Market Opportunities for the Direct Use of Low Temperature Geothermal Heat in Uganda

Faith Natukunda/ Wednesday 31st October 2018
Introduction

Geothermal potential of Uganda (estimates)

- 450 MW [McNitt, 1982]
- 1500 MW [Bahati, 2016]

Uganda’s economy is driven by agriculture

- Contributes over 25% to GDP
- Employs approximately 60% of population

Direct use of geothermal heat can play major role in enhancing agriculture, industry and tourism.
Current Applications

Limited to use of hot springs by local inhabitants for bathing, grazing of animals and as tourist attractions.

Kisiizi hot springs in Rukungiri are used by Kisiizi hospital to provide warm water for bathing and other domestic needs.

Used in salt production at Katwe and Kibiro sites but to a small extent. Sun drying has taken precedence.

*Generally not so much use to show for the potential available.*
Eight promising geothermal sites are assessed:

- **Buranga**  [120 - 150°C]
- **Kibiro**  [Above 200°C]
- **Katwe**  [160 - 220°C]
- **Panyimur**  [80 - 120°C]
- **Rubaare**  [134 - 140°C]
- **Kitagata**  [120 - 140°C]
- **Ihimbo**  [80 - 100°C]
- **Kanyangorok**  [140 - 160°C]
Buranga

• Lies within Semiliki National Park.
• **Crops grown:** cocoa, cassava, maize.
• **Region contributes 90% of cocoa exported**
• **Livestock:** cattle, goats, sheep.
• Fishing along River Semiliki and L. Albert.

• **Opportunities:** cocoa & cassava drying, leather tanning, fish drying, balneology.

Source: Lutheran World Relief (U) (2015)
Kibiro

- On peninsula in L. Albert.
- **Crops grown:** cassava, coffee, cotton, pineapple.
- Fishing on L. Albert.
- Salt mining at Kibiro hot spring.
- Gold mining at R. Kafu basin.
- Pit-sawing in Budongo forest.

**Opportunities:** cassava, coffee & pineapple drying, timber drying, balneology.
Katwe

- Borders L. Edward, L. George, L. Katwe & L. Kikorongo
- Crops grown: Robusta & Arabica coffee, passion fruit, mangoes, millet.
- Mining of copper, cobalt, cement and lime.
- Salt mining at L. Katwe – reserve of 22.5 million tons of crystalline salts.
- Tourism – numerous species of wild life and birds
- Timber harvesting, charcoal making and brick laying are practiced.

Opportunities: Salt extraction, brick hardening, waste water treatment, drying of coffee, cotton & mangoes.
Panyimur

- Located at the shores of L. Albert
- **Main economic activities:** crop husbandry, animal husbandry, fishing, bee keeping.

- **Crops grown:** coffee, cotton, sorghum, sesame, tomatoes.
- Fishing on L. Albert and Albert Nile.
- *Region produces over 7595 tons of fish annually*
- Hosts a number of honey processing factories

- **Opportunities:** fish drying, honey processing, agricultural drying of coffee, sorghum.
Rubaare

• Main economic activity is crop growing – rich soils and conducive weather.

• **Crops grown:** bananas (matooke), coffee, beans, millet and vegetables.

• Livestock farming also practiced – cattle for milk, skin, meat and hides.

• Tourism though on a low scale – numerous species of birds

• **Opportunities:** matooke and millet drying, milk pasteurization, leather processing and a geothermal spa.
Kitagata

- Agriculture covers about 2215 sq. km of land.
- Known for growing of bananas, coffee and tea and dairy farming.

- Stone quarrying, sand mining and lumbering also practiced.

- **Opportunities:** drying of bananas, tea and coffee, milk processing, leather tanning and timber drying.

- Use of geothermal in drying tea and coffee will decrease load on forest to provide timber for drying
Ihimbo

- 90% of population in agriculture – grow coffee, matooke and temperate fruits – apples, grapes, pears and peaches.

- Fishing is carried out on L. Edward

- Various tourist sites – Queen Elizabeth National park, Bwindi Impenetrable forest, Ilimbo and Minera hot springs

- **Opportunities:** drying and processing of matooke, coffee and fruits for export, juice processing, milk pasteurization, fish drying, and balneology.
Kanangorok

• Located in the Kidepo Valley National Park.
• People are nomadic pastoralists – keep cattle.

• *Crop husbandry not practiced much owing to semi-arid climate.*
• *Crops grown:* coffee, tea, maize, cassava, sweet potatoes.

• *Opportunities:* drying and processing of maize, cassava & sweet potatoes, leather tanning and milk pasteurization.
• Nomadic nature posses a challenge to implementation of geothermal projects.
Market opportunities assessed basing on two areas;

**Resource characteristics**
- Includes temperature, flow rate, chemistry, and other parameters for sustainable implementation.
- Lindal diagram used to categorize temperatures with applications.

**Economic considerations**
- The population and its behavior, economic activities dominant at prospective sites and measure of produce from the activity.
Conclusion

Current mode and scale of direct use is unsatisfactory.

Uganda has enough resource potential for direct use application.

A key area is agriculture, notably drying of food, grains, fruits and vegetables and milk processing, as evidenced at most sites.

Other applications include; fish drying, leather tanning, salt extraction, balneology and tourism.

**Required:** Enhancement of road networks to consumers, and increased awareness of best practices.
Thank you

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