



A quartely publication

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Word from the Editor



Mr. Daniel M. Nzonzo, HSC
Principal Corporate Communication Officer

First things first: we have moved from Unyunyizi News to Irrigation News. This was necessitated by the rebranding the Authority is undertaking, which has seen the building hosting the headquarters change from 'Unyunyizi House' to 'Irrigation House.' This is a deliberate move for us to enhance our visibility and build an identity that cuts across age and language.

The 14th issue of Irrigation News brings a good serving on our hand in Tana River County food security basket, as promoted by Bura Irrigation and Resettlement Scheme and Bura Irrigation Development Project. The history, current and the future of farming; concentrating on excellent farmers and how the irrigation infrastructure set up by the Authority is assisting them in transforming their lives to promote food and nutrition security.

We could not stop chatting about the stories and photographs as we put them together. "Wow, check out that farmer! No, have a look at how this initiative is enhancing irrigation agriculture!"

As I continue thanking you for reading and interacting with us over the past few years, I remind the readership that all the reads as well as other activities the Authority is undertaking are accessible on our social media platforms. May you continue to benefit from it.

This special edition also demystifies 'Piling' as an irrigation term, we engage Mr Peter Orua, the Scheme Manager Bura Irrigation Scheme, in the One on One segment and Eng. Joseph Karangu, the project Manager, Bura Irrigation Development Project as he takes us through the project's details, and much more.

Chairman's Note



Chairman of the Board
Hon. Eng. Joshua Toro, REng, MIEK

Congratulations H.E William Samoei Ruto, PhD, C.G.H, President of the Republic of Kenya and Commander-in-Chief of the Defence Forces, on your election win and taking oath of office. The National Irrigation Authority is pleased with your keen attention to irrigation and is looking forward to delivering on matters irrigated agriculture.

Congratulations, too, to Hon Alice Muthoni Wahome, for being appointed Cabinet Secretary, Ministry of Water, Sanitation and Irrigation. We are ready to work under your leadership, Madam Waziri. Agriculture being the backbone of Kenya's economy, it is a strategic area for transformation in the Bottom-up Economic Transformation Agenda. To this end, irrigation will play a key role given that more than 80 percent of Kenya is ASAL and rain-fed irrigation has been unreliable as a result of climate change.

The Authority recognizes reaffirmation of irrigation development as a means to economic transformation and we are ready to deliver on its mandate of providing and coordinating sustainable development and management of irrigation services for food security and social economic growth. The Authority's track record for excellent performance in the previous financial years, including the completion of Thiba Dam which filled up in August and is now serving the farmers of Mwea Irrigation Scheme, reassures our commitment to service delivery.

Given the zeal shown by the Authority's able staff, I am confident that in due course this nation will be food-secure, shielding us from the pangs of drought and starvation our dear brothers and sisters are suffering in various parts of the country.

Word from the CEO



Mr. Gitonga Mugambi, EBS
CEO National Irrigation Authority

In a special way, I take this opportunity once again on behalf of National Irrigation Authority, to congratulate His Excellency William Samoei Ruto, PhD, C.G.H, for being elected as the Fifth President of the Republic of Kenya and Commander-in-Chief of the Defence Forces. The Authority will support Dr Ruto's Government in fulfilling all irrigation-related activities in THE PLAN.

In the first quarter of the Financial Year 2022/2023, the Authority continued with implementation of its mandate as stipulated in Part III, Section 7(1) of the Irrigation Act 2019, which includes development and improvement of irrigation infrastructure for national or public schemes, provision of irrigation support services to private medium and smallholder schemes, in consultation and cooperation with county governments and other stakeholders.

In the quarter, the Authority realized a milestone after the filling of the 15.6 million cubic metre of capacity Thiba Dam and the surplus overflowing through the spillway on August 21, 2022. This is after I officiated the lowering of Thiba Dam gate to mark the official impounding of the water in the dam in May this year. This is a great milestone in addressing the perennial problem of water shortage in Mwea Irrigation Scheme.

It was a great honor to host H.E Hon. William Samoei Ruto, PhD, C.G.H, the President of the Republic of Kenya and Commander-in-Chief of the Defence Forces accompanied by Deputy President of the Republic of Kenya Hon. Rigathi Gachagua and other leaders from the National Government and County Government of Kirinyaga during the commissioning of Thiba Dam on October 15, 2022. The President was pleased with the achievement and stressed on irrigation being the surest way to food security. He promised to see to it that Kenya realizes its full potential of irrigated agriculture by exploring the three million acres of irrigable land, targeting to double the current land under irrigation to 1.4 million acres in the next three years through Public-Private Partnerships.

Bura Irrigation Development project which is at 95 percent completion is well on course and the Authority is continuing to put all the necessary measures to ensure it is completed as scheduled. Once complete, farmers in Bura Irrigation Scheme will have enough water for irrigation throughout the year and increase land under irrigation to 25,000 acres. The gravity-fed system will also reduce the amount of money spent on maintenance as well as pumping water to the scheme, in turn reducing the cost of crop production in the scheme.

I am grateful to my team for being hardworking, intelligent, brave, strong and willing to get up early and stay up late and to work towards achieving food security and nutrition in the Country. 🍷🍷

The History of Bura Irrigation Scheme



By **George Maina**

The development of Bura Irrigation Scheme began in 1978 with 6,700 hectares set aside for irrigation in Phase One and 5,000 hectares for Phase Two. It kicked off with combined efforts from the World Bank, the Kenyan Government and a few other donors with the aim of developing rural areas and providing job opportunities.

During the initial stages, the National Irrigation Authority (NIA), formerly National Irrigation Board (NIB), was



Settlers enjoy a watermelon in Bura Irrigation Scheme.

in charge up to 1985. The management of the project was then handed over to the Ministry of Agriculture, followed by the Ministries of Regional Development,

Land Reclamation, Regional and Water Development, and finally, back to the Ministry of Agriculture until 2002. In 2003, the Ministry of Water, Sanitation and Irrigation took over operations of the Scheme. The NIA once again, took over from December 2005.



Settlers cultivating crops in Bura Irrigation Scheme in 1959

Unlike Perkerra, Tana and Mwea Irrigation Schemes, this scheme did not have detainees as labourers. Instead, people were drawn from different provinces, then through the Provincial Administration. Others were from the detention camp that was at Hola; a few came from the disciplined forces, and they were all settled at the scheme. The first group of farmers was settled in 1982.

In the 1990s, the World

Bank and other donors withdrew support and operations slowly stopped, resulting in difficulties and eventual collapse. The collapse pushed farmers to depend on food aid/relief before they moved to other places in search of food and other sources of income to support family. “When the scheme collapsed, I looked for other ways of earning like selling water and carrying multiple sacks every day,” says Stephen Jaramaba. Other people remained in the scheme were looked forward to its revival. From 1993, the government started a revival. In 2005, the attempts of reviving the scheme were successful and few farmers who were still in the scheme started growing several crops. A year later farmers who had left started returning. Cotton growing was attempted but lack of enough water for irrigation due to frequent breakdown of the Nanighi Pumps and inadequate market made it impossible to continue.

As a result, the farmers switched to seed maize production and other horticultural crops such as watermelon. In 2016, farmers started growing rice, which is currently doing so well in the scheme under 2,000 acres and above

while other crops such as maize, watermelons, onions, green grams and tomatoes occupy about 1, 100 acres. In an acre, farmers harvest between 30 to 40 bags of 90kg from Komboka rice production.

The scheme has a population of 2,245 settled farmers who live in 11 villages, each farmer has three acres for growing cash crops and 0.125 acres for kitchen garden.

Bura Irrigation Scheme taps water from River Tana, about 50km away, by pumping using diesel-fuelled generators and pump sets each with a discharge capacity of 2.7m³/second. However, a gravity-based irrigation water conveyance system (Bura Irrigation Development Project) is under construction and its completion will reduce the scheme’s expenses on fuel and maintenance of the pump station. Once complete, the number of irrigated acres will grow from 12,000 to a maximum of 25,000. This will enhance food security in Kenya.



Farmers harvesting watermelon in Bura in May, 2022

Bura Irrigation Scheme, the land of crop diversity



A farmer harvests bulb onions in Bura Irrigation Scheme.



By **Brendah Rajwayi**

Farmers at Bura Irrigation Scheme are exceptional for crop diversity. The scheme has expanded from 6,250 acres under irrigated agriculture at its inception to the current 12,000 acres out of a potential of 25,000 acres. The farmers grow seed maize, commercial maize, green grams, cowpeas,

soybean, watermelon, cotton, tomatoes, sorghum and most recently Komboka rice, as allowed by the soil fertility.

The development of the Lower Tana Basin through development of irrigated agriculture was inevitable due to rapid increase in the country's population since the 1950s and owing to a vast of Kenya's land area being arid and semi-arid (ASAL).

The scheme was started with the objective to settle the landless, unemployed or the under-employed. About 5,150 families were to be settled in Phase I and about 3,000 families in the next. Currently,

2,245 farmers are settled at the scheme. In addition, it was to open up arid and semi-arid regions to farming by providing water as well as improve and rehabilitate the environment by planting trees to provide fuel wood and building materials for the scheme's population and its surroundings. The target area to be afforested was 11,250 acres.

The National Irrigation Authority supplies irrigation water to support production activities at the scheme. Additionally, it develops and improves irrigation infrastructure for national

or public schemes, provides technical advisory services to irrigation schemes in terms of design, construction supervision, administration, operation and maintenance under appropriate modalities, including agency contracts.

The Authority is supported by various farmer-based organizations that support the scheme's operations. The Irrigation Water Users Association (IWUA) help with water management and distribution at the tertiary level while Bura Irrigation Farmers Sacco provides credit and markets the produce. Moreover, the farmers have village grower groups for the recruitment for contracted farming, for example seed maize production, and Community Based Organizations (CBOs) that mobilise farmers to carry out production activities at the scheme.

Bura Irrigation Scheme has four water pumps, each with a discharge capacity of 2.7m³/second. The average pumping of 16 hours a day can accommodate approximately 2,000 acres of crop, equivalent to the use of approximately KSh204,000 fuel. The Authority is constructing Kora Kora gravity intake and new canal that will convert the scheme from pump fed system to gravity fed system so as to improve its sustainability.

The gravity-fed system will reduce the amount of money spent on maintenance of the pump station accessories as



A farmer inspecting watermelons in Bura.

“

Averagely, farmers at Bura Irrigation Scheme earn KSh200 million annually from horticultural crops such as watermelon, tomatoes and bulb onions. Additionally, they earn approximately KSh250 million from rice, commercial maize, pulses and cotton production.

well as fuel cost, thus reducing the cost of crop production. Bura Irrigation and Settlement Scheme Rehabilitation Project will, upon completion, put an additional 4,000 acres under irrigation and enhance food and nutrition security, thereby improving livelihoods and food security in the country. The scheme injected KSh39 million into the economy

in the 2019/20 financial year from seed maize alone through contracted farming by Kenya Seed Company Limited. In 2020/21 financial year, it injected KSh48 million into the economy through Komboka rice farming and KSh216 million in the financial year 2021/22 through the same rice venture. Averagely, farmers at Bura Irrigation Scheme earn KSh200 million annually from horticultural crops such as watermelon, tomatoes and bulb onions. Additionally, they earn approximately KSh250 million from rice, commercial maize, pulses and cotton production.

“Bura Irrigation Scheme has been my source of livelihood. Through farming here at the scheme, I have raised my family and paid school fees for my children,” Jackson Ngatia, a horticultural farmer growing watermelon in his

4.5-acre farm, says. He is expecting good returns from his harvest. “This season will be good. I am expecting 30 tonnes from my farm and will be selling at KSh25 per kilogramme from KSh15 because the market is favourable,” he adds.

Mohammed Abdullahi Shidhe, an agro-pastoralist, echoes the impact irrigation has had in his life. “With farming, I am sure my goats, cows and family have food,” he says. “When I decided to venture into farming I started with maize and the returns it gave me made me want to do more. Now I grow maize and watermelons,” he adds. He continues to encourage pastoralists to venture into food crop farming to boost income.

“Komboka rice farming has changed my life. This season, I am expecting to harvest an average of 36 bags of 90kg from an acre,” Stephen Jaramba, a rice farmer testifies. The National Cereals and Produce Board has provided them with ready market offering KSh60 per kilogramme of rice.

Mr Peter Orua, the Bura Irrigation Scheme manager, is optimistic that this price will go up when more people from the private sector join and currently buying the rice at KSh62 per kilogramme.

John Muigai, a 28-year old onion farmer, says he has been farming for the last seven years. “I have never sought employment. Farming has been my source of livelihood. With it, I have



Maize crop under irrigation in Bura Irrigation Scheme.



A farmer in her green-grams farm in Bura, Tana River County

taken care of my wife and three children,” he says. “I urge the youth to take up hoes and get into farming. To earn a living, you must sweat.”

Bura Irrigation Scheme has not only changed the livelihood of farmers and added to the food security basket of the country, it has also employed many.

Grace Njuguna, a plant operator, says she was able to raise her standard of living and provide for her family’s basic needs through operating a grader at the scheme. She levels the field for rice farmers during the planting season and during the off-season works on the scheme roads.

Stephen Waithanji watches

over the farms in the night to keep animals, including warthogs and buffaloes, at bay while Suleiman Abdi drives birds away during the day.

“Bura Irrigation Scheme is cosmopolitan. For this reason, we strive to offer farmers a variety of crops they can afford to grow. Currently, they range from Komboka rice, seed and commercial maize, to watermelon, bulb onions, tomatoes and sunflower,” says Mr. Orua.

He adds the Authority has started undertaking trials before introducing any crop to the Scheme farmers. Seed maize and Komboka rice are examples of crops that have undergone successful trials

before being introduced to farmers. “We will be introducing soya bean farming to the farmers in the next season after successful trials. Sunflower (Hysun 33) is a variety that is also promising and upon successful completion of trials, we will introduce it to the farmers,” adds Mr Orua.

As envisaged during inception, the scheme has supported and continues to support many livelihoods as the main source of food and employs people. This has had a major impact on the region and beyond as some of the crops are sold in Mombasa, Garissa, Dadaab and Nairobi.



A farmer in his Komboka rice field in Bura Irrigation Scheme.

A journey of hope: Saving Bura with Komboka rice



By Brenda Rajwayi

Compared to Pishori rice, Komboka rice is known for its higher number of tillers, uniform crop stand, even and early maturity, aroma, higher yields, easiness to thresh, longer panicles, resistance to diseases (Blast and Rice Yellow Mottle Virus (RYMV)), appealing

grain type, good plant height and no lodged hills. Farmers previously growing IR 2793-80-1 prefer it and consider it as the better option.

At a field demonstration by the Kenya Agricultural and Livestock Research Organization (KALRO), International Rice Research Institute (IRRI) and National Irrigation Authority (NIA) on February 24, 2020 in Ahero Irrigation Scheme, farmers hailed the milled Komboka rice for its cooking quality, non-stickiness, good taste, and aroma. Millers noted the rice to have a high milling recovery rate, non-stickiness

when cooked, aroma, and medium-sized grains.

Komboka rice was launched in late 2020, promising a yield of about 35 bags per acre. The rice was developed by IRRI and registered by KALRO. Since then, it has been promoted through a collaboration of KALRO, IRRI and NIA.

Dr Raphael Wanjogu, Chief Officer, Research and Development at NIA and KALRO-Kimbimbi introduced it to Bura Irrigation Scheme.

“Komboka rice farming has changed my life. This season, I am expecting to harvest an average of 34 bags of 90kgs from an acre,” Stephen Jaramba, a rice farmer at Bura Irrigation Scheme, says. Peter,

A publication of the National Irrigation Authority

a rice farmer from Bura has been getting 36-120kg bags, from a 1.5-acre plot. "For my 1.5 acres, growing this variety from scratch would cost roughly KSh130,000. The crop has a ratoon that requires little crop management, yields at least 50 percent of the initial production average," says Peter.

The NIA provides irrigation water at Bura at a one-off fee of KSh7,500 per 1.5 acres in six months, covering both the main crop and the subsequent ratoon crop. Additionally, it trains in the best farming practices for Komboka rice. Most of the farmers practise mechanised rice harvesting, which growers say is cost-effective. "We pay a fee of KSh8,000 per 1.5 acres for a combine harvester, which is a drop from the initial manual labour costing KSh15,000," says Mr Somo Ismael, a farmer at Bura Irrigation Scheme.

Growing of Komboka has not only contributed immensely to the food basket in Tana River but also the economy. In the Financial Year 2020-2021, farmers earned KSh48 million and in 2021/22 KSh216 million from Komboka rice farming. Additionally, it has created employment to the youth during land preparation, weeding and packaging of the paddy rice. The National Cereals and Produce Board (NCBP) has provided farmers at Bura with the ready market for the rice. NCBP pays KSh60 per kilogramme of

paddy rice up from the initial KSh40.

Mr Peter Orua, the Manager for Bura Irrigation Scheme, is optimistic that this price will go up with more people from the private sector coming in to buy the rice at KSh62 per kilogramme.

Mr Somo says that NIA has intervened in a number of challenges farmers face at the



Stephen Jaramba

Komboka rice farming has changed my life. This season, I am expecting to harvest an average of 34 bags of 90kgs from an acre

scheme, including acquiring certified seeds and land levelling. Manual levelling takes time, especially for

those holding large tracts of land.

Mr Orua, says the scheme has put 2,031 acres up from the initial 1,400 acres under rice production. This acreage is at different growth stages in the current cropping season.

It is proof that Komboka has widely gained acceptance from farmers at the scheme and beyond. He attributes this to farmers having travelled from as far as Mwea to Bura to grow Komboka rice at the scheme. The irrigation potential of the scheme is 25,000 acres; currently 12,000 acres are developed while 10,000 acres are in active use.



A farmer inspects Komboka rice in Bura Irrigation Scheme, Tana River County

Bura gravity: A first of its kind irrigation project in Kenya



By Johnbosco Obonyo

The Bura Irrigation and Settlement Scheme Rehabilitation Project, which is under construction, is planned to transform lives and advance irrigated agriculture in Tana River County. We sat down with the project manager, Eng Joseph Karangu Wairore, for its details, execution, and timelines.

He has a Master's degree in Civil Engineering from the University of South Australia, post-graduate diploma in Hydraulic Engineering in River Basins from Hydraulic Research Institute- Cairo and a Bachelor's degree in Agricultural Engineering from Egerton University.

Eng. Karangu has more than 25 years of engineering experience and has worked with the Ministry of Water, Land Reclamation and Rural Development, Ministry of Water and Irrigation, Water and Flood Water Management and now the National Irrigation Authority as a Principal Irrigation Engineer.

How was Bura Irrigation and Settlement Scheme



Eng. Joseph Karangu

conceptualised?

Bura Irrigation and Settlement Scheme was initiated by the Kenya Government in 1978 and was completed in 1981. At inception, the schemes irrigation infrastructure comprised of a temporary pumping station at Nanighi with four pumps with a total discharge of 5.8 m³/second, a sedimentation basin, 50km main canal, 11km branch canals and 10-night storage reservoirs capable of irrigating 12,000 acres.

The scheme produced food

crops and high quality cotton between 1982 and 1989 when the scheme irrigation water supply became irregular and unreliable affecting the expansion and sustainability of the scheme.

The government with the assistance from Kuwait Fund for Economic Development (KF) commissioned a study in the 90s with the aim of identifying the challenges affecting scheme. The study identified high cost of operation and maintenance of the scheme as the major challenge affecting the reliability of water supply to the scheme. This was attributed to the use of pump-

fed system that requires fuel whose price is ever increasing, routine maintenance of the pumps and replacement of the same after the expiry of their life span. These cost severely strained the available scheme recurrent budget.

The study recommended upgrading of the irrigation scheme from pump-fed irrigation system to gravity-fed system and increase the amount of abstracted water from the current 3m³/second to 11m³/second to allow reliable irrigation of 25,000 acres. Hence the Bura Irrigation and Settlement scheme rehabilitation project. This would be achieved through Construction of Korakora gravity Intake, including protection works, construction of new conveyance system from Korakora to Nanighi: 26km long from the new intake site to join the existing main supply canal and Rehabilitation of existing irrigation infrastructure. This is the Bura Irrigation Rehabilitation and Settlement Project.

When did the construction start?

After completion of the project's feasibility study and thorough design in 1990s, construction works started on May 27, 2013.

Any challenges encountered along the way thus far?

Yes, the works commenced on May 27, 2013 and were expected to be completed on November, 26, 2015. Due to valid reasons initially, notably

interference by the community during construction citing land and employment of locals, inadequate GoK counterpart funding to meet the 70:30 GoK to donor financing ratio and delay in approval of master list, the contract completion date was extended to March 31, 2018. Nevertheless, the rate of work progress by the contractor was slow even after these issues were resolved and he only achieved 31 percent by the time of the contract termination on May 2018 due to him being declared bankrupt.

How did you bounce back from that?

After termination of the contract and in order to expedite the achievement of project objective, the project co-financiers (Arab Co-ordination Institutions Joint Supervision Mission) (KF, OFID, Saudi Fund for Development (SFD)), State Department of Irrigation and NIA agreed to have the initial works packaged and executed in three phases comprising of:

- Phase 1: Sheet piling



Eng. Joseph Karangu (in green reflector jacket) inspects the construction of Bura Irrigation and Settlement Scheme Rehabilitation Project in Tana River County.

and associated Korakora Intake

- Phase 2: Completion of new main canal, its hydraulic structures and the associated civil works
- Phase 3: Rehabilitation of existing irrigation infrastructure

NIA procured two contractors Afrikon Ltd and Tunasco Insaat Anonim Sirketi in Joint Venture with Marsh Construction Company Limited and Marfa Construction Company Limited to undertake phase one and two respectively of the pending works.

Please walk us through the project's components?

This project entails the construction of the Korakora gravity intake, which includes submerged weir, diversion canal, head regulator and sedimentation basin. The second phase, construction of the new supply canal from Korakora to Nanighi is 26km with the following components, canal excavation and lining, construction of service road, the dyke and associated civil works such as runoff crossing culvert,

bridges, road crossing and animal watering points

What is an intake?

An intake structure is a transition through which flow is diverted from a source, such as a river, reservoir or the ocean, into a conduit, which may be a canal or a pipe. It consists of a diversion canal, head regulator and a siltation basin.

A sustainable intake should be user-friendly and designed to perform three essential tasks. First, the intake should provide water at the right head. The elevation of the intake site should provide adequate head for water to flow from the intake to irrigation commands and have extra head to allow for water application to the farms.

Second, it should provide adequate quantity of water to meet the scheme water demand at all times, even when river flows are low. For the case of Bura Irrigation Scheme, the peak water demand is estimated as 11 cubic metres per second.

Third, the intake is expected to provide water at the right quality. Given that River Tana is highly silted, the intake should be capable of excluding most of the silt and floating objects from accessing the irrigation infrastructure. In the case of Bura Irrigation Scheme, a submerged weir is provided at the diversion canal mouth to exclude heavy sediment. As the water flow into the 15m wide siltation basin the velocity decreases allowing for deposition of the suspended solids. The siltation basin will be desilted regularly to create room for the incoming silt.

At what point will Bura Irrigation Scheme farmers start using water from this infrastructure?

Korakora gravity intake is currently at 95 percent expected to be completed by end of this year, while the 26km canal is expected to be completed by the end of 2023. The gravity project will then be commissioned while Nanighi pumping station will be decommissioned. Irrigation water will be released to the scheme by gravity in accordance with the schemes water demand.

Which milestone will the Authority achieve

in Bura Irrigation Scheme through this infrastructure?

This being a gravity-fed system, operating costs will go down because there will be no diesel pumps, which have expensive operating and maintenance costs. Additionally, this will increase the amount of abstracted water from the current 3m³/second to 11m³/second allowing increasing area under irrigation.

Is this one of your biggest implementing project?

It is. In fact, I express my heartfelt gratitude to the CEO for giving me the responsibility of managing the implementation of the project and to the three DGMs for their oversight and to my co-workers and the consultants for the immense effort they have put to make the project succeed.

Message to the farmers?

You have been waiting for a while, but I can promise you that the project is on track. After completion, the rate of water abstraction will rise to 11 cubic metres per second from the current three cubic metres per second. The successful implementation of this project will ensure reliable water supply improve agricultural productivity and help modernise and stabilise and lower cost of irrigation operations.

This will boost the food and nutrition security of farmers and other residents of Tana River County, enhance wealth creation and provide jobs by expanding the irrigated area from the present 10,000 to 25,000 acres. Additionally, it will make a significant contribution to the manufacturing sector through processing of irrigated industrial crops such as cotton and sunflower.

Message to the team behind the implementation of the project?

I appreciate the tremendous effort the team has put into implementing the project, especially since the construction of the intake, employed the unique technology of secant piling that is not frequently employed in this nation. Their capacity to overcome variety of challenges and quickly pick up new experiences has resulted in high-quality work and efficiency in project implementation.

Pictorial



(1-5) H.E William Samoei Ruto, PhD, CGH, President of the Republic of Kenya and Commander-in-Chief of the Defence Forces (in black blazer) accompanied by Deputy President of the Republic of Kenya Hon. Rigathi Gachagua, Ministry of Water, Sanitation and Irrigation Cabinet Secretary Hon. Alice Wahome (in pink), Kirinyaga

County Governor Hon. Ann Waiguru, National Irrigation Authority CEO Mr Gitonga Mugambi, EBS, and other leaders from the National Government, counties and National Irrigation Authority commission Thiba Dam on October 15, 2022.

Staff News



Congratulations

The Board of Directors and the Management congratulate all staff and stakeholders for their dedicated work to achieve the Thiha Dam dream.

Other notable activities:

- Extension of the parking lot.
- New medical provider: AAR
- Renewal of Flying Doctors for staff emergency
- Mentorship: The Authority has engaged 27 students for attachment in different stations and departments/sections as well as seven interns in the first quarter of FY2022/2023. So far, we have had 36 interns in total.

“Water to every irrigable acre”



I, Hon. Eng. Joshua Toro, and my family extend gratitude to the Board, CEO, Management and staff for the unending support and love during my grieving period following the passing on of my son, Hamuel Toro Ngugi, on August 23, 2022 after a short illness. May God continue to grant us the grace to soldier on as we keep Hamuel's memories in our souls.

Thank you!



Hongera waziri

National Irrigation Authority

Congratulates you

Hon. Alice Muthoni Wahome

for being appointed as the

**Cabinet Secretary,
Ministry of Water,
Sanitation
and Irrigation**

Water to every irrigable acre

Photo: courtesy

Congratulations



Canayzer Owuor and Millicent Michumba of Ahero Irrigation Scheme got little baby girls while Dinah Gicheo, stationed at the Head Office, got a baby boy. May they grow in wisdom and stature, and in favor with God, experiencing the goodness of the Lord. Congratulations!

Congratulations...



STAFF RE-DEPLOYMENTS AND APPOINTMENTS

- Joel K. Tanui previously the Regional Coordinator Nyanza Region and Western Kenya Schemes Manager has been deployed to the Head Office as the Ag. Chief Officer, Operations and Irrigation Management Services.
- Kennedy Ouma, who was officer-in-charge Lower Kuja Irrigation Scheme, is now deployed to the Western Kenya Schemes - Ahero as the Ag. Scheme Manager.
- Isaac Munga, previously an Irrigation Officer at Ahero, goes to Lower Kuja as the Ag. Scheme Manager.
- Harun Mbugua, who has been the Agronomist (Production Manager) in Galana-Kulalu Food Security Project, is promoted to be the project's Ag. Officer-in-Charge.
- Eng. David Tanui previously the Officer-in-charge in Turkana becomes the Nakuru as Irrigation Engineer within Rift Valley.
- Eng. Felix Shiundu, previously a Senior Irrigation Engineer in Lower Eastern/Coastal Region, is redeployed to Turkana Region as the Officer-in-charge at Katilu Irrigation Scheme.

“Water to every irrigable acre”

Exploiting irrigation to improve Kenya's potato farming



By **Benedict Owilla**

Irish potato (*Solanum tuberosum*) is the world's fourth leading food crop (Liu, et al., 2020) with some 360 million tonnes produced annually (FAO, 2021), and third most consumed food after rice and wheat (CIP, 2020). In Kenya, potato ranks second to maize as a food and economic crop with 2-3 million tonnes produced against a potential of 8-10 million tonnes annually (NPCK, 2022). It is, therefore, a strategic staple crop in the food-deficit Kenya. The country's potato production system is dominated by small-scale growers under rain-fed system and is carried out in regions of 1,200-3,000 metres above sea level with suitable soils and ample rainfall.

The socioeconomic value of potato in Kenya is significant with nearly 800,000 farmers producing 2.7 million tonnes contributing to more than KSh50 billion to the economy annually through the value chain and export (TrendEconomy, 2021). For instance, in 2020, Kenya

exported KSh516.04 million potatoes, making it the 47th largest exporter of the crop in the world.

Potato farming in Kenya faces a major challenge due to lack of adequate quality seeds. Only 7,000-tonne clean seeds are produced against an annual demand of 30,000 tonnes (Potato supply chain news, 2021). In addition, the predominantly rain-fed production systems explain the low yield and quality of tubers of 7-10t/ha compared to 17t/ha realised globally.

Rapid population increase in potato-growing regions have increased land subdivision, hence the reducing yields. Also, emerging economic trends are increasing consumption of particular varieties of potato. Consequently, Kenya loses foreign exchange through imports to fill the demand deficit. In fact, local high-end fast-food consumers rely entirely on fresh/chilled potato imports from as far as Egypt and South Africa.

The country's foreseeable future is characterised by fluctuating (if not declining) annual productivity, which undermines the sustainable production capacity of the country. This calls for adoption of productivity-enhancing technologies and/or production systems to realise further gains in production of

this vital crop in Kenya.

Kenyan farmers have responded to these challenges by recycling seeds which are, however, associated with reduced yields. Crop diversification, too, is practised to help manage weeds, pests and diseases. Additionally, farmers have exploited the rapidly expanding agrochemical industry to manage pest and disease problems. Further, the market is getting segmented and potato products are getting differentiated through value addition. However, there still persist challenges of declining available land in favourable climates and fluctuating production as well as productivity associated with climate change.

The solution to the declining productivity of Kenya's potato industry lies in adoption of climate resilience-enhancing strategies. These include intensive potato cropping systems, development of new crop varieties and soil moisture management in drier climates. The increasing climate variability and the prevalent bimodal rainfall patterns make soil moisture management the most viable option. This can be achieved easily through adoption of irrigation.

The rapidly expanding irrigation in Kenya offers



A potato farmer in Kiambu County.

opportunity to improve potato productivity, improve tuber yield and quality, and ensure supply of good quality seeds. Irrigation positively affects the entire potato value chain, and thus holds the key to reversing the current trends and rejuvenating the country's potato industry. Irrigation is a multi-pronged enabler in the potato value chain with great potential in several ways: Research has shown that Kenya's commercial varieties adapt well to irrigation and give high yields of good market value, even in hot climates.

In fact, the World Potato Council has identified regions with dry climate, high solar radiation and irrigation water as having a comparative advantage for potato production. Further, tuber size uniformity, which are key quality parameters in potato marketing are assured in irrigated systems more than in rain-fed production systems. Irrigation, therefore, has the potential for helping bridge the seed deficit and thus save the potato industry the time and

money spent on outsourcing quality seeds. The fact that Kenya's irrigation development is characterised by rapid expansion in hot and dry climates, therefore, offers relief and provides a great opportunity for the potato industry to take a transformative trajectory of production that will in turn stimulate large-scale processing for local and export markets.

The National Irrigation Authority is a strategic partner in Kenya's potato farming. The rapidly expanding irrigation sub-sector in Kenya creates new frontiers for the industry to exploit irrigated potato production. Irrigated seed production in these areas is particularly a potential low-hanging fruit for the industry.

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Irrigation, therefore, has the potential for helping bridge the seed deficit

What is piling in construction works?

Piling is the technique of drilling foundations to give the weak soil below it extra structural support. This technique makes the earth ready to support large structures like a new house, office building, road, or other infrastructure. It is also used in construction of retaining walls.



Secant piling in Bura Irrigation and Settlement Scheme Rehabilitation Project

Typically, piles are long poles constructed of concrete, steel, or wood. Depending on soil characteristics and project requirements, its shape, circumference, and weight may change. For support of taller structures, such as skyscrapers, piles might need to carry uplift loads. Engineers must take wind or wave-induced overturning forces into account in this situation.

In essence, pile foundations function by dispersing the weight of large structures over a larger surface area. There are two main methods: sheet and secant piling.

Sheet piling is the process where sections of sheet material (metal, timber, concrete) with interlocking edges are driven into the ground to provide earth retention and excavation support.

Secant piling is a cost-effective technique used to construct retaining walls by way of alternate, intersecting primary and secondary piles forming a continuous wall. The prime pile cuts into the secondary piles. Primary piles are never reinforced while the secondary ones are

with reinforcement cages to strengthen the wall to take loads to facilitate cutting/drilling of the pile. This technology has been applied in the construction of Bura Irrigation Development and Rehabilitation Project intake works.

The concrete mix design of the piles is important to ensure the pile can be constructed efficiently to perform effectively.



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We will act.

Word Search

National Irrigation Authority's **Vision** is "Water to every irrigable acre", **Mission**; Provide and coordinate Sustainable Development and Management of irrigation services in Kenya and upholds 7 core values. Locate these values in the following grid:

Z	D	A	K	C	P	Y	A	K	Q	S	V	W	Y	O
B	I	N	T	E	G	R	I	T	Y	D	E	K	V	N
E	P	T	I	D	V	X	V	W	K	E	Q	I	U	K
Y	T	I	L	A	U	Q	Y	R	C	I	U	M	Y	P
L	K	P	A	S	S	I	O	N	X	Q	I	H	Z	W
H	Q	O	K	Y	X	W	J	D	F	J	T	T	P	S
I	B	G	N	Z	M	F	R	E	D	I	Y	Z	K	F
M	S	I	L	A	N	O	I	S	S	E	F	O	R	P
W	M	U	E	I	N	N	O	V	A	T	I	O	N	H
X	O	T	P	H	Z	Y	J	O	P	J	V	J	W	I

Answers to the previous Word Search

E	C	A	F	R	U	S	R	X	E
Z	S	O	C	J	K	I	L	C	N
S	I	D	A	M	E	W	N	D	E
T	L	E	N	W	D	A	M	O	T
N	T	F	A	B	Y	T	D	H	A
I	A	P	L	E	C	E	F	T	G
A	T	A	V	G	F	R	K	E	I
R	I	N	S	Y	S	T	E	M	R
Q	O	V	E	R	H	E	A	D	R
C	N	Y	T	I	V	A	R	G	I

- | | |
|---------------|--------------|
| 1. Dam | 10. Irrigate |
| 2. Surface | 11. Canal |
| 3. Rain | 12. System |
| 4. Siltation | 13. Weir |
| 5. Water | 14. Gravity |
| 6. Pan | 15. Method |
| 7. Fed | |
| 8. Overhead | |
| 9. Conveyance | |

Thanks for walking the journey with us.



Mr Peter Orua ,Scheme Manager at Bura Irrigation Scheme.

Peter Orua: Top-performing Engineer turning Bura around



By **Johnbosco Obonyo**

Mr Peter Orua is the Bura Irrigation Scheme manager. He is pursuing a

Master's degree in Soil and Water Engineering at Jomo Kenyatta University of Agriculture and Technology (JKUAT) and has a BSC in Agricultural Engineering from Egerton University. Mr Orua has more than 11 years of experience in irrigation engineering.

A man of few calculated words, Mr Orua has an infectious laughter.

How would you describe yourself?

I am a team-player who respects authority and driven by the desire to make change and a positive impact in the lives of people.

How was it growing up?

I grew up in Ogande Village, Homa Bay County in a family of 10; three boys and seven girls. I am the seventh-born. I am from a humble family. My parents, both retired teachers, brought us up to be

responsible, accountable and hard working. In fact, my mother holds this rigid belief that “If you do not work, you should not eat.” With this in mind, we had to hold ourselves to high moral standards and put up a lot of effort to merit our place in everything that we did. We had no room for mischief, and we were accountable for every action. I remember, while in high school, my dad occasionally gave me my school fees to keep till it was needed. I also adored riding bicycles. Growing up, we did not have toys, so we had to get creative. I loved moulding animals and construction machinery. We used cables and boxes to make car toys that had extended steering wheels, gears and brakes. We paid close attention to every detail, even going so far as to keenly observe how cars were operated and imitate them while operating our playthings with all the relevant car sounds (Voom! Voom! Voom!). Out of curiosity, I would open up my dad’s watches and radios, trying to understand how they worked and looking for the people talking behind the radio (he laughs). As my interest in physics grew, I later subsequently learned that the voices were actually transmitted frequencies.

Best memories growing up?

I have a lot of memories, because growing up was fun. I was daddy’s boy and we got along well with my father, occasionally drawing various animals and taking care of cattle during my free time, especially during school holidays. Initially, I thought I would become a veterinary doctor, but, alas, the engineering career in me was in the making.

Your schooling...

I attended Wiobiero Primary School from Class One to Class Two, then transferred to Rodi-Kopany Primary School, from where I sat for my Kenya Certificate of Primary Education (KCPE) examination. I was admitted to Orero Boys Secondary School, thanks to my good performance...and really, I did not have any other choice because my parents had warned us that they would never look for schools; our marks got us admitted to the merited schools. Later, I joined Egerton University to pursue a Bachelor of Science degree in Agricultural

Engineering. I am pursuing a Master of Science degree in Soil and Water Engineering at Jomo Kenyatta University of Agriculture and Technology (JKUAT).

How was your experience at Egerton University?

Campus life was quite amazing. I met friends working for National Irrigation Authority (NIA) like Eng. Stephen Mutinda, the Project Manager of the recently completed 15.6 cubic metres Thiba Dam, who was my classmate. Eng. Jairus Serede, a Senior Irrigation Engineer stationed at the head office and Mr. Aggrey Koech, Irrigation Engineer at Bunyala Irrigation Scheme, who were a class ahead of us. The virtues of hard work, accountability and responsibility already instilled in me came in handy because we had crash programmes during our university days. We used to have most semesters lasting 12 weeks each and read for more than 12 hours a day when preparing for exams. It is at Egerton that I also learned to work under pressure.

How has your experience growing up moulded you into the person you are today?

Growing up, I wanted to be a veterinary doctor. My love for animals was so paramount. Since primary school days, I liked the subject of Science and Agriculture. In high school, it was physics and ended up doing all sciences. Physics would explain to me how things work. I have lived by the virtues instilled in me by my parents.

“Something worth doing is worth doing well,” my mum would retort. We were never allowed to delegate our assigned duties and there was no room for mediocrity, the sun would also not rise while we were still asleep, except when one was unwell, and it would not set while we were away from home, unless with permission. These virtues still make sense to me and I intuitively apply them.

How did you join the job market?

After campus, I did several odd jobs, including managing our family businesses, working for the then Independent Electoral and Boundaries Commission (IEBC) at different occasions and in various capacities. Later on, in 2010,

I secured an employment with Cooperative Bank of Kenya.

In 2011, I joined NIB (National Irrigation Board), now NIA as an Irrigation Engineer and was posted to Mwea Irrigation Scheme. In 2016, I was transferred to Bura Irrigation Scheme in the same capacity where I was later appointed as the Scheme Manager, a duty I discharge to date. I have spent the better part of my career working for the NIA; I owe it to the NIA and co-workers. The NIA employees are deeply committed to changing this nation. Let's keep up with the positive attitude.

Greatest shocker?

I once received a notice of contract termination while working for a certain organisation on contract terms. Fortunately, I had supportive co-workers and supervisors who saw to it that I did not go under. This is a story for another day if time allows (laughing heartily).

What does the completion of Bura Irrigation and Settlement Scheme Rehabilitation Project mean for Bura Irrigation Scheme?

Bura Irrigation Scheme farmers have limited access to irrigation water. The Bura Irrigation and Settlement Scheme Rehabilitation Project completion will give us the opportunity to effectively crop up to about 25,000 acres of land under irrigation, providing reliable and sufficient amount of irrigation water to the scheme through a gravity-fed system. Once completed, it will additionally assist NIA do away with the high operation and maintenance costs associated with pumping irrigation water. The project is a step in the right direction resulting in positive development and will ultimately be a game-changer.

Advice to young professionals entering the job market?

Any kind of work that helps you put food on the table and pay bills should be respected; so, grab the opportunity if chance allows. Your likelihood of receiving a second/better engagement as well as other opportunities after securing one job opening depends on the networks you establish and the experience acquired.

One should not cherry-pick a job opening;

instead, use the opportunity to get started. "A bird in hand is worth two in the bush"; I applied this principle during my earlier job-hunting times and did various jobs not necessarily related to my engineering degree. I am proud that these jobs would foot my bills and put food on my table rather than beg.

Advise to those planning to retire?

I am not an authority on this field given my age; anyhow, one needs to plan where and how he/she would like to retire; take care not to retire and move upcountry if you rarely visit upcountry. If one spent most of his/her time in a city/town set-up, just stay around the city/town after retirement. Additionally, do what you enjoy while on retirement to sustain yourself economically.

How would you describe your staff?

I have a very dedicated and skilled workforce. We support one another as we work towards a common goal of improving Bura Irrigation Scheme and, more especially, the lives of Bura Scheme farmers. I'm grateful for the support from each and every one of them.

Achievements/Dreams?

I immensely contribute to the rehabilitation of the Mwea Irrigation Scheme; this was a complicated exercise since cropping activities and the rehabilitation works ran concurrently. I am currently burning the midnight oil to ensure the sleeping giant, Bura Scheme, is on the right track so as to be able to take off soonest. It's my dream for Bura that must come to pass.

Lessons on the way?

At Bura Irrigation Scheme, I entered into new frontiers and, true to expectations, there were obstacles, challenges and new opportunities. I must admit that working with my team for the first time as a manager was quite challenging since they had until then known me as the Scheme engineer. Politics, both good and bad, managing farmers and employees and how to keep active networks with employers, colleagues, and the provincial administration nearby test you on all fronts. It is important to keep your ear on the ground as a manager, you should not always rely only on the formal



Rice farming in Bura Irrigation Scheme

information sources, but also on the informal ones; nonetheless, decisions should not be made solely on gossip and rumours, but rather on facts. One should also be aware of the fact that not everyone has your best interests at heart.

Challenges encountered along the way?

I recall that in my handing over meeting with IWUA leadership at Mwea Irrigation Scheme, the IWUA leaders had an impeachment motion against their chairperson based on some serious allegations. I was left wondering how I was going to make it through in Mwea with that hot politics on my first day. Moreover, the Scheme was very expansive (about 22,000 acres at the time) and I almost considered quitting but I soldiered on. I am happy that I surmounted all these.

When I got to Bura Scheme, there was another challenge: Almost the entire Engineering Department's casual staff downed their tools in my first few weeks and demanded to be addressed on getting their unpaid salary arrears.

I found myself addressing this amicably with the other Head of Departments, since our Manager then was out of station, and the staff agreed to resume their duties.

When I was just about two months old at Bura, another challenge came and I was informed to go and receive our then Principal Secretary at Kora gravity intake, on behalf of our then Manager, while on tour of the Bura Irrigation Rehabilitation Project. Later, we went to our Nanighi Pump station where I only expected to brief him on technical issues. Little did I know that the PS would require a brief on the financial and agricultural aspects of the scheme that I had scantily grasped! It was tough but explained everything to the best of my knowledge. I am happy that these challenges have shaped me to be who I am today.

What has been your contribution to the Big Four Agenda?

Dealing with cosmopolitan farmers and satisfying them all is difficult. In order to protect farmers from obvious losses, we have

only introduced crops for mass production in farmers' fields after conducting trials at our Research Station and confirming that indeed the trials are successful. The crops so far introduced to farmers are Soybean (SEEDCO's SP 19 & DPSB8), rice (KALRO's Komboka rice), Seed maize (MONSANTO's/ Bayer EA's DK 777 & KENYA SEED's H517,H532 & H624) and Sunflower (ADVANTA's HYSUN 33). We have more crops in the pipeline.

Farmers are now able to take care of their health issues, upgrade their housing, and are food secure thanks to the extra money they have in their wallets and purses from various farming activities. I would like to see farmers, through their organizations, add value to the products that we grow at the scheme.

Typical working day

Time management is very important. I wake up at around 6am, get ready, and head to the field first to check on the field activities. I arrive at the office around 10.00am to meet my staff,

farmers and visitors. Larger portion of the time in the office is spent on solving farmers' issues and engaging different stakeholders.

Driving force

My driving force is God and my faith in Him. This gives me a lot of inspiration, power and concentration. I am also driven by the desire to help and see people thrive and succeed in life. I detest failure and I am always committed to doing my best in every assignment or in any situation.

Do you read?

I read a lot. I love motivational material, especially Christian literature and books on leadership.

Partying shot

Always honour God, be professional, firm, and fair.



The construction of Bura Irrigation and Settlement Scheme Rehabilitation Project in Tana River County.



VISION

“Water to every irrigable acre”

MISSION

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

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