30TH JUNE -2ND JULY 2014 WEEKLY REPORT

The training started on the 30th June to 2nd July 2014 after rescheduling due to graduation ceremony held on 4th July 2014. Registered 30 students who could be accommodated in one session were introduced to the objective of the training. The training had targeted mainly the student population at Kenyatta University with 100% turnout being students distributed as shown in Figure 1.

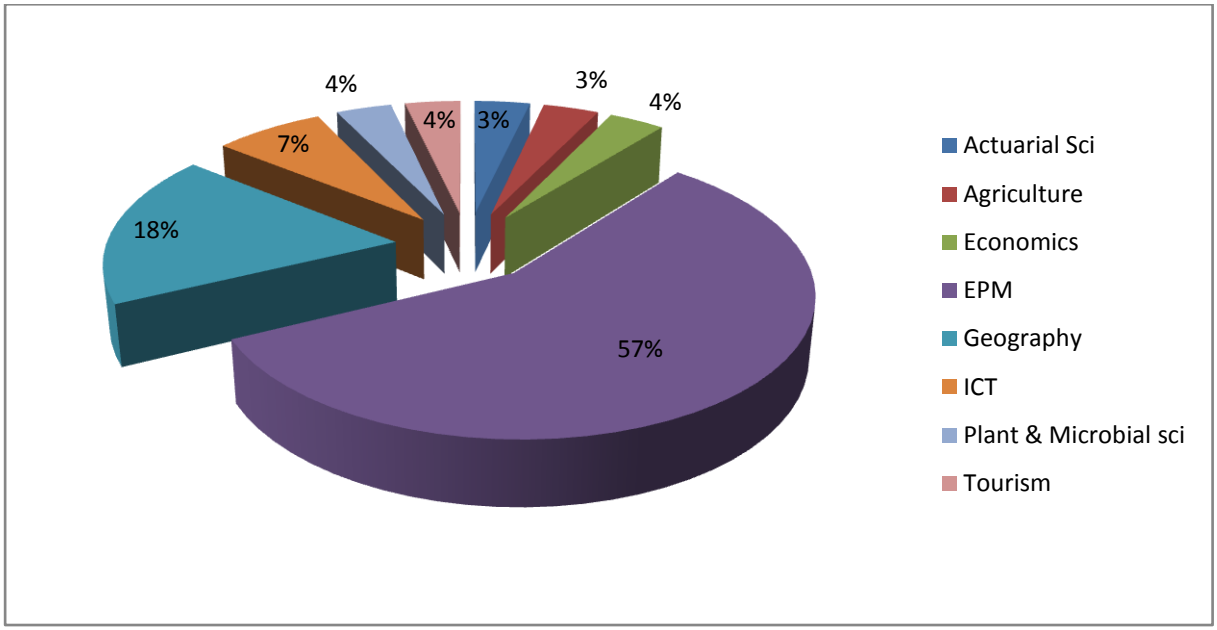


Figure 1: student distribution as per departments

Pre-evaluation forms were given to the participant to fill with an aim to assess:

1. How they came to know about the training. 11% of the participant responded through networking, 50% through website and 14% through emails and 25% through advert.
2. Which Esri product they have used. Majority of the respondents (76%) reported having not used any of the GIS softwares and this gave further evidence for the need of this training.
3. What they would like to learn most from a list of choices and what is their expectations at the end of the training. Majority of the participants (31%) came to the training so that they

could use the knowledge garnered in their profession. 38% came to learn how to use ArcGis and 24% to use GIS for research project. This demonstrates a need for further training to all students in Kenyatta University (Figure 2).

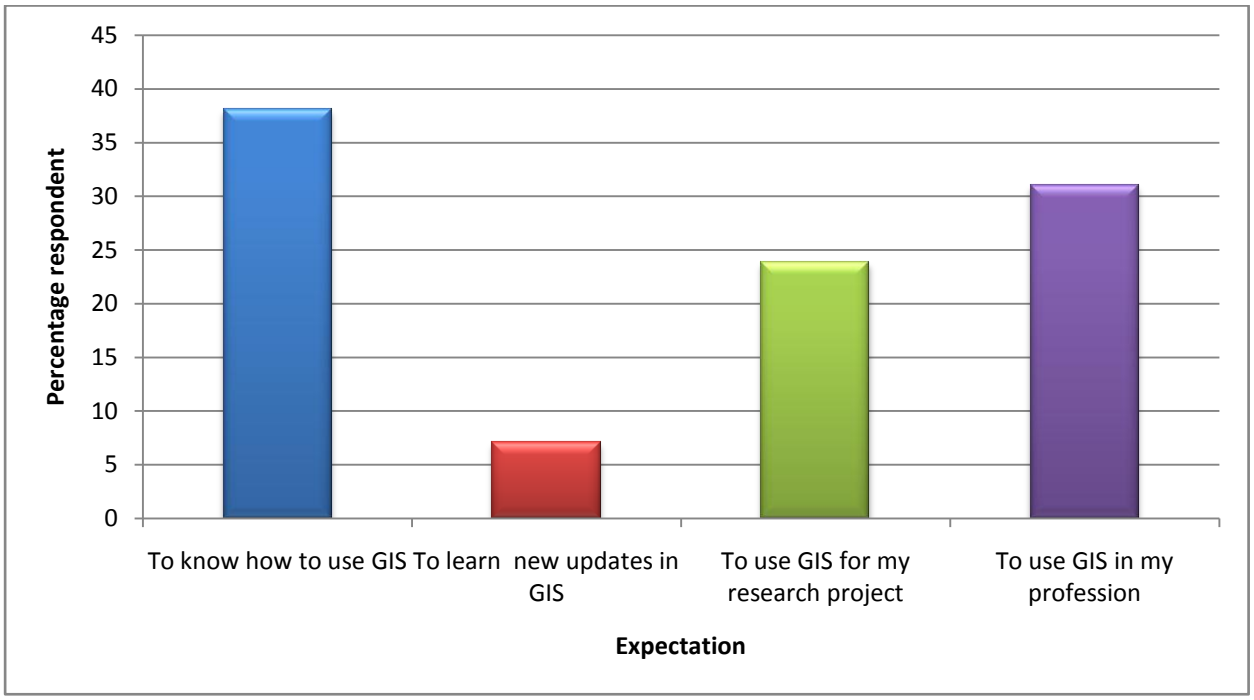


Figure 2: Student expectations after the training.

Objectives

The main objective of the training is to teach the student how to use ArcGis as a tool for Gis.

The other objectives aimed at introducing the participant to:

i. what is GIS
ii. what is ArcGis
iii. what can ArcGis do

This was achieved through an overview of what is GIS, how it is related with our Environment, that GIS is not for specific type of people but for all professionals. Professor Onywere did a

thorough introduction of what is GIS. ArcGis introduction was aimed at bring out to the students the difference between GIS and ArcGis.

Participant were therefore prepared to what approach will be taken to make them appreciate ArcGis as a tool for GIS and demystify the belief that ArcGis is a complicated tool to use.

Low uptake of the use of ArcGis software has necessitated the confiners of the training to come up with the best approach to teach the participant how to start off with ArcGis on their own and in a very simple way that is approachable to people who never had any training of ArcGis software.

In this training, after the concept of Gis was introduced to the participant, the teaching approach adopted for the ArcGis software was to train using slides that are actually prepared with data pre-copied to the computers they are using. The copied Student folder contained two folders as shown in Figure 3. Each folder contained different datasets that are aimed at training the student to handle data of all types.

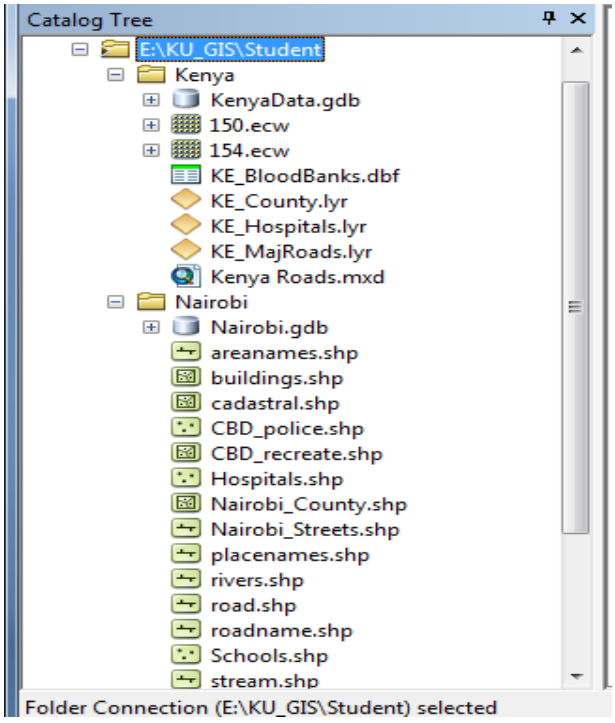


Figure 3: Student Folder Contents

The flow of the training combined the doing and the explanation in a step by step approach.
This approach was adopted because in most of the cases when a new technology is introduced to the users, the biggest challenge is usually how to start using the software and how to navigate using the available manuals. Manuals that are general to the end users sometimes do not consider the very basic concern of people who are not exposed to the technology at the lowest level. This thus put off those who are not technologically oriented and the challenge being common to all developing countries.

In the first day of training, the basic explanations of Esri Arcline of tools; ArcCatalog, ArcMap, ArcGlobe, ArcScene, ArcTool boxes and ArcReader were mentioned to the participant.
ArcCatalog was taught from start menu, program files, ArcGis path to show the participant where the software is installed in their computers. This basic approach gave the participants exposure of the path to follow suppose there are no shortcuts created or they use computers different from their own. Extensive explanation of the ArcCatalog was given and participant used their computers to open the ArcCatalog and connect to the Student folder containing the pre-copied data. Figure 3 above shows a folder connection session in a Catalog Tree captured during the training.
Students were excited to be able to follow the trainer's step by step training and a lot of interest could be seen by the keen and high concentration during the training sessions.

The next step was introduced ArcMap using the same approach and participant shown the similarities and difference of the ArcMap as the main working environment and the ArcCatalog.
This culminated with doing some exercise to start ArcMap on their computers, to locate the ArcTool box and closing the software. This ascertained that the student can be able to start the ArcMap program on any computer even when no shortcuts are created on the desktops. Figure 4 shows a screen shot taken during the training session.

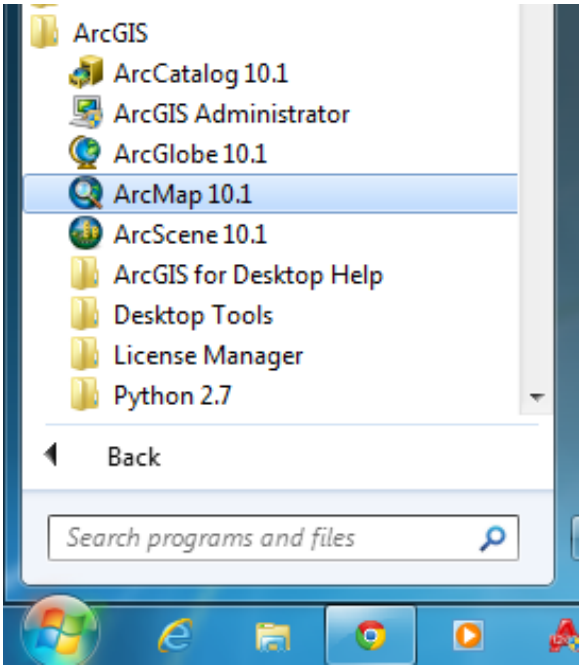


Figure 4: Starting ArcMap 10.1 from the Start.

Geoprocessing tools were demonstrated in a slide. This was a preparation of the excise that drew a lot of interest to the students. Figure 5 shows the Modelbuilder slide.

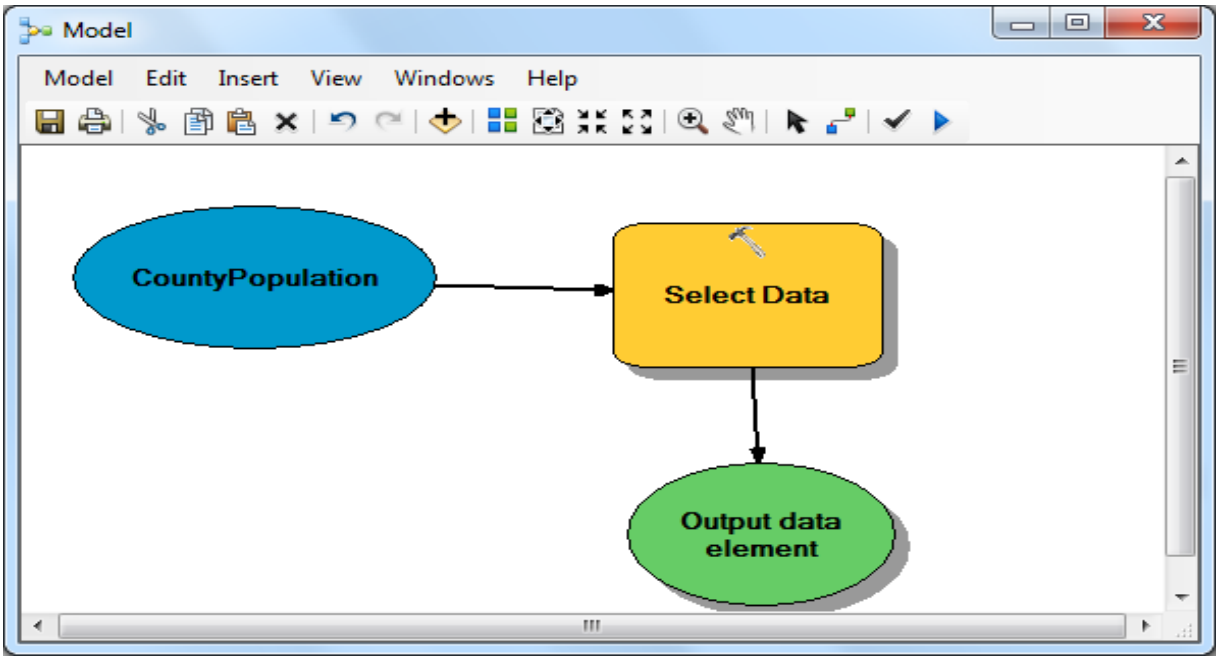
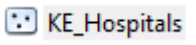


Figure 5: Modelbuilder window.

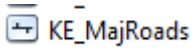
Day two was a link up of the first day but geared to have more exercise that opened a lot of explanations to the type of data, the ArcTool box, the data conversion and data projection.

Type of Data:

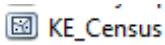
Explanation of data geometry using points to represent hospitals, schools population density etc.



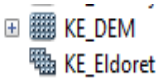
Point geometry of Kenya Hospitals layer in the KenyaData geodatabase.



Line geometry to represent linear features like railways and roads.

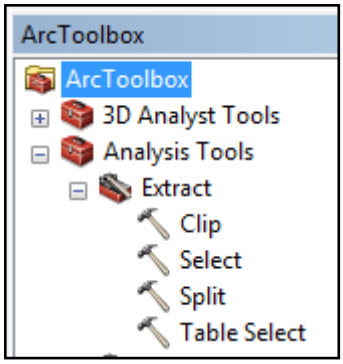


Polygon Geometry to represent Kenya Census.



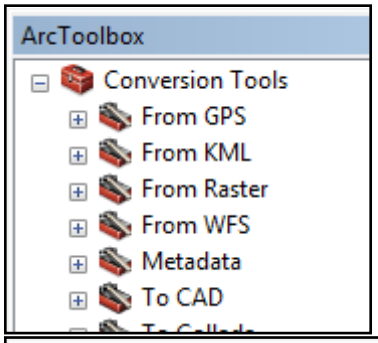
The grid symbol to represent the raster data.

The ArcTool Box:

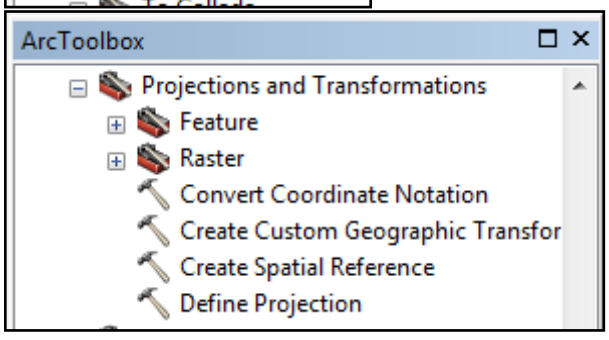


The analysis tools were explained and Select tool in the Extract sub-tool box was used in an exercise to extract a County in the CountyPopulation Geodabase.

Data Conversion:



This section was used to show the various tools available in ArcTool box to convert various data from one to the other. Participant appreciated the flexibility of working with ArcGIS using data from a big range of formats.



Data Projection:

Projections and transformation Sub-tool box in Data Management Tools was expounded and define projection tool used to show how to define feature projections incase the data

obtained from sources that never had projection definition. AreaNames in the Nairobi data was used for the exercise to define the Projection to UTM Arc 1960.

Geoprocessing excise where creation of a new feature class was done started off the exercise. Due to the demand of more practical from the first Staff training, several Geoprocessing tools like Modelbuilder (Figure 5), Extract feature were explored further using data to actualize the exercise (Figure 6).

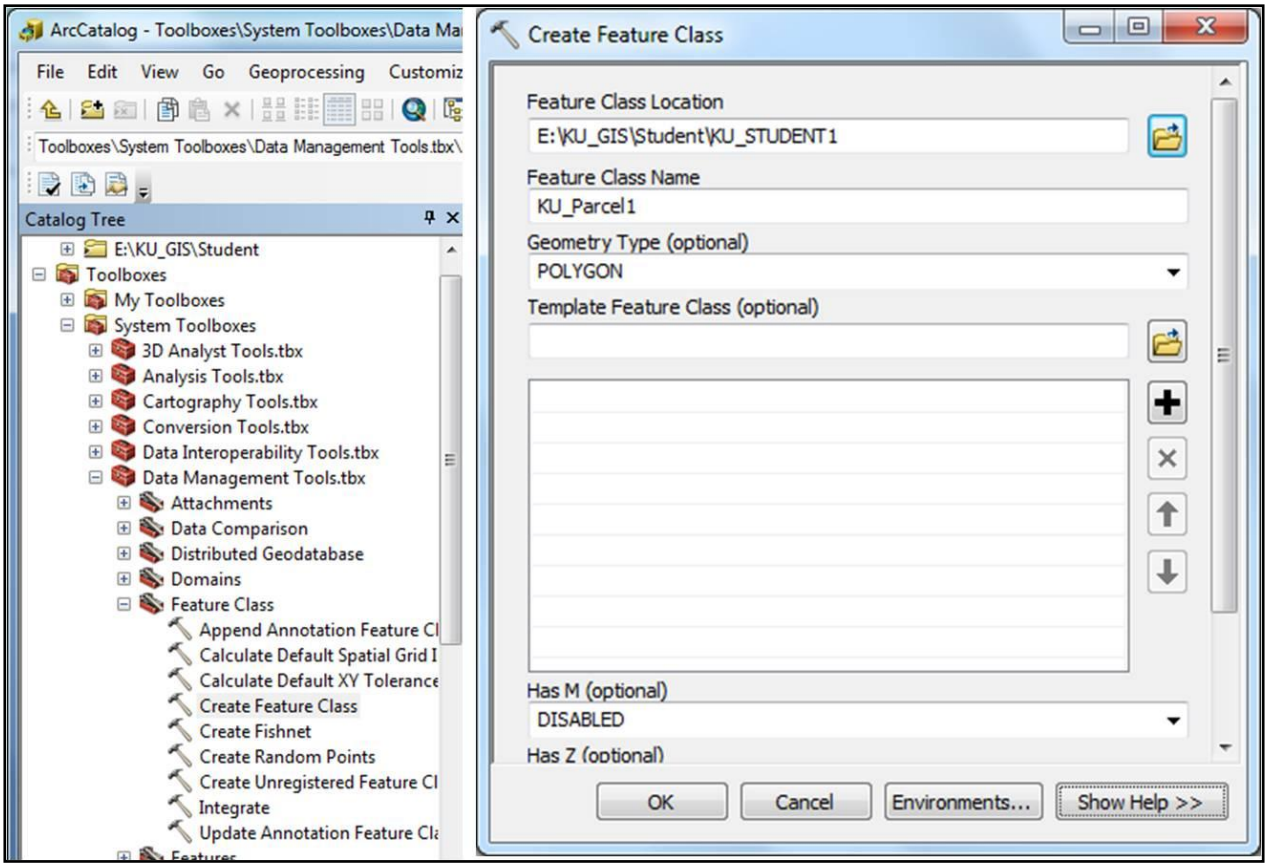


Figure 6: Creating a Feature Class

A map preparation and presentation closed the afternoon. Participants were taken through the process as they do it on their computers to come up with a map. A map of Kenya from the Students folder was used for this exercise. Students were shown how to add data from the connected folder into a blank data view in ArcMap. Projection of the County Layer was used to project the data from WGS84 Geographic coordinates to UTM Arc 1960 projected system. Attribute table was explained in details and used to produce a report.

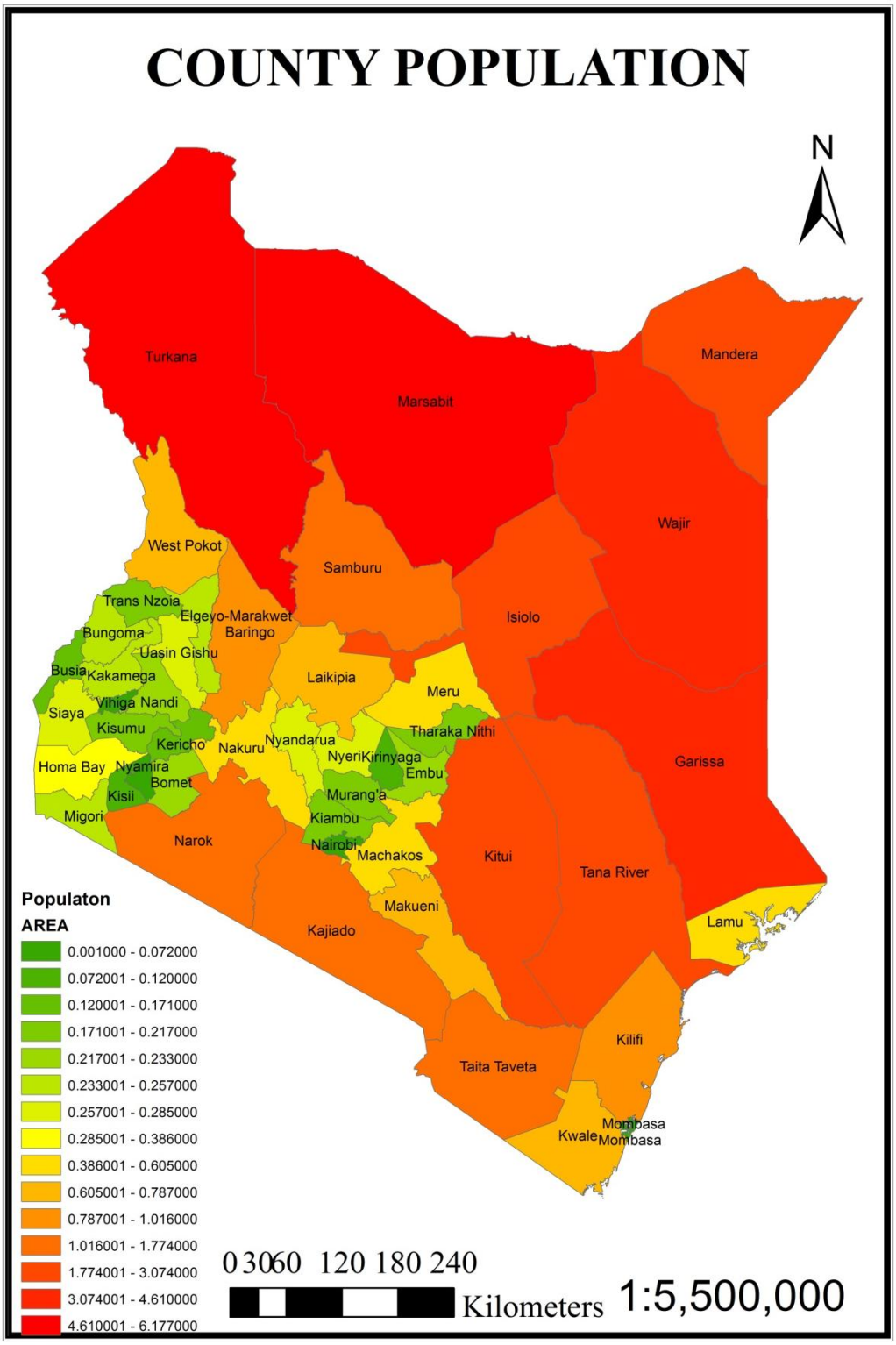


Figure 7: County Population Map.

Day three started off with a summary of what was done in day two to bring the participant up to speed with what they were taught. Data Layout view was explained as participant prepared their map and the insertion of map objects (North arrow, Scale bar, Scale, legend, etc) made the whole training enjoyable. Each participant prepared his/her map of Kenya and inserted ownership text and exported the map to a pdf format. This proved to the participants that indeed they can use the software to produce their own map which can communicate to the intended map user.

Using the CountyPopulation layer stored in the KenyaData Geodatabase, student were challenged to do a map on their own adding different layers e.g. road, lakes, protected areas and changing the colors and symbologies. Different from the previous staff training session, it was noticed that student had a lot of interest in going it all the way from start to finish on their own and redo the parts they didn't get correct.

Data management tool box was explored further and feature analysis tool box using extract tool was used to extract a county of their choice from the counties data set. A map was prepared for the respective county by each student. Figure 8 shows a map of Madera County prepared during the training.

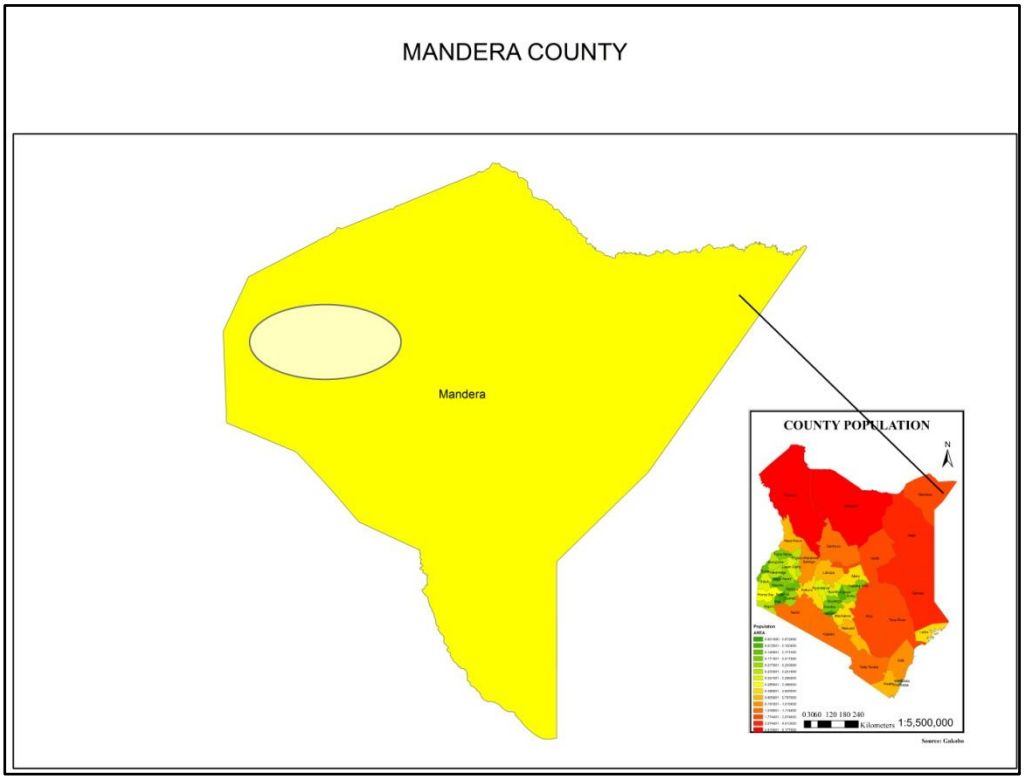


Figure 8: County of Mandera

This exercise was used to give the student a hand on training in the actual extraction of a feature from feature data set. This allowed the training demonstrate the power of ArcMap in data analysis and presentation. Participants were shown how to insert pictures into their maps to communicate more using one set of a map.

Students were later guided on how to create global account with Esri and enroll to the free courses offered online. Student attempted the exercise with many of them finishing the first exercise and getting the online certificate.

The afternoon session closed the three day training with introduction to Remote Sensed data. Satellite imageries pre-copied to the Student folder in the computers were used to explain how different bands record different set of data according to reflecting wavelength. The student were taken through the exercise of adding each band and explained what is contained in it. This was done by asking them what they could see reflected more. Knowledge of the data by professor Onywere guided the class for three solid hours to understand different band reflectance capability. Features reflected in the bands were identified e.g. the Aberdare forest, the Limuru tea zone, the Kitengela-Athi plains, the Ndakaini dam etc. A combination of all the bands in a stack layer (Figure 8) was used to change the bands color to mimic the natural colors as identified by the class.

This was aimed at exposing the student to Remote Sensing as a set of data source for GIS. Students appreciated the power in data acquired by satellite as they could see on their screens areas they are familiar with. An exploration of a 0.5 m high resolution image from Quick Bird, 2013 closed the training. Participants appreciated the differences between high and medium resolution images and also the difference coverage in term of Area.

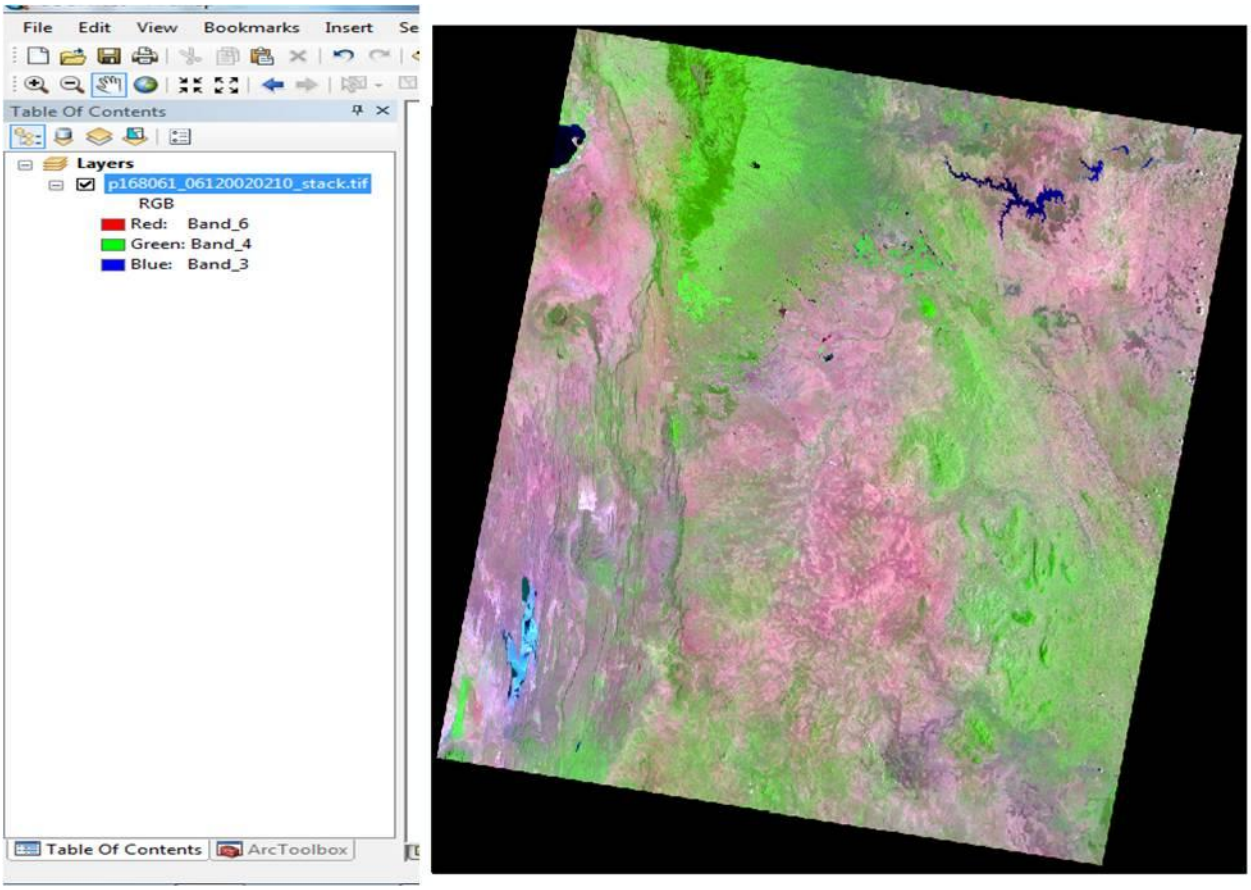


Figure 9: Remote Sensed Data.

Video clips of all the sensing training sessions were captured and are available on the website together with the photos taken on the other training sessions.

Attendance of students from day one was consistent, with the 28 student attending all the sessions. One student however could not make for the afternoon session due to personal commitments.

Post-evaluation forms were filled and participants encouraged to continuing using the Lab to practice what they were taught until they come back for the advance training in September. The aim of the Post evaluation was to gauge the overall rating of the training:

1. How the student can be able to apply what they were taught. Over 52% of the respondent indicated they could apply all what was trained.
2. Would you recommend this trainig to others? 100% yes

- Did the course meet your expectations? 100% yes
- The course material was 100% clearly presented
- Will you attend phase II of the training? 100% yes

3. Item liked most during the training. Practical based scored 61 %.

There was an interactive session at the close of the training where student requested GIS to be integrated in their normal curriculum and more labs to be set up in their respective schools.