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Expansion works in Ahero
Irrigation Scheme.

Chief Editor's Note.



Mr. Daniel M. Nzonzo- Head of Corporate Communication

Happy New Year! It is a blessing to step into 2021 with you. The Authority has much to share with you but before getting into it, the 7th issue of Unyunyizi News is out with some of the wins we achieved in the last quarter of 2020.

In this issue we look into project implementation process, the success story of Household Irrigation Water Storage Project and enlighten you on the importance of soil analysis. We will also get some life insights from Eng. Charles Muasya and acquaint you with the irrigation term 'Canal'.

On matters National Cohesion and Values, this issue focuses on Equity and Equality. In our continued segment of "Your opinion" we document some of the feedback on "how you are surviving the effects Covid-19 on your farming practices". In the next issue we look forward to featuring some of your feedback on "Your success story brought about by adopting irrigated agriculture".

Enjoy the read.

Word from the CEO.



Mr. Gitonga Mugambi- CEO National Irrigation Authority

Happy 2021. The 2nd Quarter of the Financial Year 2020/2021 was rather a fast one. Regardless, the Authority continued to weather the Covid-19 storms in order to continue implementing its mandate with the aim of ensuring that we deliver water to every irrigable acre in Kenya.

I encourage us to continue observing all the measures put in place by the Ministry

of Health on Covid-19 mitigation in order to not only protect ourselves but also our loved ones.

Irrigation is indeed a major component towards the realization of a food secure nation, about 82% -89% of the land in Kenya being arid and semi-arid. The Authority has not held back from empowering the small holder farmers by excavating water pans for them in order to ensure that they can carry out farming activities throughout the year.

This year I encourage farmers to continue putting their best foot forward in order to build this nation that our children's children may have a better future. The Authority is determined to work towards the development and sustainability of more irrigation projects to meet its vision.

I wish you a restorative year as we work towards securing our nation from hunger.

Pastoralists embracing diversification of economic activity.



By Johnbosco Obonyo

Kajiado County residents commonly known for their pastoralism practices have in the recent past joined crop farming thanks to the Household Irrigation Water Storage Project. It is one of the Counties across the Country that have benefitted from the water harvesting initiative implemented by the National Irrigation Authority. To date a total of 668 water pans have been constructed in the region in different areas. Further, 29 community/colonial water pans have been rehabilitated. These include; Olookil, Oloika, Imerti, and Ichakita among others.

The water pans collectively hold up to 3.7 million m³ irrigating a potential of 3,000 acres and has directly benefited about 3, 000 households directly so far.

"This area before this project was very dry, inhabiting wild animals, with no farming activities, but when this project was introduced, the place has transformed to a farming area and the residents are making a livelihood out of it"



Farmers harvesting tomatoes in Olookil, Kajiado County

**“ 668
water pans to
date have been
constructed in the
region in different
areas.**

James Selengia, the Chairman Olookil Dam, Kajiado.

Currently, the Authority is planning to do 10 more community water pans with each having a total water holding capacity of 100,000m³ to support farmers undertake irrigated agriculture as well as avail water for their livestock. "...this being a semi-arid place water pans will be used for domestic purposes, crop and livestock production.

The soil is very fertile. We



Livestock in a cattle trough constructed by the Authority for farmers in Kajiado.

are going to plant tomatoes, water melons, vegetables and onions" Richard Murkau, the overall farmer's Chairman, Kajiado East Projects.

Among the already completed large scale irrigation projects in the region include Entarara Irrigation Project which covers 350 acres and Isineti Irrigation Project covering 800 acres.

Project Implementation Process.



By **Brendah Rajwayi**

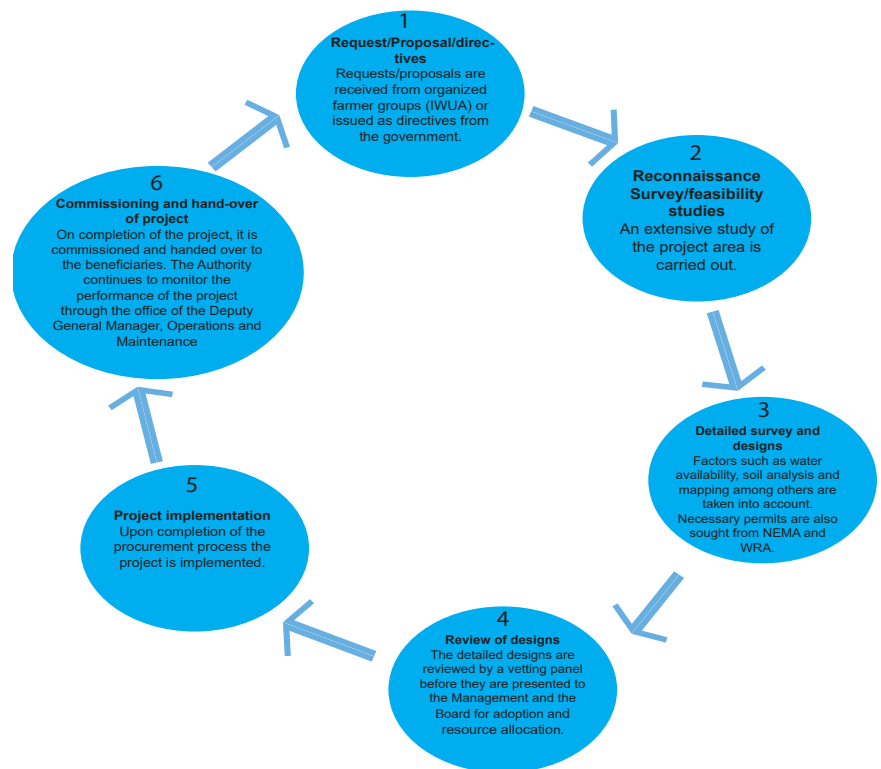
The National Irrigation Authority is implementing 13 key irrigation projects/programmes across the Country. These projects are at different stages of implementation ranging from completed, to ongoing, to projects at initial stages. This article will enlighten you on the process these projects undergo from initiation to completion.

As explained by Eng. Louise Kahiga, the Chief Engineer, Planning and Design, the process of project implementation starts from placing a request/proposal to reconnaissance survey/feasibility studies, detailed survey and designs, designs review by the vetting panel and approval of the designs, procurement, project implementation to finally commissioning and handing it over to the project beneficiaries. Throughout the process, there is an active stakeholder involvement.

The 13 key irrigation projects being implemented by the Authority include: Mwea Irrigation Development Project, Galana/Kulalu Irrigation Development Project, Bura Irriga-

tion Development Project, Turkana Irrigation Development Programme, Rwabura Irrigation Development Project, Expanded National Irrigation Programme,

Household Irrigation Water Storage Programme, Spate Irrigation for Climate Resilience, Water Security and Climate Adaptation, Community Small Dams and Water Pans, and Construction of Large Dams for Irrigation as broken down by Eng. Charles Muasya,



Project Implementation process

“

13

key irrigation projects/programmes being implemented by National Irrigation Authority across the country.

Lower Sabor Irrigation Development Project, Lower Kuja Irrigation Scheme,

the Ag. Deputy General Manager, Infrastructure and Irrigation Development Services (DGM, IIDS).

The implementation of these projects will not only lead to an increase of the acreage under irrigated agriculture but also provide for sustainable farming and steer the country towards achieving food security and nutrition.

Pictorial.



1. Ministry of Water Sanitation and Irrigation PS Joseph W. Irungu, CBS (Center), National Irrigation Authority CEO (2nd Right), Eng. Charles Muasya (right) and other officials from Ministry of Water Sanitation and Irrigation inspecting pipes to be used to supply water to Mirira Irrigation project once the ongoing works in the project are complete.
2. Ministry of Water Sanitation and Irrigation CS Sicily K. Kariuki (Mrs) E.G.H (center) receiving some vegetables from Katilu Irrigation Scheme farmers.
3. Ministry of Water Sanitation and Irrigation CS Sicily K. Kariuki (Mrs) E.G.H (2ndRight), CS Ministry of Petroleum and Mining Hon. John Munyes (4thRight), National Irrigation Authority CEO Mr Gitonga Mugambi snapping individual cobs



- from the maize stocks and removing the husks in Katilu Irrigation Scheme.
4. Water storage by use of a water pan in Olookil, Kajiado County.
 5. Construction of a water pan in Mamurra Imbuko, Kajiado County.
 6. Livestock drinking water pumped from a water pan dug by the Authority in Olookil, Kajiado County
 7. Ministry of Water Sanitation and Irrigation PS Joseph W. Irungu, CBS (Center) being helped by National Irrigation Authority CEO (Right) to fix a pipe that will supply water to Mirira Irrigation Project in Murang'a County.
 8. Farmers in Isineti Irrigation project harvesting tomatoes.

Understand your Soil for Sustainable Production.



By Rhoda Mbuvi

Mr Kinoti is a commercial farmer in Tharaka Nithi County where he bought a piece of land. To settle on the particular crop to farm, he visited National Irrigation Authority offices at Mwea Irrigation Agricultural Development (MIAD) Center for advisory services. This, he says was the best decision he ever made as he was able to achieve optimal yields.

As Kinoti confesses, when he sought for the advisory services, officers from the Centre visited his newly bought farm in the year 2019 to collect soil samples. Three weeks later, the Officers communicated the results with recommendations that informed his choice of commercial crops both annual and perennial: Bananas, Pulses (green grams and common beans).

For any agricultural land to be put into use a recommendation on soil fertility status is always important. This is a general outlook on the conditions of the soil both on health, wider physical and chemical aspects.

As explained by Mr. Vincent Kipngetich, the Officer-in-Charge at MIAD center, Soil sampling and analysis is a set of various processes that start in the field before being subjected to laboratory procedures based on the scope. Sampling of agricultural soil not only determines the status plant nutrients in the soil, but also the general soil health. Chemical soil analysis determines the content of basic plant nutrients; nitrogen (NH_4^+ and NO_3^- ions), phosphorus (P_2O_5), potassium (K_2O), pH - value, humus content, total CaCO_3 , available lime, organic matter, total Sulphur (S), trace elements, and other physical characteristics (capacity, permeability and density).

In simple terms Vincent says, soil is a living thing that always needs to be restored regularly for it to



Above: Technicians in MIAD Center Lab

Right: Bananas in Mr. Kinoti's plantation farm.



function in an ideal situation.

For a farmer to be able to restore agricultural soil, sampling and laboratory analysis is highly recommended. This exercise enables a farmer to crop the right plant, at the right time and in the right place. It also helps one answer a few questions:

1. Is the nutrient content sufficient or need be supplemented?
2. How easy is it to till the land?
3. What is the behavioral characteristics of water retention in relation to an intended target crop?

Different types of soil require different relevant cropping operation and care. Sandy soil for example is easy to till but has poor nutrients content, dries quickly, warms up fast after winter, has poor retention of water compared to clay soil which is rich in nutrients, dries slowly but cracks when dry. Silt soil, which is also easy to till but contains just enough nutrients, dries not too quickly but cracks when dry and requires tilling for better circulation.

Therefore, for a farmer to be informed and be proactive, it is recommended that soil data be collected and retained. This will not only help inform the farmer but also agricultural extension officer who will be advising the farmer on proven Good Agricultural Practices (GAP).

It is advisable therefore, to conduct soil sampling regularly to assist in understanding the best management practices and choice of crops to invest in. Two research Stations at the National

Irrigation Authority help in offering solutions for all the farmers. MIAD Centre caters for the Eastern Region while the Ahero Irrigation Research Station (AIRS) provide the services to the Western region. Among other services offered in these stations include: technology generation, transfer & monitoring, soil and plant tissue laboratory analysis, as well as

other accredited services on agro-chemical products to be registered for use by farmers.

Test before you invest. Soil has hidden risks that you cannot see with a naked eye, but requires to be dug and read with an expert eye – Vincent Kipng'etich.

Demystifying Irrigation terms.



Lined canal in Naipa Irrigation Project, Turkana County



By Johnbosco Obonyo

A canal is an artificial channel that is constructed to convey water from a source to the farms for irrigation purposes. This could be categorized into; main canal, branch canal, distribution canal, and watercourse or in-field canal.

Water is taken from the source (river, dam or reservoirs) through the main canal into the branch canal and then through the distribution canals and finally to into the field channels

A canal is an artificial channel that is constructed to convey water from a source to the farms for irrigation purposes.

from where farmers are able to irrigate their fields.

Main Canal: It supplies water from a source to irrigate farms.

Branch Canal: It offtakes from the main canal. It also plays the role of feeder channel for distribution canals, but they provide direct outlets.

Distribution Canal: There are major and minor distribution canals. The major distribution canal takes off water from branch canals. Their discharge is less

than that of the branch canal. These are mostly known as irrigation channels because of their supply of water to the field directly through outlets. The minor distribution canal on the other hand offtakes from the major distributary with a lesser water discharge. They also provide water to the courses through outlets provided along with them.

Watercourse or In-field Channel: They are small channels which convey water from the outlet of a distribution canal to the areas to be irrigated.

Canals can be lined or unlined. Lining with cement concrete is widely accepted. It can resist the effect of scouring and erosion very efficiently. The velocity of flow may be kept above 2.5 m/s. The lining is done by preparing the sub-grade and laying concrete.

Advantages of lined canals include prevention of excessive loss of water and water logging of adjacent lands due to seepage as well as erosion. It also reduces water flow resistance and weeds aquatic growth, and provides the needed side slope stability.

Unlined (earth) canal is one not concreted yet. Unlike the lined canals, the flow of water

in earth canals is not well controlled because of the elevation of the land which causes the overflowing or shortage in water delivery, high seepage and conveyance water losses which results in waterlogging of adjacent lands, danger of canal bank breakage caused by overtopping, erosion and animal burrowing. Profuse growth of aquatic weeds which retards the flow of water and causes heavy maintenance costs is common in earthed canals.

In addition, water flow in earth canals is less uniform and constant than in lined canals. Choking vegetation and pools of stagnant water causes the water flow to be even more erratic and more conducive to vector breeding. In these circumstances, problems of silting become more serious than those of erosion. It is thus recommended to turn the earth canals into a cement concrete lining in order to make it more useful and easier to maintain.

Opinion Nook.

“Some of the feedback on how farmers are surviving Covid-19 impacts”



By Rhoda Mbuvi

It is relieving to learn that farmers are coping quite well with the various challenges brought about by Covid-19 pandemic. The mechanisms put in place vary from some who had to re-organize their way of living to those who the pandemic was an eye opener to greater ventures and those who had no market for their produce among others.

Here are some of your feedback as received:

- “I export avocado and when the international borders were closed due to Covid-19, I was stuck with my produce hence was forced to venture into inter-regional market, which is flooded but I am surviving. I am finding my way in the market.” Ms Fridah from Kisii County (via email)
- “On my side as a small farmer, I relied majorly on urban setting market; Nairobi specifically but with the imposed curfew and travel bans, I experienced a lot of losses but things are getting better. I thought of adding value to my produce, started producing fresh juices from my fruits and tomato paste from my tomatoes.” Mr. John from Kirinyaga County (via email)
- “Before Covid-19, I owned a clothing shop and a hotel. When the pandemic hit, I had to close my businesses and relocate to upcountry. Being a single mother of two I had to make a living, hence ventured in to poultry keeping, goat rearing and horticulture farming. I am in a better place now. Covid-19 was an eye opener for me. It has pushed me to go beyond what I thought was impossible for me.” E. Chebet from Nandi County (via email)
- “I am large scale farmer in Kilifi County, recovering from the challenge of limited access to agricultural inputs. For instance when people were called upon to work from home, it was challenging to get labor and extension services. It was until then I learnt of mechanical ways of weeding and farming even seeking extension services electronically. The adapting has not been easy, it's costly but more effective with its negative side being that most of casual labors I relied on have lost their jobs” Mr. Gedion. (via email)
- “Am an extension officer situated in the Eastern region. At first, it was challenging to offer advisory services to the farmers but Covid-19 has forced me to be innovative. We have embraced technology and new digital tools to help farmers use precise amounts of inputs, identify distress in plants, as well as keep better control of their farm operations.” Ms. Kiilu (via email)
- “Covid-19 has made it difficult for farmers to get off-farm employment to earn money for food and some have reportedly been forced to take up fishing in the Lake. Access to clean water is also problematic, both because of the floods and because of the emphasis on hand washing in national Covid-19 awareness campaigns. These effects have forced us to rethink our farmer linkages to collaborators and markets” Mr. Joel Tanui (the Scheme Manager, Western Kenya irrigation Schemes) (via email)

Equality vs Equity.



By George Maina

The debate around equality and equity has been ongoing for quite long and it doesn't get better with time. Majority argue one value as the other and the arguments go on and on. Equity refers to the quality of being fair impartial and has attributes such as fairness, justice, impartiality and egalitarianism. It is the quality of being reasonable and fair in all decisions and actions. It is not always about treating everyone in the same way; is about treating people in such a way that the outcome for each person can be the same. This means putting measures in place to support people achieve similar outcomes. Quality of outcome



Equity

can be achieved by ensuring that everyone has access to resources and decision making and at the same time be recognized, valued and respected. Equity is practiced through actions such as fair distribution of resources among communities, social cohesion and harmony, good governance among others.



Equality

On the other hand, Equality is ensuring that everyone has the same opportunities and receives the same treatment and support. It exists where all people within a group have the same status in a certain respect. It includes equal rights under the law such as right to security and voting, freedom of speech, access to education, health care and other social securities. It also includes equal opportunities and obligations.

too little to those who need it and too much to those who do not can further worsen the inequalities we see today.

To this end, do you practice good governance? when in a position do you fairly distribute resources? Do you treat all people equally? It is essential as a Kenyan Citizen to practice these values to have one Kenya, be one people and have one destiny.

“We must be cautious when dealing with equity; providing too little to those who need it and too much to those who do not can further worsen the inequalities we see today.”

Life insight with Eng. Charles Muasya.



Eng. Charles Muasya. Ag. Deputy General Manager, Infrastructure and Irrigation Development Services.

By Brendah Rajwayi and Johnbosco Obonyo

Eng. Charles Muasya is currently the Ag. Deputy General Manager, Infrastructure and Irrigation Development Services at the National Irrigation Authority. He has a Masters in Civil Engineering from the University of South Australia (UNISA) and a Bachelor of Science in Agricultural Engineering from Egerton University. He has practiced engineering for 22 years now. We engage with him to get a sneak peek of his work life, work-life balance and accomplishments.

How was it like growing up?

Very interesting. I grew up in a small village in Kitui in a close-knit family comprising of my father, mother and four siblings. I attended catechism which helped cement my relationship with God and guided me to always be prayerful, faithful and trust in God at all times.

In my free time I would be in the field herding goats and cattle, playing football, knocking down birds from the sky with a slingshot, swimming in the clear, cold streams and fighting with the other boys of the village (*of course I never won, thanks to my height*).

Catching fish with twine and sharpened bits of wire, seeing bulls fighting by the river, hunting gazelles and antelopes with bow and arrows are some of the memorable childhood events. Actually it was a major achievement to hunt down any of these animals, but sadly I never attained this satisfaction. On a brighter side I thank God for growing up in this environment it gave me a lot of formative years that has shaped my life. I learnt how to take opportunities and push forward.

Did you have a nickname?

He laughs. I have had so many nicknames throughout my childhood, one in particular was *Kwikia*. (this is a Kamba word in this context meaning gear engagements whereby the aspect of speed comes in). I earned this for being a very fast kid.

Whenever my mother would send me to the shop I was already running there, in many instances I would get to the shop and realize I didn't get the money or the full details of the items to purchase.

Having grown up in the village, did you ever dream of living in the city?

No. I loved it in the village. We believed children in the city were ill-mannered hence bad company. No one wanted to be identified as a spoilt kid or associated with them. It was also easier to find genuine friends in the village. However, I occasionally visited during the school holidays since my father was working here. He would take us to Sarit Centre to play and it was fun.

Tell us about your schooling and getting to employment?

Being a performer in primary and high school I earned a spot at Egerton university to study Bachelors of Science in Agricultural Engineering.

After graduating I joined the Ministry of Water and Irrigation and was posted to work in Migori before being transferred to Taita Taveta, Kitui and Nairobi respectively.

From the Ministry I was nominated to study Masters in Civil Engineering from the University of South Australia (UNISA). From here I joined the National Irrigation Authority as a project engineer.

How was the experience studying in a foreign country?

Some of the key things I noted is that universities abroad have tailored courses to put more emphasis on the discipline one is dealing with. The courses are also more practical and classes very interactive. Studying abroad gives you exposure to different technologies, new cultures and learning how to embrace all these is an important life skill.

In my time studying in UNISA, students were not given room to miss classes. I also appreciated projects and assignments being submitted online. This created the discipline of timeliness and ensured that students did not submit plagiarized work. luckily, I did not experience any form discrimination there.

Tell us about your journey since joining the National Irrigation Authority?

I joined the National Irrigation Authority, by then National Irrigation Board, in 2013 as a Projects Engineer. Since then I have worked under Engineer Richard Kanui currently an Engineering Secretary at the Ministry of Agriculture, Livestock and Fisheries, Engineer Michael Thuita currently the CEO of Athi Water Works Development Agency and Eng. Raphael Ogendo the Authority's outgoing Deputy General Manager, Infrastructure and Irrigation Development Services (DGM, IIDS) from whom I have learnt much. They have been very instrumental in helping me grow my career. Working as the projects engineer exposed me to more irrigation projects in the Country.

In 2017 I was charged as the Chief Engineer with the task of coordinating and managing the planning and design of irrigation systems and infrastructure until 2020. During this time, I have planned and coordinated the implementation of projects notably the Galana Kulalu Food

Security Project, Mega dams such as Thuci, Radat, Lowaat, Thiba and High Grand Falls and the National Expanded Irrigation Programme. I was recently appointed the Ag. DGM, IIDS

As an Engineer, what are some of the works you have undertaken that you take pride in and did you face any challenges?

In the year 2006, I was posted to work in Taita Taveta where there is a lot of potential as most rivers are recharged from Mt. Kilimanjaro which is nearby. Together with the team I was working with, we were able to develop, construct and/or rehabilitate ten (10) irrigation projects putting more than 6,500 acres under irrigation. These were Njoro Kubwa Canal, Njukini, Marondo, Kasokoni, Chala, Majengo, Lumi, Kamleza, Taita Clusters, Gitobo, and Kimorigo, irrigation projects.

Initially, insufficient funds was a major challenge we faced. However, the success of the initial projects made it possible to attract more donors. Additionally, while Lower Lumi had enough water, Upper Lumi did not hence the need to create supplementary water storage. We excavated small dams to achieve this.

I was later posted in Kitui. The area was semi-arid and having no permanent rivers. We initiated technologies for harnessing and harvesting water to curb the challenge of water scarcity. We drilled boreholes, constructed sand dams and introduced greenhouse farming and drip irrigation systems. As a result, we were able to put more than 1,000 acres under irrigation through Kavisuni, Ngomano, Tungutu, and Mutune irrigation projects. I was also the design engineer for Usueni Irrigation Scheme which is one of the projects the Authority initiated and supports to date through the office of the Deputy General Manager, Operations and Irrigation Services to ensure that the farmers uptake irrigation. The scheme covers 1,000 acres.

You have done so much in opening up land to irrigation in the Country. Are you undertaking any farming activities?

(Chuckles) Yes I do. I am a farmer. I am rearing livestock and growing some vegetables, bananas and pasture. I am also a bee keeper.

But engineer, based on your sharp dress code and taste in style and fashion, nothing is any close to the mud in the farms and the frustrations in getting the perfect irrigation development design...

(Laughs) You remind me about a time when the CEO was telling me that he hopes that I don't spend all my money on designer suits and curl-kitting my hair and that I also invest. I am a firm believer in looking presentable and taking care of oneself.

I do encourage people to save and invest as well but I don't think it is wise to invest everything. Treat yourself with the little you have while you live. Be clean. Dress presentably. Smell good. This shows how responsible you are. It doesn't require so much money; you only need to be intentional about it.

“

Eng. Charles Muasya

All dreams are valid. Opportunities will come, work hard, take yours and push forward. Things will not always work your way. Either way, trust in God

How do you balance work and personal life?

People know that I am a “workaholic”. What they don't know is that I also exercise and rest a lot. My day starts at 4:30am when I hit the gym for an hour then get ready for work. Exercise is important because it helps with blood circulation. This helps me actively function throughout the day. I also walk from office to office from time to time hence I am not glued to my chair throughout the day. This is very important for good health. Also, who knows? You might just meet your life partner walking into different offices. This is not to say that is how I met my wife but I met her in one of the places I've worked in.

How are your weekends?

My weekends are set aside for family and relaxation. Some of the activities that keep me occupied are swimming, sauna, massage, football and game drives. It's always refreshing. Sometimes I travel with them but my son and daughter are always in a hurry to come back to Nairobi. I still don't understand why your young people don't like being in *ushago*.

Parting shot?

All dreams are valid. Opportunities will come, work hard, take yours and push forward. Things will not always work your way. Either way, trust in God



**For complaints regarding our services, please contact us using:
Email: complaints@irrigation.go.ke**

VISION

“Water to every irrigable acre”

MISSION

“Provide and Coordinate Sustainable Development and Management of Irrigation services in Kenya.”



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