GNSS applications for Managing Informal Settlements in Swaziland

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Swaziland

Swaziland is a small land-logged country in Southern Africa. It has a population of one million people and covers an area of 17,363 square kilometres. It shares boarders with South Africa on the west and Mozambique in the east. The country does not have vast deposits of natural resources and as result the main source of income is agriculture. With the downfall of the sugar prices in Europe and pulp markets in Asia, the country has had to rethink new survival strategies.
Introduction

Sometimes it is difficult in life to translate the advanced technology that we live with into practical and useful applications in our daily lives that will benefit all the citizens of our countries.
Introduction

Currently, trends illustrates that poverty and hunger are on the increase in Swaziland in both rural and urban areas, with people living on food aid increasing from 210,000 in 2005/06 to more than 400,000 in 2006/07.
Introduction

As a result, Swaziland is in the process of implementing the Millennium Development Goals (MDGs) to try and alleviate the situation.
Introduction

Population density shows that there is a high population concentration around the two cities, Mbabane and Manzini.
Introduction

The status of sanitation facilities also indicates that people are not living to the acceptable standards.
Introduction

Serious poverty indicators such as Child-Headed households also highlight the problem.
Introduction

- People living in the rural areas believe there are jobs in town and hence a better life.
- They move to town and try to find jobs and only to realise that the jobs are not there.
- They then have to find means to survive.
Introduction

The temptation to steal from the haves becomes great and this may result in the rate of crime increasing
Introduction

• They realise that they can not build informal settlements within the urban area as they are controlled by municipalities.

• They then move to the peri-urban areas where there is less control and still not far from town.

• They bargain with the controversial traditional authorities.
Introduction

The results of the controversial agreements
A Pro-active Approach

- After all is said and done, it is the government that has to take a pro-active approach towards solving the created problem.
- The structures constructed are not safe in many respects such as:
A Pro-active Approach

- The quality of the materials used for the structures is sub-standard.
- There is no infrastructure to provide the necessary services such as water, electricity and roads.
- Some of these structures can collapse at any time, especially after heavy rains.
A Pro-active Approach

An orthophoto map showing a comparison of formal and informal settlements
<table>
<thead>
<tr>
<th>TENURE</th>
<th>OWNERSHIP</th>
<th>ADMINISTRATION</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Swazi Nation Land</strong></td>
<td>- Rights to use the land</td>
<td>Chiefs/Induna or other traditional structures</td>
<td>- Easy access to land&lt;br&gt;- No technical expertise to monitor structures&lt;br&gt;- Land rights are not permanent, land can be repossessed&lt;br&gt;- Can not be used as collateral in financial institutions&lt;br&gt;- You can not sell the land</td>
</tr>
<tr>
<td></td>
<td>- Land belongs to the kind</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Can be passed from generation to generation</td>
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<tr>
<td><strong>Free Hold Land</strong></td>
<td>- Full rights to land</td>
<td>Municipal Councils or Ministry of Natural Resources and Energy</td>
<td>- Quite expensive&lt;br&gt;- Can not be used as collateral in financial institutions&lt;br&gt;- You can sell the land</td>
</tr>
<tr>
<td></td>
<td>- Title Deed Land</td>
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<tr>
<td><strong>Concession Land</strong></td>
<td>Rights to use the land</td>
<td>Land vested on King</td>
<td>- Land rights are not permanent, land can be repossessed&lt;br&gt;- Can not be used as collateral in financial institutions&lt;br&gt;- You can not sell the land</td>
</tr>
<tr>
<td></td>
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</table>
The Cadastral System

- The Cadastral System is applicable to the whole country.
- The main challenge is the administration of the different areas under the different land tenure systems.
- Swazi Nation Land has no official records of the extent of the properties within.
The Cadastral System

- The Trigonometric Network is the framework on which the cadastral system is based.
- The rise in boundary disputes between Swazi Nation Land and Freehold land is an indication that the system is likely to collapse in the future.
The Cadastral System

The trigonometric network has been maintained by the office of the Surveyor General.
A number of baselines have been re-observed to facilitate the transformation from WGS 84 to the local coordinate system.
A number of GNSS receivers have been purchased by the office of the Surveyor General for the monitoring of Informal Settlements.
Survey Field Teams have been setup to monitor the expansion of these informal settlements.
Conclusion

• The bread and butter issues are still very pertinent in developing countries.
• Resources for research and development are considered to be a luxury.
• This does not mean they don’t need the technology, they do.
Conclusion

• In the spirit of humanity and the quest to improve basic human lives, it suffices to say these technologies are “impossible” to live without.

• It is worth recognising the efforts that developed countries and international organisations put into research and development for the well-being of mankind.
Conclusion

• The application of GNSS to the upliftment of standard of living for mankind is an example of translating abstract concepts into practical situations that meet the requirements of our daily living.
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Thank You