Territoires, Environnement, Télédétection et Information Spatiale

Unité mixte de recherche AgroParisTech - Cemagref - CIRAD

Remote Sensing operations in Muranga/Kangema area KENYA

Camille LELONG

CIRAD – UMR TETIS

AFS4FOOD

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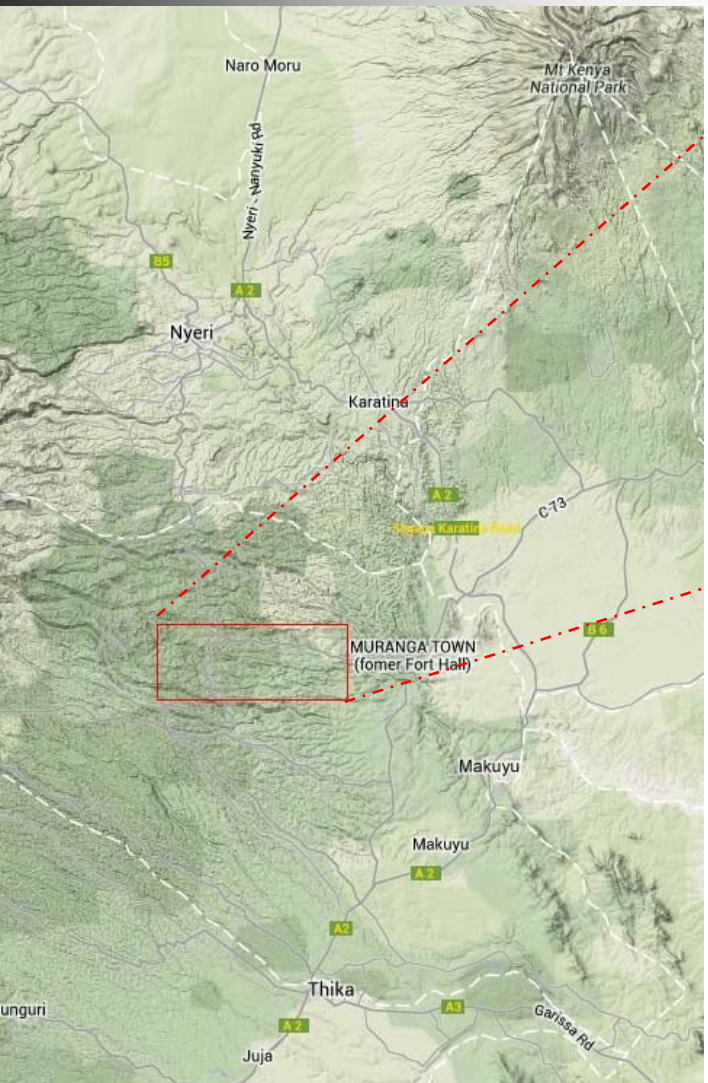
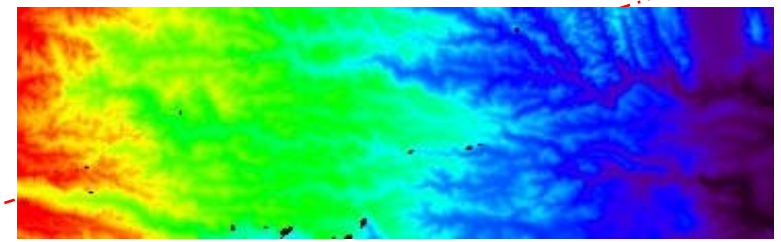
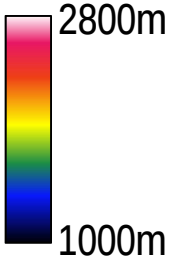
Area of study: Muranga Western Area







lat(-0.694 / -0.765)S lon(36.92 / 7.10)E

~157sq.km^2

Field survey

ound-truth collection in 2013 ⇨ simultaneous to satellite data acquisition

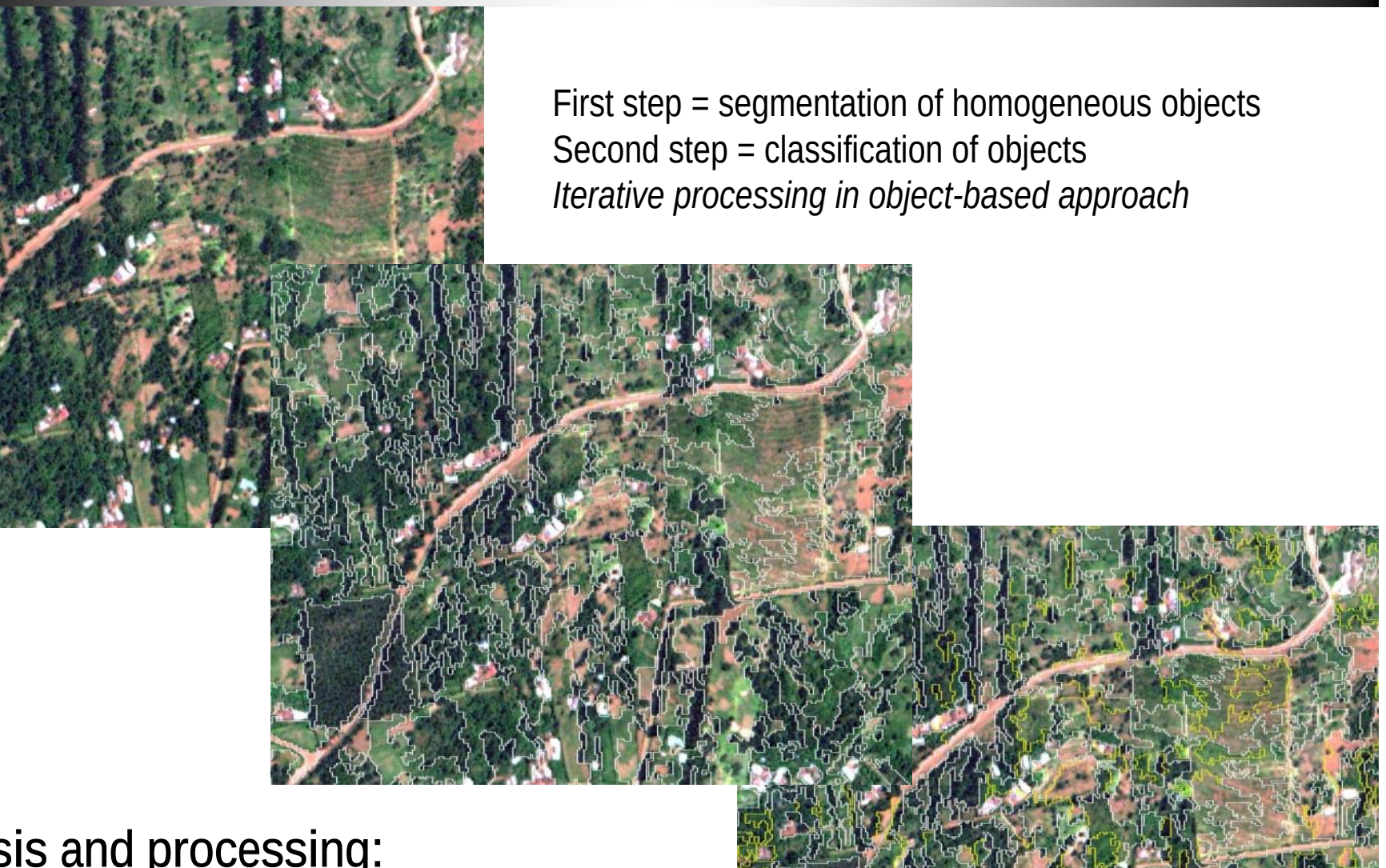
5 data points, of 2 kinds:

opped plots: description of the crops, crop associations, cropping system, listing of tree cies if any, estimation of density, observations about crop agronomical status

dividual trees : species identification and accurate location with GPS + GoogleEarth image

	ID	OS	assoc	comments
1	539 plot	coffee	rare banana	port haut, manque d'azote
2	540 plot	nappier	other grasses	
3	542 plot	wattle	cyprus	
4	545 tree	avocado		4-5 trees
5	546 plot	coffee	few banana	sunlight - photo
6	546b plot	coffee	banana grevillea	
7	545c plot	grass		weeds
8	541 tree	avocado		neflier coll NE, bananier au S, puis au
9	560 tree	croton mukindori		
10	560b tree	erythrina		
11	561 tree	erythrina		
12	562 tree	erythrina		
13	552 plot	coffee	grevillea	
14	557 plot	nappier/maize		
15	544a tree	erythrina		
16	544b tree	erythrina		
17	544c tree	erythrina		
18	545b tree	cordia africana		fleuri
19	543 tree	cyprus		3 trees in the axis N-S

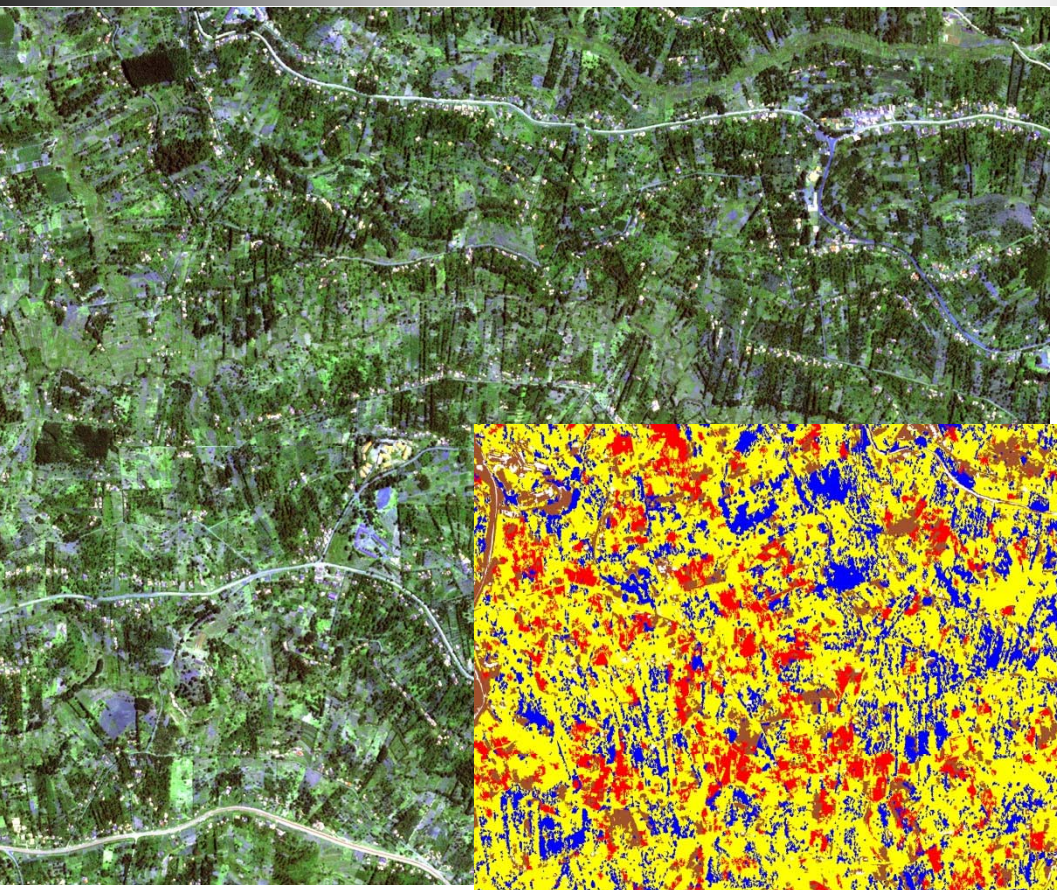
On the way to Land Cover Mapping…



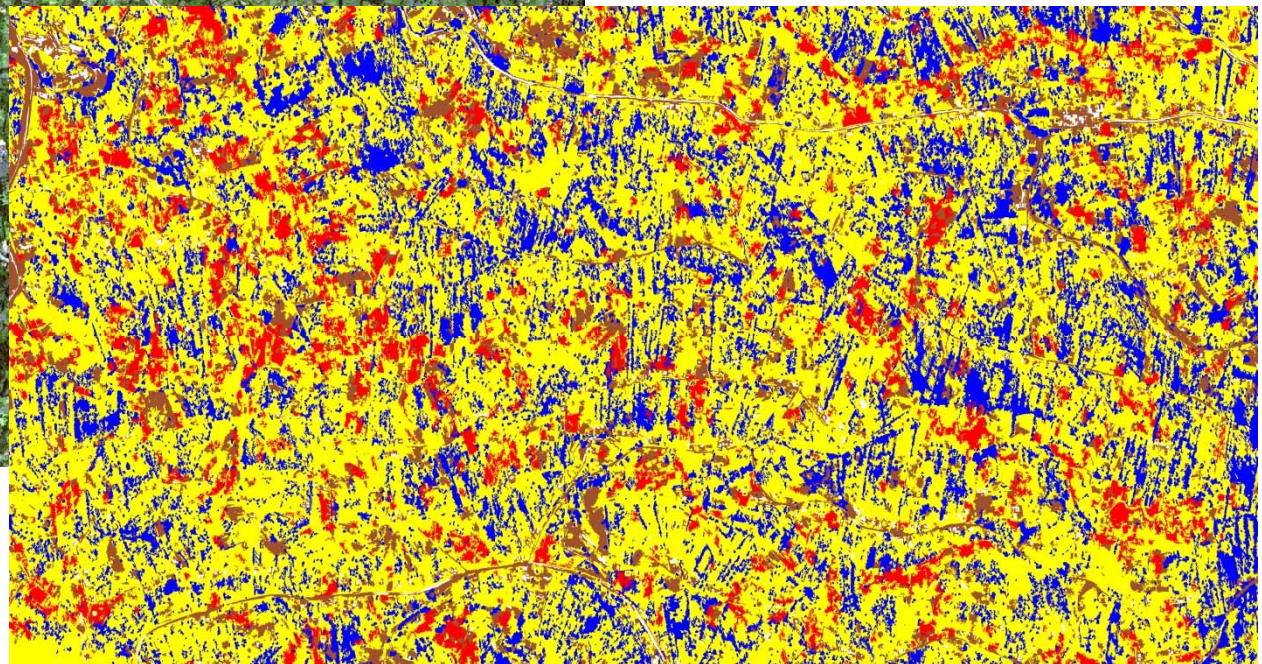
First step = segmentation of homogeneous objects
Second step = classification of objects
Iterative processing in object-based approach

sis and processing:

Land cover map (coffee plantations)

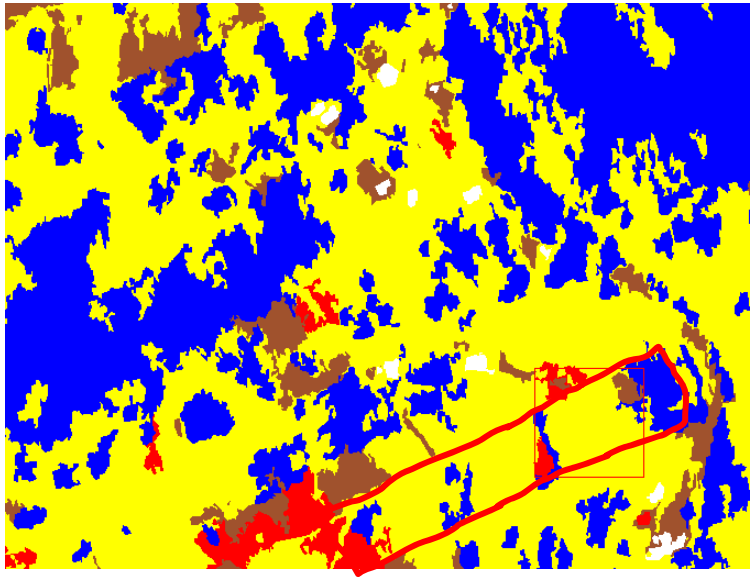


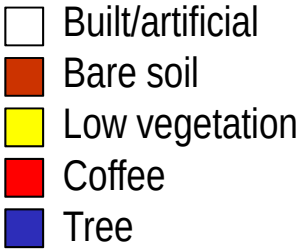
The area is covered :
60% by food and other annual crops
20% by large trees
9% by coffee



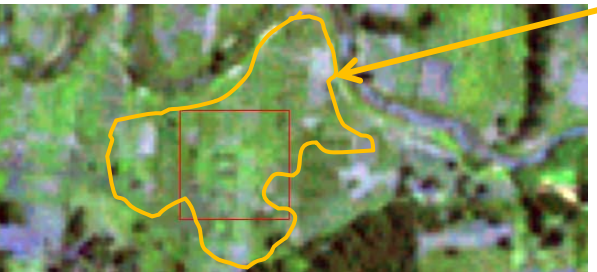
Built/artificial areas
Bare soil

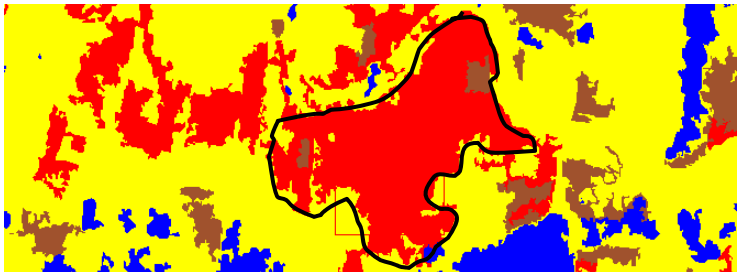
Accuracy still to be improved (validation)



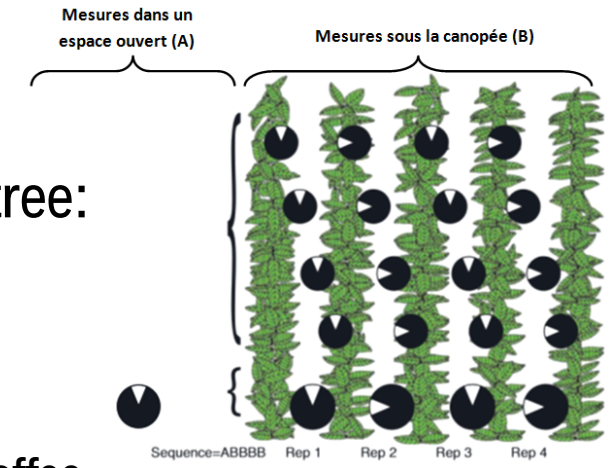


ample: some coffee plots are not detected,
while some annual crops are misclassified as coffee plots!



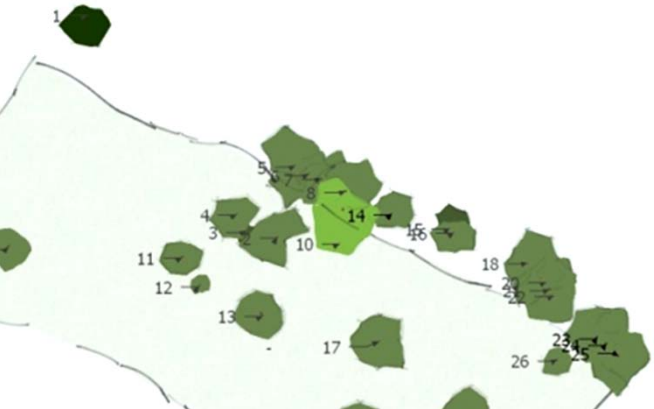


LAI and field structure in-situ measurements



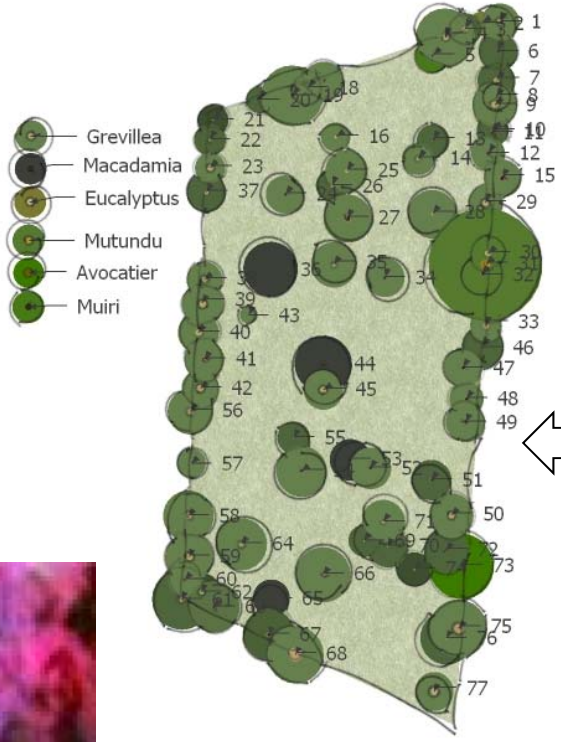
OMOGENEOUS » COFFEE FIELDS SAMPLED IN 2014:
specificity or strong dominance of the shading tree:
ea, Macadamia, Croton)

(Licor-LAI2200 LAImeter)
d descriptive/characteristic data :
e density, species, crown projection, spatial distribution, coffee
etative aspect, historical informations
and 3D sketches of the fields



LAI and field structure satellite estimation

Objective: Train the « automatic » field structure characterizaton on the field samples in order to extrapolate to the whole image



?!

Method: delimitate the trees in the satellite image, and compare with the sketch-map for validation

Problems: to delimitate the plot in the image, to recognize the plot based on the sketch-map, and to identify the correct trees…

CONCLUSION

Potential of information source at 2 scales:

- Land cover and land-use lapping and spatial analysis
- In-field coffee plot shading structure characterization

Still many **challenges** to overtake:

- Relationship between field and satellite image in surveys
- Image processing at this high level of information extraction

Process in progress...