



gismap

gvSIG applications in East Africa: Kenya and Somaliland

Giuliano RAMAT, Antonio FALCIANO, Maurizio FODERÀ

www.gismap.it ; gismap@gismap.it

Valencia, 28/11/2013



Building Technical Office of Gabiley with the extSomaliland gvSIG extension



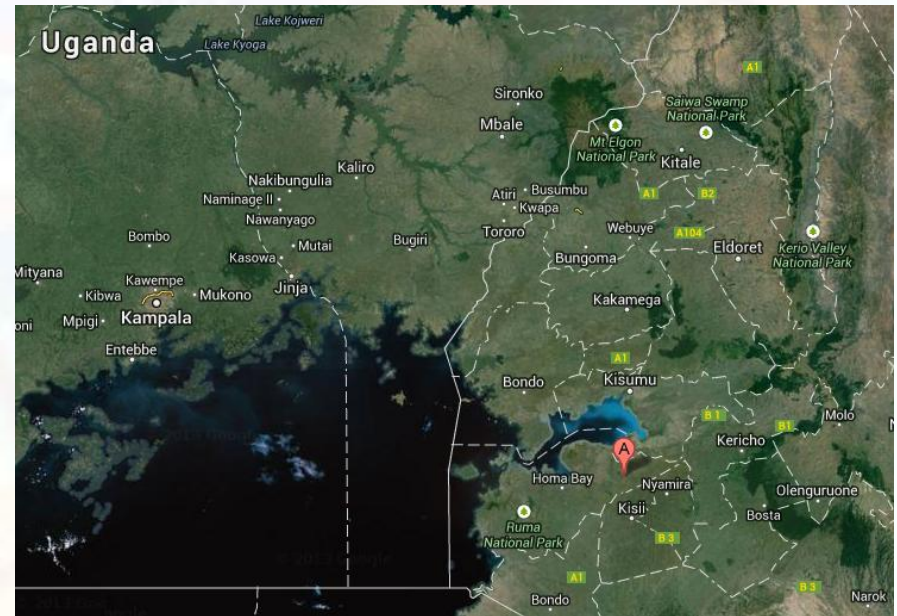
Terre Solidali



Building the GIS of WIRE Forest with extWireForest for gvSIG 1.12



Wire Hills Forest Conservation and
Sustainable Management .
Contract No DCI-ENV/2009/151-545



CEFA
the seed of
solidarity

MAIN OBJECTIVES

... is able to provide a precise measurement of interesting targets

... is easy to use and update regularly

... is fully developed with OS technology to ensure future sustainability

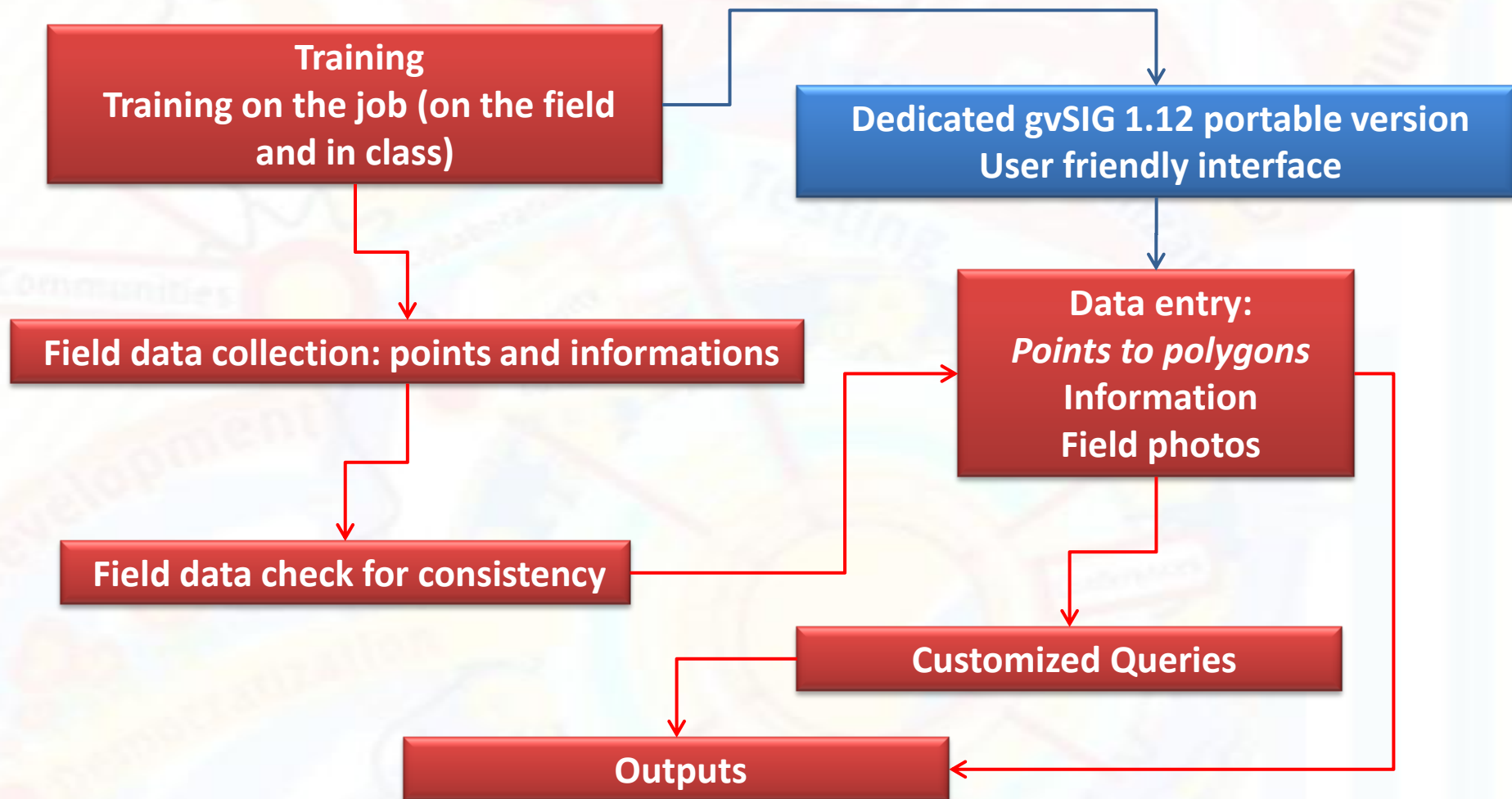
... can be highly customized and eventually translated in local languages

Provide the local partner with a GIS product that ...

... can be replicated in other main similar neighboring environments

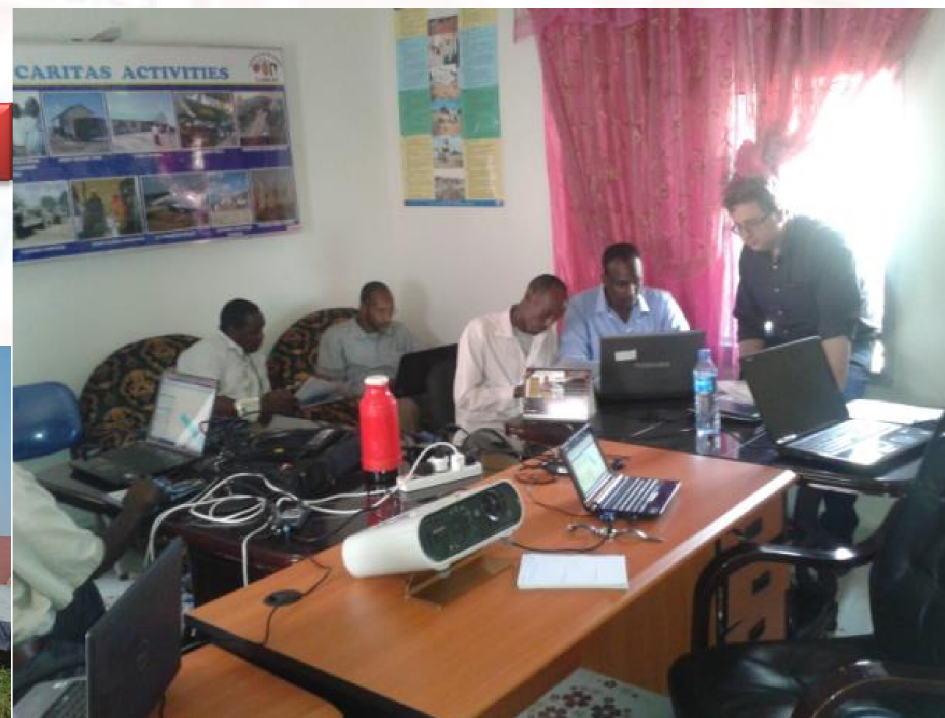
... can be linked with existing data/procedures

THE ACTIVITIES WORKFLOW



GIS / GPS TRAINING

On site training in Somaliland



Remote training in Kenya



FIELD TRAINING



GIS FIELD DATA COLLECTION

Wire Forest

SURVEY INFO

PLOT NO. PLOT RADIUS (MT)
 SURVEYOR DATE (DD/MM/YYYY)

PLOT PROPERTIES

SOILEROSION: ☐ Low ☐ Medium ☐ High FELLING-CUTTING: ☐ Not ☐ Old
 GRAZING: ☐ Low ☐ Medium ☐ High CROWN COVER: ☐ Open ☐ Moderate ☐ Dense
 FOREST AREA: ☐ Natural forest ☐ Plantation NUMBER OF TREE SPECIES:

TREES PROPERTIES

TYPE	TREE SPECIES	FREQUENCY	AVERAGE HEIGHT	AVERAGE DBH
INDIGENOUS	Anjago			
	Rhus natalensis			
	Ammonia spp			
	Combretum spp			
	Euclea divinorum			
	Ficus spp			
	Teclea nobilis			
	Terminalia spp			
	Vitex spp			
	Croton macro			
Others (.....)				
COMMERCIAL	Pinus Patula			
	Pinus Radiator			
	Eucalyptus spp			
	Cupressus lusitanica			
	Callitris robusta			
	Gravellia robusta			
Others (.....)				

NOTES

Easy-to-fill field forms for information data collection

Ts Terre Solidali

**AUTOMATION OF MUNICIPAL FINANCE
AMF PHASE III
INSTITUTIONALISATION OF FINANCIAL & INFORMATION
MANAGEMENT TOOLS IN SOMALIA**

Polygon ID (Office only) _____ Surveyor: G1 ☐ G2 ☐ Date ____/____/____
 Built ☐ Not built ☐ City: Gabley District: Gabley
 House ☐ Public Institution ☐ Commercial Activities ☐
 Option: only for Public Institution or Commercial Activities (hospital, shop, private school...) _____
 Plot No. _____ Apartment floor _____ out of _____
 Wall material: Cement ☐ Brick ☐ Stone ☐ Wood ☐ Earth ☐ Other ☐ _____
 Roof material: Iron ☐ Wood ☐ Cement ☐ Earth ☐ Other ☐ _____
 Name of the person interviewed _____
 Telephone no. _____ Ownership: Rent ☐ Owner ☐ Since year: _____
 Number of families living inside the house: one ☐ two ☐

Number of persons living in the house – fam1

Total	Total Male	Total Female	Total <18	Male <18	Male <18 go to school	Female <18	Female <18 go to school

Number of persons living in the house – fam2 (if present)

Total	Total Male	Total Female	Total <18	Male <18	Male <18 go to school	Female <18	Female <18 go to school

Mains electricity	Piped water	Road Access	Improved Sanitation
YES <input type="checkbox"/> NOT <input type="checkbox"/>	YES <input type="checkbox"/> NOT <input type="checkbox"/>	YES <input type="checkbox"/> NOT <input type="checkbox"/>	YES <input type="checkbox"/> NOT <input type="checkbox"/>

Main activity of head of family: Teacher ☐ Farmer ☐ Barber ☐ Tailor ☐ Watchman ☐
 Broker ☐ Manager ☐ Shop keeper ☐ Soldier ☐ Doctor ☐ Executive Director ☐ Secretary ☐
 Carpenter ☐ Midwife ☐ Principal ☐ Driver ☐ Sheppard ☐ Other ☐ _____

FIELD DATA COLLECTION

Getting information of sample vegetation plots in the Wire Hill Forest



High precision geometric data collection with differential GPS of Gabiley buildings

DATA MANAGEMENT WORKFLOW

The implemented extensions (WIRE FOREST and SOMALILAND) support users during the whole workflow from the loading of field collected points, data entry, labelling and merge procedures in order to have only one final vector layer

GPS collected points (3D)

Note that all the implemented tools can be accessed by dedicated menu or by toolbar.

GPS collected points (2D)

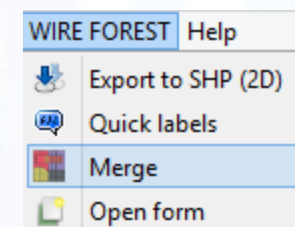
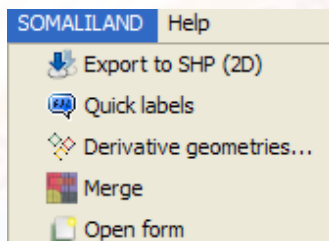
Label 2D collected points

Derive Polygons

Merge Polygons

Data Entry

Merge Schema



MERGE SCHEMA AND DATA

The merge tool allows the user to easily merge collected data among them by maintaining a predefined attribute table schema and make easier the data entry procedure

Analisis Tools

Merge: Data input:

Input cover:

- ☒ gab_cadastre
- ☐ UTM_POL121227
- ☐ UTM_POL121229
- ☐ POL121209
- ☐ POL121210
- ☐ POL121211
- ☐ POL121212

Layers on directory:

Use fields from cover:

Output cover:

SOMALILAND

Analysys Tools

Merge. Data input:

Input cover:

GPS2D121120.shp

WireForest_survey_schema

Layers on directory:

Path with layers...

Use fields from cover: WireForest_survey_schema

Output cover:

i:\sample_project\WireForest_survey_121220.shp

Choose

KENYA

Ok

Cancel

ABOUT NAVTABLE FORMS

- NavTableForms is 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.

HOW TO USE NAVTABLEFORMS?

1. *Definition of the data model*
2. *Definition of the field form*
3. Design of the ‘sketch’ form with Pencil
4. Design of the form with Abeille Forms Designer
5. Implementation of the gvSIG extension



DESIGN OF THE 'SKETCH' FORM WITH PENCIL



An open-source GUI prototyping tool that's available for *ALL* platforms.

<http://pencil.evolus.vn/>

This tool is very useful in order to represent graphically and then share quickly a prototype/sketch of the form.

Plot No.	<input type="text" value="integer"/>	
Soil Erosion	<input type="text"/>	Felling/Cutting <input type="text"/>
Grazing	<input type="text"/>	Crown cover <input type="text"/>
Forest area	<input type="text"/>	No. of species <input type="text" value="integer"/>

	Tree species	Frequency	Height [m]	DBH [cm]
1	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
2	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
3	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
4	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
5	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
6	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
7	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
8	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
9	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>
10	<input type="text"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>	<input type="text" value="integer"/>

DESIGN OF THE FORM WITH ABEILLE FORMS DESIGNER

Abeille Forms Designer 2.1.0 M3

File Edit Column Row Form Look and Feel Tools Help

Form Properties

- Component
- Column
- Row

Wire Forest survey

Survey info

Plot No.

Surveyor

Photo path

Plot properties

Soil erosion

Grazing

Forest area

Trees properties

No.	Tree species
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>

wire_survey.xml

C:\Users\Antonio\workspace\gvSIG_1.12_trunk_Kenya\extWireForest\form\wire_survey.yip

Form Preview

Wire Forest survey

Survey info

Plot No. Plot radius [m]

Surveyor Date (dd/MM/yyyy)

Photo path

Plot properties

Soil erosion Felling/Cutting

Grazing Crown cover

Forest area No. of tree species

Trees properties

No.	Tree species	Frequency	Average height [m]	Average DBH [cm]
1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

IMPLEMENTATION OF THE GVSIG EXTENSION

```
WireForm.java  WireFormExtension.java X
package it.gismap.gvsig.wireforest;

import org.gvsig.hyperlink.actions.ImgFormat;

public class WireFormExtension extends Extension {






    private FLyrVect layer;
    private String layerName = Preferences.LAYER_NAME;
    private String fieldName = Preferences.HYPERLINK_FIELD_NAME;
    private String extension = "";

    public void execute(String actionCommand) {
        layer = getLayerFromTOC();
        WireForm dialog = new WireForm(layer);
        if (dialog.init()) {
            PluginServices.getMdiManager().addWindow(dialog);
        }
        // Hyperlink settings
        LayerLinkConfig config = new LayerLinkConfig();
        config.setEnabled(true);
        config.addLink(ImgFormat.actionCode, fieldName, extension);
    }
}
```

THE FORM IN ACTION

Wire Forest survey



Wire Forest

☐ Selected ☐ Select ☐ Always Zoom ☐ Fixed Scale










Wire Forest survey





Survey info

Plot No.	<input type="text" value="1"/>	Plot radius [m]	<input type="text" value="13"/>
Surveyor	<input type="text" value="Giuliano Ramat"/>	Date (dd/MM/yyyy)	<input type="text" value="05/08/2013"/> 
Photo path	<input type="text" value="C:\WireForest_photos\1.png"/> 		

Plot properties

Soil erosion	<input type="text" value="Low"/>	Felling/Cutting	<input type="text" value="No"/>
Grazing	<input type="text" value="Low"/>	Crown cover	<input type="text" value="Open"/>
Forest area	<input type="text" value="Natural forest"/>	No. of tree species	<input type="text" value="2"/>

  1 /3000  

THE FORM IN ACTION

Building ID and area are automatically calculated.

Data entry is made easier through dropdown lists or checkbox

Photo file can be selected and an automatic hyperlink is activated

NavTable standard tools are available also in this tool

Building Cadastre of Gabiley

Selected Select Always Zoom Fixed Scale

Building Cadastre of Gabiley

General info

Building ID: **GAB-A-03-25-05** Gross Floor Area [m²]: **122**

City: **GAB** Area: **A** Sector: **03** Block: **25** Unit: **05**

Surveyor: **G1** Date (dd/MM/yyyy): **03/01/2014**

☒ Is it built? Old building code:

Photo absolute path: **D:\GEBILEY\PHOTOS\GAB-A-03-25-05.JPG**

Building features

Building type: **Commercial Activities** Building description:

Apartment floor: **0** ☒ Main electricity

Total floors: **0** ☐ Piped water

Wall material: **Brick** ☐ Road access

Roof material: **Earth** ☒ Improved sanitation

1 / 43

THE FORM IN ACTION

The number of editable tree species is automatically limited according to the entered value in “No. of tree species”

The list of species that can be entered, depends on the “Forest area” selected value

Wire Forest survey

Wire Forest

Plot properties

Soil erosion	Low	Felling/Cutting	No
Grazing	Low	Crown cover	Open
Forest area	Natural forest	No. of tree species	2


Trees properties



No.	Tree species	Frequency	Average height [m]	Average DBH [cm]
1	Anjago	25	12	125
2	Rhus natalensis	20	10	105
3		0	0	0

1 / 3000

THE FORM IN ACTION

Building Cadastre of Gabiley

 **Buiding Cadastre of Gabiley**

 **Terre Solidali**


Residents info

Person interviewed

Phone No.

Ownership

No. of families

Owner

Head of the family job

Since year

Family 1 Family 2

	Male	Female	Total
All	1	2	3
Under 18	1	4	5
Students Under 18	0	1	

1 / 43

As previously, also the tag “Family 1” and “Family 2” become editable according to the entered value in “No. of families”

Total number of persons is automatically calculated for each family

HOW TO MODIFY THE VALUES IN DROPDOWN LISTS

Allowed values in dropdown lists can easily be modified by editing the file
“.domain” files with any text editor software

```
SOIL_EROS= ,?;Low,L;Medium,M;High,H  
FELL_CUTT= ,?;No,No;Old,Old;Recent,Recent  
GRAZING= ,?;Low,L;Medium,M;High,H  
CROWN_COV= ,?;Open,Open;Moderate,Moderate;Close,Close  
FOR_AREA= ,?;Natural forest,Natural forest;Plantation,Plantation  
NO_TREESPP=0,0;1,1;2,2;3,3;4,4;5,5;6,6;7,7;8,8;9,9;10,10  
SPP1_NAME= ,?;Anjago,Anjago;Rhus natalensis,Rhus natalensis;Annona spp,Annona spp;Combretum spp,Co  
SPP2_NAME= ,?;Anjago,Anjago;Rhus natalensis,Rhus natalensis;Annona spp,Annona spp;Combretum spp,Co  
SPP3_NAME= ,?;Anjago,Anjago;Rhus natalensis,Rhus natalensis;Annona spp,Annona spp;Combretum spp,Co  
SPP4_NAME= ,?;Anjago,Anjago;Rhus natalensis,Rhus natalensis;Annona spp,Annona spp;Combretum spp,Co
```

`\extensiones\it.gismap.gvsig.wireforest\data\WireForest_survey.domain`

```
surv= ,?;G1,G1;G2,G2  
build_ty= ,?;Commercial Activities,com;Private  
wall_mat= ,?;Brick,b;Cement,c;Earth,e;Stone,s;  
roof_mat= ,?;Concrete,c;Earth,e;Iron,i;Wood,w;  
main_act= ,?;Barber,barb;Broker,brok;Business  
ownersh= ,?;Owner,o;Rent,r  
no_fam=0,0;1,1;2,2
```

`\extensiones\it.gismap.gvsig.somaliland\data\gab_cadastre.domain`

SURVEY : RESULTS AND CONSTRAINTS



SOMALILAND

30 field survey days

Almost 800 polygons created
(\pm 20% total)

Few survey during
training on the job

Survey teams change

No previous experience on survey

SURVEY : RESULTS AND CONSTRAINTS

KENYA

Work in progress.....we will present complete results during the 10th jornadas in 2014!!!!

FUTURE GOALS

Publish the collected data in a webGIS open, easy-to-manage and update in order to share all the achieved results and share knowledge

GRACIAS

Giuliano RAMAT : ramat@gismap.it

Antonio FALCIANO: afalciano@yahoo.it

Maurizio FODERA': m.fodera@studiotopografia.it

