioni na unahudumia wakazi takribani 4000. Mradi umekamilika na unahudumia, maunganisho yanaendelea kufikia wakazi takribani 14,000.

Mradi wa Maji Kizuiani umehusisha ukarabati wa vituo vinne vya kuchotea maji, ulazajiwa mabomba kwa umbali wa mita 300 na ukarabati wa viungo vya tenki la maji. Mradi umegharimu kiasi cha sh. milioni 2.7 tu na unahudumia wakazi takribani

10,614. Mradi umekamilika na unatoa huduma kwa wakazi wa Kizuiani.

Mradi wa Maji Kizitohuonjwa umehusisha ujenzi wa mnara wenye matenki ya ujazo wa lita 20,000, ulazaji wa mabomba kwa umbali wa mita 3000, ujenzi wa vituo sita vya kuchotea maji na ufungaji wa pampu ya kusukuma maji. Gharama za mradi ni sh. 74.2 milioni na unahudumia wakazi takribani 3201 wa Kata ya Kimbiji Wilayani Kigamboni



RAIS WA JAMHURI WA TANZANIA AKIZINDUA MRADI WA MAJI



TANKI la maji Mkuranga

# Information Service Provision at Water Institute: Improving Access and use of E- Resources



By Tumpale A. Mwakasangula  
Head-Library and Documentation Department

## Welcome to the Water Institute library.

The library was developed during the establishment of Water institute in 1974. The main objective for its existence is to support the core functions of the institution of teaching, research and consultancy by providing access to quality information which cater for the needs of WI community and other water sector stakeholders. The growth of technology however, has brought some transformations in the provision and delivery of services at WI. whereby ICT has become the major enabler of service delivery.

## E-Services at WI library

Meanwhile WI library is operating under the availability of internet connectivity. Computers with internet connectivity enable library users to get access to e-resources from online databases. E-services are so important to the institution as they complement physical information resources available in the library and finally result to the smooth running of the library in terms of effective service delivery. In this regard, the e-learning system, Research4Life programs and the Information Literacy (IL) programs are used to improve the access to and use of e-service at WI.

## E-Learning System

The establishment of the e-learning system in May 2021 is one of the bigger achievements made by water institute. E-learning system offers a platform for e-books which are uploaded from commercial sites or donation from stakeholders. Currently, WI e-learning system has more than 700 e-books and most of them are of recent years. The electronic system has brought many advantages to library users among them being the act to access and use library services wherever a client is, it also saves time and money, it facilitates the multiple user access to a single document as well as reducing overpopulation in the library. E-books can be accessed at web browser link:

[e-learnng.waterinstitute.ac.tz/ebooks](http://e-learnng.waterinstitute.ac.tz/ebooks)

## Research4Life Programs

In 2019WI subscribed to Research4Life program. Research4Life is the collective name for the four programs of HINARI, AGORA, OARE and ARDI. which aims at providing developing countries with free or low-cost access to academic and professional peer-reviewed content online. Library users benefit from these programs as they have online information which caters for academic needs of WI community.

HINARI- Access to Research in Health programs users to gain online access to one of the world's largest collections of biomedical and health literature resources. Apart from general health, under this program we get books, journals, conference proceeding book chapters as well as e-books in water and water related discipline.



AGORA program, set up by the Food and Agriculture Organization of the United Nations (FAO) together with major publishers, enables developing countries to gain access to an outstanding digital library collection in the fields of food, agriculture, environmental science and related social sciences.

OARE, set up by the United Nations Environment Program together with Yale University, and leading science and technology publishers, enables developing countries to gain access to one of the world's largest collections of environmental science research.

ARDI program is coordinated by the World Intellectual Property Organization together with its partners in the publishing industry with the aim of increasing the availability of scientific and technical information in developing countries. By improving access to scholarly literature from diverse fields of science and technology. Access to Research4life: [www.research4life.org](http://www.research4life.org)



*Water Institute library*

## **Information Literacy Programs**

WI library recognize that having e-resource in place without equipping users with knowledge to access them can hinder the effective provision of services. Considering this, formal and informal information literacy(IL) programs are being conducted to equip users with skills and techniques to access these resources.

One of the areas of concern under IL are insisting on the use of google scholar to access academic information as it is equipped with scholarly work, google scholar has many advantages some of them are: - It can also lead to hundreds of relevant scholarly articles in second, provides a “cited by” feature, provides formatted citations, provides library links, find open access journals, and it find science and technology articles as well as patents and legal document.

Furthermore, WI library equip users with knowledge of citation and referencing of scholarly work by migrating users’ mind to the modern citation and referencing styles of using online referencing software.

WI library provides guides to users about the use of Mendeley which is a free web and desktop reference management application, designed to simplify reference management workflow. Users are told the advantages of using Mendeley in referencing their works as create and manage citations of books, articles, import citations from many databases, extract metadata from imported PDFs, collaborate with other researchers online and many more.

WI library expecting to grow bigger in terms of building and infrastructures to meet the mission, vision and goals of the institute and the needs of water sector. It endeavors to become a resourceful center in providing information resources while insisting on the use of e-resources. WI library encourage the Corporation with stakeholders locally and internationally for the benefit of the Institution and our country at large.



## Network data envelopment analysis models for assessing urban water utility efficiency

By Dr. Dickson K. Gidion  
Lecturer - Water Institute

Urban water utilities operate in environments without competitors; regulators use targets to monitor utility operations, with the expectation that the current year's performance should be equal to or better than the previous year's performance. For more than 20 years, regulating authorities have employed empirical benchmarking methods that differ from one country to another to rank a utility performance. The use of different empirical methods limits the sharing of management strategies from one country utility to another due to the differing nature, assumptions, input variables, and goal settings based on management-specific features. This paper presents a performance analysis of urban water utilities using data envelopment analysis. Standard data envelopment analysis for relative performance evaluation has shortcomings of benchmarking a utility in competitive basis and does not allow for setting clear improvement guidelines. For this reason, network data envelopment analysis models are proposed to overcome the problem. This novel benchmarking technique produces an efficiency value for a utility in a competitive scenario with other utilities. The technique allows decision-makers to sort out a utility with the best and worst management environments and set clear performance improvement guidelines.

Regulators typically avoid using data envelopment analysis method to benchmark a utility efficiency due to the nature of the water supply industry, which involves supplying water in an environment without competitors. Thus, to improve a utility performance, regulators monitor a utility performance using targets and assess performance under a yardstick competition regime with sunshine regulations. Yardstick competition involves ranking and comparing performance, and sunshine regulation involve transparency and public disclosure of the findings. Standard data envelopment analysis is available in many forms; variable returns to scale and constant returns to scale are mostly used in the efficiency-benchmarking field. The variable returns to scale method generates efficiency and scales and performance target information for the inefficient decision-making unit (here referred to as urban water utilities), while the constant returns to scale generates a decision making unit efficiency measure only. Urban water utilities operate under a variable returns to scale methodology. For this purposes, a standard data envelopment analysis model is a method that enables comparisons where units use multiple inputs to deliver multiple outputs, which yields a single measure of overall performance. Being benchmarked as efficient does not mean that a utility has performed better in all variables compared to an inefficient one; some inefficient utilities can achieve a high-performance score in a few variables yet be benchmarked as inefficient because of their poor performance in reaching information targets. Using the efficiency results and target information this way, the efficient utility might underperform in the future and, conversely, the inefficient utilities may become efficient.

This study developed an efficiency benchmarking method with a globally optimal solution that benchmarks a utility under a yardstick competition regime along the lines of an empirical method, while also allowing the comparison and sharing of management strategies and experience among utilities and across countries. The study extends data envelopment analysis in the form of networks to remove the standard data envelopment analysis limitations during efficiency assessment, the novel assessment technique allows cross-utility efficiency evaluation under a yardstick competition regime and yet allows the sharing of management strategies and experiences between utilities and countries. A weak utility can try to improve performance by utilising the management strategies used by an outperforming utility.

Using standard data envelopment analysis, an intermediate (or even the worst) performer could be benchmarked as efficient, making it difficult to discern successful management strategies. The yardstick competition benchmarking approach exposes utilities that are the best and worst performers and removes the barrier of each utility having to accumulate quality management techniques independently; sharing management techniques may help bring the urban water utilities together and discipline them to simulate a cohesive management team.



# UKARABATI WA JENGO LA HOSTELI YA WANAFUNZI BLOCK F NA UPANUZI WA MAABARA YA HUDRAULICS

## Maendeleo ya miradi

Mpaka kufikia sasa kwa ujumla utekelezaji wa jengo la Block F umefikia 90% na jengo la maabara ya hydraulics limefikia 80%. Hata hivyo ili kupunguza gharama za utekelezaji wa miradi hii baadhi mikataba ya utekelezaji wa mradi wa Block F imehusisha na utekelezaji wa kazi zinazofanana kwa jengo la maabara ya hydraulics. Hivyo mafundi wamekuwa wakifanya tathimini za gharama za ufundi kwa kuhusisha majengo yote mawili.

Tunategemea miradi yote kukamilika katikati ya mwezi Octoba 2021 kama taratibu za ununuzi zitaenda sambamba na kasi ya utekelezaji wa kazi husika. Lengo hili ni kuhakikisha tunapoanza mwaka mpya wa masomo 2021/2022 majengo haya yote yaanze kutumika ambapo kupitia jengo la Block F Chuo kitaongeza kipato kutokana na ukusaji wa fedha za gharama ya hostel kwa wanafunzi maana jengo hilo linategemea kumudu idadi ya wanafunzi 172 ambao kupitia hawa Chuo kitaweza kukukusanya kiasi cha shilingi za kitanzania 51,600,000 kwa mwaka.



Muonekano wa Block F ukarabati ukiwa unaendelea



*Imeandaliwa  
na*

Mhandisi. Bernard Rugayi

## NAIBU KATIBU MKUU WIZARA YA MAJI, MHANDISI NADHIFA KEMIKIMBA AKAGUA MIRADI YA MAENDELEO CHUO CHA MAJI.

Naibu Katibu Mkuu Wizara ya Maji, Mhandisi Nadhifa Kemikimba, mapema leo tarehe 09/09/2021 ametembelea na kukagua miradi ya maendeleo inayotekelezwa kwa force account Chuoni hapo. Katika ziara yake hiyo akiwa na mwenyeji wake Mkuu wa Chuo Dkt. Adam Karia, amepongeza kasi ya ujenzi wa miradi ya kukarabati jengo la hostel ambalo linatarajia kukamilika ifikapo Oktoba 15, 2021 na litahudumia wanafunzi wapatao 164.

Sambamba na ukarabati huo, amepongeza upanuzi wa maabara ya Hydraulic ambao unaendelea kukamilika kwa kasi nzuri, huku ujenzi wa Zahanati mpya ya kisasa ukiwa katika hatua za mwisho kabisa za kuanza kutumika rasmi.



*Naibu Katibu Mkuu Wizara ya Maji, Mhandisi Nadhifa Kemikimba akikagua ukarabati wa Hostel Block F.*

Naibu Katibu Mkuu, amesisitiza Chuo kuendelea kusimamia utekelezaji wa miradi na majukumu ya Chuo ili kuhakikisha huduma iliyokusudiwa kutolewa na Chuo hiki kwa watazania inapatika kwa weledi wa hali ya juu.

Mwisho amepongeza Mkuu wa Chuo kusimamia vizuri taasisi hiyo kwani maendeleo chanya sasa yanaonekana.



## DRINKING WATER CHALLENGE



### ***The Challenge was conducted by Water Institute during Sabasaba trade fair.***

The acceptability of drinking water to consumers is subjective and can be influenced by many different factors. Bottled water comes in different brands, prices, and shapes exposing consumers to consumer choice decisions which is a decision consumers have to make when buying bottled water. Consumers bottled water decisions may be influenced by the quality of the water to which the community is accustomed and a variety of social, environmental, and cultural considerations such as friends' recommendations, social class, educational level, promotion, availability, and competitor effect, etc. (Lema Wodaje, 2018).

The drinking water challenge which was conducted during the 2021 Sabasaba trade fair held from 28<sup>th</sup> June to 13<sup>th</sup> July, this event brought more than 2,800 local companies and 54 foreign companies and attracted more than 700,000 visitors. The exercise aimed to gather consumers' perception of drinking water taste. The exercise was a blind taste test, where consumers were not aware of the brands of water available as water brands were sealed. Consumers' feedback was collected for effectively twelve (12) days from 29<sup>th</sup> June to 10<sup>th</sup> July. The water was labeled A, B, and C. More than 500 visitors' participated in the drinking water challenge.

The majority of respondents were females who were above 50%; aged between 21 to 40 years. Most of the respondents were aware of water brands, preferred water bottles, and waters other than the ones labeled. In addition, results showed a prevalence of other bottled water in different locations other than the ones labeled. The water taste was divided into four categories namely sweet, sour, salty, and bitter, the results showed that the majority of respondents perceived the bottled water as sweet which is a natural or refreshing taste, furthermore some perceived the different bottled water brands as sour, salty and bitter. Lastly, the water challenge results were shared with the bottled water industries who participated in the challenge as promised and/or requested.

## MATUKIO CHUO CHA MAJI

### MAKISATU 2021



Mashindano ya kitaifa ya Sayansi, Teknolojia na Ubunifu (MAKISATU) ni mashindano ambayo huratibiwa na Wizara ya Elimu kupitia Tume ya Taifa ya Sayansi na Teknolojia (COSTEC) yenye lengo la kutambua na kuibua Ubunifu, Ugunduzi na Maarifa Asilia ya Watanzania waliopo katika Vyuo vya Ufundi stadi na mfumo usio Rasmi. Washiriki wa mashindano walitoka katika Taasisi za elimu na mtu mmoja mmoja, pia kulikuwa na taasisi ambazo zilienda kufanya maonesho ya bidhaa na

huduma wanazotoa katika taasisi zao. Chuo cha Maji kilikuwa ni miongoni mwa Taasisi za elimu ya kati ambapo kilishiriki kuonesha kazi kuu inazofanya.

Mashindano haya hufanyika kila mwaka katika mikoa tofauti yakiwa na lengo tajwa hapo juu, ambapo MAKISATU 2021 yalifanyika Dodoma kuanzia tarehe 06 May, 2021 hadi 11 May, 2021.

Mashindano ya mwaka huu yalikuwa na kauli mbiu isemayo "SAYANSI, TEKNOLOJIA NA

### NACTE 2021

Baraza la taifa la elimu ya ufundi Tanzania, NACTE waliandaa maonyesho ya vyuo vya ufundi kwa kushirikiana na Taasisi ya Sekta bunafsi Tanzania, TPSF. Lengo ilikuwa ni kuwakutanisha Wadau, Waajiri pamoja na vyuo vya ufundi kwa ajili ya kujifunza na kufahamiana katika utendaji wa kazi pamoja na huduma zinazotolewa.

Chuo cha Maji, tulifanikiwa kushiriki kikamilifu katika maonyesho haya, lengo kuu likiwa ni kutangaza huduma zinazotoa chuoni ikiwa ni sehemu ya kujinadi na kutangaza mafunzo, huduma za ushauri wa kitaalamu, pamoja na tafiti mbalimbali inazofanya chuoni. UBUNIFU KWA UCHUMI ENDELEU".





## MATUKIO CHUO CHA MAJI

### SABASABA 2021



Maonesho ya Kimataifa ya Biashara (Sabasaba), huratibiwa na Mamlaka ya Maendeleo ya Biashara Tanzania (TanTrade). Maonesho haya yanalenga kutoa fursa kwa wafanyabiashara wa ndani na nje ya nchi pamoja na taasisi mbalimbali kutangaza biashara, bidhaa na huduma wanazozitoa. Kauli ya mbiu ya maonesho haya mwaka huu ni “Uchumi wa Viwanda kwa Ajira na Biashara Endelevu”. Maonesho ya Biashara ya kimataifa hufanyika kila mwaka Jijini Dar es Salaam, na mwaka huu maonesho haya

yalifanyika kuanzia tarehe 28 Juni hadi tarehe 13 Julai.

Washiriki wa maonesho haya ni Wafanyabiashara wa ndani na nje ya nchi, Makampuni mbalimbali, na Taasisi mbalimbali kutoka Serekalini na Sekta binafsi. Chuo cha Maji kilikuwa miongoni mwa Taasisi za Serekali zilizoshiriki maonesho 45 ya Biashara ya Kimataifa (Sabasaba).

Lengo kubwa likiwa ni kukitangaza chuo cha maji pamoja na huduma zake zote za elimu na ushauri wa kitaalamu kwa wadau wa elimu kujumuisha wafanyakazi mbalimbali wa serikalini na sekta binafsi, wafanya Biashara, wanafunzi wa vyuo, shule za sekondari na msingi pamoja na raia wa kawaida waliotembelea maonesho haya.

### TCU 2021

Maonesho ya vyuo vikuu Tanzania huratibiwa na tume ya Vyuo vikuu nchini (TCU). Maonesho haya yanalenga kutoa fursa kwa vyuo na taasisi za Elimu ya juu kutangaza kozi mbalimbali wanazao fundisha. Kauli mbiu ya maonesho ya mwaka huu ni “Kudumisha uchumi wa mapato ya kati na kukuza ukuaji kupitia elimu ya juu, sayansi na teknolojia”.

Maonesho ya vyuo vikuu hufanyika kila mwaka na mwaka huu yalifanyika kuanzia tarehe 26/06/2021 hadi 31/06/2021

Washiriki wa maonesho haya ni vyuo vyote vinavyotoa elimu ya juu nchini pamoja na wadau mbalimbali wa elimu ya juu nchini, Chuo cha Maji kilikuwa miongoni mwa vyuo vilivyo shiriki maonesho ya 16 ya vyuo vikuu (mnazi mmoja)

Lengo kubwa lilikuwa ni kukitangaza chuo cha maji pamoja na huduma zake zote za elimu, ushauri wa kitaalamu, utafiti pamoja na kufanya udahili kwa wanafunzi wapya wa shahada na stahada.





## INTEGRATED LEAKAGE MANAGEMENT SYSTEM (ILMS) MECHANISM



Photo was taken in Moshi Urban Water Supply after presentation of ILMS system.

Integrated Leakage Management System (copyright number C0840137) is a system designed for the purpose of reducing water loss (real loss and physical loss) by using low-cost techniques compared to currently relied technology. The system is designed to operate both manually and automatically to ensure that leakage is reported as soon as it occurs.

The system includes four features which are water supply network and customer mapping, leakage reporting and monitoring system, tank water level and security monitoring, and lastly production and DMA water consumption analysis.

Towards transforming water supply services through digitalization the system has considered many factors from a wider perspective, and focused on underlying opportunities within water utilities' water management challenges. It has incorporated performance indicators, routine calculations of water loss levels/rate. The technology maybe applied for the purpose of determining amount of water lost at any specific time within a supply network, to get information of leakages with its coordinate through manual and automatic means, to store the information of leakage with its coordinates for several years, to check the water level in the tank without visiting the tank area and to view summary of water leakage reported and performance of leakage managing plan through a dashboard system.

The system has already been used in some water utilities such as IGUWASA (installed May 2021) and IRUWASA which use the first version which has only one feature of reporting leakages. The system has shown positive results and greater efficiency than before as it has helped water utilities increase collections, reduce water losses, and help strengthen the water supply service plan.

As the system operates more independently it is our expectation that it will reduce operating costs and increase collections as well as other results already experienced in the area where it has been operating.



### 1. Bachelor's Degree in Water Resources and Irrigation Engineering.

#### Entry Qualification

Form VI: Holder of Advanced Certificate of Secondary Education (ACSE) with Two principal passes with a total of 4.0 points (based on the following conversion scale: A=5, B=4, C=3, D=2, E=1) from two of the following subjects: Mathematics, Physics, and Chemistry.

Completed A-Level studies in 2014 and 2015 must possess an Advanced Certificate of Secondary Education (ACSE) with Two principal passes (Two Cs) with a total of 4.0 points (based on the following conversion scale: A=5, B+=4, B=3, C=2, D=1) from two of the following subjects: Mathematics, Physics, and Chemistry.

OR

Diploma (NTA Level 6): Holder of Ordinary Certificate of Secondary Education (OCSE) with four passes in non-religious subjects; AND Ordinary Diploma in either of the following fields: Water Supply and Sanitation Engineering, Hydrogeology & Water Well Drilling, Hydrology & Meteorology, Water Quality Laboratory Technology, Civil Engineering, Irrigation Engineering, and other fields related to Civil Engineering or Water Resources Engineering with minimum GPA (NTA 6) of 3.0

OR

Full Technician Certificate (FTC) in Water Resources Engineering, Hydrogeology & Well Drilling, Hydrology & Meteorology, Water Laboratory Technology, Civil Engineering, and other fields related to Civil Engineering or Water Resources Engineering with minimum average C grade based on the following conversion scale: A=5, B=4, C=3, D=2.

#### BASIC TECHNICIAN CERTIFICATES AND ORDINARY DIPLOMA PROGRAMS

1. Water Supply and Sanitation Engineering
2. Hydrology and Meteorology
3. Hydrogeology and Water Well Drilling
4. Water Laboratory Technology
5. Irrigation Engineering

#### Entry Qualification

Holder of Ordinary Certificate of Secondary Education (CSE) with four passes (D Grade) in non-religious subjects three of which should be in any of the following subjects: Mathematics, Physics/ Engineering Science, Chemistry, Biology, Agriculture and Geography

OR

Holder of Ordinary Certificate of Secondary Education (CSE) with two passes (D grade) in any of the following subjects: Mathematics, Physics/ Engineering Science, Chemistry, Biology, Agriculture and Geography AND holder of National Vocational Award (NVA) level 3 in a related fields.

# WATER INSTITUTE

## SHORT COURSES

The Institute offers several short-term continuing education/ professional development courses which are usually non-accredited. The prospective participant can apply for admission to a course chosen from the list of options or an organization can make a special request for a made to order (tailor-made) course.

These courses are aimed at enabling the participant to learn up-to-date skills required for performing the tasks of his current occupation or to acquire additional skills required for performing the tasks in his occupation or to learn the skills required in a different occupation he wants to enter. Details on course titles, contents, target participants, required minimum qualifications, duration, dates and fees are available in a our website.

A variety of ready-made courses are offered which focus on skill areas required for water resources management and water services provision/ management. Alternatively an organization can request for training of its personnel in a made-to-order (tailor-made) course.

### The List below are the some of the short courses offered:

SN	TITLE OF THE COURSE	DURATION	COST (Tsh)
1	Advance Hydraulic Analysis Simulation Using Epanet	2 Weeks	600,000
2	Advanced Wastewater Treatment Technology	1 Week	600,000
3	Advanced Water Treatment Processes	1 Week	500,000
4	Assets Management	1 Week	350,000
5	Attaining Excellence in Customer Service	1 Week	300,000
6	Basics Engineering and Safety of Dams	1 Week	500,000
7	Basics of Earthen dam design	1 Week	500,000
8	Basics of Water Pump Electrical Installations.	1 Week	500,000
9	Basics of Water Pump Mechanics	1 Week	500,000
10	Community development services in water sector.	1 Week	450,000
11	Contract Management for Water Sector	1 Week	450,000
12	Customer Acquisition and Retention Strategies	1 Week	300,000
13	Design of Hydro-meteorological Network	1 Week	400,000
14	Design, Operation and Maintenance of Drip irrigation Systems	2 Weeks	600,000
15	Developing Customer Relations Strategy	1 Week	300,000



SN	TITLE OF THE COURSE	DURATION	COST (Tsh)
16	Effective Reporting, Minutes writing and Presentation skills.	1 Week	300,000
17	Electronic Topographic Surveying	2 Week	400,000
18	Establishment and Maintenance of Hydro-meteorological Gauging Stations	1 Week	500,000
19	Financial management	1 Week	450,000
20	Geotechnical Site Investigation	2 Weeks	600,000
21	Groundwater Exploration	1 Week	600,000
22	Hydraulic Analysis Simulation Using Epanet	1 Week	450,000
23	GIS Applications	1 Week	300,000
24	Hydraulic Analysis Simulation Using Epanet through the utilization of a partial network	2 Weeks	600,000
25	Hydraulic Analysis/ Simulation Using Excel Spreadsheet	1 Week	450,000
26	Hydraulic Modeling/ Simulation Using Excel spreadsheet and Data Managed by GIS	2 Weeks	600,000
28	Information search skills and scientific writing for research-based projects.	1 Week	350,000
29	Introduction to Contract Management	1 Week	450,000
30	Introduction to Procurement Contracts.	1 Week	350,000
31	Leadership Skills Development in Public Sector	1 Week	450,000
32	Leadership Skills Development.	1 Week	450,000
33	Monitoring and Evaluation of Programmes and Projects in Public and Private Sectors	1 Week	450,000
34	Plumbing and Pipe Fittings	1 Week	400,000
35	Project Management	1 Week	350,000
37	Public Procurement and Force Account	1 Week	350,000
38	Public Relations and Corporate Communications	1 Week	450,000
39	Pumping Test Technology	1 Week	400,000
40	R programming for hydro-meteorological data processing and analysis	1 Week	400,000
41	Remote Sensing	1 Week	300,000
42	Risk Management	1 Week	300,000
43	Solid Waste Management	1 Week	400,000



## Contact & Address

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**For more Information visit; [www.waterinstitute.ac.tz](http://www.waterinstitute.ac.tz)**