

gvSIG applications in East Africa – Kenya and Somaliland

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1 Introduction

The availability of well structured geographic data, together with the possibility of a regular updating, represents a very important tool worldwide and, in particular, in developing countries.

The management of alphanumeric data associated with geographic ones is not always a trivial task in GIS environment, because their complexity increases not only with the number of fields, but also with the domain values and validation rules which have to be followed by the GIS operator in order to have a well structured geographic database.

Editing a table manually is a common task in a GIS, however it includes an high risk of committing various kinds of error, from the accidental mistyping to the editing of unrestricted or useless values. In order to prevent this, a good approach in several GIS desktop software consists into implementing forms. A form without restrictions is useless in order to avoid the before mentioned errors, instead a “smart” forms able to check and validate data is the best choice.

2 Local overview

Somaliland local government is trying to develop a policy of knowledge transfer in different sectors and, among these, the capacity of urban management and planning. In this framework, GISMAP has supported the Italian ONG Terre Solidali, to train the Gabiley Municipality technical staff and make them able to produce a precision building cadastre together with a socio-economic survey.

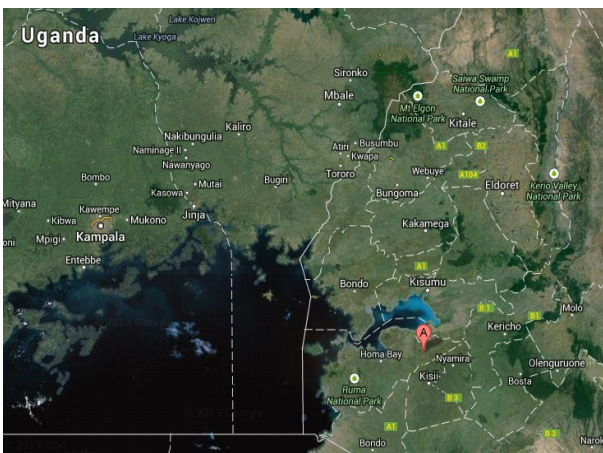
Kenya Forest Council is carrying out, in the scheduled activities of the Wire Forest project implemented by the Italian NGO CEFA (Wire Hills Forest Conservation and Sustainable Management - Contract No DCI-ENV/2009/151-545), a complete field survey of the surrounding hilly forested areas requiring a GIS solution to better store, update and analyse the collected field data.

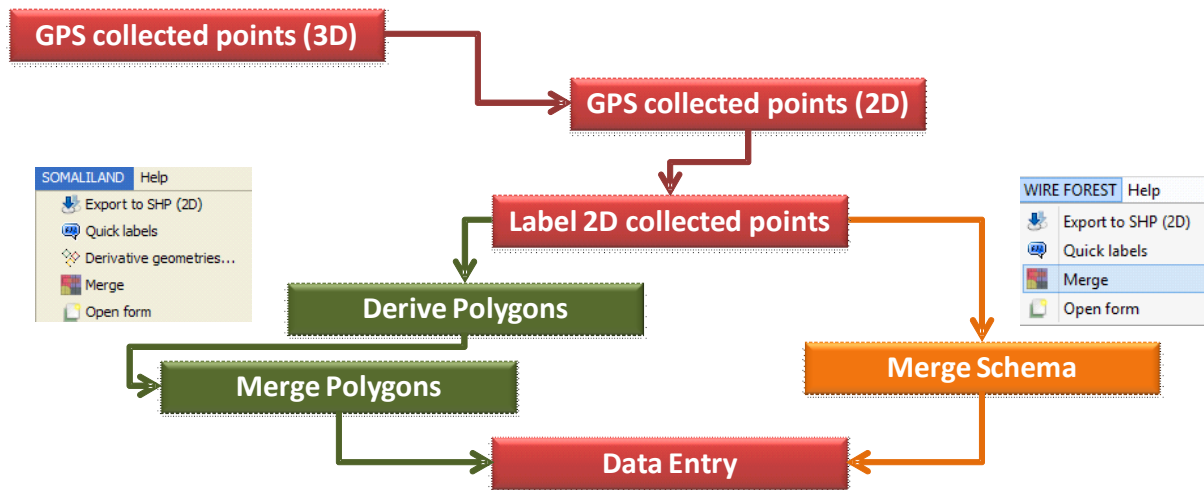


GISMAP, in both cases, has offered a similar approach adapting the proposal to the different needs of the partners.

The main goal of GISMAP was to provide local partner and authorities with a GIS product:

- is easy to use and update regularly;
- is fully developed with open source technology to ensure future sustainability;
- can be replicated in other main similar neighbouring environments;
- can be linked with existing data/procedures;
- can be highly customized and eventually translated in local languages;
- is able to provide a precise measurement of interesting targets.





3 The experience of Gabiley (Somaliland)



In Gabiley (Somaliland), GISMAP has defined together with local staff one complete field form identifying as well the domains for any single field to be collected and entered, providing as well a training on the job on how to use the differential GPS in order to have high precision measurements, and how to store, edit and manage these data.

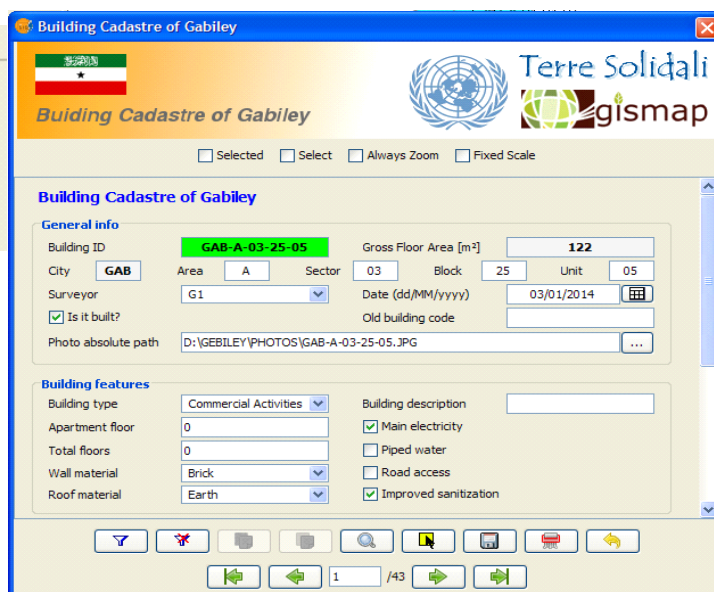
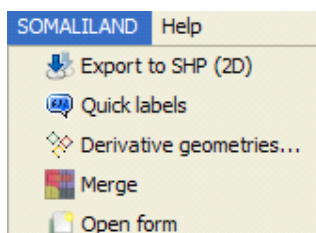
A customized gvSIG extension has been developed providing a user friendly survey form, based on the NavTableForms library, to enter the data through GUI controls, such as drop-down lists and checkboxes, according to specific validation rules and domain values. Most of the allowed values can be

customized and modified simply by editing a .domain file through a text editor making the full system even more user friendly and adaptable to local evolution and small changes in data entry.

Thus, the risk of mistyping is strongly reduced, the data quality increases and there's a considerable reduction of costs and time.

This customized extension guides the user throughout the entire work flow from GPS points data load, conversion into 2D shapefile, creation of polygons by derivative geometries, quick labelling of features and data entry by the customized form previously described.

After a first period of data collection, a training on the job on how to use this user interface has been provided to the final users.



4 The experience of Wire Forest (Kenya)

In Wire Forest area, GISMAP has adopted a very similar procedure, developing the training in remote instead than on site. The survey form has been also customized according to users needs and, due to the lower precision required, the field points have been collected by ordinary GPS.

Through these customized extensions, two technical offices in different sectors and countries have been trained and provided with a powerful GIS decision support system making them able to map actual situation and plan future activities.

The implementation of user friendly survey forms extremely reduces the risk of mistyping that is really frequent and make



GIS solutions unable to perform correct queries or apply a coherent symbolization of the attributes. It has to be taken into consideration that the adoption of a fully free and open source technology ensures future sustainability of the data collection, storage and management as well as the possibility to stay in touch with dynamic web communities.

5 About the forms

From a technical perspective, the design and implementation of forms was possible thanks to NavTableForms, “a library to build navigable and validated Java forms for gvSIG, ala NavTable”. It allows the implementation of user-friendly custom forms based on NavTable but with further functionalities, such as validation rules and domain values. In detail, the following steps were covered in order to implement the forms:

1. Definition of the data model, in order to deeply understand how alphanumeric data are structured;
2. Definition of the field form in paper format, to be fulfilled during the survey and then digitalized at office in gvSIG;
3. Design of the ‘sketch’ form with Pencil (<http://pencil.evolus.vn/>), “an open-source GUI prototyping tool”, very useful in order to quickly share and review the form design with the customers;
4. Design of the form with Abeille Forms Designer, once the 'sketch' form is accepted by the the customer and before to start coding the gvSIG extension;
5. Implementation of the gvSIG extension.

The controls mainly used were text-boxes, drop-down lists and check-boxes. A further component not implemented in NavTableForms was used:

JCalendarButton (<http://jcalendarbutton.sourceforge.net/>), i.e. “a simple java swing component that displays a popup calendar next to a date input field”.

6 Results and future goals

The achieved results in Somaliland, are pretty good because it has to be strengthen that local trained people did not have any previous knowledge neither on GPS nor on GIS.



During the around thirty days of field collection activities, more than 800 polygons have been surveyed and ancillary socio economical data and photos have been acquired.

Training activities on how to query the field data allowed local technicians to get derived information in a fast and effective way.

It should be also taken into consideration that filed survey teams have changed due to unexpected constraints and thus the global results becomes even more remarkable.

Surveys in Kenya are currently in progress but, according to the feedback from local staff, it is going in a proper way and the results should be available shortly.

In order to make the collected data available for the local communities, it is currently under examination the possibility to set-up a webGIS service, implemented with open source solution and with a short remote training for local staff in order to complete transfer the capability to manage the service independently even after the conclusion of the projects.