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Public Participation in Environmental and Socioeconomic Considerations for Proposed 2.5 MW Pilot Eburru Geothermal Power Project, Kenya

Gabriel N. Wetang'ula

KenGen, Olkaria Geothermal Power Stations, P.O. Box 785-20117 Naivasha, Kenya

gwetangula@kengen.co.ke, gwetangula@gmail.com or ganw@unugtp.is

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ABSTRACT

Public participation (PP) in impact assessment is growing. In many countries and regions, the focus is shifting from information provision towards consultation and active involvement. For Eburru geothermal power project, stakeholders and interested parties were identified while following legal requirements for public consultation and participation. The stakeholders were informed of the project intentions through formal letters, meetings, and workshops. The concerns, views and comments raised by the stakeholders were recorded and reviewed as discussed.

The socioeconomic concerns identified during the public participation in the EIA process for the Eburru geothermal power project are as follows: a) Community involvement, b) Employment, c) Water supply to the community, d) Electricity supply, e) Provision of basic amenities, including health and education facilities, f) Afforestation programme, g) Security improvement and h) local business development. The measures that have been developed to address these concerns are discussed. These measures include: a) Awareness programmes, b) Management involvement in consultations, c) Employment opportunities for locals, d) Compensation and settlement, e) Provision of economic packages through CSR in education, health, water supply, road infrastructure & electrification, f) Environmental action plans, and g) Other community support mechanisms such as the Clean Development Mechanism

1. INTRODUCTION

Kenya Electricity Generating Company (KenGen) is a leading electric power generating company in Kenya, producing about 80% of electricity consumed in the country. The company uses various sources to generate electricity ranging from hydro, thermal, wind and geothermal. KenGen currently owns and operates two geothermal power stations at Olkaria, in Naivasha district with a total installed capacity of 115 MW. KenGen proposes to build a 2.5 MW geothermal power plant on public land at Eburru geothermal field. This geothermal field is one of the 14 geothermal prospects in the Kenyan Rift (Figure 1), approximately 140 km north-west of Nairobi and 10 km south-west of Lake Naivasha (a Ramsar Site) and Eburru Forest. Eburru forest is a gazetted indigenous forest. The field covers an area of about 16 km2 with an altitude of up to 2800 m a.s.l. The company had undertaken surface exploration studies, and drilled and tested six (6) exploration wells in late 80's. Existing geothermal wells will be utilized to develop a generation plant of approximately 2.5 MWe. This is to meet the increasing demand for electricity in Kenya using geothermal, which is an indigenous, reliable, and environmentally benign source of energy (Wetang'ula et al., 2008).

In accordance with the Kenya's national environmental legal requirements i.e. Part VI Section 58 (1) (2) and 2nd Schedule (Article 10b) of the Environmental Management Coordination Act (EMCA, 1999), an Environmental Impact Assessment study was mandatory before commencement of the proposed geothermal power project in Eburru area. An EIA was therefore undertaken in compliance with the requirements of relevant environmental regulations. The proposed project has to comply with some relevant National and International legislation and regulations. The principle national legislation is the EMCA, 1999 and the EIA and Audit Regulations, 2003.

An initial appraisal of the potential environmental impacts arising from the proposed project activities were done followed by further screening of the impacts to narrow down to the most significant environmental impacts. Appropriate prediction and evaluation methods for the key impacts were identified and used. For this project, stakeholders and interested parties were identified while following legal requirements for public consultation and participation.

The activities to be undertaken during implementation of the proposed geothermal power project will involve the following: Steam field development where Eburru well EW-01 will be used for producing geothermal steams to provide the necessary thermal energy. Steam pipeline will be installed to transport the steam to the plant. A re-injection line will also be constructed to take separated wastewater from EW-01 and condensed steam from the plant to a re-injection well EW-04 without exposing the fluid to the surface environment. The plant equipment consisting of a turbine, condensers, a generator, pumps and transformers, will be manufactured in factories and delivered to the site and mounted on concrete foundations. The turbine will be coupled to a generator, which will convert mechanical rotary energy into electricity at 11 kV. The electricity will then be stepped up to 33 kV by a transformer and then connected to an existing 33 kV national grid line (Wetang'ula et al., 2008).

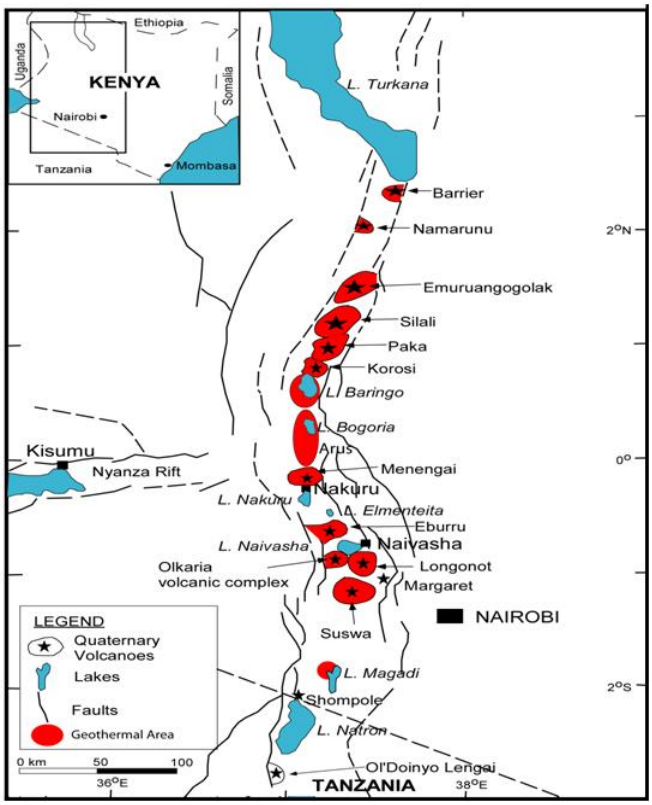


Figure 1: Map of the Kenyan Rift showing the Eburru geothermal project

2. PUBLIC PARTICIPATION

Public participation may be defined as the involvement of individuals and groups that are positively or negatively affected by a proposed intervention (e.g. a project, a programme, a plan, a policy) subject to a decision-making process or are interested in it. Levels of participation in impact assessment vary, from passive participation or information reception (a unidirectional form of participation), to participation through consultation (such as public hearings and open-houses), to interactive participation (such as workshops, negotiation, mediation and even co-management). Different levels of public participation may be relevant to the different phases of an impact assessment process, from initial community analysis and notice of the proposed intervention, to approval decision making, to monitoring and follow-up (André et al., 2006).

2.1 Objectives of Public Participation

Public participation is essential for good governance and may empower local communities. Impact assessment is multi-purposive, aiming specifically to:

- Invite the affected and interested public into the decision-making process to foster justice, equity and collaboration;
- Inform and educate the stakeholders (which includes the proponent, public, decision-maker(s) and the regulator) on the planned intervention and its consequences;
- Gather data and information from the public about their human (including cultural, social, economic and political dimensions) and biophysical environment, as well as about the relations (including those related to traditional and local knowledge) they have with their environment;
- Seek input from the public on the planned intervention, including its scale, timing and ways to reduce its negative impacts, to increase its positive outcomes or to compensate impacts, which may not be mitigated;
- Contribute to better analysis of proposals leading to more creative development, more sustainable interventions and consequently greater public acceptance and support than would otherwise be the case; and
- Contribute to the mutual learning of stakeholders and to improvement of the public participation and impact assessment practice for a proposal.

2.2 Basic Principles of Best Practice

Basic principles apply to all stages of public participation in impact assessment processes from strategic to operational levels. It is important to recognize that these levels are interdependent and, in some cases, may conflict. A balanced approach is critical when applying the public participation principles to ensure that impact assessment fulfils its purpose and is carried out in what would constitute best practice. Contemporary public participation practice in impact assessment should be:

Adapted to the context – Understanding and appreciating the social institutions, values, and culture of the communities in the project area; and respecting the historical, cultural, environmental, political and social

backgrounds of the communities, which are affected by a proposal.

Informative and proactive – Recognizing that the public has a right to be informed early and in a meaningful way in proposals, which may affect their lives or livelihoods. Increased interest and motivation to participate occur by diffusing simple and understandable information to the affected and interested public.

Adaptive and communicative – Recognizing that the public is heterogeneous according to their demographics, knowledge, power, values and interests. The rules of effective communication among people, in the respect of all individuals and parties, should be followed.

Inclusive and equitable – Ensuring that all interests, including those non-represented or underrepresented are respected regarding the distribution of impacts, compensation and benefits. The participation or defence of the interests of less represented groups including indigenous peoples, women, children, elderly and poor people should be encouraged. Equity between present and future generations in a perspective of sustainability should be promoted.

Educative – Contributing to a mutual respect and understanding of all impact assessment stakeholders with respect to their values, interests, rights and obligations.

Cooperative – Promoting cooperation, convergence and consensus building rather than confrontation. Engaging conflicting perspectives and values as well as trying to reach a general acceptance of the proposal toward a decision that promotes and supports sustainable development should be pursued.

Imputable – Improving the proposal under study, taking into account the results of the public participation process; including reporting and feedback to stakeholders about the results of the public participation process, especially how their inputs have contributed to decision-making.

2.3 Role and Benefits of Public Participation in Environmental Decision Making

When governments enable the public to participate in decision-making, they help meet society's goal of sustainable and environmentally sound development. Public participation in environmental decision-making and, in particular, in EIA, may lead to some benefits in these processes.

The engagement of the public is vital for creating an environmentally sustainable future. The benefits for public participation in environmental governance and decision making include the following:

- The protection and enhancement of the environment is the main aim of most environmental decision making processes, and public participation can improve the quality of both the process and the end decision.

- The participation process is also a learning one for all the stakeholders involved, especially if there is a free flow of information between the parties. For the public it can often be the first experience of taking an active part in the democratic process.

- Environmental decision making processes benefit from the direct and immediate knowledge held by citizens and business, concerning environmental conditions in their communities and industries.

- Encouraging the public and other stakeholders to share their knowledge, with the regulatory authorities, fosters better-informed decisions and decreases the likelihood of environmental harm, whilst increasing project viability. For example of 25 overseas projects sponsored and evaluated by the World Bank, 13 failed mainly through lack of local input (E.L.I, 1997).

- It should be realized that "wisdom is not limited to scientific specialists and government officials," and that "rational analysis, carried on in ignorance of political reality, may well end up so divorced from social reality, as to be of little use to anyone" (Barkenbus, 1998; Acland, 2002).

- Public participation gives broader perspectives on a particular process, and early involvement gives: added time to study issues and develop the process; enhanced credibility of the decision making process; early identification of the diverse perspectives on the issues of concern; and the generation of solution options (E.L.I, 1997).

- Better-designed projects, which avoid costly delays in appraisal and implementation, can also result from early and planned consultations and public participation (Bisset, 2000; Acland, 2002). For the proponent, early participation can have the added benefit of diffusing opposition to a project. If a broad based consensus is built, it can also lead to a public sense of 'ownership' (Acland, 2002).

- The public's enthusiasm is potentially a powerful motivating force for the environmental decision making process. Public input can also supplement scarce government monitoring, inspection, and enforcement, resources (Bisset, 2000).

- Involvement in environmental decision making is a learning experience giving the public insight into the governance process. If the experience is good, it powers the way for future co-operation. The converse can also be true! Experience has also shown that environmental issues are powerful catalysts of civic participation and serve as a good incentive for citizens' action and responsible democracy.

- In the longer term, public participation can improve democracy. Again, this is no secret. Regular public participation shows people that they are valued and that their views are important. These exercises build trust and confidence in the authority undertaking the exercise and demonstrate to the public that change is possible. Individuals and community groups can become more active and more responsible for their environment and quality of life. People can feel more part of a community and authorities can make better relationships with these communities which continue after the decision has been taken. Participation exercises can build confidence to undertake other initiatives, help give the public the skills to do so and generate enough enthusiasm to complete the initiative.

- As a result of public participation, the process of decision-making, up to and including the final decision, becomes more transparent and legitimate. Public debate on proposed activities among all interested groups at an early stage of decision-making

may prevent or mitigate conflicts and adverse environmental consequences of the decisions with transboundary impacts (United Nations, 2006).

2.4 How public participation is best secured in environmental decision-making

Public participation is best secured in addressing environmental issues and in environmental decision making if it is:-

- **Initiated early and sustained:** The public should be involved early (before major decisions are made) and regularly in the environmental decision making process. This builds trust among participants, gives more time for public participation, improves community analysis, and improves screening and scoping of the environmental issue at hand. This for example reduces the risk of rumors with regard to an environmental issue and can also give the regulator more confidence in the approval decision they must make.

- **Well planned and focused on negotiable issues:** The public should know the aims, rules, organization, procedure and expected outcomes of the public participation process undertaken. This will improve the credibility of the process for all involved. Because consensus is not always feasible, public participation should emphasize understanding and respect for the values and interests of participants, and focus on negotiable issues relevant to environmental decision making.

- **Supportive to participants:** The public should be supported in their will to participate through an adequate diffusion of information on the proposal and on the public participation process, and a just and equitable access to funding or financial assistance. Capacity- building, facilitation and assistance should also be provided particularly for groups who don't have the capacity to participate, and in regions where there is no culture of public participation, or where local culture may inhibit public participation.

- **Tiered and optimized:** A public participation program should occur at the most appropriate level of decision-making (e.g., at the policy, plan, program or project level) for a proposal. The public should be invited to participate regularly, with emphasis on appropriate time for involvement. Because public participation is resource consuming (human, financial, time) for all environmental decision making processes, public participation optimization in time and space will ensure more willing participation.

- **Open and transparent:** People who are affected by a proposal and are interested in participating, whatever their ethnic origin, gender and income, should have access to all relevant information. This information should be accessible to laypersons required for the evaluation of a proposal (e.g., terms of reference, report and summary). Laypersons should be able to participate in relevant workshops, meetings and hearings related to making a decision on an environmental issue. Information and facilitation for such participation should be provided.

- **Context-oriented:** Because many communities have their own formal and informal rules for public access to resources, conflict resolution and governance, public participation should be adapted to the social organization of the impacted communities, including the cultural, social, economic and political dimensions. This shows respect for the affected community and may improve public confidence of the process and its outcomes.

- **Credible and rigorous:** Public participation should adhere to established ethics, professional behavior and moral obligations. Facilitation of public participation by a neutral facilitator in its formal or traditional sense improves impartiality of the process as well as justice and equity in the right to information. It also increases the confidence of the public to express their opinions and also to reduce tensions, the risk of conflicts among participants, and opportunities for corruption. In a formal context, the adoption of a code of ethics is encouraged.

2.5 Regulatory Requirements for Public Participation and Consultation

2.5.1 National legislation

After the enactment of EMCA 1999 in Kenya, environmental awareness campaign was initiated by the National Environment Management Authority (NEMA) who was mandated to enforce the environmental legislation in Kenya. The effect was the enactment of subsidiary regulations such as Environmental (Impact Assessment/Audit) Regulation 2003. This regulation made it mandatory for consultation and public participation for the approval of development projects. The need to consult communities on projects with potential impacts to their lives was thus a premier concern during the EIA process i.e. Part III Section 17 (1)(2). Section 17(1) of the regulations states "*During the process of conducting an EIA study, the project proponent shall in consultation with the Authority seek the views of persons who may be affected by the project*".

2.5.2 Public Participation in Environmental Decision Making /Impact Assessment - International Context

Principle 10 of the Declaration of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (Brazil, 1992) emphasizes that environmental issues are best handled with the participation of all concerned citizens, at the relevant level.

Agenda 21 adopted by UNCED recognized the important role of public participation in Environmental Impact Assessment (EIA) in achieving sustainable development (item 23.2 of Agenda 21). The World Summit on Sustainable Development in Johannesburg, South Africa, in 2002 developed further these provisions (United Nations, 2006).

The principles promoted by these conferences are fully integrated into the provisions of the UNECE Convention on Environmental Impact Assessment in a Transboundary Context, which came into force in 1997 (United Nations, 2006).

The Aarhus Convention (UNECE, 1998), although it presently applies primarily to the region of Europe, has global significance for the promotion of environmental governance. The Convention focuses on the need for civil participation in environmental issues, as well as the importance of access to environmental information held by the government and its public authorities. Aarhus goes further than previous international conventions, in

providing explicit linkages between environmental rights and human rights.

3. EBURRU GEOTHERMAL PROJECT EIA PUBLIC PARTICIPATION AND ITS SOCIOECONOMIC ISSUES

Kenya like the other developing countries in Africa has experienced rapid development in environmental awareness by its citizens. With this environmental awareness, there is articulation of socioeconomic issues on development projects such as geothermal development. Of major concern is the socioeconomic cost of development projects. The socioeconomic cost of any activity is the loss or pain suffered owing to environmental degradation, material damage, accidents or public subsidies (Friedrich and Voss, 1993).

The 1st and 2nd Eburru geothermal power project community consultation meetings (Figures 2- 7) were held on 21st June 2006 and 19th May 2008 respectively. All community consultation meetings were attended by government representatives composed of provincial administration, KenGen officials, local political representatives (The Councillor), Organized Groups, Conservation NGO's and the community members. Every meeting was preceded by an invitation from the Project Proponent (Senior Environmental Scientist) by the Provincial Administration (Area Provincial Administrator, the Chief) to give a brief concerning the meeting. The consultation meetings were all chaired by the District Officer of the project area (for this project it was chaired by District Officer, Gilgil division). Attendance during the 1st and 2nd community consultation meetings was 341 and 149 people respectively consisting of local community members and other stakeholder representatives. Before commencement of the 1st community consultation meeting, the project proponent (KenGen officials) accompanied the Provincial Administration Officials (District Officer and Chiefs) to the proposed project site (Eburru Well EW-01) to familiarize with the area.

After the introductory remarks from the Provincial Administration (The Chief), the project proponent (KenGen official) gave a presentation brief on the proposed Eburru geothermal power project. The printed handouts of the proposed project brief had already been circulated to the members prior to the opening of the meeting. The brief highlighted the following: Project name; Objectives of the project; Nature of the project; Activities to be undertaken during implementation; Project design, size and implementation period; Potential Impacts; and Mitigation of impacts.

A short presentation on the technical aspect of the Eburru project was made by the Project Proponent, Reservoir Engineer. According to the Project Engineer, the arrangement are that the proposed project utilize 2 out of the 6 wells, which were drilled by KenGen in the 1980's to produce geothermal steam (EW-01) to generate about 2.5 MW of electricity and well EW-04 for re-injection of the wastewater from the plant. Planned activities will include:- Grading of the existing roads; Laying of water supply line from the reservoir tanks to the project site; Demarcation and leveling of the wells and power plant sites; Construction of the power plant and ; Laying of wastewater reinjection pipeline from well OW-01 and power plant to well OW-04. An overview of the anticipated environmental issues were highlighted ranging from vegetation removal; gaseous, noise and dust emissions; water and soil quality; geological risks and social benefits with the proposed Environmental management plans to prevent adverse impacts.

Presentation of the proposed project brief was followed by the meeting chair (Provincial Administration, Area Chief) welcoming the members of the community to present their views, ask questions, comment and contribute in any way towards the proposed Eburru geothermal power project. The key issues, questions and comments were first noted by the Secretary to the Community consultation meeting and the responses to issues that required clarification from the Project proponent were given thereafter by KenGen and Provincial Administration Officials.

The last major stakeholders consultation meeting (Figures 8- 9) that was attended by selected Eburru community representatives; minority people representative in the area (Ndorobos and Maasai); political leaders; Government Departmental representatives from different ministries (Fisheries; Water Resources, Forestry, Public Health); Local Conservation Group (Lake Naivasha Riparian Association); Provincial Administration and KenGen management was held on 6th June 2008. During this meeting an elaborate presentation of the Eburru Geothermal Power Project EIA Study findings incorporating the comments from the earlier community consultation meetings was made. After which, the meeting was declared open to all attendees to ask questions; give any comments and suggestions in relation to the KenGen's proposed Eburru geothermal power station project. The key issues identified during the public and stakeholder consultation meetings are as summarized in Table 1. The socioeconomic assessment was thus done in consideration of stakeholders' needs and fears.

Figure 2: A community member contributes during the 1st meeting and the chief distributes a brief on the project

Figure 3: Community member contributes during the 2nd Public consultation meeting

Figure 4: District Officer Addressing the 1st Public consultation meeting

Figure 5: District Officer Addressing the 2nd Public consultation meeting

Figure 6: Area Assistant Chief address of 2nd Public consultation meeting

Figure 7: Area Political Leader Addressing the meeting

Figure 8: Project Stakeholder address during Stakeholders consultation meeting

Figure 9: Response to issues raised during Stakeholders consultation meeting by KenGen official (Geothermal Execution Manager)

3.1 Lessons Learnt from the Public Consultation Process

The scope of the consultation process for this project was extensive and may be considered to be an example of good practice. Recognizing that it was based on agreement between all the concerned parties rather than a prescriptive list shows the value of recognizing legitimate interests and contributions. The process of conducting the EIA, presenting the results to the public/stakeholders and acting on the discussions, seems to have worked well in this case. Work is envisaged to start later in 2009 with the support of the local population and with little concern about environmental damage.

However, there are generic lessons that can be drawn from the process, which can be considered as successful example of public participation. It is worthwhile highlighting these lessons here as they can be used as the basis on which to develop future public participation strategies. They include:

- Acceptance on behalf of KenGen/developer that public participation can be a positive experience rather than a hazardous chore creates the right environment for successful public participation.
- Integration of public participation activities within one coherent EIA strategy is beneficial as opposed to initiating the participation exercises inside and outside the EIA process which may be a source of conflict among different groups.
- Extensive participation used before final strategies are adopted can lead to publicly acceptable project implementation strategies. This was particularly apparent for this project which tended to involve communities who already accepted the technology and the risks, and who stood to loose in socio-economic terms if the project fails to take off.
- Transparency in the decision-making process fosters confidence in the public participation process. It is clear that where the public were well informed of the nature of the decision-making process and of where the participation fitted into that process, the potential for cynicism in terms of the objectives of the public participation was much reduced.
- Provision of sufficient information facilitates public participation (the converse situation being that lack of information frustrates the public and prevents sufficient understanding of issues to allow productive dialogue) and avoids mistrust.
- Public participation could lead into wrong directions if not clearly steered.
- Political issues play an important role in public participation.

These findings are completely consistent with the principles of best practice public participation developed from theory and practice that are explained above.

4. MEASURES TO ADDRESS SOCIOECONOMIC CONCERNS

At the center of every socioeconomic concern is an emotional issue. The source of socioeconomic concerns is the difference in appreciation of the issues due to a difference in the background between the geothermal developer and the stakeholders. This difference may be bridged through several measures that were adopted by KenGen for the proposed project.

4.1 Awareness Programme

KenGen believed that before any discussion of the issues could commence, it had to introduce itself to the stakeholders. Hence, as a standard procedure, the company conducted information awareness campaign for various stakeholders consisting of the local administration, government agencies, local communities, non-governmental organizations (NGOs), and private business. A multi-disciplinary EIA team was constituted for this purpose. The activity has been running since 2005. The information content for the awareness programme included the geothermal resource, the project description, potential environmental impacts, measures and benefits to host communities.

Public/stakeholders consultation meetings were conducted (Figures 2-9). During information sharing on the proposed project, some members of the community were convinced that the project is good for the community and the country as a whole. The company also assessed that it was best to document the proof of acceptability. This was usually in the form of written resolutions of endorsements (Minutes and attendance register) by the local provincial administration, the local community and other sectors.

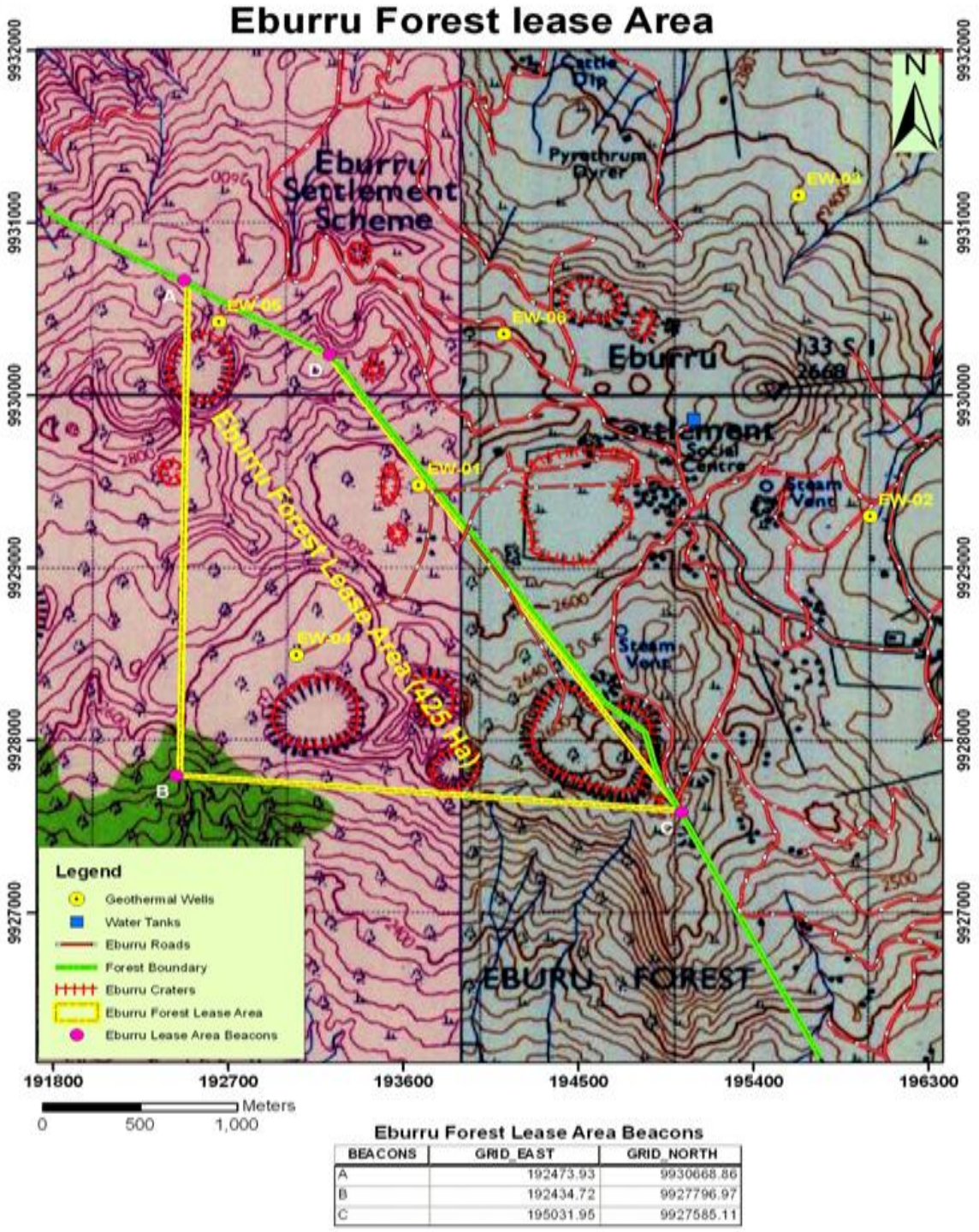
The local community and stakeholders also visited the current Olkaria geothermal power project to validate the claims of the company on sound environmental management for the proposed project. The programme has been adopted in the other projects (surface exploration studies for Menengai, Paka, Korosi and Chepchuk geothermal prospects) of the company due to its positive effects on acceptance.

4.2 Company Top Management involvement in Consultation

The company during its transformation for Good to Great (G2G) introduced Community Liaison office to serve as a link between the top company management and the various stakeholders as it was realized that communication with stakeholders must be championed and passed to high-level advocates within the organization. Participation of company management in public and stakeholder consultations signified accountability to the stakeholders.

4.3 Employment opportunities

There has been much anticipation among the local communities that as much as possible local labour be employed on the project, especially to carry out semi-skilled and unskilled tasks. This employment will lead to increased incomes for those employed. It has been therefore recommended as a key requirement that 80% of non-skilled jobs be reserved for locals from the settlements within the project area and its immediate area of influence.



Eburru Forest Lease Area Beacons

BEACONS	GRID_EAST	GRID_NORTH
A	192473.93	9930668.86
B	192434.72	9927796.97
C	195031.95	9927585.11

Figure 10: Eburru geothermal project land lease area & existing wells

4.4 Compensation and settlements

During geothermal drilling in Eburru a number of households had to be compensated for the private land parcels on which wells EW-2, 3, 5 and 6 were drilled. Wells EW-01 & 04 were drilled on public land (forest land). The two wells (EW-01 and 04) that will be utilized for this proposed project are within Eburru forest boundaries (Government/Public land). Land access rights to about 425 ha of land (Figure 10) for the proposed project and any future expansion is being sought by KenGen from Kenya Forest Service (KFS) who are the custodians of Eburru forest hence no dislocation of settlement will take place. Negotiations are already underway. Any private land parcels that might be affected by future capacity expansion will be compensated at market rates.

4.5 Provision of Economic Packages through Corporate Social Responsibility

Social acceptability is often equated with the stakeholders' access to meaningful benefits or benefits which have direct positive impacts (de Jesus, 1997; 2005). Various benefits will be shared with communities in recognition of their contribution to the national security and national development for hosting the project. The company will

regularly allocate community development funds in order to mould the community into architects of rural development. CSR projects include educational support in terms of scholarships, school facilities and books; health and sanitation in terms of medicines, clinics and medical/dental services; sports; local infrastructure assistance such as the construction of roads and water systems; and livelihood improvement.

4.5.1 Education

Through coordination with the District Education Office within the Ministry of Education, KenGen will provide many opportunities for male and female students to complete their studies at the primary, secondary, and university levels. This education support will be through improvement of education infrastructure such as school buildings; provision of equipment for schools and; provision of academic scholarships for local students who have excelled in their studies to advance their academic careers.

4.5.2 Supply of Water to the Community

There are no public water supplies in Eburru sub location. The traditional method of obtaining water is from condensation of the geothermal steam from natural fumaroles. This method used by locals to harness drinking water may expose them to chemical constituents in geothermal fluids which could be potential toxicological hazard to their health. During drilling for the Eburru geothermal project in 1988, KPC (now KenGen) erected large water tanks within the area (Figure 11) and setup a system of pipeline to pump water from Lake Naivasha. It has been proposed that supply of domestic water to the Eburru local community be incorporated in the Eburru geothermal project as KenGen's corporate social responsibility (CSR). In the past KenGen was supplying the local community with water intermittently during the drilling project in 1988. This continued even after demobilization of drilling activities but became unsustainable, as it was costly. However, this has resumed and KenGen has been assisting the community to lay a water supply line through donation of galvanized pipes under its CSR programme in the area.

Figure 11: KenGen's Eburru Water Reservoir tanks

4.5.3 Support of Health Facilities

KenGen recognizes the importance of having a healthy local community around its geothermal projects. To meet the health challenges facing the local communities, the community development programmes run by KenGen will include the procurement of medical assistance for the Eburru community health centre, which will involve support of the community to hire a clinical officer, and clean water infrastructure as the current source of water is condensed geothermal steam from fumaroles. The company also plans to organize a series of annual health programmes such as mobile clinics. The nearest government health facilities from the Eburru area are Gilgil and Naivasha sub-district hospitals which are over 25km away.

Table 1: Summary of socioeconomic issues identified during public consultations meetings of the proposed Eburru geothermal power project

Meeting	Underlying needs	Underlying fears
Eburru Market grounds Meeting (21.06.06) Eburru Sub location Assistant Chief's Office grounds (19.05.2008)	○ Community involvement in the project ○ Employment for locals-un skilled & semi skilled jobs ○ Support of water supply scheme through donation of water pipes ○ Electricity supply to the area residents ○ Continuous Water supply due to decline in steam tapped water due to generation. ○ Freedom of passage to grazing ○ Supply of electricity generated to the people ○ Provision of basic amenities esp. health facilities ○ Support of women & youth groups in the area ○ Afforestation (tree nursery establishment ○ Provision of tree seedlings for afforestation) ○ Improved roads ○ Enhancing security in the project area. ○ Enhancing education through CSR scholarships	○ KenGen to help solve insecurity problem ○ Side effects / problems associated with the project ○ Land compensation for affected parcels ○ Electricity transmission without supply to the locals ○ Noise emission from the project ○ Employment ○ Safety of the residents /crops/livestock from the associated impacts

4.5.4 Rural Electrification

KenGen recognizes the importance of power supply to communities in rural area close to its power project. However, communities closest to the power plants remain in the dark due to the existing legal requirements of the Energy Act where KenGen is only mandated to generate and not to distribute electricity and also the prohibitive cost of installing the lines because of poverty and low population density in the areas. Recognizing the importance of electrification to spur economic growth in the countryside, the company may contribute through its CSR programme to accelerate rural electrification programme in area. This will enable the locals to engage into self employments through initiation rural cottage industries.

4.5.5 Roads Infrastructure Improvement

The key road to this project area is Moi North Lake road. The project area will be accessed using the access earth road off Moi North lake road. KenGen developed the access road during exploration drilling phase and it will be maintained regularly. The operation and maintenance of the road to the project area will have a long-term positive impact. There will be some increase in vehicular movement to the project area and increased traffic to and from Naivasha due to improved road condition. Currently, there is only one private van that makes one trip to Naivasha town 30km away per day (leaving Eburru in morning and returning during evening hours). Improvement in the existing road will facilitate Public Service Vehicles (PSVs) accessing Eburru and enabling locals deliver their farm produce to Naivasha and Gilgil markets 30km away. This area produces Irish potatoes which rarely get to the market due to poor road network.

4.6 Environmental Management / Action Plan

The most important strategy that would help gain stakeholder acceptance for the proposed project will be implementation of the commitments made during the public / stakeholders consultation meetings. All the committed measures made are part of the EMP. For example, among the issues most asked during public consultation meetings was the impact of geothermal development on public health and on the forest. Protection of public health will be manifested in the daily monitoring of air and water quality around the power project to check the company's compliance with environmental standards. The claim by KenGen that it would minimize forest destruction during geothermal power development will be witnessed by the local community when the company will minimize and routinely monitor vegetation clearance during construction. The evidence of the company's sincerity will be further strengthened by the fact that local communities residing in the area will be tapped to establish tree nurseries for re-afforestation of Eburru forest.

4.7 Memorandum of Understanding (MoU)

The proposed project fall within Eburru forest, which is a gazetted government forest. The Kenya Forests Act, 2005 Section 41 subsection (2) provides that mining and quarrying may be carried out in a state or local authority forest under the authority of a license issued by the Kenya Forest Service and the local authority. The conditions on which a license for mining and quarrying, or any other activity carried out in the forest, requires that if the activity concerned is likely to result in the depletion of forest cover, the licensee has to undertake compulsory revegetation immediately in consultation with the Service upon the completion of the activity (Section 42, subsections 1 &2).

Forests (Participation in Sustainable Forest Management) Rules, 2007 also gives provision for the Kenya Forest Service to invite the private sector to participate in the sustainable management of state forests (Rule 6). Rule 7 goes further to list authorizations of forestry activities in which agreements for private sector participation in management can be made. Rule 7 sub-rule 1c states "*a special-use licence, which may be issued to a person to undertake, inside state forests, activities whose primary purpose is to yield public benefit in transportation, communication, **energy**, research or education*".

Based on this, KenGen and the Kenya Forest Service have signed a Memorandum of Understanding (MoU) to reforest the affected areas. The MoU drew attention to the significance of Eburru forest as an ecosystem that sustains unique flora and fauna. The agreement also states that all parties occupying the surrounding forest area must preserve the delicate balance of the ecosystem as an essential element in a sustainable life system. This programme involves 425 hectares leased for the proposed project and whose access by the public will not be limited. The restoration program in collaboration with the Service and local community will then spread to the entire forest that has been degraded by charcoal burning, illegal logging, cattle grazing and cultivation.

4.8 Building Model Forest Local Community

Eburru geothermal project is located in forest environment where local communities abound (Figure 12). Depletion of resources they depend on has forced the populations to encroach this watershed. The company's solutions lie in the appropriate technology, adequate funding and the willingness of local community to organize themselves and empower their members to work for a better quality of life. The scheme will involve organization of local community to undertake the reforestation and the overall management of Eburru forest area. With such a scheme in place, the local community will manage their livelihoods and avoid encroachment into Eburru forest. The result will be a socioeconomic fence that will relieve pressure on the forest resource resulting in its recovery. Improved socioeconomic status of the community will give them the confidence in their capacities and make them proud of their contribution to the environment.

Figure 12: Local community grazing their livestock within the Eburru forest

4.9 Other Community Support Mechanisms

Other community support alternatives will be the Clean Development Mechanism (CDM) programme, a plan conceived in 1992 by the United Nations Framework

Convention on Climate Change (UNFCCC) to provide an avenue for KenGen to capture the broader benefits of resources such as geothermal energy. The full extent of the potential yield is difficult to forecast, but the enormous opportunity to promote sustainable development and increase foreign investment flow is clear. For KenGen, which promotes the use of geothermal resources for electricity generation, the CDM can become a powerful financial incentive that will be used to support local community.

5. CONCLUSIONS

Public participation in environmental decision-making and, in particular, in EIA, may lead to some benefits in these processes. As a result of public participation, the process of decision-making, up to and including the final decision, becomes more transparent and legitimate. Public debate on proposed activities among all interested groups at an early stage of decision-making may prevent or mitigate conflicts and adverse environmental consequences of the decisions with socioeconomic impacts. In the end, all these efforts has resulted in the respect and trust of stakeholders and will ensure smooth implementation and operation of the proposed geothermal project due to less complaints, less cases and less expense for public relations due to a generally supportive community.

As part of our social responsibility to the local community, KenGen is seriously committed to developing an environment that will serve as an improved place to live and work and to developing a mutual understanding with the surrounding communities. Not only does KenGen make efforts to improve the quality of life of the community but also to maintain a sound environmental condition. The company does not expect a zero concerns during project construction and operation, as there will always be new issues and new publics that may arise. However, with socioeconomic issues identified and mechanisms of addressing them in place, such concerns will be minimized.

In addressing socioeconomic concerns, geothermal development must be sensitive to social responsibility and community services, and take proactive measure to lay the groundwork for acceptable community development programmes.

Thus the recommendation from the social assessment and public consultation of this project is that the best practices identified should be considered when undertaking EIA for all future geothermal projects and, specifically, that public participation should take place from the very earliest stages as possible thereby going beyond the EIA/Audit Regulation 2003 requirements.

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