



Thwake

Issue 4

Period up to October 2023

Dam Journal

A publication of the Ministry of Water, Sanitation and Irrigation and the Program Implementation Team (PIT)

Portraits of **TRANSFORMATION**

Bringing tales of transformation and socio-economic development from some Project Affected Persons (PAPs) compensated by the Government of Kenya for the Thwake Multipurpose Water Development Program

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- ▶ Catalyst for Career Growth: How Thwake Dam Graduate Trainee Program has sharpened our skills



Kenya 
VISION 2030



Our vision is to see Thwake Multipurpose Water Development Program become an enabler for socio-economic development and general well-being of a society. When you bring water closer to communities, you become a catalyst for development and social security. You actualize dreams of thousands of young girls, women and youth.

~ Madam Nnenna Nwabufo

Director General in charge of East Africa Operations, African Development Bank



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Editor – Godfrey Olali

CONTRIBUTORS

Peter Musuva, Rhoda Kambua, Eng. Shadrack Yego, Augustine Makau, Godfrey Olali, Justus Jumbe, Tom Okello, Ibrahim Mwakare, Alex Mwangi, Evans Munene, Mercy Mueni, Robert Cheruiyot, Felister Wairimu, Clinton Mwaura

REVISION & TECHNICAL PROOF READING

Eng. Shadrack Yego, Augustine Makau, Rhoda Kambua, Peter Musuva

CIRCULATION & LOGISTICS

Justus Jumbe, Tom Okello, Lydia See

DESIGN & LAYOUT

Gladescares Ltd.
gladescareslimited@gmail.com

Thwake Dam Journal reports on activities, developments and milestones at the Thwake Multipurpose Water Development Program (TMWDP) - a key Vision 2030 flagship program being implemented in the Lower Eastern counties of Makueni, Kitui and parts of Machakos.

Thwake Dam Journal is published quarterly by the Ministry of Water, Sanitation and Irrigation and the Program Implementation Team (PIT). Views expressed in this publication do not necessarily reflect the position of Thwake Multipurpose Water Development Program (TMWDP).

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Thwake Multipurpose Water Development Program



MINISTRY OF WATER, SANITATION & IRRIGATION

Head Office:
Maji House, Upper Hill, off Ngong Road
P. O. Box 49720 – 00100 Nairobi, Kenya
+254 (0)20 271 6103, 490 0000
www.thwakedam.go.ke

Note from the Editor



**Thwake Dam
will be a leading
instrument for
socio-economic
inclusion.**

Dear Esteemed Readers,

Greetings and welcome to yet another compelling edition of our magazine – Thwake Dam Journal Issue 4. This publication provides an ideal forum for exchange of information on many topical issues and ongoing developments and progress of Thwake Multipurpose Water Development Program – a critical pillar in catapulting Vision 2030 and an enabler of socio-economic growth for millions of residents in the Lower Eastern region of the country. It is important to remember that socio-economic growth of residents is at the heart of implementation teams of this project - the Ministry of Water, Sanitation and Irrigation, the African Development Bank (AfDB) and other key stakeholders.

In our preceding publications, we have numerously stated that socio-economic development of the people is not just a corporate function, but also a way of life. Our objective and role therefore transcends traditional boundaries and extends into actively fostering a culture of giving back to society.

This publication is featuring latest ongoing developments in the project including how residents have utilized compensation cash given in a sustainable manner to uplift their lives positively. The publication also features one-on-one interviews with top leadership of the African Development Bank (AfDB), Makueni County, visits by dignitaries and many other exciting stories and pictures. As the Editor of this distinguished publication, I feel an overwhelming sense of gratification when I see the resonance that our magazine has found among its audience.

Finally, I thank the pool of contributors who have in one way or another, ensured that the editorial production was done seamlessly. We wish to encourage more contributions from industry practitioners, academia, researchers, students and the community to ensure a continued success of the journal.

Cheers,
Godfrey

Message from the Cabinet Secretary

Hon. Alice Wahome



State optimistic in realization of Thwake Dream

Thwake Multipurpose Dam is a strategic water utility which is going to change millions of lives in the Lower Eastern region of the country. The Government is committed and assures Kenyans that despite some minor challenges which have hampered the timely completion of this Vision 2030 facility, all measures have been put in place to ensure the contractor delivers. I urge for utmost cooperation and synergy between all stakeholders involved – especially the contractor, the supervising consultant, the community and the top leadership from the three counties of Makueni, Kitui and Machakos.

As a ministry, we believe that the concerted effort and participation

from all stakeholders in this project will be a key strategy in achieving the objectives and the vision of this life-changing project. Already, our implementation teams are applying SMART strategies involving regular meetings with the project teams, the county leaderships, the national government administration officers and all other stakeholders to monitor the progress and identify challenges and opportunities. These strategies will ensure seamless flow of works so that the project can achieve the timelines set for February next year.

I am also happy to announce to you that the Government is already laying out plans to ensure the remaining upcoming downstream phases are funded. These phases are

critical in meeting the objectives of this project. In an effort to ensure this project attracts massive investments which will catapult the regions' socio-economic growth, the government has already started the process of evaluating prospective bidders interested in investing in the downstream phases, under the Public Private Partnership Model (PPP).



I urge for utmost cooperation and synergy between all stakeholders involved.

Disclaimer: The Cabinet Secretary, Ms. Wahome has since been transferred from the Ministry of Water, Sanitation and Irrigation. By the time this visit and the editorial production took place, she was still at the helm.

Message from the Principal Secretary

Dr. Paul Ronoh, PhD



Let's all set our eyes on the ball

Even as the Government is putting all the necessary infrastructure and financial resources required by the consultant, the contractor and all the teams involved in the realization of this massive undertaking, I urge all the teams and stakeholders to clearly set their eyes on the ultimate prize.

This is because, in line with the Governments Bottom Up Economic Model and Transformation Agenda (BETA), investors are already setting their eyes on Thwake Multipurpose Dam to seize the expected benefits for industrial development, food

production and economic realization. Indeed, Thwake Multipurpose Dam is poised to be a critical pillar in the attainment of key socio-economic areas such as agriculture productivity, the rise and development of micro, small and medium enterprise (MSME) economy, housing and settlement, healthcare, digital superhighway and creative economy, environment and climate change.

This project, once completed as planned, will also transform farmers from food deficit to surplus producers, raise productivity of

key value food chains, and reduce dependence on basic food imports. This is why as a Government, we urge for concerted efforts and synergy between the teams. Successful teams are the fuel that drives a project. They take tasks, and with expertise and experience, complete them according to plans—on time and within budget. However, to do this requires thorough administering and coordinating.

The ministry will continue to accelerate the support required for the achievement and timely completion of this dam.



This project, once completed as planned, will also transform farmers from food deficit to surplus producers, raise productivity of key value food chains, and reduce dependence on basic food imports.

Disclaimer: The Principal Secretary, Dr. Paul Ronoh, PhD has since been transferred from the Ministry of Water, Sanitation and Irrigation.

Message from the Water Secretary

Eng. Samuel A. O. Alima, EBS



The “Dream of Thwake Dam” soon coming to fruition

During the period under review, the dam implementation teams have made significant progress with milestones that are critical in the overall achievement.

By the time of going to press, the construction of the dam’s civil works and other related activities have hit overall progress of works at slightly above 86 percent, with embankment dam filling recorded at 71 percent and spillway physical progress recorded at 95%.

We have also notably made some progress in the construction of the water intake tower, which has advanced while the construction of the employer’s camp is also currently at over 50 percent.

It is important to note that the upstream and downstream coffer

dams were completed and are now operational.

However, during the period of April to July 2023, minimal improvement on the overall progress of works was noted with the low uptake of civil works attributed to the contractor’s financial challenges and the inability to mobilize additional finances and machinery to site to ensure the extended timeline of 6th February 2024 is attained.

The contractual completion date of 4th November 2022 was not attained and on request, the contractor was granted Extension of Time (EOT), and a revised completion date for phase 1 now set for February 2024.

The ministry has further directed the contractor to accordingly revise the works programme to fit into the new

completion date and strictly adhere to it. The supervising consultant has also been directed to ensure all supervising staff work closely with the contractor to resolve any emerging challenges so as not to affect progress.

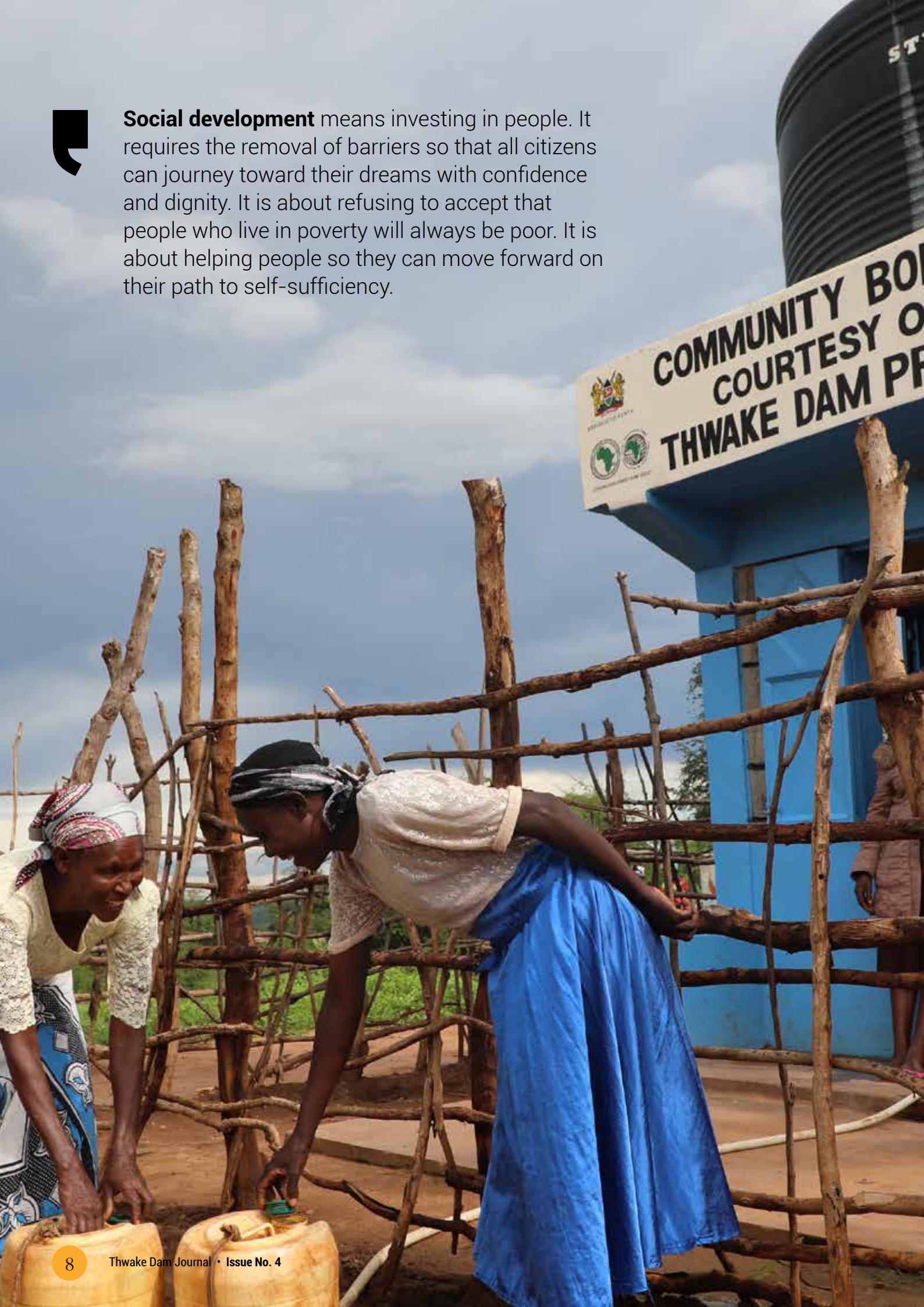
71%
Embankment
dam filling

95%
Spillway physical
progress

Eng. SAO Alima is also the Project Engineer



Social development means investing in people. It requires the removal of barriers so that all citizens can journey toward their dreams with confidence and dignity. It is about refusing to accept that people who live in poverty will always be poor. It is about helping people so they can move forward on their path to self-sufficiency.



The AfDB Appraisal

Thwake Multipurpose Dam at the heart of AfDB's priority projects, says Mission during site appraisal tour.

By Godfrey Olali

A delegation from the African Development Bank (AfDB) recently concluded a successful Implementation Support Mission of the Thwake Multipurpose Dam project, being constructed on the border of Kitui and Makueni counties. The team conducted a comprehensive site supervision exercise and had the opportunity to meet officials from China Gezhouba Group Company Limited - the Chinese company tasked with delivering the Vision 2030 project, the Supervising Consultant SMEC, the Program Implementation Team and counterparts from the Ministry of Water, Sanitation and Irrigation.

The delegation was led by Thwake Multipurpose Water Development Program Task Manager at AfDB, Ms. Nancy Ogal and her colleagues Ms. Emily Kilongi, and Ms. Winnie Wairimu.

During the Mission, the team also met and held discussions with officials from the National Treasury, where talks dwelt on disbursement challenges and interventions. The Mission further engaged with the Dam Safety Panel of Experts (DSPE) – a leading technical Dam Construction Think-Tank comprising international experts – to solicit their views on the status of program implementation.



Above: The Task Manager, Thwake Multipurpose Water Development Program at the African Development Bank (AfDB) Ms. Nancy Ogal (right) listen as Assistant Resident Engineer 1 Johnstone Mwanthi (center) explains a point during a recent Implementation Support Mission.

Picture/ Courtesy/PIT

“Thwake Multipurpose Dam is at the heart of the Bank’s priorities in the water and sanitation sector, not in Kenya alone but in other regions too. We want to see the delivery of a dam that will bring development,” said Ogal during the meeting. Other AfDB officials provided input to the Mission through virtual meetings and bilateral discussions with individual members of the Project Implementation Team. The discussions covered areas such as financial management, procurement and disbursement.

The Mission, however, noted with concern delays in the program of works and other challenges, which they promised to jointly mitigate with the various implementation teams.

The Government of Kenya and the African Development Bank (AfDB) through the Ministry of Water, Sanitation and Irrigation is implementing this flagship program to fulfill the long-term country’s development ambition in the areas of water, energy and agriculture. The program comprises a multi-

purpose dam for water supply, hydropower generation and irrigation development. It will also provide regulation of flows on River Athi downstream of the dam for flood control and drought mitigation. The implementation of the dam civil works and other related activities is currently ongoing with the overall progress of works at 84.06 percent.

The project has faced some delays blamed on factors such as the scaling down of the labor force, thanks to the COVID-19 pandemic and acute shortages of explosives used for blasting of rock to fill the embankment.

The contractual completion of November 2022 was not realized due to technical challenges at the river bed which had a lot of poor foundation soil that required further technical investigations to resolve costing the contractor valuable progress time. This prompted the DSPE to advise that construction completion should allow adequate settlement of the Dam Embankment before placement of the concrete face to the embankment.

Thwake Dam Downstream Phases: *The game-changer in food & nutrition security*

By *Godfrey Olali* - Thwake Dam Communications Specialist and
Peter Musuva - Monitoring and Evaluation Expert for the program



Former Water, Sanitation and Irrigation Cabinet Secretary Hon. Alice Wahome during an earlier tour of Thwake Multipurpose Dam. She was accompanied by the Makueni County Governor H.E. Hon. Mutula Kilonzo Junior and a host of leaders from the national and county governments of Makueni, Kitui and Machakos.

Picture/ Courtesy/PIT



Thwake Dam officials leading the delegates in inspection of ongoing dam embankment area.

Picture/ Courtesy/PIT



Former Makueni County Commissioner Ms. Beverly Opwora (2nd right) leads former CS, Ministry of Water, Sanitation and Irrigation Hon. Alice Wahome during a tour of the site.

Picture/ Courtesy/PIT

“

The State will expedite the roll-out of the remaining critical downstream phases of Thwake Multipurpose Dam, whose first phase is under construction, to ensure food security for Lower Eastern region.

**Hon. Alice Wahome,
Former Cabinet Secretary for Water,
Sanitation and Irrigation**



Speaking during an inspection tour of the project jointly funded by the Government of Kenya and African Development Bank (AfDB), the CS assured that her ministry will move with speed and ensure the first phase of the dam is completed as per the schedule.

“The progress is impressive and encouraging. The government will be supportive and act as a facilitator to safeguard billions of tax payer’s money which is being pumped into this project. I’m mostly interested in the downstream food security component because the three counties of Makueni, Kitui and Machakos have fertile soils for farming. We must fast-track the other phases since the Head of State is keenly looking at commissioning this dam,” she said. She added that the project would have moved faster, but the process of mobilizing Sh37 Billion for construction works, settling the Project Affected Persons (PAPs), legal issues and other construction challenges slowed down works.

“We are very clear now where we are headed and will not allow any unnecessary delay. We will work with the contractor and implementing teams. We have no time to waste since our people are waiting for this water,” said the CS who was accompanied by the Principal Secretary, Dr. Paul Ronoh, Makueni County Governor Mutula Kilonzo, Makueni County Commissioner Beverly Opwora, Water Secretary Eng. Samwel Alima, EBS, Program Coordinator Eng. David Onyango among a host of leaders from the county and local administration. While promising enough

water to residents, the CS was hopeful that in two years’ time, the commodity will be available and be supplied to people since the completion period is already moving at a good pace. “We’ve agreed on the time that will be needed to fill up the dam. Millions of people drawn from these regions are eagerly waiting for water and this is why the Makueni Governor Hon. Mutula (Kilonzo) is here,” she added. The minister also revealed that treatment works will be done concurrently with dam filling. On pollution, she added that the newly formed Nairobi Rivers Commission will work with all the relevant multi-agency teams and ministries on the clean-up of Athi River. Revealing that the Nairobi Rivers Commission is already attracting a lot of interest and funding, the CS directed the enforcement teams to crack the whip.

“One of the mandates of my ministry is to ensure Kenyans access clean and safe water. Industries emitting chemicals and the practice of farming along the river banks must stop forthwith,” she directed urging the media to lead in the advocacy campaigns by naming and shaming. She encouraged the contractor to work within human rights parameters when blasting and urged them to ensure communities benefit from the available opportunities in both skilled and unskilled labour.

Speaking during the tour, Governor Mutula urged the ministry to rehabilitate the local access roads while appreciating the Corporate Social Responsibility (CSR) initiatives done. He registered his support for the project.

Disclaimer: The Cabinet Secretary, Ms. Wahome has since been transferred from the Ministry of Water, Sanitation and Irrigation. By the time this visit and the editorial production took place, she was still at the helm.

Governor Mutula Kilonzo optimistic Thwake Dam can catapult Makueni to become Kenya's food basket



The project lies between Kalawa and Mavindini wards where the poverty index is high but with water availability, residents can be assured of food security.

By Shadrack Yego

The Governor of Makueni County H.E. Hon. Mutula Kilonzo Junior has expressed his satisfaction that the semi-arid county has the potential to become one of Kenya's food baskets once Thwake Multipurpose Dam starts operation.

Terming the project as a game-changer for the region, he said the Vision 2030 venture has the answer to the perpetual water and food stress bedeviling Makueni County for decades.

In a recent interview with *Thwake Dam Journal* in his office, the Makueni Governor indicated that the project which lies between Kalawa and Mavindini wards where the poverty index is high, has the potential of lifting the lives of thousands of residents to the apex of food security.

"In Makueni, we have very good soil type that can support agriculture through irrigation thereby changing our food security index. Makueni has the distinct opportunity to become the food basket for Kenya. Furthermore, our proximity to national infrastructure projects like the highways and railways is a big game-changer in terms of market proximity," said the Governor.

He added that what the residents lack is enough water for both domestic and agricultural use to enable them undertake irrigation activities.

"Major world cities like Beijing, London, Stockholm, Washington, Berlin, Geneva and many others are served by rivers which have heavily contributed to their developments. Even great civilizations happened along the rivers," he added. He pointed out that Makueni County is lucky to have a project of this magnitude and has close

proximity to the Konza Techno City being touted as Kenya's Silicon Savannah, and for industries to flourish, sufficient water, power and energy must be there.

"You can't create a city without sustainable water. Major cities in the world that are doing well in terms of tourism and other infrastructure development have sustainable water systems. As a country, we must get serious about water," said the Governor who also thanked the Ministry of Water, Sanitation and Irrigation, the contractor and the consultant for implementing a number of Corporate Social Responsibility (CSR) initiatives. On compensation of Project Affected Persons (PAPs) he thanked the teams for ensuring seamless pay-outs which has enabled smooth implementation of the dam works.

He added that once the project will be complete, road connectivity to Kitui in terms of markets will improve with thousands of employment for locals.

"Construction of a five-star hotel within the dam area of residences will certainly create jobs for locals and contribute to the tourism sector. The dam will have a big socio-economic impact and this is why as a country, we are also in discussion with the African Development Bank (AfDB) to fund the remaining phases," he said, adding that sanitation will be improved in areas such as Wote, Kathonzweni and Kibwezi.

To ensure skills transfer, the governor put up a request to the contractor for capacity building of the county government's water personnel in mega water dams construction to scale up their prowess.

Shadrack is the Program Engineer





Thwake Multipurpose Dam prioritized as State keen on its full completion

By Peter Musuva

Thwake Multipurpose Dam being constructed on the border of Kitui and Makueni counties is among strategic State projects within the Lower Eastern region of the country earmarked for faster completion, a key government unit has stated.

Speaking recently during an inspection tour of the Vision 2030 flagship project being implemented by the Ministry of Water, Sanitation and Irrigation, officials from the Government Delivery Service (GDS) unit stated that the Government has given extra attention to a number of key flagship projects in the region and Thwake Multipurpose Dam tops that priority list. GDS is a unit that is domiciled at the Office of the Prime Cabinet Secretary H.E. Hon. Musalia Mudavadi and is tasked with the monitoring and evaluation of

the State projects' and ensuring their seamless implementation and delivery in the realization of the government administration's economic transformation agenda.

The purpose of the visit was for the officials to appraise themselves with the progress, developments and challenges for the project.

"The Government has given extra attention to a number of key flagship projects in the Lower Eastern region of the country and Thwake Multipurpose Dam is amongst the projects prioritized," said the leader of the delegation, Georgina Njoroge. She added that the State is keen on flagging out key projects in order to understand the challenges facing such projects so as to come up with ways of removing the bottle necks.

She was accompanied by a section of officials who represented the Makueni County Commissioner, officers from Critical Infrastructure Protection Unit (CIPU), among others. The meeting was also attended by Thwake Program Coordinator Eng. David Onyango, a section of Program Implementation Team, Engineer's Authorized Representative from the Consultant Nicholas Rowse, Senior Resident Engineer Pius Musis among others.

The Government of Kenya and the African Development Bank (AfDB) is implementing this flagship program to fulfill the country's long-term development ambition in the areas of water, energy and agriculture.

Peter is the Senior Monitoring and Evaluation Expert for the Program

Thwake Dam team partners with Kenya Police Service, to sensitize residents on dam break emergency preparedness & planning

By *Augustine Makau*



Thwake Program Implementation Team (PIT) members with a team from National Disaster Management Unit during a series of meetings in Coastal Region. The team had visited the Coast Regional Commissioner.

Picture/ Courtesy/PIT

In an effort to ensure that communities living along river catchment areas downstream of Thwake Dam are properly sensitized on dam break emergency preparedness and planning, the Program Implementation Team, Ministry of Interior and Coordination of National Administration and the National Disaster Management Unit drawn from the Kenya Police Service, recently carried out engagement meetings with the Coast regional security committees and administrators.

This is in line with the requirements on International Committee on Large Dams, the Dam Safety Panel on Experts, and a study by independent consultant which defined and reported on planning, preparedness and emergency response in case of a possible dam break.

Thwake Dam is a concrete faced rockfill dam (CFRD) typically made of compacted rockfill, with the upstream face to be lined with a concrete slab. Chances of its possible break is almost nil. The meetings took place in Mombasa, Kilifi, Tana River, Mwatate and Tsavo National Park,

where the teams met the regional commissioner from Mombasa and county commissioners from Kilifi, Taita Taveta and Tana River.

The tasks of these regional security committees and administrators will be to explain roles and responsibilities aimed at creating awareness on the dam break, to help support implementation of dam break preparedness and planning, to keep dam break preparedness and planning alive in their respective regions, to act as the conduits of stakeholder engagement and ambassadors, to champion and take lead in providing information to residents so that they become aware of such an eventuality.

This exercise was informed by the need to have timely prediction of floods for emergency planning and preparedness, need to have inspection and maintenance of facilities on dam instrumentation, provision of data for monitoring their safe performance and to reduce the threats of a possible dam break.

Another objective of the exercise was to provide general procedures to reduce the risk of human life loss and injury, minimize property damage,

identify the unusual and emergency events based on the features of Thwake Multipurpose Dam, identify actors, responsibilities and procedures in case of an emergency, provide a plan which facilitates public safety by notifying all appropriate authorities and provide information to all stakeholders to allow for an informed evaluation to be made during emergency events.

It was also meant to provide sufficient information for the redaction of the emergency action plan, which is a detailed plan of action for foreseeable flood emergencies affecting the safety of Thwake Dam and affected properties downstream.

The key stakeholders who will be involved in this procedure include the National Police Service, Fire Brigade Services, Kenya Meteorological Department, Kenya Red Cross Society, Emergency Medical Services, County Governments, Ministry of Transport and Infrastructure, Non-Governmental Authorities, Media, Water Resources Authority and others.

Augustine is the Health, Safety and Environment Expert for the Program

How Thwake Dam Grievance Redress Committee has fostered good relations with communities & staff

By Rhoda Kambua



Members of the Thwake Grievance Redress Committee

Picture/ Courtesy/PIT

Even as the construction works are ongoing, one of the tools that has successfully steered and fostered good relationships with the surrounding communities is the formation of the Grievance Redress Committee (GRC).

Already, Thwake Dam has two GRCs – one dealing with community matters while the other deals with general staff welfare matters.

Grievance Redress Mechanism is a system set up to receive and act on complaints and grievances reported by beneficiaries, stakeholders or other affected persons against activities being conducted by an organization.

The GRM for Thwake Dam is a multilevel arrangement for registering and addressing such complaints from the various categories of project affected people developed as an integral part of the project, to serve social accountability, inclusion, sustainability and transparency purposes.

Its membership comprises of personnel from the contractor, the consultant, the local administration and the project implementation team. The committee meets

once every month with the supervision of the African Development Bank consultant, to review matters and general complaints.

GRM is an important element of the Thwake Dam project implementation and normally responds to concerns and grievances of the project in a timely manner.

Recently, the committee met with 12 members present. The objectives of the meeting were the re-constitution of a new committee to address employees' grievances and fast tracking a smooth and satisfactory conclusion of pending grievances that are affecting the community.

As the environmental, health and safety staff have been members of the existing committee it was agreed that they take the lead role in forming the employees' grievance committee and exit the community grievance committee. The purpose was to engage and involve communities and other local stakeholders impacted by the project while providing all parties with a process to deal effectively with complaints and grievances arising from project activities.

Rhoda is the Gender and Social Development Expert for the Program

Makueni Governor H.E. Hon. Mutula Kilonzo Junior poses for a photo with young Graduate Trainees during one of his visits to Thwake Dam.

Picture/Courtesy/PIT



What it takes to design and construct a Concrete Faced Rockfill Dam (CFRD)

By Evans Munene

Thwake Dam is a concrete faced rockfill dam (CFRD) which heavily relies on rock extraction, placement, and compaction to form the primary support for the dam. After the placement of the rock material, a reinforced concrete slab will be constructed on the face of the rock to form an impervious layer to hold the water.

This type of dam is designed to take advantage of the strengths of both materials. The concrete face provides a durable and stable surface, while the rock fill provides a massive foundation and good drainage.

Designing a concrete faced rockfill dam (CFRD) involves several key steps, which include:

1. **Site investigation:** A thorough investigation of the site is conducted to gather information about the geology, hydrology, and topography of the area where the dam will be built and other factors that will affect the design of the dam. This includes drilling boreholes to gather information about the soil and rock layers beneath the dam site and measuring the flow and water levels of the river or stream that the dam will impound. This information is used to determine the suitability of the site for a CFRD, and to identify any potential hazards or challenges that may need to be addressed during design and construction.
2. **Hydrological and hydraulic analysis:** This includes analyzing the flow and volume of water that the dam will need to impound and release, as well as the potential for flooding, drought and other hazards. This information is used to determine the design parameters of the dam such as the appropriate size and location of the dam, and the design of the spillway, the tunnels, the inlet tower and other outlets.
3. **Geotechnical analysis:** This includes studying the soil and rock conditions at the dam site, to determine the stability of the foundation and the strength and behavior of the rockfill and concrete materials that will be used in the dam. It also helps in assessing the potential for settlement, erosion, and other factors that may affect the long-term stability of the dam.
4. **Structural design:** This includes determining the layout, dimensions and structural elements of the dam, such as the height, width, and shape of the dam, the thickness of the concrete face, and the layout and dimensions of the rockfill. The dam design is developed based on the information gathered during the site investigation and analysis, as well as the design of the drainage systems.
5. **Safety and stability analysis:** This includes evaluating the safety and stability of the dam under various loading conditions, such as earthquakes, floods, and temperature changes, to ensure that the dam can withstand these conditions without failure. The safety and stability of the dam are analyzed using numerical models and other analysis tools. This includes assessing the potential for failure modes such as overtopping, sliding, and foundation failure, and developing mitigation measures to address these risks.
6. **Environmental assessment:** This includes evaluating the potential environmental impact of the dam and identifying measures to mitigate or avoid negative impacts. The local communities are assessed and mitigation measures are developed to minimize these impacts.
7. **Economic analysis:** This includes evaluating the costs and benefits of the dam, in order to determine whether it is economically viable.
8. **Monitoring and instrumentation:** The design includes the installation of instrumentation to monitor the performance of the dam during and after construction, including piezometers, inclinometers, and extensometers.



The construction of a concrete faced rockfill dam typically involves several stages which include site preparation, where clearing the area, building access roads, and preparing the foundation for the dam.

Another step is excavation and foundation preparation, where the area where the dam will be built, is excavated and the foundation is prepared. This may involve removing loose soil and rock and compacting the remaining material to provide a stable foundation for the dam.



Another critical element is the placement of rockfill, where material is placed and compacted in layers behind the dam's upstream concrete face. The rockfill is typically placed using dump trucks, bulldozers, and other heavy equipment. Construction of the concrete face, involves formwork which is set up for the concrete face and the concrete is poured, typically in stages, to form the dam's upstream face.



Drainage and instrumentation involves instalment to prevent water from building up behind the dam, and instrumentation such as piezometers, inclinometers, and extensometers are installed to monitor the dam's performance during and after construction.

Backfilling and landscaping entails stage where behind and downstream of the dam is backfilled and landscaped to prevent erosion and restore the natural environment.

Evans is a Graduate Trainee, Dams, Roads & Bridges Department

Thwake Dam contractor gifts pupils in celebrating Chinese New Year

By Mercy Mueni



Officials from the China Gezhouba Group Company (CGGC) – the builders of Thwake Multipurpose Dam recently gifted at least 120 learners drawn from three primary schools neighboring the dam in marking this year's Chinese New Year.

The team, accompanied by Community Liaison officials and a section of PIT, visited Unyeeo Primary School in Mbooni Constituency, Mumbeeni Primary School in Makueni Constituency and Kinyaa Primary School in Kitui Rural Constituency where enthusiastic learners, teachers and pupils received freebies in terms of cash.

Chinese New Year is the festival that celebrates the beginning of a new year on the traditional lunisolar Chinese calendar. In Chinese, the festival is commonly referred to as the Spring Festival and is the time to worship ancestors and celebrate with loved ones. The holiday lasts for seven days.

The lunar new year is the most important annual holiday in China. Each year is named after one of the 12 signs of the Chinese zodiac in a repeating cycle, with this year being the Year of the Rabbit.

“We are happy to join the community today and gift pupils in three schools as we mark Chinese New Year. CGGC strongly believes in embracing and working with the community around this project and we will continue supporting several

ventures,” said Mr. Tang Yazhou, who headed the CGGC delegation. He was accompanied by the Ag. Project Manager Li Shan and a group of officials from the company. Mr. Li Shan added that CGGC is committed to supporting community initiatives and ensuring the well-being of members. Teachers, parents and learners from the three institutions thanked the Thwake Dam team for the support.

The Government of Kenya (GoK) and the African Development Bank (AfDB) through the Ministry of Water, Sanitation and Irrigation are jointly funding and implementing the Thwake Multipurpose Water Development Program. This is a flagship program under Vision 2030 of the Government of Kenya.

The program comprises a multi-purpose dam for water supply, hydropower generation and irrigation development. It will also provide regulation of flows on River Athi downstream of the dam for flood control and drought mitigation. The program is being implemented in four phases.

*Mercy is a Graduate Trainee,
Community Liaison*

The essence of grouting: How the exercise will ensure the integrity of Thwake Multipurpose Dam

By Robert Cheruiyot



Workers undertaking grouting works at Thwake Dam construction site

Picture/ Courtesy/PIT

Grouting is a critical component of dam construction in the control of water seepage in foundation rocks. This is the process of injecting grout material (a mixture of cement and water) into the foundation rock through drill holes at high pressures so that the grout is squeezed through cracks, joints and other openings present in the rock.

When the grout material sets/dries it seals these fissures so that water in the reservoir area does not seep/permeate through the foundation rock. If the rocks beneath the plinth are not grouted well, water will seep through and cause uplift of the plinth and ultimately lead to dam failure.

At Thwake Multi-Purpose dam, grouting is done at the main dam plinth, cofferdam, spillway weir and at the tunnels. Before grouting works begin, geotechnical investigations are done to understand the formation of foundation rock. During geotechnical investigations, core drilling is done and cores are recovered and logged.

Water pressure tests then follow where water is pumped into a drill hole at high pressure.

Flow of water against applied pressure is observed and lugeon values calculated to quantify the water permeability of foundation rock.

Analysis of the recovered cores and water permeability will then assist the engineers in the design of drilling angles, depth of grout holes, grouting pressures and water cement ratios. Once this is completed grouting begins. At Thwake Dam, both consolidation grouting and curtain grouting are done at the main dam plinth and at the spillway weir.

Consolidation grouting is aimed at increasing the bearing capacity of the foundation rock while curtain grouting is done to control seepage of water at the plinth foundation rocks. Consolidation grouting are shallow holes (10m-20m in depth) and uses relatively low pressures than curtain grouting. On the other hand, curtain grouting has deep holes (30m-85m in depth) where high pressures of up to 1700kPa are used. Once grouting is completed, the effectiveness of grouting work is determined by drilling random check holes, conducting water pressure tests and calculating lugeon values. Some

of the challenges encountered during the early stages of grouting works at Thwake Dam include the collapsing of grout holes during drilling, packers and drilling rods getting stuck inside drill holes as well as language barriers.

Despite these challenges, both the consultant and the contractor through the support of the client – Ministry of Water, Sanitation and Irrigation – have risen above them and are on the way to delivering effective grouting operations that could guarantee the stability and safety of Thwake Multipurpose Dam.

This operation has also greatly empowered Kenyan engineers in technology and knowledge transfer as more graduate engineer trainees have now mastered the grouting operations. These young engineers will be a great asset to the country considering the prioritization of dam constructions by the government of Kenya to increase land under irrigation which will boost the production of agricultural products making Kenya a food-secure country.

Robert is a Graduate Engineer Trainee (Grouting operations)

Impact of Thwake Multipurpose Dam on Counties

Food security

Employment for youth

Safety of women and children

Water provision

Increased crop yield

Hydropower development

Regulation of flows on River Athi downstream

Emergence of small-holder industries

Flood control

Tourism facilities

General socio-economic activities for residents

Growth of local markets

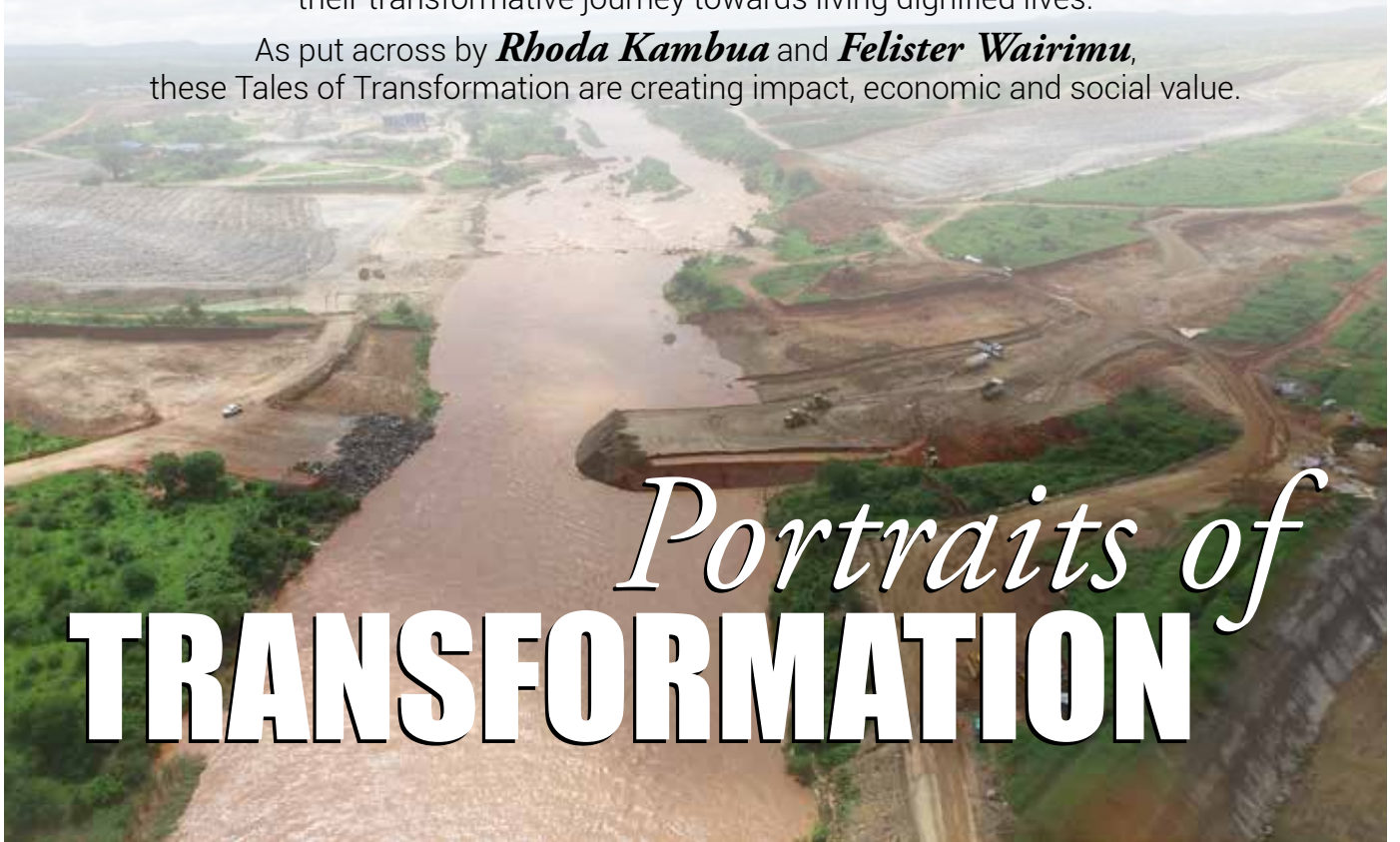
Employment for youth

Provision of Water to Konza Techno City

Drought mitigation

Hundreds of residents who were compensated have opened up and narrated their transformative journey towards living dignified lives.

As put across by **Rhoda Kambua** and **Felister Wairimu**, these Tales of Transformation are creating impact, economic and social value.



Portraits of TRANSFORMATION



Mama Katilu Matheka Mutua

She is from Kisayani village, Katithi sub location, and Mavindini location. She is 80 years old and an immediate neighbour to the dam. Her source of livelihood is farming and rearing livestock. She farms maize, *kunde*, *mtama* and fruits. Through compensation, she was able to construct a good house compared to the previous one. Her land was partially acquired and her grandchildren have benefited from the project through employment.



Mrs. Mary Mbuva Family

She is from Kisayani village, Katithi sub location, Mavindini location. She is 80 years, a mother of 7, a farmer and livestock keeper. She was interviewed with her daughter Ann Mbuva 37 years old. Hers was Parcel No. m/m 1249 and m/m1250. They are immediate neighbour to Thwake Dam Project. Some of the children have benefited from the project by employment and through compensation they were able to construct permanent structures to substitute the semi-permanent structure they lived in before.



Mrs. Pauline King’oo Ngovi

She is 76 years old and hails from Katithi sub location Mavindini location and a mother to 9 children. She was interviewed together with her daughter in-law Ms. Zippora Ngovi, who is 33 years old. Through compensation they were able to construct a modern homestead, bought water tanks, water boozers and the children were able to put up businesses at the nearest market. She farms *kunde*, maize, cowpeas, beans, fruits like bananas, oranges, mangoes and pawpaw.



Mr. Stephen Ngwili

He lives at Kaseve village, Katithi sub location neighbouring the project at Athi River downstream. Mr. Ngwili is a primary school teacher with 3 children who are still schooling. A beneficiary of Thwake Dam acquisition process, from the compensation, he was able to construct rental houses near the project area to accommodate employees. He bought water tanks and water boozers and put up businesses of restaurant and shops at Mavindini market and Kaseve market.



Mama Veronica Wayua

The team interviewed the wife to the late Mr. Nyamai Kyunguti, Mama Veronica Wayua who is in her 70s, her daughter Florence Nyamai and daughter-in-law Elizabeth Kyunguti. They live in Unyeeo village, Syotuvali sub location, Kathulumbi location. Their parcel was K/K 1162. They were partially acquired enabling the family to rebuild their homestead in the same parcel of land with permanent structures and modern. They depend on farming as source of their livelihood.



Ms. Ruth Muia

She lived in Kathukuni village, Katithi sub location and moved to Kathiani Kathulumbi location. She has two children; her parcel was M/M 1240. They depend on farming as a source of their livelihood. Through compensation they were able to construct permanent houses from their previous semi-permanent structures.



Mr. Stephen Nyulu & Dorcas Nzilani

They relocated from Unyeeo village to Nthongo village Kathiani sub location. Their parcel was k/k 04. Stephen and Dorcas have 4 kids, and are farmers. They also own private transport. They bought a water boozer and 5 water tanks. They were able to educate their children.



Stephen Mboya Mulonzi (Late) & Faith Mueni

The family relocated from Unyeeo village and moved to Kitoto village, Kathulumbi sub location, and their parcel was k/k08. They are farmers with 4 children. They keep livestock, bought water boozer and constructed modern houses after compensation. They own rental houses at Kathiani market.



Elizabeth Wa Mwangagi

She was partially compensated and her land parcel was k/k176 &k/k168. She rebuilt her homestead in the same land with her 5 children. She is from Mililuni village Kathulumbi location. She constructed new houses, bought water tank, does farming and rears livestock.



Mr. Mutuku Mwanja

They are from Kinyau sub location and moved to Masimba sub location, Kanyangi location. They have 6 children, do farming of fruits like mangoes and rear livestock. They also have a business in the nearby shopping centre. Their parcel was Kanyongoyo 187&188.



Mrs. Kanini Joshua

The family moved to Miangeni village, Masimba sub location, Kanyangi location, Kitui Rural. They have 3 kids who are in school. They were able to acquire 10 hectares of land, construct a house and educate their children. The family depends on farming and livestock keeping for their livelihood.



Mr. and Mrs. Mwema Nyanzi

Mr. Muema Nyanzi and wife Ms. Syowia Dorcas Muema live in Mutalani village Nzambia location Kitui Rural. They have 7 kids. Their land was partially acquired by the project. They do farming, keep livestock and have rental houses that accommodates Thwake Dam employees. They constructed new houses and bought water tanks after compensation.



Mr. Josphat Kisavi Matheka

This family relocated from Miksi Mathangathi sub location, and moved to Muani village, Thambu sub location Kathonzwani location. They have 5 siblings. He lives with his daughter-in-law, Josephine Wambua. They are farmers and keep livestock as the source of their live hood.



Mr. Musyoka Kisio & Grace Musyoka

This family relocated from Katithi sub-location and moved to Muani village, Kathonzwani location. They are farmers and keep livestock, have goats and cows. They constructed houses, cow sheds and a hay store, bought water tank and constructed a water pan for irrigation and water storage during rainy seasons. They have 8 children.

Disclaimer: All the PAPs interviewed in this publication authorized and gave consent for interviews and publication of their pictures for this magazine. No other entity is authorized to reproduce the images without the consent of TMWDP

Why AfDB is keen to ensure Thwake Dam meets its full objective

By Godfrey Olali



African Development Bank (AfDB) Director General, in charge of East Africa Operations, Ms. Nnenna Nwabuo during the interview in her office

Picture/ Courtesy/AfDB

The continental lender has assured full collaboration with all stakeholders in the implementation of critical downstream phases

The African Development Bank (AfDB) has assured the Ministry of Water, Sanitation and Irrigation and other stakeholders, that it will fully collaborate with them to ensure the implementation of three remaining components critical in ensuring Thwake Dam realizes its full objective.

Speaking recently during an interview with *Thwake Dam Journal* in her office, the Bank's Director General in charge of East Africa Operations, Madam Nnenna Nwabuo, indicated that the Ministry and other stakeholders including the National Treasury and Planning and the county governments of Makueni and Kitui must work to ensure the Dam is fully operational, properly maintained and sustained.

"We must agree that once the dam is complete, it can't be operational without the implementation of other critical downstream phases like water supply, hydropower development and irrigation. We encourage the Ministry not to rest. We hope to work with the State to ensure the remaining phases are fully implemented so that this facility can meet its full objective," she said, and added that the Dam Management and Operations document

must be expedited for proper maintenance, operations and sustenance.

"I can assure you that the county governments of Makueni, Kitui and Machakos are eagerly waiting for the completion of this dam for the betterment of thousands of residents. It's a game-changer for them. We are open to working with the Ministry and all stakeholders to achieve this objective," added Madam Nwabuo.

She opined that water is an important element for economic growth and Kenya has had a long history of drought. Services that Thwake Dam will provide, she added, will go alongside boosting water supply for Konza Techno City in Machakos County and that is why water is key hence the reference "Multipurpose Dam."

Madam Nwabuo equally added that residents of Kitui and Makueni counties are looking forward for all the components to be completed to enable thousands of women, men and youth to take part in economic activities. The Government of Kenya and the African Development Bank (AfDB) through the Ministry of Water, Sanitation



and Irrigation is implementing this flagship program to fulfill the long-term country's development ambition in the areas of water, energy and agriculture.

Phase one, currently ongoing, involves construction of an 80.5 m high multi-purpose dam with a storage capacity of 688 million cubic metres and associated auxiliary works. It is located one kilometer downstream of the confluence of Thwake and Athi Rivers. It is a concrete-faced rock-filled embankment dam covering an area of around 9,217 acres with a catchment spanning about 10,276 km².

The second phase will involve the development of water supply, sanitation and wastewater infrastructure to supply an estimated 150,000 m³/day of treated water to approximately 1.3 million people drawn from the rural and urban areas of Kitui and Makueni Counties and Konza Techno City in Machakos County.

The third and fourth phases will see the development of a hydropower generating system with an installed capacity of approximately 20 MW and an irrigation scheme to irrigate 40,000 hectares (approx. 100,000 acres) of land.

"Thwake Multipurpose Water Development Program was in the pipeline for a long time and under discussion with the Government of Kenya. It was in the wish list for Vision

2030, thereby prompting the Kenyan government to approach the Bank for the construction of an 80.5-meter dam at the confluence of Athi and Thwake rivers in Makueni and Kitui counties," she said.

On women and children, Madam Nwabufo further indicated that studies have shown that the burden of fetching water normally falls on women and young girls in most contemporary African societies.

"Many school-going little girls walk early in the morning for long distances in search of water. This has seen most of them abused and even maimed with many being exposed to security risk. But when you bring water closer to them, the risks are heavily reduced. When you bring water closer to communities, the girls who often drop out of school will find time to attend lessons while women will take part in more social activities for their health and well-being. Water is an enabler for the general well-being of society," she stated.

While acknowledging that an estimated 70 percent of Kenyans are taking part in agricultural activities, she added that irrigation will support them to produce more and contribute to food security and self-sufficiency. The agro-economic activities will also help residents to better their conditions of living.



Thwake fraternity joins in congratulating Eng. Alima for State Medal of Honour

By Justus Jumbe

Members of Thwake Dam fraternity drawn from the Ministry of Water, Sanitation and Irrigation, the Program Implementation Team, the Contractor, the Consultant and other stakeholders, joined in congratulating the Water Secretary Engineer Samwel A. O. Alima, who is also the Thwake Dam Engineer for being recognized by State for his contribution to the nation.

Eng. Alima was among the citizens awarded the Medal of Honour by H.E President Dr. William Samoei Ruto, PhD, CGH, for his outstanding and commendable technical contribution in steering

the country's water sector in his capacity as the Water Secretary. He was conferred with Elder of the Order of the Burning Spear (EBS) state honour.

“The entire fraternity of Thwake Multipurpose Water Development Program (TMWDP) and the Program Implementation Team (PIT), congratulate you for your well-deserved recognition by H.E. Dr. William Samoei Ruto, CGH, President of the Republic of Kenya and Commander-In-Chief of the Defence Forces in recognition of distinguished and outstanding services rendered to the nation, and

being conferred with Elder of the Order of the Burning Spear (EBS) state honour,” read a statement from PIT.

Orders, decorations, and medals of Kenya are awarded by the President of Kenya in recognition of outstanding or distinguished services rendered to the nation in various capacities and responsibilities. Awards are made by the President upon the advice of a National Honours and Awards Committee in the president's office.

Justus is a Senior Procurement Expert for the Program

Hongera Engineer on this amazing accomplishment as you continue steering Thwake Dam Project to its full completion.

Catalyst for Career Growth: How Thwake Dam Graduate Trainee Program has sharpened our skills

By Clinton Mwaura

The vibrant Graduate Trainee Program being rolled out at Thwake Multipurpose Water Development Program aims to build a stronger student skills-transfer ecosystem through promoting talents and capacity thus helping us fill the gaps between theory and practice and mastering the required skills.

This program seeks to develop talent, enhance knowledge sharing, and improve graduate's understanding and interest in the dam construction.

The program is designed for fresh graduates who are transitioning into a workplace. In order to gain some practical work experience. It offers

core professional skills through project-based learning, mentorship and exposure to processes and systems.

According to the African Development Bank (AfDB) – which fully supports implementation of graduate trainee programs in Thwake Dam through Ministry of Water, Sanitation and Irrigation, youth unemployment is a big issue in Africa.

The strategy being adopted in most of their projects begs the question: what can be done for the youth and women - both skilled and unskilled; what kind of jobs can be created

through such projects? Most of these graduate trainees here learnt theory but opportunities like this help them get practical lessons from experts. This has exposed them to hands-on training and has strengthened their capabilities. It is therefore a win-win situation for everyone.

At Thwake Dam, we have a role to carry out assignments through the guidance of senior staff. Actually, we learn as we work.

This has given us the ability to participate in on-the-job training wherever possible, performing office duties as required by the supervisor, taking part in meetings, workshops, ensuring that day-to-day experiences are taken note of as well as keeping a log of things we have learned, creating reports and making presentations, building professional relationships with staff, carrying out research and assisting other professionals, completing fieldwork or visiting different work sites when required and ensuring evaluation of work at the end of the graduate program.

Clinton is a Graduate Trainee, Construction Management



State to mobilize funds for Thwake Dam's downstream phases under PPP model, says Water CS Alice Wahome

By Godfrey Olali

The State will mobilize funds and investors for implementation of the remaining downstream phases of the iconic Thwake Multipurpose Dam under the Public Private Partnership Model (PPP).



Speaking recently during the site inspection tour of the project, the immediate former Cabinet Secretary for Water, Sanitation and Irrigation Alice Wahome, announced that the government has already started the process of evaluating prospective bidders interested in investing under the Public Private Partnership Model (PPP) being spearheaded by the government.

“We are mobilizing for funding under the PPP to fastback the remaining downstream phases of the dam,” she said of the Vision 2030 project whose physical completion rate now stands at above 86 per cent.

The dam which is being funded by the African Development Bank (AfDB) and the government, is being constructed at the confluence of River Athi and Thwake at the borders of Makueni and Kitui counties. The facility is expected to benefit at least 1.3 million residents drawn from the rural parts of the Lower Eastern counties. The first phase is expected to be completed by February next year.

During the meeting, CS Wahome emphasized the government’s commitment in ensuring the successful completion of the dam.

She also acknowledged the critical role the dam infrastructure will play in providing water for domestic use, agriculture and industrial purposes, not only for Makueni county but also neighboring counties that stand to benefit from the facility.

On his part, Makueni Governor H.E Hon. Mutula Kilonzo Jnr, expressed his optimism stating that the project is a game-changer for the region.

“Thwake Dam is a game-changer for Makueni County and the entire region. We are determined to overcome all the challenges and see the project through to its final completion,” he stated.

Makueni Senator Daniel Maanzo on his part, said that as the county leadership, they will ensure the project becomes a success and reality to the residents. The visit was also attended by Water Secretary Eng.

Samuel Alima, key government officials, the contractor and the supervising consultant.

Phase one which is currently at an advanced stage, involves construction of an 80.5m high multi-purpose dam with storage capacity of 688 million cubic metre and associated preliminary works. It is an embankment dam covering an area of around 9,217 acres, with catchment spanning about 10,276 km².

The second phase, will see the development of water supply, sanitation and waste water infrastructure to supply an estimated 150,000 m³/day of treated water to approximately 1.3 million people drawn from the rural areas of Kitui and Makueni counties and Konza Techno City in Machakos County.

The third phase will see the development of a hydropower generation system with an installed capacity of approximately 20 MW, while the last phase will entail the development of an irrigation scheme for 40,000 hectares of land.

Disclaimer: The Cabinet Secretary, Ms. Wahome has since been transferred from the Ministry of Water, Sanitation and Irrigation. By the time this visit and the editorial production took place, she was still at the helm.



The immediate former CS posing for a group picture with a section of young Graduate Trainees during a site inspection tour.

Picture/ Courtesy/PIT

Makueni County Commissioner's office lauds Thwake Dam progress, promises State support

By Tom Okello

The State will ensure smooth implementation and completion of the Thwake Multipurpose Water Development Program through continuous collaboration between the county government, the local administration and key stakeholders.

Speaking during a site visit, the then Makueni County Commissioner Ms. Beverly Opwora, assured that the national government will support the implementation and completion of the life-changing project being funded by the Government of Kenya and the African Development Bank (AfDB) and being implemented by the Ministry of Water, Sanitation and Irrigation.

“There is goodwill from the community around and they are looking forward to the completion of this project. My office will collaborate with the county government and other stakeholders so that we strategize on ways to tackle the emerging challenges and issues. We are focused as a national government to ensure the completion of this first phase and embark on other subsequent phases. This project will change millions of lives and the State is seeing it as an anchor to the reduction of poverty, creation of jobs, a pillar to the socio-economic

improvement of locals around,” she said. Ms. Opwora made the remarks during a courtesy call on her by a section of members of the Thwake Dam National Program Steering Committee (NPSC) of which she is also a member. She later joined the team for an extensive tour of the project.

Thwake NPSC comprises members from key stakeholder ministries and state agencies tasked with overseeing and supporting its implementation and attainment of its goals.

They include representatives from the National Treasury and Planning, Ministry of Information and Technology, Ministry of Energy, Ministry of Health, National Construction Authority, Water Resources Authority, National Environmental Management Authority, Tanathi Water Services Board, the Makueni County Commissioner and the Program Implementation Team (PIT).

The administrator also commended the NPSC for steering the program and embracing synergy and teamwork since its inception.

Speaking earlier during the courtesy visit, the Thwake Dam Program Implementation Team (PIT)

Coordinator Eng. David Onyango, thanked the office of the Makueni County Commissioner for ensuring smooth implementation of the project.

“Madam, your predecessors contributed to the successful implementation of this project and as NPSC, we appreciate the support. Issues of compensation of Project Affected Persons (PAPs) have been steered seamlessly, thanks to the former commissioners. We are happy most of the PAPs have now settled and we look forward to continuous working relationship with your office,” said Eng. Onyango who is also the NPSC Secretary while accompanied by a section of NPSC members during the visit.

The team later made an extensive tour of the dam led by Water Secretary Eng. Samuel Alima, who is also the chairman of the NPSC and his Irrigation counterpart Mr. Aboud Moeva.

Other NPSC members present during the tour and meeting were the Chief Executive Officer (CEO) of Tanathi Water Services Board Eng. Frederick Mwamati, Mr. William Mwangi (Ministry of Energy), Mr. Gamaliel Omondi (Ministry of





Members of the NPSC join the Program Implementation Team (PIT) experts, the contractor and the supervising consultant during a site inspection meeting

Picture/ Courtesy/PIT

Health), Eng. Erick Okello (National Construction Authority), Mr. Fred Nyongesa (Water Resources Authority), Ms. Pamela Ongwae (Ministry of Information and Technology), Ms. Caroline Mueni (National Treasury and Planning).

Thwake Multipurpose Water Development Program – a multi-billion program being rolled out by the Government of Kenya (GoK) and the African Development Bank (AfDB) in the Lower Eastern region is being implemented in four phases.

This includes the construction of an 80.5m high multi-purpose dam; the development of a hydropower generating system with an installed capacity of about 20 MW; the development of water supply, sanitation and waste water infrastructure to supply an estimated 150,000 m³/day of treated water to approximately 1.3 million people and an irrigation scheme development that will irrigate approximately 40,000.

The construction of the Dam and its associated structures (civil works) is currently under implementation.

Tom is the Financial Management Expert for the Program



The National Program Steering Committee (NPSC) members during a courtesy call on the office of the County Commissioner, Makueni

Picture/ Courtesy/PIT



NPSC Chairman Eng. Samuel A.O Alima (seated, center) former Irrigation Secretary Aboud Moeva (seated, 2nd left), former Makueni County Commissioner Berverly Opwora (Seated, 3rd right) with NPSC members during a past meeting

Picture/ Courtesy/PIT

Thwake Multipurpose Dam poised to solve water & food security quest for Lower Eastern region

By Godfrey Olali

Thwake Multipurpose Water Development Program, an ambitious initiative being rolled out by the Government of Kenya and the African Development Bank (AfDB) will be done in four phases through the Ministry of Water, Sanitation and Irrigation as the implementing agency.



H.E. President Dr. William Ruto, is on record stating that the country uses approximately Sh200 billion on food imports alone. However, Kenya is progressively working towards reversing this with irrigation-fed agriculture, and Thwake Dam – once completed - will be a key pillar in boosting irrigation.

Thwake Dam, considered to be the second largest water reservoir in the country, will benefit approximately 1.3 million residents drawn from the rural parts of semi-arid counties of Makueni, Kitui and parts of Machakos.

The project will critically transform the socio-economic enterprise of the region which has suffered rampant water scarcity for decades. Drought and famine, have severely affected millions of residents – especially women and children.

Phase one which is currently at an advanced stage, involves the construction of an 80.5m high multi-purpose dam with a storage capacity of 688 million cubic metres and associated preliminary works. It is located one kilometre downstream of the confluence of Thwake and Athi Rivers.

It is an embankment dam covering an area of around 9,217 acres, with a catchment spanning about 10,276 km².

The second phase, will see the development of water supply, sanitation & wastewater infrastructure to supply an estimated 150,000 m³/day of treated water to approximately 1.3 million people drawn from the rural areas of Kitui and Makueni counties and Konza Techno City in Machakos County.

The third phase will see the development of a hydropower generation system with an installed capacity of approximately 20 MW, while the last phase will entail the development of an irrigation scheme for 40,000 hectares of land.

Today, the living conditions of billions of people are certainly improved by the construction of dams. Indeed, dams have played a key role in socio-economic development since the third millennium BC when the first great civilization evolved on the major rivers. Dams are estimated to contribute approximately 12-16 percent of world food production feeding about 1 billion people.

For years, thousands of residents from Makueni and Kitui have been affected by floods that sweep away their farms during rainy seasons.

However, with the construction of this dam, the target population will not only benefit from an abundant supply of water which will lead to improved health and spur economic development, but also frequent floods will be controlled.

The Project Affected Persons have also benefited from compensation. Most have relocated and built new homes, venturing in socio-economic activities thereby giving hope to their families. Currently, there are hundreds of male and female laborers drawn from local villages and other counties employed directly into this project.

The project is also supporting local industries through sourcing of construction materials such as cement, steel and fuel for the construction of the dam.

The Ministry of Water, Sanitation and Irrigation and the African Development Bank, have also rolled out a Young Graduate Trainee program in this project.

The program seeks to develop young talents through training and capacity building, targeting fresh university graduates from the local universities. This program is built to give graduates an opportunity to have more control and influence over their career development.

The Ministry, through the Contractor and the Consultant, has also rolled out a Corporate Social Responsibility Program (CSR), covering areas such as education, health and water.

These initiatives, have been undertaken to improve the well-being of the local communities.

So far, 41 classrooms have been renovated in 12 schools, six new classrooms constructed in three schools, two health facilities renovated, and two health facilities constructed. Other CSR projects done so far include; three boreholes to supply clean water to the local community

During a recent visit to the site, the African Development Bank Director General, in charge of East Africa Operations Nnenna Nwabufu, indicated her confidence urging investors to seize the opportunities that would be brought when the program is completed.

Clean-up of water catchment areas and rivers which will feed the dam is also a matter of priority. The Ministry of Water, Sanitation and Irrigation is committed to improving sanitation upstream of Thwake Dam by investing in a number of interventions. A robust clean-up plan of Nairobi and Athi Rivers being funded by African Development Bank (AfDB) and the French Development Agency is on course.

This strategy, is already being carried out by an Inter-Agency Technical Committee on Athi River Protection and Pollution Control and Management.

Positive impacts anticipated from this project include a raised standard of living for residents and sustainable income generation and productivity, good housing and hygiene.

The distances traveled and time spent by women and children in search of water will be reduced, instead, this energy and time will be spent on economically and socially viable activities for the families.

Development of this Dam will provide ready markets for goods and services and reduce rural-urban migration since people will get employed in the upcoming opportunities in the area.

The project will also be a major boost to the realization of Vision 2030 and the achievement of the UN-backed Sustainable Development Goals (SDGs) through the eradication of extreme poverty and hunger by enhancing income sources and food security.

The Government and the African Development Bank, are committed to ensuring that this life-changing project, is completed as planned so that thousands of Wananchi, can benefit, live dignified lives and partake in matters nation building.

Godfrey is the Senior Communications Specialist for the Program

Delegates thrilled as Thwake Dam social success stories showcased during AfDB's AGM

By Alex Mwangi and Mercy Mueni



Delegates who attended a recent Annual General Meetings of the Boards of Governors of the African Development Bank Group were taken through two short films which showcased the social impact of Thwake Dam on the lives of thousands of residents neighboring the project.

The two films focused on socio-economic impact majoring on thematic areas such as water, education and health. The meeting, also attended by the African Development Bank Group President Dr. Akinwumi A. Adesina, took place at Sharm El Sheikh International Conference Center, in Sharm El Sheikh, Egypt between May 22-26, 2023.

It was themed “*Mobilizing Private Sector Financing for Climate and Green Growth in Africa*” and provided a framework for Bank Group Governors to share their experiences with galvanizing private financing domestically and internationally and harnessing natural capital to bridge the climate financing gap and promote the transition to green growth in Africa.

The first film showcased water accesses to the communities through construction of boreholes while the second one focused on the impact of a new maternity wing.

The film also highlighted the works progress, the positive social impacts of the Corporate Social responsibility (CSR) project at Kathulumbi Health Centre where the project has constructed a new maternity wing.

It also focused on Kamutonye Primary School where the renovation of two classrooms has been done and water harvesting works at Kwa Kavithi community borehole. As part of corporate social responsibility, Thwake Dam

THWAKE DAM CSR FOCUS

EDUCATION
HEALTH
WATER

project has seen thousands of residents living around the dam benefit. The CSR goal is to improve the well-being of the local community in Mbooni, Kitui Rural and Makueni Constituencies which border the dam area.

So far, CSR has focused on three thematic pillars including education where close to 41 classrooms have been renovated in 12 schools, with the construction of six new classrooms in three other schools.

In the health pillar, the project has renovated two health facilities and constructed two new facilities - a maternity wing and administration block, while in the water sector pillar, three boreholes have been drilled and are fully operational.

Thwake Multipurpose Water Development Program, a Vision 2030 flagship project being financed by AfDB, is one of the key portfolio projects that has been given priority by the bank.

The program targets to fulfill the long-term country's development ambition in the areas of water, energy and agriculture. It comprises a multi-purpose dam for water supply, hydropower generation and irrigation development and will also provide regulation of flows on River Athi downstream of the dam for flood control and drought mitigation. It's being implemented in four phases.

Intensify delivery and efficiency, Eng. Alima urges Thwake Dam contractor & consultant

By Thwake Dam Journal Reporter

The Water Secretary Eng. Samuel Alima, EBS, has urged the contractor and the consultants working at the Thwake Multipurpose Dam project to expeditiously intensify their daily work input.

Eng. Alima, who is also the project engineer, reminded the teams that the dam is on a critical path and requires all the necessary collaboration and support to ensure it is delivered as expected.

The implementation of the dam civil works and other related activities is currently ongoing with dam embankment filling at an advanced stage.

The project has since requested a time extension to February 2024 and a further 12 months' defects liability period following a myriad of technical challenges including the discovery that the river bed had a lot of poor foundation soil which required further technical investigations to resolve – costing the contractor valuable progress time.



Senior Resident Engineer Pius Musis (left), former Makueni County Commissioner Bervely Opwora (2nd left), Project Manager, China Ghezhouba Group Company (CGGC) Li Shan (2nd right) and Water Secretary Eng. Samuel A.O. Alima (right) during a site visit.

Picture/ Courtesy/PIT

The scaling down of the labour force due to the COVID-19 pandemic and acute shortages of explosives used for blasting rocks to fill the embankment due to the war in Ukraine also added to the delays. More recently, the Panel of Dam Safety Experts advised that construction completion should allow adequate settlement of the dam embankment before placement of the concrete face on it.

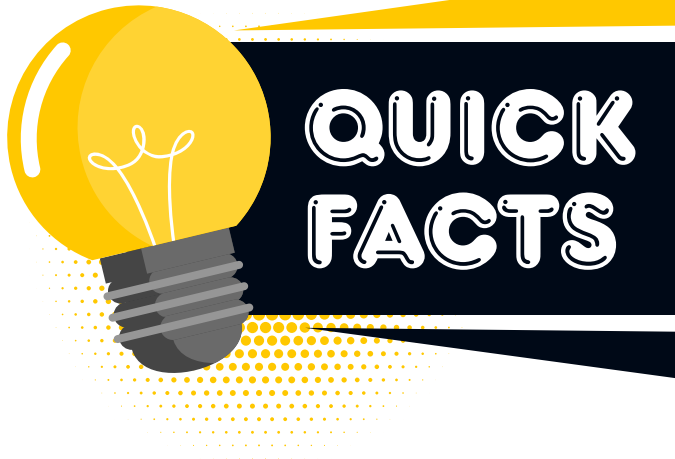
“The Ministry is closely monitoring the progress and we are keen to ensure this first phase is completed seamlessly. I urge the contractor and the consultant to ensure adherence to the extended program of works to ensure completion and delivery of the dam project on the new completion date,” said Eng. Alima who was accompanied by the Program Coordinator Eng. David Onyango, Senior Resident Engineer Pius Musis, Dam Engineer Branko Pavlovic, the Contractor and a section of project staff. He was on an inspection tour of the ongoing works at the dam as part of his monthly routine inspection of the project.

Thwake Dam is a concrete face rockfill dam that heavily relies on rock extraction, placement, and compaction to form the primary support for the dam. After the placement of the rock material, a reinforced concrete slab will be constructed on the face of the rock to form an impervious layer to hold the water.

Water Secretary Eng. Alima also toured several sections of the Dam reiterating the need for the contractor to continuously improve in efficiency of operations across all its sections, even as he promised to unlock financial woes.



Workers at Thwake Dam construction site



10 AMAZING & INTERESTING FACTS ABOUT DAMS

Source: amazingfacts4u.com

1. A dam is a barrier designed and constructed to contain the flow of water.
2. Dams are built for purposes such as generating hydroelectricity, creating recreational areas, minimizing flood risks, diverting water for irrigation, and providing water for towns and cities.
3. The first dam for which reliable records exist was built on the Nile River sometime before 4000 BC. near the ancient city of Memphis.
4. The oldest continuously operating dam still in use is the Kofini Dam, which was constructed in 1260 BC on the Lakissa River in Greece.
5. There are approximately 850,000 dams located around the world. Of the more than 40,000 that are categorized as large dams, more than half are located in China and India.
6. It is estimated that 24 countries currently generate more than 90 percent of their electrical power from dams, and 70 countries rely on dams for flood control.
7. Gravity Dams use the downward force of the weight of the construction materials to resist the horizontal force of the water. These are the largest and heaviest of the concrete dams. They have a large base and they can only be built on a solid rock foundation.
8. Arch Dams are supported by the walls of the canyon in which they are built. The arch dam is built in a curved arch facing the water. Arch dams can only be built in narrow canyons where the rock walls are solid and steep. Notches, called keyways, are cut into the canyon walls on both sides, and then the dam is built so that it fits into these notches.
9. Buttress Dams have a sloping slab that is supported by buttresses or walls. Buttress dams use less concrete than the other two types of dams as above.
10. Embankment dams typically are constructed of compacted earth, rock, or both, making them less expensive than others that are constructed of concrete. More than 80 percent of all large dams are of this type. Because the earth is not as strong as concrete, earthen dams are very thick. When building an earthen dam, engineers use soils that do not let water seep through.

Learners tour Thwake Dam, marveled by engineering master-piece

By *Ibrahim Mwakare*

An estimated 400 learners from Unoa Primary School in Makueni Constituency recently toured the Thwake Multipurpose Dam Project, being constructed on the border of Kitui and Makueni counties. During the event, the learners toured the critical Vision 2030 project, where they were able to learn and appreciate the ongoing project forming a basis for their career choices. “We are happy to be here today to see what it takes to construct such a huge dam. The learners are happy and most of them are hoping to become future staff in this program,” said Ms. Winnie Sila, the school’s head who coordinated the tour.

They also brought 100 tree seedlings of different indigenous tree species that were planted during the event by staff and teachers. “This positive mark goes a long way in mitigating climate change calamities being witnessed globally,” she added. Thwake Dam environment team is committed to growing at least 5,000 trees every rainy season to improve the forest cover around the dam and for a stable microclimate.

Ibrahim is an Engineer Graduate Trainee, (Environment, Health and Safety)





From Our Lens

1. Former Water, Sanitation and Irrigation Cabinet Secretary Hon. Alice Wahome waters a tree at the Thwake Dam site. **2.** Environment, Safety and Health Expert Augustine Makau chats with county security team during a visit. **3.** Members of National Program Steering Committee (NPSC) at the site. **4.** Officials from China Gezhouba Group Company (CGGC) at the site. **5.** A staff from TMWDP with pupils in one of the classrooms constructed under CSR initiative. **6.** Ongoing works at the site. **7.** Workers at the site. **8.** Staff pose for a selfie with former Water, Sanitation and Irrigation CS Alice Wahome at the site. **9.** Ongoing works at the site. **10.** A nurse attending to young mothers at Kathulumbi Health Center in Makueni County. **11.** Members of the County Critical Infrastructure Protection Unit (CIPU) during one of the site visits. **12.** Water Secretary Eng. Samuel A.O Alima during one of the site inspection visits. **13.** A young engineer taking a picture at the site.





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A team is the fuel that drives a project. They take tasks, and with expertise and experience, complete them according to plans—on time and within budget. To do this requires thorough administering and coordinating.