Unique, Resource-rich Olkaria in Hells Gate National Park
The need to have a resource center in Olkaria

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ABSTRACT

Olkaria geothermal project is a unique destination for a day's trip to Hells Gate National Park. Characterized by beautiful undulating terrain, Olkaria hill, Ol Njorowa Gorge, Olbotut lava flow, volcanic cliff, and central tower, marks some of the unique landform features thanks to volcanicity and faulting activities. Pyroclastic volcanic rocks and ashes around give an insight picture of how the land forming processes had happened ages ago and hence a major geologic feature of the rift valley. Hells Gate National Park (HGNP), which hosts Olkaria Geothermal Project, is a park of its kind. It is the only Park in Kenya which has allowed infrastructural development. Geothermal power plants, steam lines, and high voltage electric lines crisscross the Park, adding to the natural beauty of the Park. Branded as ‘a walk on the wild side,’ the Park is characterized by diverse geological scenery, belching plumes of geothermal steam from natural geysers and power station venting points, making the area very attractive from a bird's eye view. Being a conservation area, several wild animals are often seen roaming the Park, living one wondering how animals have adapted a different behavior of living in an area full of human interference. Kenya Wildlife Service and Kenya Electricity Generating Company (KenGen) are two government parastatals with contradicting mandates, both expected to happen in one place. The latter is dedicated to producing cheap renewable energy to Kenyans while safeguarding the environment, the delicate balance between nature and development given that HGNP is the only National Park in Kenya that development has been allowed. This paper, therefore, aims at showcasing the uniqueness of HGNP and how collaborative management has helped the two organizations achieve their objectives. The paper further aims at documenting all the natural resources within the HGNP eco-system and augmenting them in one resource centre for tourism and education.
1. Introduction

Geothermal energy development in Kenya is increasingly attracting visitors from Kenya and internationally.\(^1\) The most fascinating is that the resource is located in a protected area, Hells gate National Park, located in Olkaria. Kenya conservation policies do not allow development in fully protected areas such as National Parks and gazetted forest (EMCA no-8, 1999 Cap 387\(^2\)). However, the aspirations of Kenya to industrialize by the year 2030 brought the need to explore and exploit cheap and clean energy such as Geothermal. The Hells Gate National Park was gazetted in 1984, and since then, both wildlife conservation and geothermal energy exploration have been taking place at the same time. The Park has marketed Kenya in the geothermal sector and now is the 7\(^{th}\) worldwide among the Geothermal development Countries. It has been receiving high delegate visitors from governments and learning institutions across the continent and the world that come to learn the success story of Kenya in geothermal energy\(^3\). From a natural resource management point of view, the resources in Olkaria have not yet fully been optimized. For a successful business to thrive, ways to improve profitability levels, streamline costs, and eliminate waste must be applied.

1.1 Aims and Objective

The general objective of this project is the optimization of natural resources management for successful business and profitability.

1.1.1 Aims

i. Showcasing the uniqueness and richness of resources available in Olkaria.

ii. Marketing the Hells Gate National Park through geothermal.

iii. To showcase how successful collaborative management has helped the two organizations, KenGen and KWS achieve their mandates together.

iv. To do damage control on the already tainted image of the geothermal project in Hells Gate National Park.

1.1.2 Specific Objectives

i. Documenting all the natural resources and augmenting them in a resource center for educational purposes. This including living and non-living resources.

ii. Developing documentaries about Olkaria Hells gate geothermal site and associated sceneries.

iii. Showcasing the environmental management systems which have successfully been applied in Hells Gate to ensure the sustainability of both living and non-living resources.

iv. Showcasing how KenGen is doing it unique on its way to ensure Hells Gate remains and maintains its glory.

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\(^1\) KenGen weekly vol 10, issue 8

\(^2\) Principal Act dealing with legal and institutional frame work for the management of Environmental issues in Kenya

\(^3\) KenGen weekly vol 10, issue 8: The irresistible olkaria nectar keeps them coming for more
1.2 Justification

In the recent past, there have been public outcry and activist’s advocacy in social media on KenGen continuously degrading the Hells Gate National Park. One of the major challenges that come with geothermal energy exploitation is the utilization problems that come with it. This is because most of it is found in fragile ecosystems such as Hells Gate National Park in Olkaria Volcanic complex. Kenya Wildlife Service (KWS), an organization mandated in managing the Park, has been accused of not doing enough to conserve and protect the environment of Hells Gate National Park. Though much is being done to conserve this unique resource, the impact is very little to the outside world, hence the blame game. Activists and conservationists need to know that development in a developing country such as Kenya is inevitable. KenGen and KWS have a joint responsibility to take care of the environment under their respective environmental management systems and policies. This is for the sustainability of their day-to-day business and to achieve the mandate given by the people of Kenya.

This paper, therefore, intends to showcase the uniqueness of the Olkaria geothermal project, mutualism applied by KenGen and KWS, and market the uniqueness of this Park so as to change the perspective of the common man. Others are to showcase the potential of Olkaria as a learning center to other geothermal countries in terms of environmental conservation while achieving geothermal infrastructure development. Environmental disruption is inevitable for developing countries and more especially, to geothermal development. Still, Kenya has served as an example of how she has achieved, especially in delicate ecosystems such as in Hells Gate National Park. However, KenGen must come up with more strategies in order to remain at the top of the game in the geothermal sector. It should be known that 'being number one is not a challenge; maintaining the position is the true challenge.'

2. Uniqueness, Resource-rich, and Potential of Olkaria

Kenya’s natural heritage is globally recognized for its rich biodiversity and iconic landscapes. Hells Gate National Park was gazetted in 1984, while geothermal exploration in Olkaria started way back in 1960. As per Kenyan Environmental laws, no development is allowed in protected areas. This shows co-existence between two opposing activities within one ecosystem, i.e., conservation and development.

Undulating terrain, Olkaria hill, Ol Njorowa gorge, Olbotut lava flow, volcanic cliff, and central tower marks some of the unique landform features thanks to volcanicity and faulting activities. Pyroclastic volcanic rocks and ashes around give an insight picture of how the land forming processes had happened ages ago and hence a major geologic feature of the rift valley, making Olkaria a touristic attraction and an epitome of geologic science lying silence in the underneath of Olkaria. Geothermal infrastructure such as steam lines, steam scrubbing stations, and power stations within the Tarchonanthus Comphronthus bushland gives a breath-taking view from high

5 KenGen Doc No- CPR/RCA/Q&S/Q&S/PL/02.
6 M.mwangi 2007 Geothermal development in protected areas; Kenyan experience
points such as the Olkaria II viewpoint. Plumes of steam from geothermal wells and natural geysers, plus the aromatic hydrogen sulphide gas around, leave visitors wondering how and what is happening in the underground of Olkaria.

Socio-culturally, Olkaria is the homeland of one Kenya indigenous community, the Maasai of Olkaria. They are known for embracing culture by living their indigenous life.

Most of the fragile ecosystems are rich in resources, either biological or geological. Being a park, Hells Gate has more than 100 animals and several types of plant species undocumented. Against the odds, most of the animals have adapted to daily environmental changes attributed to geothermal activities, which have affected their habitat. However, the bi-annual wildlife census shows that the wildlife population oscillations are stable, which is against nature, thus a unique scenario. Recently, the big cats, such as leopards and lions, have been spotted, an indicator of a healthy ecosystem. Proper management of the ecosystem consists of maintaining health and balanced populations. Geologically, Olkaria is rich in geological resources and features. It is characterized by faults and other structural features such as dykes and intrusions, which control the geothermal fluid movement. The soils are unique in that the inclusion of ash has completely changed its properties.

Various challenges exist in this ecosystem, among them a conflict of interest between geothermal exploration and wildlife management, habitat conversion due to on-going geothermal projects. In general, HGNP suffers "tragedy of the commons". Due to this and many other challenges, routine monitoring of wildlife and their habitats is essential for sustainable development and co-existence, thanks to mutual agreements between the two government parastatals. Land-use change in Olkaria is evidently from spatial data available, which have been chiefly attributed to KenGen's ambitious strategy to expand geothermal explorations, allegedly causing negative impacts on the ecosystem and life forms. KenGen and KWS do collaborative management to ensure the sustainability of this resource, the Park. Among the activities done are a joint KenGen-KWS baseline environmental survey for specific projects, wildlife population monitoring through bi-annual wildlife census, strict Environmental Management Program for a specific project, joint funding, and adherence to Hells Gate – Mt. Longonot parks management plan.

All the pro and cons which have been experienced in Olkaria geothermal project can be turned into an opportunity for potential income through the establishment of a learning or resource center which will be working together with the proposed Geothermal Training Institute. For it is evident, the outside eye does not see Olkaria's uniqueness. The big role is playing in Kenya in both economic, scientific, and tourist role.

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7 Situation in a shared resource system where individual users, acting independently according to their own self interest, behave contrary to the common good of all users by depleting/spoiling the shared resource through their collective action.
3. Methodology

The uniqueness of Olkaria has not been documented fully. Though well known, various data and information is scattered across the Resource Development and Infrastructure section. Different natural resources lie across the Park and Olkaria at large, both living and non-living.

The work will entail documenting all the resources from geothermal itself, rock types, features, Flora, and Fauna coming up with the past satellite imageries so as to track the change so far attributed to the geothermal development. Others will include documenting the journey and milestone the KenGen Geothermal project has so far gone through to achieve current power capacity. This will be achieved through teamwork, whereby the relevant parties will bring their data for compilation into one. The parties to be involved are all Resource and Development teams in KenGen Geothermal Development Division to document the landforms and features, satellite imageries, library, and information to document the sceneries and events, Geology for physio-geographic features, and Environment for all-natural resources.

There will be a need to capacity build the geology and environment staffs in herbarium and museum techniques for proper specimen preservation such as plants, animals, and rock samples.

Unique landform and human-made features such as hills, gorge, lava flow, and altered grounds, together with all human-made features such as the power plant, steam collecting system, will be captured using drones. All the captured data will be uploaded on the website of the resource center proposed.

With the coming up of a KenGen Geothermal Training Center, the resource center is expected to serve as a learning center for students and visitors. All the success and challenges of the Olkaria geothermal project will be centrally accessed from the center. The data will also be used by KenGen and Kenya Wildlife Service to market Hells Gate National Park hence changing the perspective of critics in Kenya and abroad.

3.1 Inputs

- Trainings-Herbarium and museum techniques
- Capturing of documentaries and filming
- Satellite imageries
- One on one discussions with media personnel on the project
- Setting up of resource center website

3.2 Outputs

- Specimen preservation, both biological and geological
- Documentary on the beauty of Olkaria geothermal site and Hells Gate National Park
- Tracked changes of the Park ever since geothermal started
- Success and challenges of the project in this fragile ecosystem
- Fully-fledged resource center with a website
### 3.3 Budget

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### 4. Recommendations and conclusions

Land-use change is the major cause of resource disruption and depletion. Olkaria geothermal project is the cause of major land-use change in Hells Gate National Park from conservation to infrastructure development. Though environmental changes are inevitable in developing countries like Kenya, care must be taken to ensure the sustainability of the resource for the benefit of inter and intra-generational equity as per the international Law. Olkaria land-use change has brought in many impacts, which can be said to be a blessing in a disguise. This is because Kenya, as a developing country, needs clean energy while conserving her environment. This has brought in critiquing by its people and the outside world on conservation matters. However, much has been done and is being done to ensure the sustainability of both resources, the Park, and geothermal. This paper recommends the documentation of all the resources, successes, and challenges of the project to turn the image to the common man, activists, and potential investors.

Kenya has now turned to be a giant in geothermal energy, being in the top ten among the geothermal countries in the world. However, this came with all the critics to the government and KenGen, as the project is located in a protected area and a very fragile ecosystem. Much has been said about the negativity of this project. Still, a lot lies in silence about the uniqueness of Olkaria, resources available, and the potential of the area to market Kenya as a geothermal tourism center and a learning site to geothermal countries. The resource center proposed will go a long way in changing the perspective of Kenyans, serve as a learning center to the outside world and market the Park in geothermal tourism hence optimization of natural resource management for higher profitability and successful business for KenGen. Optimization of opportunities should be a way forward for KenGen to remain top of the game in matters Geothermal development. Being number one is not a challenge; maintaining the position is the real challenge.

8 Development which meet the needs of current generation without jeopardizing the needs of future generation
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