

# Steam



Issue No. 5

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October - December 2011

## Makers of Menengai in their own words

Towards a  
green grid

How GDC fed  
5000 families

Bold and Beautiful Barrier **pg 22**

Our **future** is in  
the power of  
**geothermal**  
**energy**

*green,  
reliable,  
affordable*





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**Steam** is an authoritative platform that reports on geothermal development activities in Kenya. It gives readers an understanding of the great potential that exists in Kenya and how GDC is providing an enabling environment for investors to play a key role in providing Kenya with green, reliable and affordable energy.

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Geothermal development is our business. Two years since inception, we have made it clear that as a country, geothermal is the energy that will green our future and blue our skies. As the world looks to building low carbon economies by replacing heavy polluting fossils, GDC is steadily making geothermal Kenya's base load energy. Under Kenya's Least Cost Development Plan, geothermal is the most affordable and environmentally benign energy source.

GDC has set the pace and is on a strategic mission to develop 5000MWe by 2030. So how well are we doing, you may ask? With more than 400MW of steam in the Olkaria geothermal field, Kenya is nearer closing her energy deficit thanks to GDC. The available steam now awaits conversion into electricity by the national power producer whose plans for 280MW power plants are underway. The rest of the steam will be converted into electricity using the Well head technology publicized by GDC for the last two years. Installation of the first wellhead unit has started.

Talking of more remarkable successes, about 200Km to the South East of Nairobi, GDC has successfully opened a new geothermal field. We have proven the availability of commercially viable steam in Menengai. Two wells are already discharging, two under test and more being drilled. In this issue we bring you the



inside story, told in the words of the makers of Menengai. Get to savor the thrill this team experienced as it worked smart to prove that indeed geothermal is the answer to Kenya's energy security.

Talking of movers and shakers, often the field of sciences is considered a masculine sphere with only few women daring to venture. Few ladies go against the grain. Such is the case with Martha Mburu, featured in our profile pages. She joined an engineering degree as the only lady in a class of male students. She went on to complete her studies, has bagged many scholarships and now heads the Geothermal Development Company's South Rift region. At GDC, Martha is going for the gem, be sure to get more from her story.

And finally, many of us may be aware that financing is a critical success factor in the development of geothermal resources. On this front, GDC has been exemplary. The last two years have brought in enormous funding thanks to our judicious stakeholder management. We bring you the story of the SREP funding and what it signifies for geothermal exploitation at Menengai.

We have lined up these and more stories, news, book review, and career tips that serve to keep you fully thrilled until the back cover. Read on.

Truly,



# → Inside

**This is how a rig operates your Excellency...** Dr. Silas Simiyu, the GDC MD/CEO explains to H.E. President Mwai Kibaki the mechanics of drilling during the energy conference held in Nairobi. Looking on is Hon. Kiraitu Murungi, Energy Minister.

## News

President honours GDC at Fairs

5

## Features

Profiles

12

## Cover Story

Makers of Menengai

15

## The Site

Bold and Beautiful Barrier

20

## Dispatch

Iceland: World's geothermal laboratory

23

## Investor Talk

Era of steam sales

24

## Workplace

Corporate Culture: It can be gold or trash

26

## Environment

Changed fortunes

27

## CSR

How GDC fed 5000

30

## Book Review

The Fifth Discipline

32





## Your letters

### Go national with Steam

The Geothermal Development Company is the energy relief that Kenyans have been yearning for the past years. The pace of the development is amazing and bravo for a job well done.

The *Steam* is doing great and I would wish to appeal that you make it more frequent as it is highlighting a very important issue to the nation. The stories covered in the *Steam* are of importance to the communities and Kenya as a whole, and so I would wish to request that the circulation be national so that Kenyans will have the opportunity to know and understand your great job and progress.

God Bless the team at GDC and the Engineers.

**Christopher Ngolo**  
Nairobi

### Beyond compare

I got a copy of your steam magazine titled GDC strikes steam in Menengai. If you want my honest opinion, this is a great magazine beyond comparison in the corporate field. I like the sharp and lively pictures not the boring posed ones used in many corporate magazines. I like the great writing style and... there is lots of information cleverly presented. I must say many kudos to GDC for this special moment as they get Kenya green electricity. I like the team spirit in your company. Kenyans should be very proud of you. All the best.

**Patrick Kihara**  
Nairobi

### Geothermal story well told

Many congratulations to GDC for the continuous search for green energy in Kenya. GDC's efforts are truly encouraging. Your perspectives are quite fresh to be frank. I got a copy of your magazine from a friend and you have intelligently told the story of geothermal energy like never before. The great articles and pictures make your publication to stand out. Keep up the good job. To end the suffering of Kenyans due to power cuts and high bills, we are all looking at GDC to make a difference. Your MD, Dr. Simiyu, himself a writer of distinction, has promised us as much and we are waiting. The idea of direct uses is really exciting and the public needs to be made aware of this opportunities. Keep it up!

**Grace Irving**  
Nairobi

### Success story

GDC staff are truly Powering the Vision. Menengai caldera is Africa's finest hidden secret. Bravo to Dr. Silas Simiyu for being the brain behind Kenya 21st century's unfolding success story. Keep it real...to unfold the fortunes of the Menengai geothermal complex

**Evans Nyamweya**  
Mombasa

### Faith in GDC

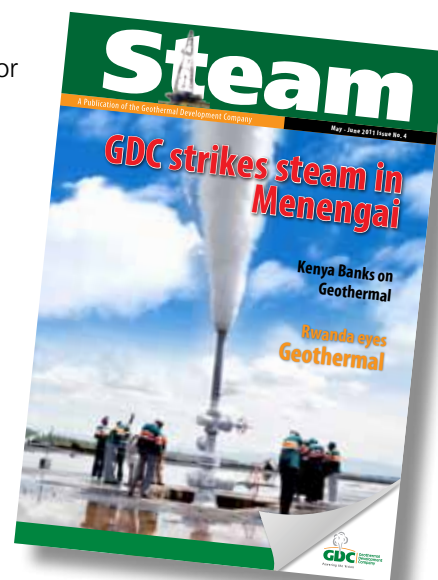
I came to know about GDC in 2010 during the ASK national show in Nakuru. I was attracted by the model on display on geothermal power generation. It did not look realistic yet this year when I made a visit to your stand at the ASK show, you had a very refreshing message. "We have struck steam in Menengai!" Am very optimistic GDC will never turn out to be a white elephant; I have a lot of faith in your professionals. Let all us be part of history to transform Kenya to where it deserves to be by 2030 and beyond. Steam is educative, fun to read. I would love to be part of your team...Bravo GDC Kudos Steam...Looking forward to the next issue.

**Joseph Macharia,**  
Molo

### Great stride

Thank you very much for sending us your latest issue of Steam. We were truly delighted to see all the great developments you have initiated recently. Menengai seems to have great potential, so does Bogoria-Silale. Congratulations to you for the successful drilling operations in Menengai!

Wishing you all the very best for your conference in November!



**Marietta Sander,**  
Executive Director, International  
Geothermal Association (IGA)

*The Editor welcomes letters on topical geothermal issues. Write to the Editor, Steam, Geothermal Development Company, P.O. Box 100746 - 00100, Nairobi Kenya. You can also send email to [steam@gdc.co.ke](mailto:steam@gdc.co.ke). The Editor reserves the right to edit the letters for space and clarity.*

# Let's develop wealth of the region

**E**astern Africa is determined to transform herself into a strong block critical for global participation, hence the progressing unification process.

But this grand vision can only bloom if her bountiful resources are commercially developed. We need to robustly start off with geothermal energy, the most remarkable wealth of the region, thanks to the geological actions that created the Great Rift Valley and attendant volcanic activities.

That our region is enviably endowed with abundant geothermal resources on the continent is a given. There is a thick vein of 6, 500 kilometers stretching from Yemen to the Mozambique called the East African Rift System (EARS), with a geothermal potential conservatively estimated at 15, 000MWe.

Interestingly, insufficient energy still clogs regional economic wheels, yet, we are sitting on immense geothermal reserves. Of course we all know that energy is the bedrock on which industrial thrive is anchored.

Indeed, for a region so desirous of an industrial birth, geothermal is handy. Let's face it. To stimulate industrial growth, we need to go full throttle in our quest for sustainable green energy. As it is, we cannot attract heavy assembly lines, speed trains or smelting plants for want of sufficient energy. Consequently, economic fatigue and unemployment index tips the scales across board.

## Precedence

But exploration and utilization of geothermal resources demands economic and political commitment from concerned governments. Kenya set precedence with the formation of

Geothermal Development Company (GDC), which is a special agency targeting to harness 5,000 MWe by 2030. GDC is also creating the most conducive platform for investor-entry into the geothermal enterprise. The philosophy of Public-Private-Partnership will see faster streaming of green energy to our grid.

And that is why states in the region have to bite the bullet and pursue the Kenyan example. In Kenya, the government is steadfast and supportive of the geothermal sector. In the past two years, through GDC, two rigs are on site drilling in Menengai. More rigs are on the way. We have completed massive surface exploration; we are building human capacity for the industry as well, and we have struck incredible steam. Such massive undertaking is achievable with a committed government.

**"To stimulate industrial growth, we need to go full throttle in our quest for sustainable green energy."**

## Forex and forest

Yet, Kenya is not an island. We cherish to see all countries in the region enjoying politically and economically correct energy cushioned from the whims of global geopolitical, geo-economical or climatic variations. Governments in the region are cognizant of the debilitating effect of fossil fuel on forex and forest.



Geothermal development also calls for deliberate efforts that consolidate resources and expertise. At GDC we have a programme of capacity building for local and international experts. Rwanda has already benefited from this programme and we encourage many more to come and learn from us this unique and very useful science.

Still, departments of geology, mines and energy should also encourage their policy-makers toward this really lucrative energy frontier. As experts, there is an urgent need to put forward a credible argument on geothermal and its associated benefits so that sound and informed legislations, supportive of geothermal development are formed.

Ultimately, the tact with which policymakers, investors and experts will approach the geothermal discourse will definitely dictate our doom or boom.

*Dr. Silas Simiyu,  
Managing Director & CEO,  
Geothermal Development Company.*

# Chairman roots for education

**P**aul E.O. Gondi, the Chairman Board of Directors has urged the Pokot Community to take their children's education more seriously if they are to fully enjoy the benefits of geothermal and other resources in the region.

"There is massive potential here especially in geothermal energy, but this can only be meaningful when the community is more educated," the chairman counseled.

Mr. Gondi said this when he led the GDC family in distributing foodstuff to the community.

He was responding to requests from the community leaders about employment for the local youth.

Giving an example of Albert Panga, an accountant at GDC, and many others who have been employed in various disciplines, the chairman indicated that with the right education more people from the community will get employment.



**Oooh! the joy that GDC brings...** Paul E.O. Gondi, the GDC chairman hands food ration to a resident of East Pokot. (See comprehensive story page 30-31)

He explained to the excited locals how GDC will make use of the water from power plants to support economic activities in the region especially for irrigation.

The food stuff worth Ksh. 4 million was a generous donation from the GDC employees in response to the hunger crisis that bedeviled the region mid this year.



## President honours GDC

**Congratulations!** H.E. President Mwai Kibaki presents to the GDC chairman, Paul Gondi, the Best Energy Trade Stand Award at the Mombasa International Trade Fair.

**An award for geothermal...** Dr. Silas Simiyu, the Managing Director at GDC receives a trophy from H.E President Mwai Kibaki at the Nairobi International Trade Fair. GDC emerged top in its category





# State committed to geothermal – minister



*Hon. Kiraitu Murungi, Energy Minister.*

**T**he government is putting in all efforts to ensure that geothermal energy becomes the base load power in the country, in a bid to attract and retain investors

on the basis of affordability and reliability, Energy Minister, Hon. Kiraitu Murungi said.

The minister reiterated that the government through the Geothermal Development Company (GDC) is absorbing the perceived upfront risks associated with geothermal development.

“Energy from geothermal is the energy for now and the future of this country. I’m happy to announce that the government is committed to ensuring that it creates an enabling ground for investors who will come and put up power plants. GDC is absorbing all the upfront risks,” he said.

The GDC Managing Director

**“Energy from geothermal is the energy for now and the future of this country.”**

and CEO, Dr. Silas Simiyu reiterated that Kenyans are on the brink of affordable and reliable electricity. He

told the press that the GDC model will see faster connection of electricity into the national grid.

“As a state-corporation, our duty is first and foremost to ensure that all Kenyans can access this affordable power from our own indigenous resources. At the rate with which we are progressing we are headed for very promising and good days ahead,” Dr. Simiyu, said optimistically.

The minister affirmed that the government will prioritize the development of geothermal to achieve Vision 2030 targets.

## GDC in tree-planting drive



**A seedling at a time...** Pupils join GDC staff in the tree-planting drive.

**G**DC staff in Naivasha and Nakuru, commemorated the World Environment Day in style. In Naivasha, the staff led by the Environment and Safety Department, cleaned the Kabati area. Joined by local stakeholders, including students,

the GDC team presented seedlings to the Naivasha Medium Prison and planted others in tandem with GDC’s commitment to conservation of the environment in areas of operation.

Speakers at the tree planting ceremony emphasized the need for

sustainable environmental conservation, and more so by the youth. They further urged that protection of the environment is every Kenyan’s responsibility now that the practice is enshrined in the new constitution.

In Nakuru, a total of 1,000 seedlings were planted in an event which was attended by representatives from Kenya Forest Service, National Environment Management Authority, Friends of Menengai and neighbouring schools. Pupils from Osembo, Jacaranda and Lions school, thrilled

the guests with their poems and songs in praise of the environment.

“We will continue rehabilitating the environment and plant indigenous trees and grass in all the disturbed areas,” said James Wambugu, the Manager, Resource Development at GDC.



## Board tours Iceland and loves it

*The Board of Directors was recently in Iceland to understand more on geothermal energy. It was freezing, still, everyone loved it. Far left is Dr. Peter Omenda, Chief Manager at GDC who accompanied the Board.*



**Understanding the caldera rocks...** Paul E.O. Gondi shares a moment with Director Sally Towett during a visit to the Menengai Geothermal Project.



Chairman Paul E.O. Gondi (centre) joins Martin Heya (left) and Hon. David Ole Sankori for a photo op in Iceland.



**Understanding the geothermal business...** The GDC Board of Directors get tips from Michael Mbevi (centre) on how a rig works.

# Excelling scientists honoured



John Lagat (left) happily displays his award as GDC chairman looks on.

John Lagat and Lucy Njue have been honored for their contribution to GDC and the development of geothermal.

The scientists were garlanded in a brief ceremony held in Nakuru. Lagat is the Chief Geologist while Njue is a geologist.

The MD & CEO Dr. Silas Simiyu applauded the two saying they have demonstrated the will, excellence and commitment to deliver on their duties. He gave an example of Menengai exploration where geological results have guided the drilling team to success.

Lagat was awarded "For leading in the development of an accurate conceptual model of Menengai

geothermal prospect, which led to citing an excellent geothermal well while Njue was honored "for authoring a paper on 'The Menengai caldera structure and its relevance to geothermal potential' that will be presented in Geothermal Resource Council (GRC) in San Diego USA."

While congratulating the duo, Dr. Simiyu noted that GDC will continuously recognize and reward merit.

"We will continue to reward all those who demonstrate competence in their various field of expertise," he said. On his part, Lagat thanked the management for the gesture saying it has created "a great precedence and an avenue to recognize talent."



Lucy Njue (left) receives her award from Director Sally Towett as GDC chief manager Dr. Peter Omenda cheers on.

## Sudan seeks GDC's support to tap geothermal power

Sudan has shown a keen interest in partnering with GDC to assist it explore and develop its own geothermal energy resources.

A delegation from Sudan's energy sector toured Menengai project in Nakuru to assess the possibility of domesticating Kenya's success geothermal story.

"GDC should come to Sudan and begin undertaking assessment of our country's geothermal potential," said Engineer Elhadi Mohammed Ali, who was the head of the delegation.

The delegation also included Engineers Rahid Ali Abdallah, Adil Farah Elgasim Elgalili, Yasir Abdalla Saeed who is the Director of Renewable Energy and Hind Elamin Elnour.

## GDC is a flagship parastatal – Minister

Energy minister Hon. Kiraitu Murungi commended GDC on its efforts to develop geothermal energy in the country.

The minister said he was amazed at GDC's accomplishments in just a few months after inception.

"I feel like Jesus Christ when he went up to the mountains...I feel like pitching tent here," the minister told the press on a tour of the Menengai Geothermal Project.

"The future of energy in this country is in geothermal," he continued animatedly. "GDC is a flagship parastatal in the Ministry of Energy. It has the support of everyone in the government."

Meanwhile, the Minister emphasised the primacy of geothermal towards the country's economic development. He argued that geothermal power production will assure constant supply of reliable and affordable power.

He also added that the government expects GDC to realize a 5,000MWe target by 2030 and open up the sector for private participation in order to attract development capital and meet increasing demand.





*GDC scientists explaining to visiting UNU Fellows how a Geophysics machine works*

## GDC appointed to drive regional geothermal development

development that will see an accelerated growth of geothermal energy among member states," says James Wambugu, the Manager, Resource Development at GDC.

Countries in the region are expected to develop proposals to the ARGeo secretariat which is being coordinated at the UNEP offices in Nairobi.

"The next stage in this engagement is for GDC to hold a conference with all the countries to chart the way forward. Mostly GDC will facilitate exploration and build capacities of the member states in geothermal energy," Wambugu explains.

This latest development will enable GDC to expand its burgeoning international consultancy services, and become the focal point of geothermal knowledge transfer. Previously GDC has carried out consultancy work in Malawi,

Rwanda and Yemen.

ARGeo has set aside funds for exploration drilling and capacity building for member-states. GDC will also get part of the development money which will be channeled to the Bogoria – Silale block, Wambugu says.

"We expect our geothermal institute to be in place as soon as possible. The institute will be a focal point for this consultancy. Our plan is to equip the institute with fully-fledged laboratories so that visiting students on exchange programmes can get a comprehensive exposure," says Wambugu.

Kenya has a competitive edge on geothermal development in the region. It has vast geological locations that serve as field work for visiting students, it has geothermal power plants, drilling rigs and even direct utilization programmes. Besides, the creation and success of GDC is itself a case study on how to develop the resource. (See *comprehensive analysis on page 20 - 21*)

**"Kenya has a competitive edge on geothermal development in the region."**

The African Rift Geothermal Development Program (ARGeo) has enlisted GDC as the regional consultant for its programmes.

This means that GDC will help countries in the region, which are under ARGeo, to develop their geothermal resources. ARGeo, created in 2003 has a membership of six countries: Ethiopia, Eritrea, Kenya, Uganda, Tanzania and Djibouti.

"We have had a series of discussions and negotiations with ARGeo which has culminated in the development of an MOU between GDC and the secretariat. It means that GDC will take a lead role in capacity building and scientific

## All set for power generation

Nineteen companies have expressed interest to develop eight, 100-megawatt steam-powered electricity plants in Menengai, and a similar number for the Bogoria-Silali block. The blocks are being developed by the state-owned Geothermal Development Company (GDC).

Some companies that placed tenders include Mitsubishi Corp., Alstom SA based in France, General Electric Co. in the U.S., and Toshiba Corp.

"We want them to compete against each other to get the plants

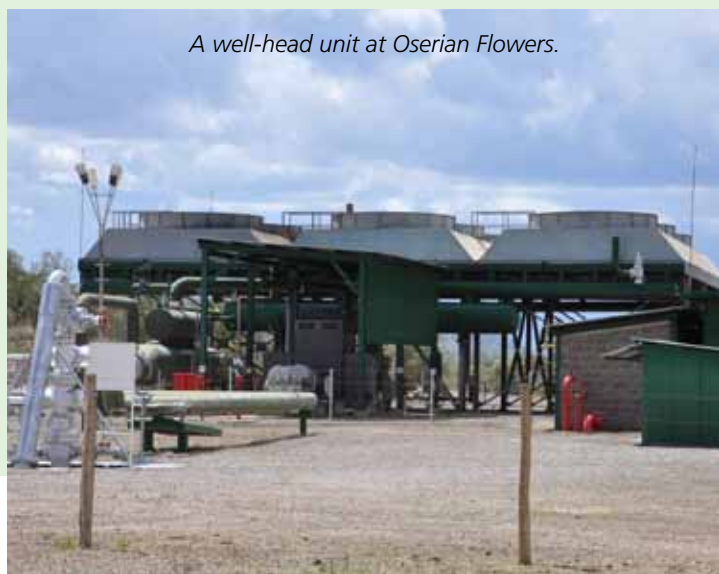
up," noted Dr. Silas Simiyu, the companies Managing Director.

GDC is now drilling in Menengai Field. Already four wells have are complete with an estimated output of 30 MWe.

Construction of the power plants is expected to start as early as January and be completed in 2017 at a cost of 291 billion shillings (\$3.1 billion).

Kenya is Africa's largest geothermal

producer and is currently scaling up the search for steam to produce at least 5, 000 MWe by 2030. The country has a geothermal potential of between 7000MWe – 10, 000MWe.



*A well-head unit at Oserian Flowers.*

## Amid oil Uganda still fancies geothermal

Hit by intermittent rampant power shortages, Uganda is now considering exploiting its estimated 450MWe geothermal resources for power generation.

The Government of Uganda recently recognized a need to promote the use of renewable energy sources as alternatives or supplements to other traditional sources like hydropower and fossil fuels.

"Uganda has considerable potential for renewable energy from geothermal projects, especially in regions with volcanic activity," says Godfrey Bahati, an Assistant Commissioner, Department of Geological Survey and Mines.

According to Bahati the recent studies on the Uganda geothermal systems have focused on three

geothermal prospects including Katwe, Buranga and Kibiro all located in the tectonically active and recent volcanic belt in the Western Rift valley along the border of Uganda and the Democratic Republic of Congo.

Bahati notes that surface exploration is in its advanced phases. "The three areas were chosen as priority areas because of their volcanic and tectonic features that are indicators of powerful heat sources and permeability," he explains.

The commissioner revealed that the government has since 1993 injected \$ 2 million but there is still \$35 million needed to complete surface exploration, exploration

**"Geothermal heat can be used for drying agricultural produce and extraction of minerals like salt from Katwe and Kibiro."**

drilling and installation of a power plant.

"Geothermal heat can be used for drying agricultural produce and extraction of minerals like salt from Katwe and Kibiro areas using modern technology."

"Once the project is completed as per the National Development Plan (NDP), it will push power to the national grid complementing Hydroelectric power and other sources of energy," Bahati concluded.

*Compiled by Godfrey Olali.*

## Now Djibouti goes geothermal

Djibouti will spend about US \$19.6 million for geothermal exploration in the next two years, according to Energy Minister Ahmed Fouad Ay.

The project will be funded by the Global Environment Facility, an independent organization that provides grants to developing countries, as well as the World Bank and the Organization of Petroleum Exporting Countries.

Drilling is expected to be completed by 2013. The country intends to develop a 56- megawatt geothermal power plant by 2018.

"The commissioning of a geothermal power-plant will help Djibouti switch to green energy in less than a decade," Finance Minister Ilyas Dawaleh Moussa told the press recently.



Djibouti, with a population of about one million people, relies on oil imports to produce electricity.

Peak power demand in Djibouti is about 75 megawatts; the demand is likely to increase to 138 megawatts by 2015 and 219 megawatts by 2035, according to World Bank

projections. The electricity network covers only 50 percent of the country.

Djibouti began importing power from neighboring Ethiopia in May after the construction of a transmission line connecting the two countries.



# Attracting and developing human resource for **geothermal** development

**10 Questions for the HR Manager, Rose Tindi**

## 1 What is the role of HR in GDC?

To attract, develop and retain a highly motivated and productive workforce. We do this by developing people-friendly policies.

## 2 How unique is HR in a geothermal environment?

Geothermal experts are few in the labour market. This calls for heavy investment in capacity building and staff retention. Geothermal experts have also to be recruited one year ahead of the arrival of rigs to allow adequate time for training.

## 3 What has been the most challenging aspect for HR in GDC?

GDC is growing rapidly and therefore there is a continuous demand for specialized expertise. This has really kept us on our toes.

## 4 What is it like to work in a HR office?

It is challenging and interesting. Getting right candidates from a pool of applicants is really an intricate exercise. Managing Human Resources requires patience, fairness and objectivity with focused thinking, necessary for human management.

## 5 How does the HR team link with other departments in GDC?

HR is the provider of all human capital to all departments. We partner with line managers and supervisors from

other departments in servicing their Human Resource requirements. We also bring on board managers by incorporating them in our HR committees and sensitizing staff on aspects of HR policies and labour laws to ensure staff-related issues are addressed amicably.

## 6 What are your plans for employee development?

We have developed the first edition of the career progression guidelines. It will guide the progressive growth of each employee. We are also developing an elaborate succession plan in line with our corporate strategy. Meanwhile, we continue to support our employees to pursue further studies through paid examination leave of up to 14 days per annum.

## 7 How would you like the HR office to be in the next five years?

To achieve 90 per cent employee satisfaction index and reduce annual labour turnover to less than 2 per cent. Overall, we would like our HR office to be the global market leader

in the management of the most motivated and highly productive Human Resources.

## 8 What has been the greatest achievement of your department?

Our biggest milestone is meeting the diverse needs of our staff by developing Human Resources Policies and Procedures manual. The registration of our Retirement Benefits Scheme, training of over 400 staff by June 2011 (Competence & Corporate Training and conferences), fully managing our in-house medical scheme and timely processing of salaries.

## 9 Describe your team

The HR team of 28 comprises some of the best experts in the field as well as young, high-potential and thriving officers who embody passion and commitment to talent management. We call each other by first names and maintain a high level of team spirit, unity of purpose and selflessness.

## What would you wish to see GDC achieve in the long run?

To see GDC transform lives of more Kenyans through job creation and provision of affordable electricity by achieving 5,000 MWe by 2030.

*Compiled by Godfrey Olali*



*Rose Tindi (seated left) with a section of her HR team.*



# Charitable lady who moves geothermal wheels

have to put up with in order to get an education," she says. This is the premise that led to the founding of the Elimu foundation. Having lived at the Coast before moving to Nairobi as a child, Rosemary feels a special attachment to the Coastal region. Hence Elimu Foundation catering for the child at the Coast. "We fundraise for schools, one at a time, to revamp schools in coastal slum areas in order to afford these children a better environment to pursue their studies."

Having worked as a teacher at Aga Khan for seven years, then moving into the transport industry under management and administration for eight years and later to the grain industry before joining GDC, Rosemary says that the various areas where she has been have been challenging but overcoming challenges makes the journey to success sweeter. These challenges have helped mould her day to day life and more so are her well of inspiration for the charity work she is involved in.

"The experience of fundraising has been challenging," remarks the Loreto Limuru alumni. "Sometimes we succeed, and other times, we don't." So, why children? "I was a teacher at Aga Khan Mombasa for a while," she explains, "and in that time, I truly understood what has always been said, that children are our most valuable resource and thus need to be facilitated."

These sentiments led to Rosemary joining the Nyanza Education Trust (NET) that seeks to empower and uplift the stature of the girl child. "We focus on making the girl child understand that she is important and

that she too can play an important role in the development of society."

The innovation that led to the establishment of various charity organizations is replicated in Rosemary's day job at GDC. At the firm she is in charge of the property management. Lucy Osamba a colleague describes Rosemary as "greatly experienced and widely exposed thus innovative."

"I ensure that the company's facilities and equipment remain in good state of repair, as well as ensuring that the company meets its contractual obligation," says Rosemary. "I also ensure availability of motor vehicles and transport to staff. When it comes to my work, what I have learnt is that success can breed laxity. To combat this I say, 'do not be content with your success, review and keep challenging yourself.'"

Her direct reports speak warmly of her as a source of inspiration. "Rosemary always encourages us to work well and deliver so that one day we may rise to higher positions," says Lucy. "I see her as a very wise person who is always willing to help and is also very passionate about her job."

The inspiration theme transcends departments. "Rosemary is solution minded and is not involved in laying blame on others, if something is not working, she will assist as much as possible," says Nancy Juma.

Working for GDC makes Rosemary one of the people directly involved in ensuring electricity security for Kenya. "I am proud to be part of an initiative that seeks to change the economic fortunes of Kenya by ensuring steady supply of electricity," Rosemary enthuses.

Since life is not about all work, Rosemary is what she calls a

**"I am proud to be part of an initiative that seeks to change the economic fortunes of Kenya."**

**By Deborah Kalei**

**D**o something extraordinary to society - for satisfaction. That is the driving principle of Rosemary Okello, a Chief Administration Officer at GDC.

Rosemary preaches water and drinks the same when it comes to philanthropy.

"I am passionate about charity work," she enthuses, "a group of friends of mine and I came together propelled by the conviction to give back to society." Numerous meetings and brainstorming sessions birthed the Elimu Foundation, an NGO that concerns itself with lifting education standards.

"It is heartbreaking to see some of the conditions less fortunate students

...cont page 14



# Going for the gem

By Eric Wamanji

On a bright Tuesday July morning, Naivasha is abuzz as we drive through. Merchants scream for customers, touts call for passengers, and battered motorbike taxis wildly zip by.

Nothing in this bustling former colonial haven betrays the fact that amid the chatter and clatter, there lives here a calm and gifted engineer who is set to revolutionize geothermal energy as we all know it.

Martha Mburu is the Geothermal Development Company's Area Manager in charge of the South Rift. More importantly, it is the vital docket - Direct Utilization of geothermal resources - that sets her apart. And today, she has a handsomely bankable strategy that thrusts economists and financiers into a spin.

She wants to tap directly on geothermal to dry farm produce, heat green houses, spur tourism, and undertake irrigation, leather treatment and for industrial process. She is simply going for the gem.

This morning, Martha is upbeat - her characteristic motherly gentleness. After pleasantries and an opportunity to giggle at Abigail, fondly known as Aby here - the new member of the family barely three months old - I take my seat at the breathtaking house.

"Would you like tea?" Martha asks solicitously. I nod to the affirmative.

The creamy walls tastefully immortalize achievement and precious memories of years of yore - a wedding snap, graduation mementos, and new births are all carefully preserved here.

It is after the fine cup of tea that we thread upstairs past a pinkish-hued children bedroom to the balcony overlooking gravellier and bougainvillea, where tweets and chirps oil our interview session.

## Legendary

"I was a conservative girl," she begins. "Still in school I performed well in all the subjects. I could have become anything I wanted without a sweat. Interestingly, unlike other children, I had no childhood career

dreams. Perhaps, I would have ended up in the convent because then I admired nuns. To me they embodied holiness and I really valued a religious life."

But Martha is not a nun. A top scorer, Martha wouldn't wish to be a doctor following a dissection exercise gone awry in school. She did not fancy electrical engineering either because someone told her only the then KPLC now Kenya Power, employed such people, meaning her prospects would be slim. Still, civil engineering was not exciting; "making roads was not my thing," she offers.

Instead, the mother of three would study Bsc. Mechanical Engineering at the University of Nairobi and later plunge herself in the tough and complex geothermal enterprise.

In her formative years, she traversed jungles, gorges and calderas to study the reservoir system and advice on commercial viability.

Martha is the legendary lady who would be the only woman in her engineering class, ranked tops, and who went ahead to be among the few Kenyans to study direct utilisation of geothermal.

But the fact that she was the only woman in her class was embarrassingly unsettling.

"I even tried to change to electrical engineering where there were some girls. The dean, however, declined arguing that more girls were needed in mechanical engineering."

Martha hails from a mainly girls background. She went to a girls' school and even toyed with the idea of becoming a nun; yet here she was all alone in a men's only club so to speak.

Soon the village girl would become a celebrity engineer both on campus and away, after crushing the boys in exams and projects, and burying the stereotype at sea.

She was one of the lucky few to strike a job before graduation. Still, she got bored. She moved to the Ministry of Public Works where "perks were impressive, I had a big office but there was no work." So she got bored, again!

Luckily she finally landed a job at Kenya Power and Lighting Company. "After an intensive one year on-the-job training, I was moved to Olkaria and assigned work at the reservoir section."

Martha is a pedigree scholar.

...cont page 14



# Going for the gem

...From page 12

She was tops of her Master's class at the University of Reading, UK to the amazement of many who expected little from an African woman. She would even proceed to clinch a highly prestigious award that left the auditorium, where she presented her paper, speechless.

That's why you can trust Martha to transform the direct use geothermal landscape in this country.

Martha hates to be ignorant. She is therefore an avid reader. She mentors. She teaches.

"I read a lot about family, parenting and healthy living apart from my work related material," she says. When she is free, you will find Martha researching on energy and engineering. The Internet comes in handy here.

## Why direct use?

"During my post-graduate studies in New Zealand and Iceland, and during the field trips in Nevada, USA, I saw how the geothermal we take for granted was transforming economies



and lives. I want the same for our country," she says.

The soft spoken and assertive Martha is confident that geothermal energy is the elixir of Kenya's development and attainment of Vision 2030. Her philosophy is greatly in sync with her boss and mentor, Dr. Silas Simiyu.

And she has set up a war chest which she hopes will trigger a vast empire of geothermal utilization not only in Kenya but in the entire region. This, she reckons, would propel Kenya to an economic grandeur hitherto not thought of.

"We have the natural resource. We have the expertise. We have goodwill, there is no reason we can't succeed," she says, dashes to check on Aby, then returns with tangerine and a packet of fresh juice.

## Martha the mother

Martha has a way of making life comfortable, always.

Here she is a mother and you don't get the trace of the boss, of the award-winning scholar or of the lady who would give geothermal a new face.

"When I'm here I'm a mother and a wife," she says, coos and smiles at Aby. "Career is great, family is sacred," insists the religious Martha who is also raising her children to be God-fearing.

Her engineer husband, currently pursuing a PhD, genuinely supports her all through. This success streak of family and career is a rarity in our times.

So what's her secret? "There are no secrets. It's a matter of choice. We let our careers or homes crumble because of meaningless pursuits. For

instance, it would be foolish of me to bring the office in the house and behave like a boss, and an engineer."

That is why in her free time she will always be with her family – a unit she so cherishes. Sometimes she will be participating in church activities.

Ebullient, the engineer turned geothermist notes that her greatest goal is to see this country and region embracing direct utilization of geothermal. And so what else from her: "When Aby goes to school, I'll start my PhD too," she offers.



## MARTHA AT A GLANCE

Martha got a World Bank Scholarship to study Master of Science Degree in Renewable Energy Technology from the University of Reading, UK.

She also trained in Geothermal Reservoir Engineering at the United Nations University-Geothermal Training Programme, Iceland.

Studied Postgraduate Diploma in Geothermal Technology from the University of Auckland, New Zealand.

She has won two prestigious awards and has published widely in peer reviewed journals.

## Charitable lady who moves geothermal wheels

...From page 12

'telephone farmer'. "I have a sugar cane farm and I also keep cows. Though I make it a point to travel to my Kisumu farm at least once a month, my connection to the farm is by phone, but I hope to change this."

To unwind, Rosemary enjoys dance and music. "Lingala is my favourite," says Rosemary who is dubbed friendly, understanding, and motherly by those who have interacted with her.

Rosemary is married with 5 children. "They are my pride and joy,"

she enthuses. "One is working, two are in campus and two are in high school."

Her mantra - stand tall no matter how small you are; remain humble even as you stand tall- it is what will get to where you are.



# Makers of Menengai - in their own words



*A group of Kenya's top geothermal scientists have defied conventional challenges to establish the Menengai Geothermal Project. Two years ago intense work commenced at the field, a journey that many cynics thought was doomed. It was not long before Menengai proved to be one of the best things that ever*

*happened to Kenya - Menengai is productive beyond imagination. GDC has proven the availability of the resource in what remains a hypnotizing experience. Steam followed some of the makers of Menengai in their own words.*



## **Putting it all together Dr. Silas Simiyu**

**A**s a geophysicist I had created a lot of interest in Menengai for a long time. I carried a number of studies on Menengai too. Then, it appeared far-fetched to develop any resource outside Olkaria. But we were not deterred. Together with a team of scientists we continued to study Menengai and managed to convince policy-makers on the viability of developing the prospect. So when the government created GDC the reality that Menengai will soon emerge to be a focal geothermal point sunk home deeper. We were all excited. Still it was not an easy start. We spent sleepless nights trying to put up the best strategy for Menengai. Our different teams worked round the

clock to see the birth of Menengai. Two years down the line, and Menengai is towering with rigs is really divine. To me it is like a dream come true. Starting a company from the scratch, hitting the ground and running was really encouraging. Another fete we made was the acquisition of two deep drilling rigs and funding for two more. Buying a rig is not an easy exercise. We managed it nonetheless. When the rigs arrived we knew the energy landscape of Kenya would change for the better. And it has!

*Dr. Simiyu is the Managing Director & CEO of Geothermal Development Company*

# Makers of Menengai: In their own words

## Windy walk to the well

### Michael Mbevi

**M**aking of Menengai to me was an act of faith. When we resolved to drill at Menengai with our own rigs, I said to myself "Wow! Finally we drill with our own rigs!"

When I joined GDC I was charged with developing specifications for the purchase of the rigs and ancillary equipment. It was not easy to get it right for such a complex machine. Then there was a whirlwind of a journey that saw us travel to China to inspect the rigs. When I laid my eyes and hands on the rigs under fabrication bearing our GDC corporate colours and logo, it was like the transfiguration for me – a dream unfolding to reality right in front of my eyes.

The arrival of the rigs in the country was quite exciting. Still assembling a team of competent drillers was challenging. Nonetheless, the commitment and dedication from our crew was really touching. The team has great interest in learning the operation of the rigs and today the kind of confidence displayed by our crew is really humbling.

Regardless of the scientific effort that goes into a field, only drilling affirms the availability of the resource. And as we drilled on, it was like a mother in her first labour, she really doesn't know what to expect. Still we struck the first well that thrust us into a trance. Today, the progress in Menengai is simply great. We are going to make it big.

*Mr. Mbevi is the Manager, Drilling Operations*



## Going for the bull's eye

### James Wambugu

**T**he steam gushing from the drilled wells in Menengai is like poetry to me. It is a vindication of our science. We started to eye the caldera way back in 2004. We even carried some surveys there. But our turning point came in 2009 when GDC was created. When I knew we were to investigate Menengai in greater detail, my heart rejoiced. Then GDC was a new company and everyone was watching our steps.

For a moment, well true, I got apprehensive. This is because scientific exploration is like a guide. Wrong data can easily lead to sinking of unproductive wells and with it gobbling millions of shillings. Since drilling crew depends on our information, this means that exploration calls for precision so that we can drill at the exact point where the resource exists. It's like going for the bull's eye. The good news is that our team is made of accomplished scientists. So we descended on Menengai with a lot of passion and verve. We traversed the young volcanic rocks and survived the heat. The end result was a workable conceptualized model that is guiding drilling today. Indeed, striking steam in Menengai based on our science was really a sweet success.

*Mr. Wambugu is the Manager, Resources Development at GDC.*



## Thinking green

### Ben Kubo

**M**enengai today is a place to behold. From the crater of evil, it has been transformed into a fascinating caldera of hope that will bring reprieve in electricity costs. I started working in Menengai way back in 2004. Then, I was part of a think-tank that was passionately interested in developing geothermal resources in the country. I remember making so many treks in the Menengai jungle, auditing animals and plants,

and trying to evaluate challenges of any environmental impact on the ecosystem. In the process, I had to do a lot of explanations to communities and even authorities. Most concerns dwelt on possible environmental destruction. Still, people were happy to learn that geothermal is by far the safest source of energy.

And as a forester tree cover is close to my heart; I always feel naked without a tree nursery. That is why today we are targeting to plant one million seedlings in the crater and the surrounding farmland. We have already established a





*“When I knew we were to investigate Menengai in greater detail, my heart rejoiced. Then GDC was a new company and everyone was watching our steps.”*

## **Confronting boulders Johnson Mungania**

**W**e started eyeing the Menengai geothermal project way back in 2004, four years before GDC was created. Earlier, studies by some foreign consultants had dismissed Menengai and ranked it third after Longonot and Arus in possible development. We developed our own model and placed Menengai first. So there was excitement in the team when our concept carried the day.

I was tasked with developing all the civil infrastructural work for Menengai in preparation for deep drilling. This meant that we had to make roads, cut well-pads, and connect water and electricity. This would not have been a big deal were it not that the Menengai terrain is treacherous and required extra effort. In fact, so rugged was the terrain that skeptics wondered whether any engineer could make a road here. We proved them wrong after we moved in and turned the wild rocky patch to an accessible outpost. We could not be stopped nonetheless. And the civil works in Menengai rolled on.

We had to surmount another challenge – getting adequate water for drilling. While water is critical to geothermal drilling, Menengai

and its neighborhoods don't have surface water to draw from. That posed another major challenge. It gave skeptics more reason to dismiss our plan as too ambitious and untenable.

But at GDC we never say die. We used our advanced geophysical equipment and vast knowledge of the local geology to locate high yielding subsurface aquifers. We then drilled water boreholes, spent sleepless nights plumbing, built mega storage tanks, pump stations, power supplies and we are now drilling. It was thus enchanting to strike steam at last. It was a testimony of how a determined and committed workforce can make things happen.

*Mr. Mungania is the Manager, Infrastructure & Logistics.*



nursery in Menengai.

There was also extensive community liaison to be done. We negotiated on land issues, and discussed job opportunities for the local youth.

Early 2010, I moved to Nakuru as the Area Manager in charge of Central Rift. Menengai squarely fell into my jurisdiction. Sleepless nights were commonplace as we endeavored to turn Menengai into a star project. The sheer determination and conviction from the GDC management and staff saw the birth of Menengai in

such a spectacular way. It is quite interesting that everyone believed in us ranging from the employees, to the government and development partners. The success of Menengai is an indication of how good policies and support from the government and donors can bring change and hope. It is also a demonstration of how sound employee policies lead to profound productivity.

*Mr. Kubo is the Area Manager, Central Rift, and the Manager Environment, Safety & Community Liaison.*

*“It is quite interesting that everyone believed in us ranging from the employees, to the government and development partners.”*

# Green jab to move geothermal forward



By Eric Wamanji

**A**t the Menengai caldera, steam gushes with a screaming rumble. This spectacular sight will generate clean energy for Kenya. That geothermal energy is chic is in no doubt and that is why environmentalists have floated a raft of funding that will catapult the growth of the renewable energy sector. Through the Climate Investment Funds (CIF) a \$ 300 million (Ksh. 27 billion) concessional grant has been tabled to pilot in six developing countries to reduce Green House Gas emissions.

Analysts bet that this fund will spruce up the energy circuit by providing base capital and fashion an attractive environment for investor-entry into the lucrative geothermal sector. The funds will also accelerate generation of, and accessibility to, clean energy. Kenya enthuses a time of energy abundance that is affordable, reliable and clean to smash thick glasses of darkness and underdevelopment.

Two trust funds have been established under the CIF -the Clean Technology Fund and the Strategic Climate Fund. The Strategic Climate Fund is three-pronged: The Forest Investment Program, the Pilot

Program for Climate Resilience and the Scaling-up Renewable Energy Program (SREP).

Under SREP the geothermal sector, hitherto on the fringes but now enjoying deserving center-stage support, stands a chance to attract up to \$ 65 million (Ksh. 5.85 billion), says Caleb Indiatsi, the Deputy Manager, Corporate Planning & Strategy at GDC. This money will be channeled to the first phase of the Menengai Geothermal Project which will stream to the national grid 400 MW by 2015.

"We recently presented the Kenya Investment Plan in South Africa. Our proposal was well received and accepted," Indiatsi told Steam.

The six countries selected for pilot include: Kenya, Mali, Honduras, Maldives, Ethiopia and Nepal.

"We were congratulated for our commitment and speed. Kenya was also commended for using its own expertise to develop the plan instead of relying on external consultants," explained Caroline Tele, a Planning Officer at GDC.

In Video Conference Meeting of the SREP Subcommittee on September 8, 2011, the Investment Plan was unanimously endorsed. Thereafter, the World Bank and



*Caleb Indiatsi, Deputy Manager, Corporate Planning & Strategy GDC*

Africa Development Bank (AfDB) are to carry out an appraisal of the Menengai project. And indeed AfDB has completed its Appraisal Mission and an Appraisal Report for Menengai prepared. The Appraisal Report together with a Supplemental Document on the Investment Plan has been submitted to the Subcommittee Members who have up to October 28, 2011 to make comments before final approval. AfDB is seeking to disburse up to USD 25 million of the SREP allocation for the Menengai Project.

In the expected funding structure for Kenya, \$40 million (Ksh. 3.6 billion) will go to geothermal energy, a resource of unparalleled prowess, while \$ 10 million (Ksh. 900 million) will be channeled to Hybrid Mini-grid systems.

"Depending on the absorption rate of the funds, geothermal is likely to get \$25million (Ksh. 2.25 billion) more while solar will attract an additional \$10 million (Kshs. 900 million)," Indiatsi explained.

In the document titled Kenya's Investment Plan, Kenya sought to demonstrate that geothermal, wind and solar energy are viable ventures for financing, while meeting the fund's threshold. The paper was developed under the Ministry of Energy with contributions from GDC, Kenya Power, ERC, REA and Ketraco.

The CIF were established to provide grant and concessional financing to developing countries aiming at achieving transformational outcomes and demonstrated joint engagement by Multilateral Development Banks (MDB's) through programmatic approaches to scale-up resources to a set of pilot countries for climate resilient and low emission development.

These funds are channeled



# Green job to move geothermal forward

through the African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank and the World Bank Group. Recipients are required to leverage the funds with other external donors. According to Kenya's Investment Plan \$ 1(Ksh. 90) is leveraged against \$ 8.4 (Ksh. 756) "from other sources."

"We applied like any other nation. Then we were shortlisted, we presented our documents which has now been endorsed," says Indiatzi who together with Eng. Raphael Khazenzi (The Acting Director for Renewable Energy at the Ministry of Energy) are the project's architects.

According to Indiatzi, beneficiaries are expected to leverage on the funds in a way that will attract external donors. For instance, in Menengai, the first phase is attracting other financiers. The World Bank and AfDB have pledged \$ 110 million (Ksh. 9.9 B) and \$120 million (Ksh. 10.8 B).

## Economic vistas

SREP aims at demonstrating the economic, social and environmental viability of low carbon development pathways in the energy sector by creating new economic vistas by increasing energy access and promoting productive use of electricity generated from renewable sources. On this vein, it targets to bridge the gender schism on clean energy.

In the trail of this, private arms of development banks have also expressed their interest to support investors to establish power plants in Menengai. Such lenders include the private arm of AfDB, Proparco the private arm of AFD, and World Bank's IFC.

"This move is great for private investors. It means that investment in geothermal and other renewables has become very attractive," Indiatzi notes.

The base allocation for each country is \$ 25 million (Ksh.2.25 billion). However, the six countries were divided into three tiers with allocations of \$ 25 – 30 million, 25 – 40 million, and 25 – 50 million depending on their investment plans.

"Kenya was placed in tier 3 where it can get \$ 25 – 50 million. \$ 60 million was put on reserve and can be accessed by any of the six countries depending on their investment plans and after justification and applying for the funds to the SREP sub-committee. Thus potential Kenya can access \$ 25 – 110 million" explained Indiatzi.

Kenya's National Least Cost Power Development Plan, projects that geothermal energy should provide at least 5000 MWe of the required 15, 000MW by 2030.

While energy is critical in transforming the country to mid-income status, the glaring danger of climate change still poses a great challenge toward achieving this grand dream, hence the pursuit of geothermal energy.

## Energy Policy

That is why the Government of Kenya has developed the National Climate Change Response Strategy of 2010 that integrates climate change dimension into national policies and programs. The quest for green energy, especially geothermal, is at the core of this strategy.

The broad objective of the energy policy in Kenya is to ensure adequate, quality, cost effective and affordable supply of energy through use of indigenous energy resources in order to meet development needs, while protecting and conserving the environment.

Indeed the Kenya electricity sphere has of late witnessed sweeping reforms that resulted to the unbundling of the sector. It also saw the birth of an independent regulator, participation of several players, including private power producers, and an efficient and transparent institutional framework.

SREP aims at demonstrating the economic, social and

environmental viability of low-carbon development pathway to increasing energy access using renewable energy and creating new economic opportunities.

It comes at a time of immense state commitment to a sector that enjoys a green status and massive reserves in excess of 10, 000 MWe spread in over 14 high temperature sites along the geological fault-lines of the Rift Valley. Kenya's model is a spectacular blend of public and private engagement in the geothermal sub-sector putting the country way ahead of its time.

The state's thoughtful efforts through the establishment of GDC have been hailed as a case study worth of replication in the region. Rwanda is a case in point. Currently looking forward to initial drilling, she has greatly been inspired by the Kenya success story.



# Making of a regional green grid

By Eric Wamanji

When ARGeo chose the Geothermal Development Company (GDC) to spearhead consultancy services in the region, in a way, it was firming the fibers of regional integration.

Geothermal resource, which is an environmentally friendly, abundant resource in the region and gentle, is causing a stir as stakeholders run head-over-heels to have a pie of it.

Every second, the geological ruckus beneath our feet, especially at the faultiness of the rift valley, spews millions of barrels of heated geothermal steam that can easily be converted to a social and economic wonder like plentiful electrical power.

Interestingly, power deficiency is a common factor in the region too. In the past few months, Uganda, Kenya and Tanzania rationed electricity, occasioned by over-reliance in hydro-power, yet at the fall of drastic climatic shifts, hydro has only led to stalled turbines.

That is why in the new assignment, GDC is expected to take a lead in implementing several structures and strategies that will power the region. Importantly, GDC will play a critical role in enriching the Eastern Africa Power Pool (EAPP).

In 2005, the African Union (AU) established EAPP that is expected to interconnect the region with electricity. The pool is a framework of converging power resources and transmitting the same among member states that face frustrating cases of deficit. States in the EAPP include: Egypt, Sudan, Djibouti, Ethiopia, Kenya, Uganda, Rwanda, Burundi, DRC and Tanzania.

But the pool can only be a reality with availability of enough electricity. Already GDC is providing her expertise to countries in Eastern Africa Rift System region to tap on their geothermal potential. Rwanda is a case in point. GDC is providing the key expertise required for Rwandese takeoff in geothermal development.

The EAPP will also create and harmonize grid interconnection code in the region. It is also geared towards technical development in the region, capacity building and carrying out



feasibility studies.

The power pool is a product of the conference of Ministers (COM) which consists of Ministers responsible for electricity in their countries. The chairman is selected every two years. Ethiopia's Minister for Water and Energy Ethiopia is the current chairman beginning from May 2011.

In what has come to be known as the Kigali Declaration, the Conference of Ministers meeting in the Rwandese capital in May 2011 affirmed that: accessibility to affordable reliable electricity is key to the region for social economic growth; the ministers also appreciated the need for improved connectivity and electricity supply security to the region especially through massive interconnections.

Geothermal also got a very positive nod as the renewable energy that will mitigate on climate change. In Kenya, geothermal is the base load power. Through GDC, the Government of Kenya targets 5000 MW by 2030.

In Kigali, the ministers also reaffirmed their desire to commit more funds to electricity generation and to support critical operational issues like Grid Code for safety and efficiency, common electricity

market regulations, and to establish a regional regulatory body.

With enough geothermal power for Kenya, it will be easier for GDC to facilitate a power export to the pool. Kenya's geothermal potential is estimated to be more than 10,000MWe.

## Guide kid

The geothermal question has been boosted by the African Region Geothermal Development Facility (ARGeo) entry and inviting GDC as the guide kid in the enterprise. The success of ARGeo will see massive multilateral engagement in the area of geothermal energy and a subsequent green boost to national grids.

ARGeo's conception was to strategically overcome the initial financial and expertise challenges that come with geothermal development and place the region on a geothermal mode. ARGeo is funded by the Global Environmental Facility (GEF) with UNEP and World Bank being implementing agencies.

With a massive capacity of power generation, geothermal energy no doubt will provide more power to the region. Besides, geothermal,

**"In Kenya, geothermal is the base load power. Through GDC, the Government of Kenya targets 5000 MW by 2030."**





which is a common factor in the rift system is progressively emerging as the new frontier of investment for power plants and geothermal experts. This means that even the African Geothermal Institute that GDC is planning to set up will further the integration effort and accelerate harnessing of the resource.

**S**ave for Egypt, all the countries in the power pool own substantial reserves of geothermal energy. ARGeo's aim is to promote development and utilization of geothermal in the region. The ARGeo spirit is informed by the reality that geothermal energy will add low cost power generation capacity, increase the security of power supply and promote use of clean energy that cuts on Green House Gases (GHG).

The project is currently coordinated at the UNEP but proposals must be approved by the World Bank. This effort will see to the realization of an accelerated geothermal development and stimulate attendant investment in the region.

Expertise development and sharing will be critical to this enterprise. Kenya is by far having the edge in geothermal technology having started her activities way back in 1957.

Progressively the mass of expertise has been building up and blossomed with the creation of GDC. In fact one of GDC's mandates is capacity building. In house and external training has remained a daily endeavor at GDC. To succeed, GDC has invited world renowned geothermal experts to come and train its staff. The company has also

sent some staff to Iceland, USA and China for further training in different disciplines. The regional geothermal training UNU-GTP, that GDC is a key player, is also part of the capacity building that will prove to be handy in the region.

Initially, investors shied off from the geothermal enterprise citing high upfront costs and risks. ARGeo was conceived to cushion this fear and to stir the sector. To this end the ARGeo program boasts US\$ 13 million as Risk Mitigation Facility which is managed by the World Bank. UNEP will manage the technical aspect. There will be support for such activities like surface exploration and support Public Private Partnership. It will also recommend for environmental protection legislation, resource use regulations and social impact issues.

ARGeo has three critical components: a Regional Network that would manage a geothermal

information system, capacity building and awareness raising programs. This is managed under UNEP.

Second is the technical assistance for institutional and capacity building managed by UNEP and then Risk Mitigation under the World Bank. This is support to private and state firms, supporting policy on geothermal and development of national energy master plans.

In fact, Risk Mitigation which is World Bank-managed will also have some exploration, drilling and appraisal grants for actors in the sector.

The Global Environment Facility (GEF) is a joint partnership between UNEP, UNDP and the World Bank charged with the responsibility of forging international cooperation and to finance activities addressing climate change among other global problems.

ARGeo which was established in 2003 will no doubt interplay with GDC and EAPP to forge a region unified by a green grid.

**Above:** Some of the delegates who attended the ARGeo meeting in Nairobi.

**Right:** GDC's Dr Peter Omenda shares a point with Dr. Meseret Teklemariam.



# Bold and beautiful Barrier



A volcanic cone in Barrier Volcanic Complex, Northern Kenya.

By Charles Muturia

Located at the southern tip of Lake Turkana, Barrier Volcanic Complex (BVC) is perhaps one of Kenya's best kept geothermal secrets. A product of a series of volcanic eruptions – Barrier has erupted nine times, the latest in 1921. Barrier is as scenic as it is harsh.

The volcano complex is characterized by four distinct volcanic centres namely: Kaloleyang, Kakorinya, Likau West and Likaiu East. From the geological look of it, the volcanic cones dotting this area tell there is a lot of heat underneath. The recharge of the geothermal system is great. There is seepage from the lakes due to permeability. There are also hot springs and fumaroles scattered all over, even in very hot days you can still see smoky grounds. These young lava rocks are too harsh greatly restricting mobility. Besides, the place can get quite hot; day temperatures often rising to highs of 47°C.

As part of its mandate to develop geothermal resources in Kenya GDC has carried out detailed surface exploration work here to establish the potential of the prospect. The prospect covers an area of more than 900 km<sup>2</sup>. Initial investigations are

very promising – Barrier's potential is somewhere above 750 MWe.

GDC undertook various geoscientific studies including geological mapping to determine Barrier's volcanological evolution and the structural controls of the geothermal system. Geophysical study methods used included resistivity techniques composed of transient electromagnetic (TEM) and magnetotellurics (MT). These are methods that are used to scan the belly of the earth and enable scientists to tell the structure and heat dynamics of underground.

Geochemical techniques included the collection of gas and steam condensate samples from fumaroles to determine the nature of the geothermal reservoir. Ground radon and carbon dioxide surveys were undertaken to indicate the presence of geothermal reservoirs and also to map permeable zones.

## A great geothermal resource

Results of the geoscientific surveys indicate the presence of a geothermal resource in this bold and beautiful area. The heat source is associated with shallow magmatic intrusives beneath the volcanic complex.

Estimated gas geothermometry temperatures give mean subsurface temperatures of over 281°C. This means that a shallow magmatic heat source is alive below the volcanic centers underlying the geothermal reservoir.


The high temperature resource area covers about 60 km<sup>2</sup> and using a conversion rate of 15 MWe/km<sup>2</sup>, the volcano has potential of over 750 MWe.

The resource in BVC is suitable for electric power generation and direct use applications. The field is ready for exploratory wells to confirm the extent and the state of the reservoir.

*Muturia is a Senior Geophysicist at GDC*

*"As part of its mandate to develop geothermal resources in the Kenya GDC has carried out detailed surface exploration work here to establish the potential of the prospect."*





# Why Iceland is a hot spot for travellers, geothermists

By Sylvia Malimo

The New York Times listed Iceland as fourth of the 41 places to visit in 2011. Characterized by vast glaciers, rumbling volcanoes, hot springs, geysers, towering mountains and cascading waterfalls, this makes the landscape unique especially to a geothermal enthusiast as much as to a traveller.

The name Iceland is very deceptive and makes the geologically active island sound completely intolerable, especially thinking about mid-winter. Yet it's a worthwhile world to visit.

Iceland was named by Norwegian Floki Vilgeroarson after he encountered a bit of ice when he landed in the north. Yet due to the warm Gulf Stream current, the average temperatures in December stay around 00C (320F) and don't hover more than 30c.

The island's capital, Reykjavik, one of the world's cleanest cities, and a place I have been calling 'home' for the last eight months, is also known as 'Smoky Bay,' in reference to the geothermal springs.

To the geothermal world, Reykjavik is the epitome of direct uses of geothermal energy. Geothermal is aptly applied in district space-heating, greenhouses and of course electricity generation.

To a student in geology and geothermal industry, Iceland is the best teacher. The landscape and geological formations here are unique on the planet. The temperate climate provides an ideal atmosphere in winter or summer for one to explore Iceland's enchanting topography.

Arriving in Iceland, in autumn (late August, 2010), I was better prepared for the harsh

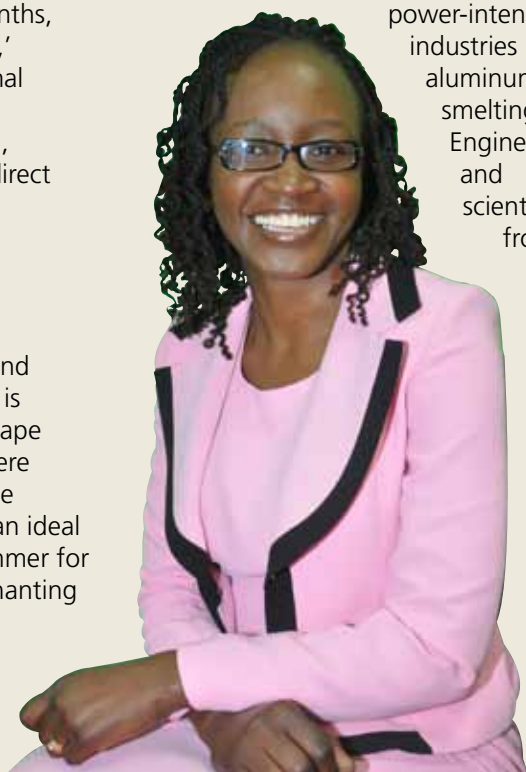
weather: the Icelandic wind, as I remembered from the previous stay in the summer of 2009, the unannounced weather changes and the freezing conditions.

The wind is the worst aspect of Icelandic weather. Its incessant blow tames any outdoor expeditions. Still, I resolved to enjoy what the North Pole was to throw at me.

Classes started as soon as I arrived at Haskoli Islands (University of Iceland)

The University of Iceland hosts over 13,000 students annually, is the oldest and most established college in Iceland and offers varied studies in its numerous faculties. Most of the courses in the graduate departments are in English but it is a bit more strenuous to find a bachelor's program completely in English for the non-Icelandic speakers.

Iceland is also a preferred spot for tourism and power-intensive industries like aluminum smelting. Engineers and scientists from



dozens of countries with geothermal power potential, including China, the Philippines, Poland, and Kenya flock to the United Nations University – Geothermal Training Program (UNU-GTP) in Reykjavik each year to tap the know-how that has transformed Iceland from bog energy to zero carbon emissions in 70 years.

Learning from the experts in geology and geothermal energy is an honor that I shall always cherish. The student attendance in these disciplines is high, most of whom are foreign students on exchange programme. It shows how Iceland is a preferred country in Earth Science studies.

The close to zero degree temperatures was a nightmare in the beginning but I have learnt to dress right and use the heater, thanks to geothermal district space heating. I have also learnt to appreciate our equatorial temperatures. Imagine this: during winter, the days are short nights long. Light is in fact just available for 3-4 hours and temperature hit the negative so low to numb your nerves.

Reykjavik in winter is a splendor though as the various Nordic architectures blend seamlessly adorned with colorful lights and displays that light up the entire town during the winter holiday season.

## Northern lights

Iceland is the perfect place to see the Aurora Borealis (Northern lights), one of the best ways to catch extraterrestrial activity on Earth. After the holidays the day light is only 3-4 hours and for anyone who likes adventure and enjoys the darkness, this is a great time of year. The sun doesn't really rise to far above the horizon in Iceland during winter but since it hovers in the sky it makes for great twilight lighting that lasts much longer than in lower latitudes. It makes for some excellent photo opportunities and is an ideal light to improve on decent travel photos.

But then as my first assignment to this geothermally active country beckons, I sit and reflect on how much Iceland is a jewel to behold and an example for Kenya to follow.

With Iceland I can go on infinitum, but I have assignments to submit and deadlines to beat.

*Malimo is a Geochemist at GDC. She is currently pursuing an MSc. In Geochemistry at Haskoli Islands, in Iceland.*

# New order in power generation as GDC gathers more steam

By Geoffrey Mabea

When GDC floated an expression of interest inviting potential power producers to put up plants in Menengai, it was ultimately ushering in a new frontier for investors and opening up a new lucrative business venture steam sales.

Initially, power producers, KenGen and Orpower 4 drilled their own wells of steam to generate electricity but the landscape changed with the creation of GDC which is charged with the mandate of developing steam fields and selling the same to investors.

GDC endeavors to cut the cost of retail electricity tariffs and will likely sell the steam to power producers at a bulk tariff of about US cents 4 per kwh. The power producer will then sell a kwh at 7.5 US cents per kwh to the distributor who will eventually sell the same at 8.5 US cents kwh as the retail price.

"Our goal is to accelerate the generation of low cost electricity that can be used to increase productivity of our people and make them self-reliant; we want to produce as much steam as possible in order for the prices of electricity to go down. This has been proven in Philippines and Indonesia," says Dr. Silas Simiyu, the GDC MD and CEO.

"Our goal is to accelerate the generation of low cost electricity that can be used to increase productivity of our people and make them self-reliant."

In Olkaria where GDC has been drilling since late 2009, the steam gathered will be sold to KenGen to power the 280 MW Olkaria IV power plant. Then there will be steam to be sold in Menengai. Already the process of evaluating bidders is underway and it will not be long to know who will be the new kid in electricity generation.

GDC will enter into a steam sales agreement with the generator; models that will see GDC interact with the generator or GDC provide steam to the generator but cost it as a pass-through charge to the off-taker. Other models are also being considered, all geared towards providing the best for the consumer. currently electricity in the country trades at an average Tariff 19 US cents per Kwh.

Potential investors in geothermal electricity will now be required to disclose their total cost outlays and clearly demonstrate their impact on electricity tariffs.

"What we are going to consider is how the investors' costs will be reflected in the general tariffs. The one whose tariff will be low will definitely get the steam," adds Dr. Simiyu.

According to Dr. Simiyu, investors will be vetted in terms of the cost and efficiency of the machines.

When every care is taken along the way, it therefore means that Kenyans will be rapidly ushering in a new era of clean, affordable and reliable electricity. Currently the power bills are high in Kenya due to reliance on diesel generators. Unreliable rain patterns have also complicated the electricity status of the nation. The laws shall direct the entire tendering and procurement process of steam to ensure that investors in the energy sector only earned decent profits.

Dr. Simiyu contends that GDC's steam would only be sold to qualified bidders through an open tendering system following the International Competitive bidding process.

The cost of tariffs can be reduced further with the reduction in the cost of drilling and exploration operations. For instance, as GDC is using its own rigs to drill in Menengai, the cost of drilling per well dropped dramatically from Ksh. 600 million to Ksh. 250 million. Furthermore, with great scientific studies, it means that scientists can cleverly guide the drillers where to hit rich steam veins. That was the case in Menengai where the first well yielded a bountiful productivity of 10 MW instead of the conventional 5 MW. This means that GDC is managing to cut on costs appropriately.





# Smart ways to beat stress

By Jedidah Ojwang

A bad morning has the capacity to stretch out into a bad day, a bad week, a bad month and so on. As the 'bads' increase you will find yourself irritable, jittery, restless, mad and depending on how long it is, you will try to pull your hair out. This internal tension will stress you up. Anyone who will come your way may have to stomach a sneer.

As much as you are having a bad day, it is vital to maintain professionalism and calmness in the work place. At work, people trust you to be professional. They do not expect to be downloaded on with your stress. Interestingly, stress will always be part of us and dealing with it separates the grain from the chaff.

To effectively treat an ailment, you first need to know the source of the problem. You need to identify the source of the stress. This will give you a clear picture on what to avoid and how to tackle the situation.

1 First things first, apply the principle of the serenity prayer- accept the things you cannot change, change those you can and decipher the difference between the two. As human beings, we find ourselves trying to fix things. However, we forget, or at least pretend to forget that we are only human and very many things are beyond our control- someone else's behavior is among them. It is important that you should always try to avoid the unnecessary stress occasioned by those that are permanently embedded on us.

2 Next, remember two wrongs never make a right! We live in an imperfect world and it is important for us to learn to live and deal with it. People will do annoying things either knowingly or unknowingly and this may up your stress levels. To minimize your stress affinity, try to avoid negative energy and naysayers. Also learn to forgive and move on. Remember, as it is said, when you forgive you set free a prisoner - you.

Sometimes, the damage is already done and you are already stressed. That does not mean it is time to hang

up your boots and spiral into a web of anguish. You need to fix the stress situation before it gets out of control.

3 Half the time, our stress is caused by inefficient time management and in the same breadth can be halved by effective time management. To avoid this unnecessary stress, always be promptly in all your undertakings. Coming to work late while checking on who is checking on you is already stressful enough. This will leave you forever behind the schedule. Handing in reports late, or doing assignments in a hurry because of procrastination, or always working under pressure will leave you cursing your boss for being bossy and will also get you stressed!

4 Experts keep on saying that you should eat healthy. You should listen to them; they know.

See, when you take in a lot of coffee and sugar and any junk food, your metabolism increases and you get hyper. If you are faced with a difficult situation, you will find yourself reacting fast and half the time without thinking. The result of that is obvious- a thousand apologies.

5 Remember, when you are stressed, you are wound up. It therefore makes sense to unwind. Do what makes you happy and calms you down. Read a book, write, take a walk, take a long bath, work out and sweat out the tension, go dance, all in all, find something extra to do outside work.

6 It is also important to have a 'go-to' person -someone who you can just go to talk to. Remember, a problem shared is a problem halved. When you talk to someone, you feel better because you relieve your chest from the weight while also getting a solution for your current predicament.

When all is said and done, just laugh about it. You'll be as shocked as to how such un costly nature worked a whole lot.

*Jedidah is a PR & Communication Officer at GDC*



"As much as you are having a bad day, it is vital to maintain professionalism and calmness in the work place."

# That culture can be gold or trash

By Bruno Linyiru

Wednesday May 11, 2011 the clock struck 6:00 pm. Nakuru was breezy and dusk quickly approached as a lone man drove past Maili Kumi off Nakuru- Nyahururu Road, towards the Menengai Caldera.

Ordinarily these are off-working hours. Workers join their families or friends. The executive ones would be playing golf or striking deals in high-end hotels. This is not a time to drive to a lonely jungle.

Still, Dr. Silas Simiyu, the MD & CEO at GDC defied convention. He would later spend the night in this chilly wilderness providing support to discharge the first geothermal well in Menengai. The excited chief executive freely mingled with engineers in solidarity.

In essence, as a leader, Dr. Simiyu was saying he is leading from the front. Of course employees were encouraged and the well discharged gleefully. What this act did was to set standards and contribute to the GDC corporate culture – a culture that says “we are colleagues first.” Such a gesture puts employees at ease by crushing illusionary barriers created and so beloved of seniors in organizations. There are many other actions that a leader performs that determine how organizational culture is constructed.

Like communities, organizations too have distinct cultures. The difference is that an organization's culture is sensitive to markets because it affects the corporate image, reputation and thereby bottom-line, negatively or positively. It is why progressive organizations have elected as part of their daily business to nurture and monitor their culture in a bid to attract supportive behaviours from stakeholders who include employees, customers, the media and the general public.

Corporate/organizational culture is difficult to define or explain in specific

terms. Culture may loosely be defined as ‘how things are done around here’. Every organization ultimately develops its own culture though many corporations have mix of the various types of culture namely, power culture, role culture, task culture and person culture.

To a large extent GDC has a culture of task orientation. This culture focuses on the job or project to be accomplished. Author Laurie Mullins likens this culture to a net, where some strands are stronger than others, and with much of the power and influence at the interstices. Task culture seeks to bring together the right resources and people and utilizes the unifying power of the group. Influence is widely spread and based more on expert power than on position or personal power.

Culture is not necessarily achieved through pronouncements and speeches but through deliberate actions. That's why the MD's action communicated louder. These actions ingrain and deliver a powerful

message. When the Chairman of the board consistently makes it on time for meetings despite his ‘young’ ages the young employees take the cue.

Indeed, culture encompasses an organization's philosophy - how employees think

and act. By extension it determines corporate personality. And culture is critical to an organization's strategic growth.

And since culture is fluid, it is subject to change. However, like all fluids without a channel, culture can meander and loose the organizational goals. Its direction is paramount in creation and defining a momentous culture – hence the support of leadership.

The point here is that culture is developed as peoples' shared beliefs, values, norms and attitudes that constitute a pervasive context



informing our actions. Cultural imperatives range from how staff takes care of property, service delivery, fairness or lack of it. It is also manifested in the quality of products and services, how people dress and relate to each. You can develop a serious formal culture or a mixed one - the neo- American type.

Every weekend for instance when I pass by our Riverside Office in Nairobi, I find some employees who, out of their own volition, choose to go to work or even remain late. This is contrast say to the typical eight-to-five and Monday-to-Friday approach.

For culture to be useful it has to receive sound endorsements from management. Let the management frown at unbecoming habits even within its stock and let it also celebrate and pronounce further the desired cultures. Management also need to preach water and drink it. There is always a cultural confusion when you pontificate on one element yet your actions betray the very preaching. Indeed, for staff to adopt a productive culture, they need an environment of trust, security, fairness and support.

Such culture is driven by strong leadership that seeks to hold together an organization. The greatest is the culture of discipline, tolerance and respect for divergent views. And always remember that by blowing out the other person's candle it doesn't make yours glow better.

**Mr. Linyiru is the Manager, Finance at GDC**

**“For culture to be useful it has to receive sound endorsements from management.”**



# Changed fortunes

Joseph Chege strolls by the rows of his lush maize and bean crop in Wanyororo, Menengai. He uproots a weed here and stops to tend and admire his waist-high maize crop there.

"I have never seen something like this since I migrated here almost 20 years ago," he says, hands held akimbo. "Usually this land could only give forth yellowed maize stocks. The ground was full of murrum. It could hardly hold water nor contain any nutrients. We lived a very miserable life."

But this has changed in a flash turning Chege into one of the most optimistic farmers, and a local celebrity to boot. So just what happened?

In 2009, goes the tale, the Geothermal Development Company (GDC) was developing road access in Menengai. The team desperately needed murrum to carpet the road. There was a near-barren land by the roadside at the edge of the caldera that looked like half a farm and half an abandoned quarry. It belonged to one Chege, the farmer, who legend has it had been acutely vexed by the one acre plot for being

non-productive. The GDC team approached the farmer to mine the murrum and in turn promising that the land would later be filled with topsoil and leveled, good enough for farming.

"For a moment I was hesitant. I had never seen a rehabilitated quarry and I was afraid I would remain with a water reservoir that could be hazardous and turn my little possession into a wasteland," he recalls.

On second thought he decided to take the risk, perhaps adventure a little bit, to offer the murrum. After enough murrum had been scooped, true to the promise, GDC kept its word and filled the gaping depression with top loamy soil. The initial land was hilly and rugged; this is flat and fertile. When the rains came, Chege sowed the seeds. They turned to be the seeds of hope and great confidence.

"At GDC we are committed to rehabilitate all our areas of operations. We do this by filling quarry areas or by planting trees. The case of Mr. Chege is a classic example of what we stand for. It is gratifying to see that now his life

has been totally transformed," says Ben Kubo, the Manager in charge of environment, community liaison and safety at GDC.

Kubo notes that his team of environmentalist worked hand in hand with engineers to see that Chege's land stand as a testimony of what good environmental management can bring to communities.

"It still sounds like a dream to see this land this rich," he says. "Now the land can support my whole family comfortably," he enthuses.

Chege's fortunes did not just end at the land. He easily built a two-bedroomed stone house at the edge of his one acre farm.

"My family is not here now because I had to relocate first. Now they can come back to a new home. Life is like a fresh bloom," he says thoughtfully.

Today Chege wears a broad smile and his garden has become a common stopover for locals to admire the wonders of a rehabilitated quarry.

"Today, if I want to sell this land I'm sure it will attract premium price," he says, then requests that I take a few shots of him in the field, for great 'memories', he reckons. "I'm very happy and from the look of things, I will be able to support my family comfortably. After harvesting I will plant Irish potatoes and perhaps tomatoes. Life will never be the same," he says optimistically.

**"My family is not here now because I had to relocate first. Now they can come back to a new home. Life is like a fresh bloom,"**



**Happy farmer ....** Joseph Chege in his shamba of lush crop of maize. GDC rehabilitated his land into productivity.



**Let's see, are you connected?** ICT staff in Menengai after installing a communication mast.



**This is how a rig works...**Dr. Peter Omenda explains a point to Joe Nyagah, Cooperatives Minister at the Nakuru ASK Show.



Rosemary Olonde, Manager, Internal Audit assists pupils in planting trees at the Menengai Caldera.



**From geothermal to rhinos...**Some of the GDC staff who participated in this year's 'Cycle with the Rhinos Competition' in Nakuru.



**Warm up...**GDC staff exercise before a soccer match in Nakuru.





**Hoyeee!...** GDC Board Chairman and staff cheer after being declared the Best Energy Trade Stand at the Mombasa International Trade Fair.



**Operation save -a-life...** Ruth Musembi, Manager PR and Cornel Ofwona, Manager Reservoir Engineering donate food stuff in Kapedo.



**Taking green gospel to the forces...** GDC staff donating seedlings to prisons officers in Naivasha.



**In the bundus but all has to work...** A GDC scientist uses a solar panel to power his scientific equipment in Barrier during exploration.



**Now, this is how Turkana will be...** Koloi Nyanga a GDC staff takes a delegation of Turkana opinion leaders around the Menengai Geothermal Project.



**Gosh!, the gush!...** Some GDC staff admire the second discharging well in Menengai.





# How GDC fed 5,000 families

*John Lagat, GDC's Chief Geologist assists a child in Chepkalacha, Pokot East to lift foodstuff that was donated by GDC staff.*

**A**kai Lokuwai's face is a glow with chains of smiles as she closely follows the translator who announces that GDC has brought food enough to feed 5,000 people in Pokot and Turkana. Lokuwai's ecstasy is classical. Hundreds others, including children, in this sunny and dusty township burst into fervent cheers and claps. Quickly a song is composed; a jig follows, feet patter the ground, fine dust is raised.

In this hot August day, Kapedo is jolly. There will be something for the stomach tonight from GDC.

When it was clear that hunger pangs spun pain and ineptness in the region, the GDC family responded compassionately. Through an ad hoc initiative called GDC Operation-Save-a-Life, GDC staff swiftly raised Shs. 4 million to buy food for the needy families of the drought-hit region. The food hauled in five trucks was enough to feed 5,000 families, an uncanny number that rhymes with the 5,000 MWe which GDC will develop by the year 2030.

"This food is a blessing," Lokuwai whispers through a translator.

"Kapedo is dry and secluded. We can't grow anything here. We just rely on relief food."

Delicately balancing her ratio on her feeble frame, she wheezes: "we are happy that GDC remembered us at this time. We will never forget this."

True. Kapedo, sandy and dusty, will bring you to the stark reality of the ravages of drought. Lokuwai

thanks God there have been no deaths yet.

"But we were worried where our next meal would come from. Some of the families have nothing to eat at all. You can see how we are emaciated and wasted," she mourns.

Rains failed here last year. Livestock died and food supplies dwindled. The food crisis took its toll



**Wow!...** *These women cant wait for their turn to receive the rations in Kapedo.*



mainly on children and the elderly.

As a responsible corporate citizen, GDC came with dry maize, maize floor, beans, cooking oil and corned beef. This food was spread to over 10 villages in Turkana East and East Pokot.

### **Chepkalacha danced too**

In East Pokot too, from Kapkalacha to Orus, residents thronged market places. Here, the GDC Chairman, Paul E. Gondi assured residents that the success of geothermal would transform the food situation of the area.

"This food donation is just a simple gesture from our staff. Our idea of CSR is different and big. We plan to use water from power plants to irrigate land here. We will support communities in their quest to end this hunger problem," said the chairman.

They came in their hundreds, each with a carrier bag. To some, this gift from GDC staff was too heavy to carry and it required an extra hand.

And this gesture of benevolence touched Dr. Silas Simiyu, the GDC Managing Director. Later he saluted his staff thus:

"Your compassion is an indication of magnanimity; an indomitable spirit worth plaudits. It takes courage to be benevolent and we, the GDC family, have just demonstrated that we are a courageous people and therefore virtuous."

But hauling the food to the Easts was checked. When the caravan of GDC Operation-Save-a-Life snaked out of Nakuru on Sunday August 21, 2011, nothing had prepared the drivers for an odyssey.

"The consignment was heavy and the road, especially after Kampi ya Samaki, is horrible. We got stuck severally on the way. However, we knew we were carrying something precious that would save lives ahead. That reality was the source of our strength," Richard Gomba one of the drivers said.

Though it was a tedious and dehydrating exercise, the transport crew was happy - "We participated in saving a life," Gomba noted.

But it was not easy to acquire



**The truck, the security and the carrier...such was the scene in Kapedo**

the commodities, though there was money. In Nakuru most millers were running out of stock. The Kenya Meat Commission had bulky orders from other quotas. Beans had to be sourced all the way from Kitale. It is the commitment of the organizing team led by Cornel Ofwona, the North Rift Area Manager that finally brought so many smiles to so many people.

There was also a lot of security and logistical support from the Provincial Administration in Pokot and Turkana.

And this sign was even more exciting to Members of parliament from Turkana who hailed GDC's kindness. They noted that through GDC there is hope for communities living in northern Kenya.

MPs Josaphat Nanok (Turkana East) and his Turkana Central counterpart Ekwe Ethuro described GDC as "a true friend". They promised to support GDC's efforts in geothermal development.

Nanok noted that the proposed drilling and geothermal development in the Bogoria-Silale Block will bring development and jobs for the locals.

"We have interacted with GDC's plan and we can assure you it is good. GDC will provide water so that we can irrigate our crops," Nanok told

the optimistic assembly that gathered under a huge acacia tree.

They came with their empty bags in the morning. When dusk hovered over the acacia and mathenge grooves, they trudged home loaded with food. It was a night of a good meal for Lokuwai and many others after a long long time courtesy of GDC staff.



**Some beans and oil too...Dr. Peter Omenda, Chief Manager, gives more foostuff to a Kapedo resident**

# The fifth discipline

Author: **Peter Senge**

Publisher: **Butterworth-Heinemann**

Reviewer: **Deborah Kalei**

Price: **Ksh. 2, 800**

Available at Major bookstores

In his *The Fifth Discipline*, Peter Senge breaks from the tradition of the everyday corporate praxis and philosophy to offer a radical approach toward building sustainable organisations in what he passionately describes as learning organizations.

These are organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, and collective aspiration is set free, while employees continually learn together.

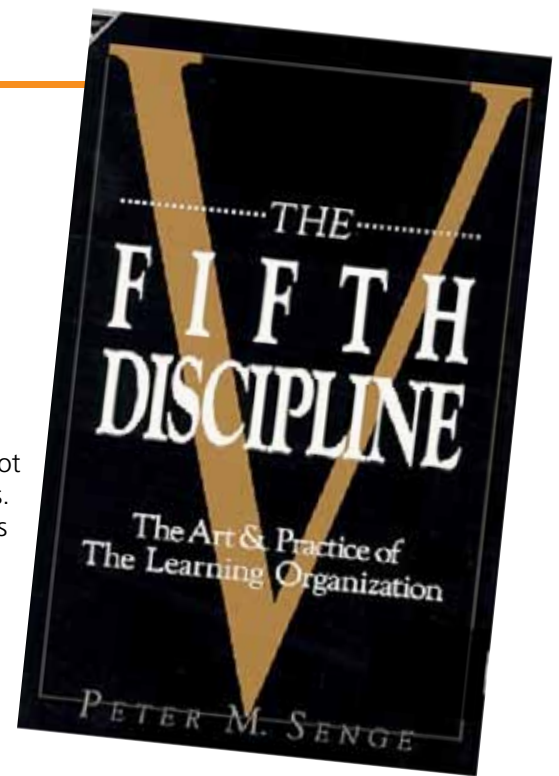
At the core of *The Fifth Discipline* are five critical creeds namely: Systems thinking, personal mastery, mental model, building shared vision and team learning.

**1.** Systems thinking- this is the backbone of the five disciplines. It proposes that an organization should learn how to understand and address the whole and examine the interrelationship between parts provided. This leads to better action.

**2.** Personal mastery- organizations only learn through individuals who learn. Personal mastery involves knowing our personal visions, focusing our energies, developing patience and not forgetting to see reality for what it is. Personal mastery involves continuous learning and understanding ones incompetence, ignorance and also identifying the areas for growth.

**3.** Mental models- these are deeply ingrained assumptions, generalizations, pictures and images that influence our worldview. Models entail soul searching and self-criticism. Our assumptions greatly impact our behaviour. When we understand ourselves, we are able to move to the next step to learn new skills.

**4.** Building shared vision- when there is a genuine vision, which Senge emphasizes is very different from the all-too-familiar vision statement; people excel and learn – voluntarily. Building a shared vision involves bringing forth shared pictures of the future that in turn create commitment as opposed to compliance.



**5.** Team learning – Team work is critical for growth. Team learning allows for dialogue. It also affords team spirit where people learn from each other.

Senge, who is also the director at the Massachusetts Institute of Technology (MIT) Sloan School of Management, admits that integrating these five disciplines simultaneously is challenging, yet pragmatic and beneficial. The five disciplines, Senge argues, gives organizations a competitive edge. Written in everyday language complete with examples, the *Fifth Discipline* is a worthwhile read for managers and leaders.

## Facts Did you know?:

1. That a well drilled in the 1920s at The Geysers was named "Whistling Annie." Once, the hot springs and fumaroles had fanciful names, including "The Devil's Wash Tub," the "Witches' Cauldron," and "Lemonade Spring."
2. That Southern California's Salton Sea Geothermal field well "Vonderahe" 1 is one of the largest and hottest geothermal wells in the world. It can produce nearly 2.2 million pounds of hot water in an hour, enough to power a 30-megawatt power plant.
3. That according to a conservative estimate by the Centre for International Economics, Australia has enough geothermal energy to contribute electricity for 450 years
4. That Fiji is very lucky to be one of those countries that sit on the Pacific Ocean's "Ring of fire". This means that in Fiji, the earth's heat is close enough to be reached by drilling holes in the ground. In most countries the same temperatures are only reached many kilometres below ground
5. That the process of extracting geothermal energy has been in existence for over a hundred years? Electricity from the use of geothermal activity was first generated in 1903, in Italy.
6. That a geothermal plant is much less invasive to the environment? This saved space can be used for other renewable energy sources, such as solar panels or wind turbines.
7. That there is no smoky air around geothermal power plants; in fact some are built in the middle of farm crops and forests, and share land with cattle and local wildlife.



# Welcome to Menengai Geothermal Project

*Come witness the making of the world's newest geothermal project.*

With over 1, 600 MWe potential, Menengai is going to be Africa's largest geothermal complex. Come see the making of this history live.

## What to see:

- State-of-art drilling rigs in action;
- Breath-taking caldera formation;
- Modern rig caravan;
- Spectacularly discharging wells;
- Fumeroles... *plus much, much more.*

Come and stand at the  
Triple Junction  
and experience  
Africa's geothermal.

*Karibu*





# True to People

**At GDC, we work in some of the driest parts of Kenya. We therefore understand community's needs and aspirations. When hunger broke out in the north, we were there. Our staff quickly raised funds to buy foodstuff enough for 5, 000 families. GDC values human dignity. We are true to communities. We power the vision.**

