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# The role of GIS in land use planning

*Juanita van Zyl*

Agricultural land use is the management and modification of the environment for agricultural purposes, and consists of the production of goods (crop production, livestock farming, mining and timber), and services (protection of biodiversity and natural resources).

Land cover should not be confused with land use. Although they share some similarities, they are also very different in other aspects. Land Cover refers to the observed physical surface of the earth including the vegetation types, soils, rocks, water bodies, urban and built-up areas. Significant changes in land use and land cover can drastically alter functional ecosystems. Overgrazing, for instance, causes desertification while intensive deforestation alters the Albedo of the earth's surface, eventually leading to decreased rainfall. Changing the earth's surface can further result in local heating or cooling, depending on the changes in the reflection in particular areas. Therefore, changes in both land use and land cover play a role in climate change, with the accompanying negative impact on natural resources. Proper planning and research is therefore required to ensure the optimal and sustainable use of natural resources.

The importance of Geographical Information Systems (GIS) usage in modern day land-use planning cannot be over-emphasised. By applying a wide variety of data to assist land use planners, it provides a platform to visualise, model and analyse natural or build up environments. The strength of GIS lies in allowing for multiple criteria evaluation, using different datasets. Depending on the type of analysis, weights are added to the assessment criteria to ensure the most relevant factors are considered in the analysis.

Another advantage of GIS lies in the fact that criteria can be changed, making visual illustrations of the changes becoming available immediately. GIS technologies provide a most reliable platform for land use planning, and decision-making.

Land use planning is not only essential for governmental planning in the optimal use of the natural resources, but allows farmers in utilising farm-land to its fullest. It is further necessary to focus on the potential and the limitations of the available natural resources for effective land utilisation as environmental conditions ultimately determine what crops a farmer can produce.

Manstrat AIS develops agricultural business plans based on GIS data for land-use planning. By combining climate data with water resources and soil data, the company produces maps that indicate areas most suitable for crop and vegetable production, and shows how various GIS datasets are used in agricultural land use planning. By combining the results of research that determine environmental factors conducive to pest and disease outbreaks, with crop and vegetable production maps, more useful maps are created for crop and vegetable production. The use of GIS technology is relatively new in land use planning. It is often difficult and costly to obtain all the necessary datasets needed for analysis. GIS technologies save time and money in the analysis of data while providing accurate and reliable answers. It also prevents undesirable changes in land-use that often occurred in the past.

GIS decision support systems provide a holistic approach to land-use planning, by conducting land suitability analysis to determine future land-use needs, as well as providing suitable future locations.



*Juanita van Zyl*

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## Tips and tools for advisors

### Packing Requirements for Fresh Vegetables

*Portia Phahlane*

Fresh Vegetables by definition are highly perishable produce and packing is an important measure in maintaining quality and final produce presentation - from producer to consumer. For farmers it is important to know as much about packaging as they know about producing. Not only must their produce attract the attention of prospective clients, but they must comply with packing requirements regularly set by formal and other markets.

Farmers must also adhere to regulations relating to the grading, packing and clear marking of fresh produce as laid down by the Department of Agriculture, Forestry and Fisheries:

- Only fresh produce of the same quality, cultivar, ripeness, size and colour may be packed into the same container.
- Each container should be packed firmly and to capacity.
- The packing material should be clean, dry, odourless and not damage the produce internally or externally.
- Packing material should not transmit any harmful substance or any substance that may be harmful to human health, to fresh vegetables.

## Getting to know the ESO Provincial Top Users

Everybody loves a winner, and Extension Suite Online Top Users are just that - winners! In this issue, we introduce you to another of your hardworking colleagues, Mr. Dumisani Nzama, who is the KwaZulu-Natal provincial top user for March 2016. Originally from Maphumulo, Ilembe district, Dumisani now lives in Durban, a place that he enjoys for its tourist attractions that include the Moses Mabhida stadium, many good hotels and of course the Indian Ocean and nearby beaches.

Dumisani has been with the department of agriculture in KZN for 30 years and employed as an Animal Scientist in Ugu District Municipality, where his immediate supervisor is Mr. Charles Carr. Dumisani advises more than fifty individual farmers, six co-operatives and also liaises with the six live-stock associations located in the local municipalities. His area of expertise is in non-ruminant animals, but his field of work includes both ruminants and non-ruminants. Furthermore, the high humidity in his area causes adaptability issues for certain livestock breeds, and he is often required to advise on the most suitable breed(s) for the district.

Mr Nzama was introduced to ESO in 2010 during a workshop and has since then, never stopped using the system. He says that ESO is a good information system as it has a significant amount of information on a variety of agricultural subjects. He highlights the different animal breeds, adaptation and symptoms of animal diseases as subjects that he finds most helpful in his daily work. He finally added that ESO is user friendly; it provides him with accurate information (he knows as he has cross-checked with other sources!); while information on the development of business plans has served him well over the years when assisting and advising clients.



Dumisani Nzama

## National ESO Top User

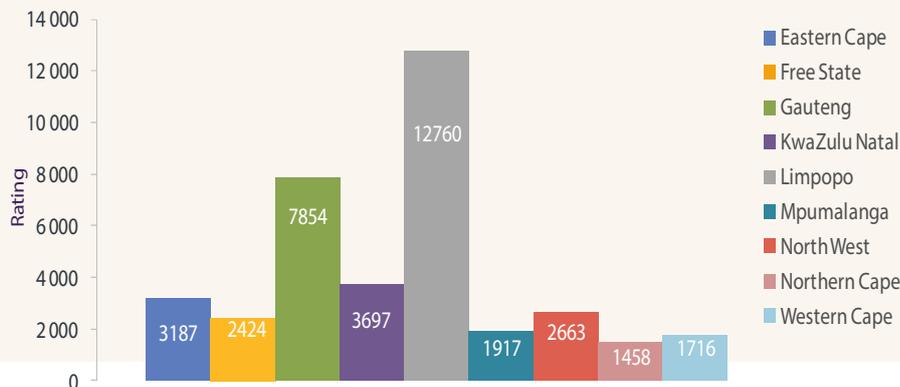
Congratulations to **Mr Louis Khomola**, the ESO National Top User for March 2016.

The monthly national ESO user will receive the following prizes: First time National ESO User 2016: **4 Gig USB memory stick**, second time National ESO User 2016: **Digital Camera**, third time National ESO User 2016: **Nokia Lumia 520**, fourth time National ESO User 2016: **Samsung Galaxy Tab**.

## EXTENSION SUITE ONLINE UTILISATION: MARCH 2016

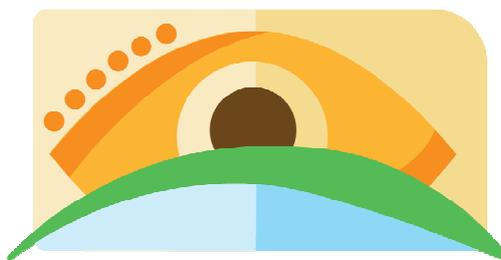
Extension Suite Online (ESO) utilisation is determined through monitoring user utilisation in the nine provinces and by attaching values to Visits, Pages Visited and Duration of Visits; a rating is calculated to establish the ESO National Top User of the Month.

### ESO PROVINCIAL TOP USER GRAPH



## ESO PROVINCIAL TOP USERS

Province	Name
Eastern Cape	Kayaletu Noqa
Free State	Ramongalo Nnini Portia
Gauteng	Sizwe Nzuza
KwaZulu Natal	Dumisani Nzama
<b>Limpopo</b>	<b>Louis Khomola</b>
Mpumalanga	Bellinah Sibiya
North West	Mompati Gabanakgosi
Northern Cape	Ernest Oitsing
Western Cape	Mampje Jacob Mapheto



## CLIMATE WATCH

MARCH 2016

Weather trends noticed in January, continued into February - large parts of the summer rainfall region would experience heat wave conditions - only to be broken the next moment by short periods of rainfall.

The map in Figure 1 is derived by calculating the difference between February 2016 and the long-term (16-year) average for February. Figure 2 gives us insight into the vegetation conditions in South Africa and how the current situation compares to

**Read the full article on the Manstrat AIS website.**

[www.manstrat.co.za - Climate Watch](http://www.manstrat.co.za - Climate Watch)

## ESO TIPS:

### Social Media

Deon Erasmus

Let's face it, social media is all the rage today. People become famous, and infamous, with one tweet, comment or blog. And what makes social media so effective, is that one can send a message into the world wide web with just one click on one, or more, of the numerous buttons found on most webpages, apps, articles or images.

Positively speaking, taking part in social media allows you to spread the word about what you like, your department or unit, and also allows you to create communities where you can communicate your message or ask for help from fans, friends and colleagues. On the other hand, one can easily get into trouble for something meant differently or taken out of context.

A tip would be to start with one social media platform, to make sure that you master it before you spread your wings, so to speak. If you use one social media platform consistently it will grow into a thriving community, and expansion to other platforms will be much easier.

Choose the right platform for what you want to achieve, an example of this:

- Use Facebook to build a community around your activities;
- Twitter is great for sharing brief messages;
- Youtube can be used to grab attention with compelling videos;
- LinkedIn can help with your professional network.

Remember that Social Media platforms take time to grow, but once it is running it is incredibly powerful, and as they say in the classics: "Be careful out there".

**Do you have any technology related questions?** Send them to [newsletter@esuite.co.za](mailto:newsletter@esuite.co.za), with your name, province and the question and we will answer them in a following newsletter edition.



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