

ArcGIS in Secondary Schools

Newsletter 01/2009

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First ESRI Summer Camp in Rwanda

Closing ceremony by Minister of State of the Ministry of Education

The first ever ESRI Summer Camp in Africa took place at ET SOS Kinderdorf school in Kinyinya, Rwanda from 29th Nov. to 5th Dec. 2008.

Théoneste Mutsindashyaka, Minister of State in Charge of Primary and Secondary Education invited to the closing ceremony of the camp on Friday, 5th December 2008. The Rector of the National University of Rwanda, the CEO of ESRI Germany and other dignitaries were present at the event.

The 15 students that participated in the summer camp presented their GIS projects about land use, water distribution and power consumption of Kinyinya, a suburb of Kigali. In his remarks the Minister of State expressed his grateful regards to CGIS-NUR K-12 project coordinator and organizer of the summer camp for the efforts she made in sensitizing GIS in secondary schools. He also thanked the GIS professionals and students for their committed work.

The Minister of State revealed that "The GIS infrastructure is one of those innovations we really need in our sector. It's both an education and development tool which if sufficiently adopted will even step up our ICT programme since it is also digitally packaged." (Sunday Times, 7th December 2008). He also expressed his willingness to further spread this technology in the whole country.

Achievements of ArcGIS in Secondary Schools

- GIS textbook with Rwandan content
- 120 teachers trained
- 10 schools established as GIS training centers
- 40 schools working with GIS starting January 2009
- Certification process for GIS teachers
- Curriculum development launched in 2008
- Students' map competition and ESRI Summer Camp

The CEO of ESRI appreciated the collaboration with MINEDUC and looks forwards partnering in this sector



CEO ESRI Germany talking to State Minister Mutsindashyaka while the Rector of KIE looks on.

The summer camp was generously funded by ESRI Germany with the goal of linking kids with technology and environment. ESRI Germany supports the roll-out of GIS technologies to Rwandan secondary schools since 2007. The CEO of ESRI Germany, Michael Sittard, was impressed by the skills of the pupils and is committed to sup-

port another ESRI Summer Camp in 2009. Michael Sittard was quoted by Sunday Times: "We see a small and astonishing country coming up, and due to the fact that Rwanda has demonstrated good strides in developing capacity, we look forward to partnering in this sector and other related fields in line with what we do."

Pupils enjoyed the GIS technologies in different applications



Two female pupils registering a geographic location on a mobile computer with GPS and GIS software ArcPad on it.

During the camp pupils went to the study area to collect geographic coordinates from housings, parcels, water wells and electricity lines with GPS technology and satellite images. They interviewed local people about electricity consumption and water use.

Afterwards they analyzed their findings on computers. One of the participants, reported to the Sunday Times: "We have been studying maps in class, but not knowing the practical part for instance how to do measurements, and the general relevance for the betterment of the environment, but now we can make sense out of it."

The Rector of NUR acknowledged the cooperation with ESRI and highlighted the impact of CGIS-NUR efforts in society



Sensing Centre since 2006 with training, software and staff."

The Rector highlighted the efforts of the CGIS-NUR visible from accomplished and ongoing projects and the number of students that have been trained in GIS. The Rwanda Coffee sector uses GIS to analyze the quality of coffee, PNILP uses GIS to monitor the distribution of Malaria, and Electrogaz monitors their water and electricity network using GI technologies, which also help to plan for further investments. City planners, the National Land Centre as well as the National Institute of Statistics are all using this extraordinary technology in their daily work.

NUR is looking forward to seeing the impact of the ArcGIS in Secondary Schools project to the skills of future GIS students at NUR "helping the university becoming a knowledge centre for GIS and Remote Sensing in Eastern Africa".

In his welcome speech the Rector of the National University of Rwanda, Prof. Silas Lwakabamba, acknowledged the good collaboration of NUR and ESRI. "ESRI is supporting the GIS and Remote

Pupils were applauded for their good work and received personal certificates

The pupils presented their findings to the audience of the closing ceremony with a sketch demonstrating their activities in the camp and with posters of their maps. The results were commended with a warm applause by the guests. Finally, the pupils received their personal certificates that were handed over by the Minister of State, the Rector and the CEO of ESRI Germany.



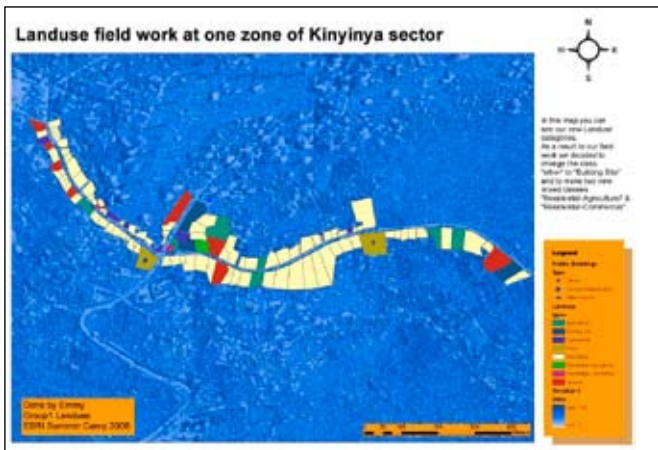
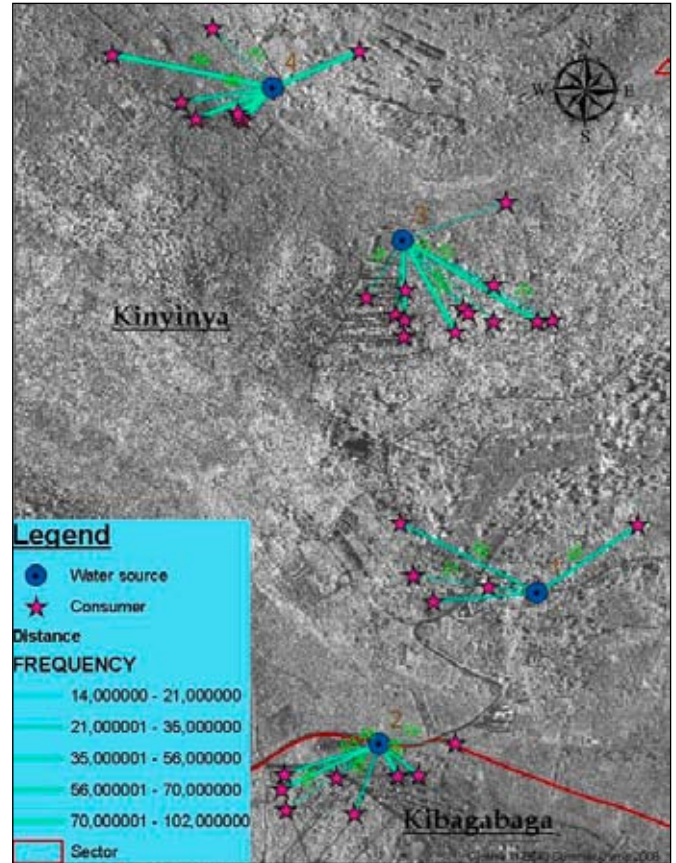
We have been studying maps in class, but not knowing the practical part for instance how to do the measurements, and the general relevance for the betterment of the environment, but now we can make sense out of it" said Bosco Sibomana, one of the students.

GIS studies conducted in Kinyinya during the first ESRI Summer Camp in Rwanda



Professionals from Kigali City, TU Munich and National Land Centre GIS Unit.

Three working groups examined each one specific topic of the Kigali suburban area of Kinyinya. The groups were instructed and assisted by professionals from Rwandan organizations using GIS and by staff from ESRI, the Technical University of Munich and CGIS-NUR.



Group 1 – Land use mapping
 On the map above you can see as a background an image from a radar satellite – TerraSAR-X – which was kindly donated by Infoterra GmbH. Structures like roads or the antennas from the “Deutsche Welle” radio can easily be detected on it. The pupils used the radar image as help to spot the extent of parcels where they couldn’t reach the corners of parcels with a GPS handheld in the field. After the field work they customized the categories of land use and created subcategories for public buildings or areas. These subcategories are distinguished by different symbols. Also they adjusted to mixed land use categories where appropriate.

Group 2 – Water distribution from public wells
 frequency revealed to be “salesmen” who carry and sell the water to various neighbors and therefore come so often.

Especially residential areas are in need of drinking water supply. This group investigated if the people in the study area have access to a water source that can be reached in a reasonable amount of time. They measured aerial distances from water wells to housings of the residents who collected water at the wells. The residents come to the wells between 14 and 102 times a week and all come by foot. The residents with the highest

Group 3 – Electricity consumption per household
 Household connections to the electricity grid from Electrogaz have been digitized by this group. They asked residents about the use of electricity in their households and distinguished into consumption types such as TV, radio, lamps etc. In diagrams they visualized the various types of use statistically.



ArcGIS in Secondary Schools – Upcoming activities

“We see a small and astonishing country coming up, and due to the fact that Rwanda has demonstrated good strides in developing capacity, we look forward to partnering in this sector and other related fields in line with what we do”, said Sittard.

The school year 2009 is just starting and with it 40 secondary schools in Rwanda will be teaching with GIS to their pupils. However, there are still many steps to take for the further spread of GIS to all secondary schools. In 2009 GIS training will be given to 120 more schools and if we follow the started model with 3 GIS teachers per school, then an equivalent of 360 teachers are going to be trained during vacation in Jul-Aug. This will only work with the strong support from the 40 existing GIS schools who will serve

as training centers to new teachers from their neighborhood. We thus follow a decentralized training model. Schools will help each other and may build a GIS community for small mapping projects in their region. Beside training, GIS software is going to be installed in the trained schools, the textbook and data will be distributed and school administration sensitized for the value-added learning through GIS. A curriculum framework is drafted but not yet put in place. The collaboration with the National Curriculum Development

Center and other semi-autonomous bodies of MINEDUC are of highest priority in order to formally allocate GIS in education respectively in the teaching schedule. The GIS teacher community is currently forming an association for the collection of objectives and concerns, lesson ideas and awareness rising in schools. CGIS-NUR, ESRI and MINEDUC are looking forward to a continued successful integration of GIS in schools throughout 2009.



ESRI Summer Camp participants (with caps), assisting GIS teachers from secondary schools, ESRI and CGIS-NUR staff posing for a photo around the CGIS-NUR Director, Jean Nduwamungu.

Special thanks to the assisting partner organizations!

The three GIS studies have been prepared on motivation from the local partner organizations of the ESRI Summer Camp. The GIS units from Kigali City and the National Land Centre, the elec-

tricity planning unit from Electrogaz and the Belgian Technical Cooperation (Rural Energy Unit) supported the summer camp with their ideas, staff and methodology. Professional

staff gave presentations about their GIS work to the pupils and they assisted working with GPS units in the field and working with ArcGIS ArcView on the computers. Further on the Mayor

of Gasabo District kindly assisted with announcements to the residents of Kinyinya sector about the upcoming camp activities which facilitated the pupil's work in the field. Infoterra GmbH kindly contributed with free access to an up-to-date scene of Kinyinya from the TerraSAR-X satellite. We would like to thank these organizations for their most valuable inputs and support. Thank you!



Posters that resulted from the GIS studies. Every pupil created his own map or diagram showing their findings.

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The newsletter of the “ArcGIS in Secondary Schools” project appears irregularly and reports about the activities of GIS in Rwandan schools.

ESRI Summer Camp 2008 in
Rwanda Sponsors:



The newsletter is distributed by email and is addressed to friends, partners and people who are interested in GIS and K-12 education.

If you wish to receive the newsletter subsequently, please subscribe on our website: www.cgisnur.org.