

Socializing the pixel: A short history

Eric F. Lambin

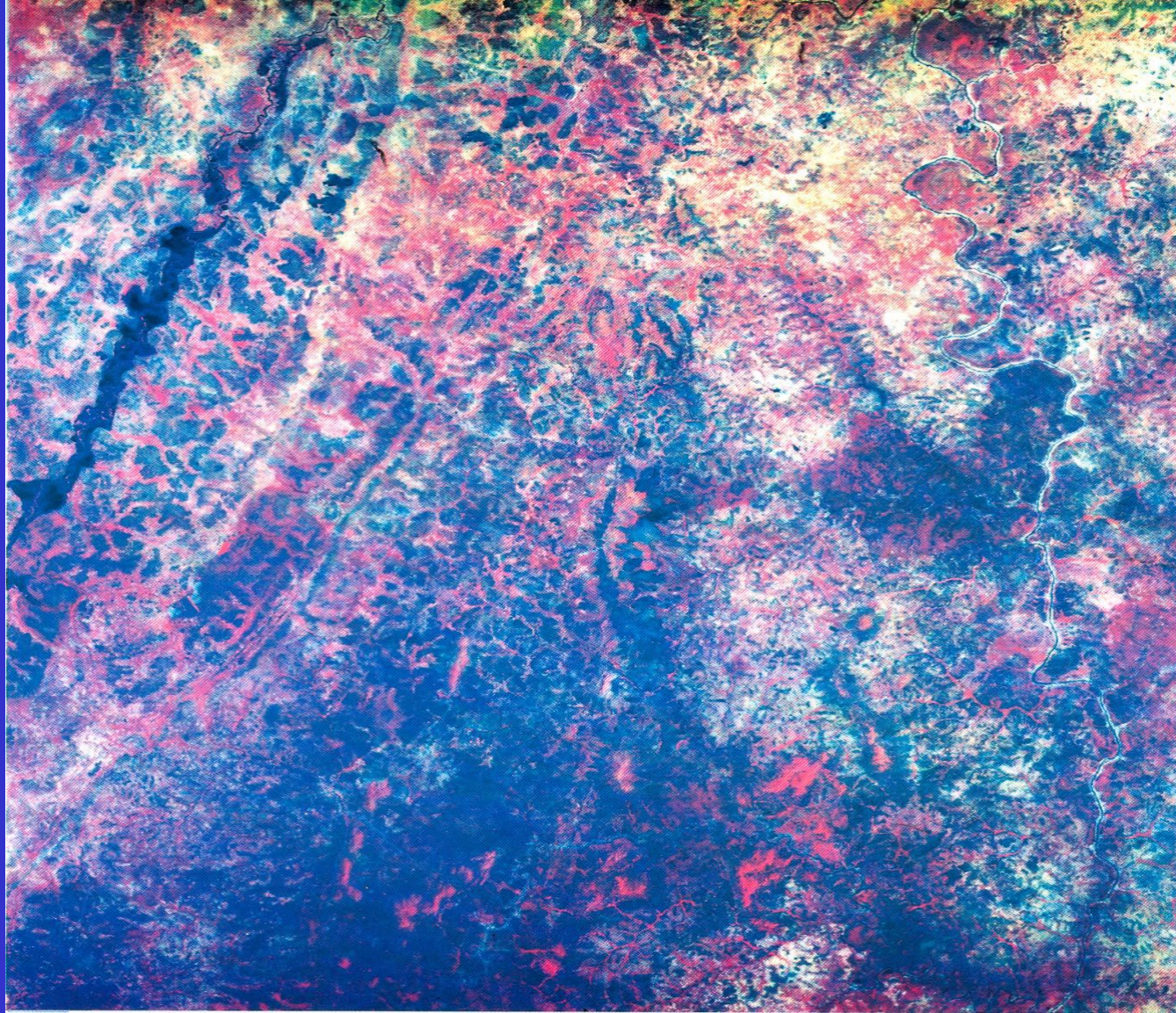
UCL & Stanford University

1985 - 2015

- 10 million-fold increase in computing power
- 512 x 512 images → global (Google Earth Engine)
- Postal service → high-speed internet
- Natural resources → human-environment interactions; resource management
- “Information content?” → “Support policies”

1985

Landsat colour composite SW Burkina Faso



1985

Map of ethnic groups



1985

Associations Landsat – thematic maps

RANK	THEMATIC MAP	COEFFICIENT		
		Contingency	Cramer	Tschupow
1.	Ethnic groups	0,819	0,504	0,504
2.	Agrarian landscapes 1	0,812	0,529	0,500
3.	Agro-ecological zones	0,810	0,490	0,490
4.	Lithological units	0,782	0,489	0,462
5.	Landforms	0,758	0,462	0,437
6.	Agrarian landscapes 2	0,761	0,432	0,432
7.	Soil resources	0,737	0,406	0,406
8.	Land parcels morphology	0,706	0,445	0,392
9.	Settlement patterns	0,651	0,394	0,347
10.	Morphological contexts	0,621	0,368	0,324
11.	Land use	0,553	0,315	0,277
12.	Vegetation landscapes	0,547	0,280	0,265

TABLE 1 : Association between the rainy season color composite and thematics maps

Fields

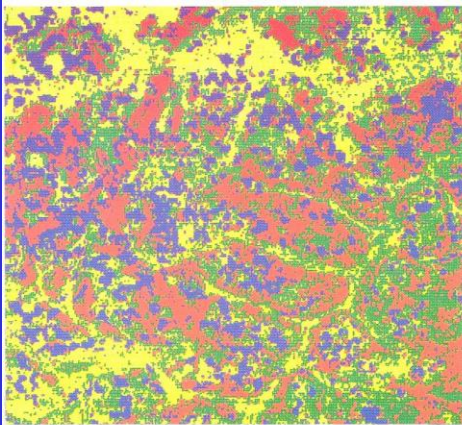


Fig. 1 - Dispersion des champs
Scattering of fields

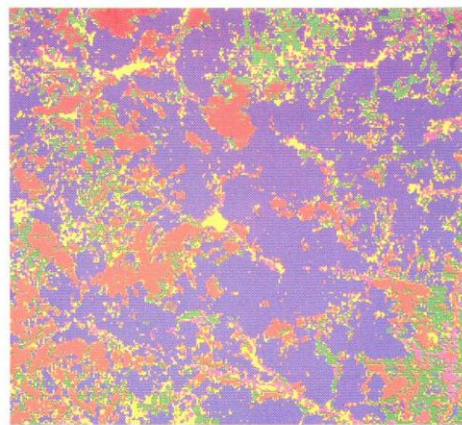


Fig. 2 - Concentration des champs
Concentration of fields

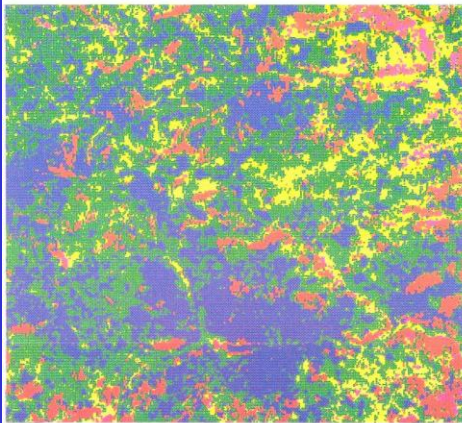


Fig. 3 - Terroir en auréoles
Pattern of rings

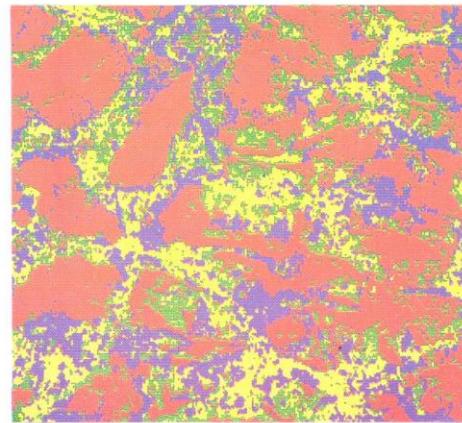
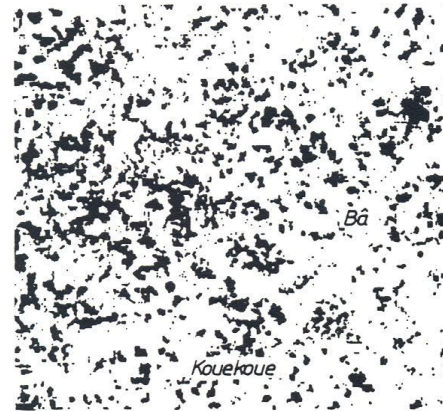


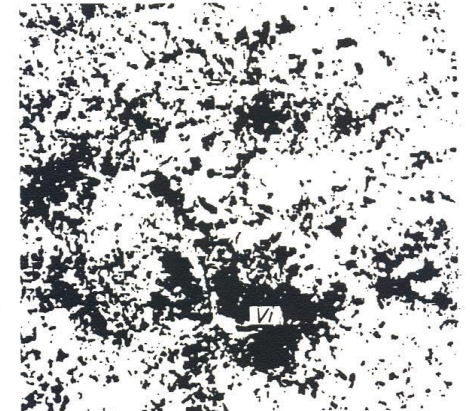
Fig. 4 - Terroir en réseau
Network pattern



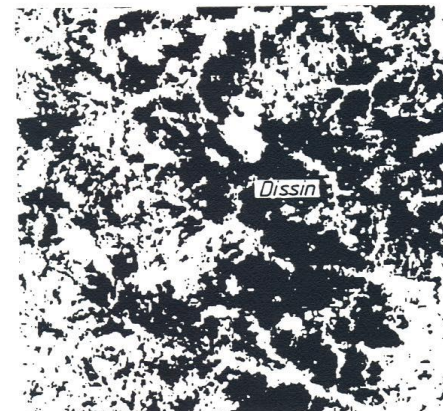
- _____ Champs et sols nus
Fields and bare ground
- _____ Cuirasses latéritiques et sols dégradés
Lateritic duricrusts and degraded soils
- _____ Savanes arbustives et arborées
Bushy and tree-covered savannas
- _____ Savanes boisées et forêts claires
Wooded savannas and open forests
- _____ Bas-fonds saisonnièrement inondés
Seasonally flooded lowlands



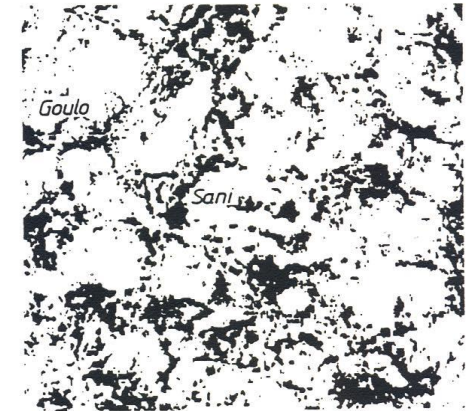
a) Bâ



b) Petit Balé



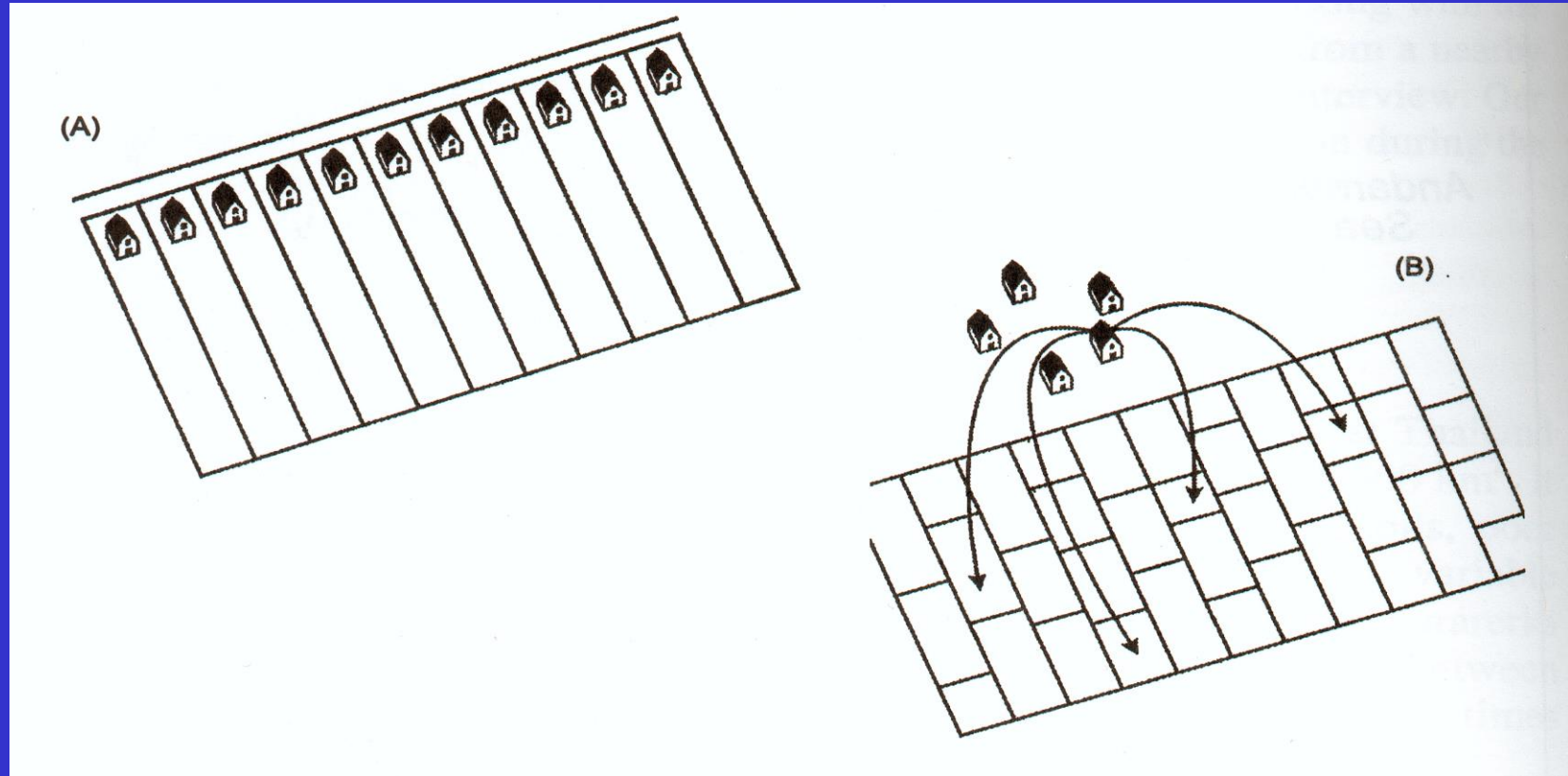
c) Dissin

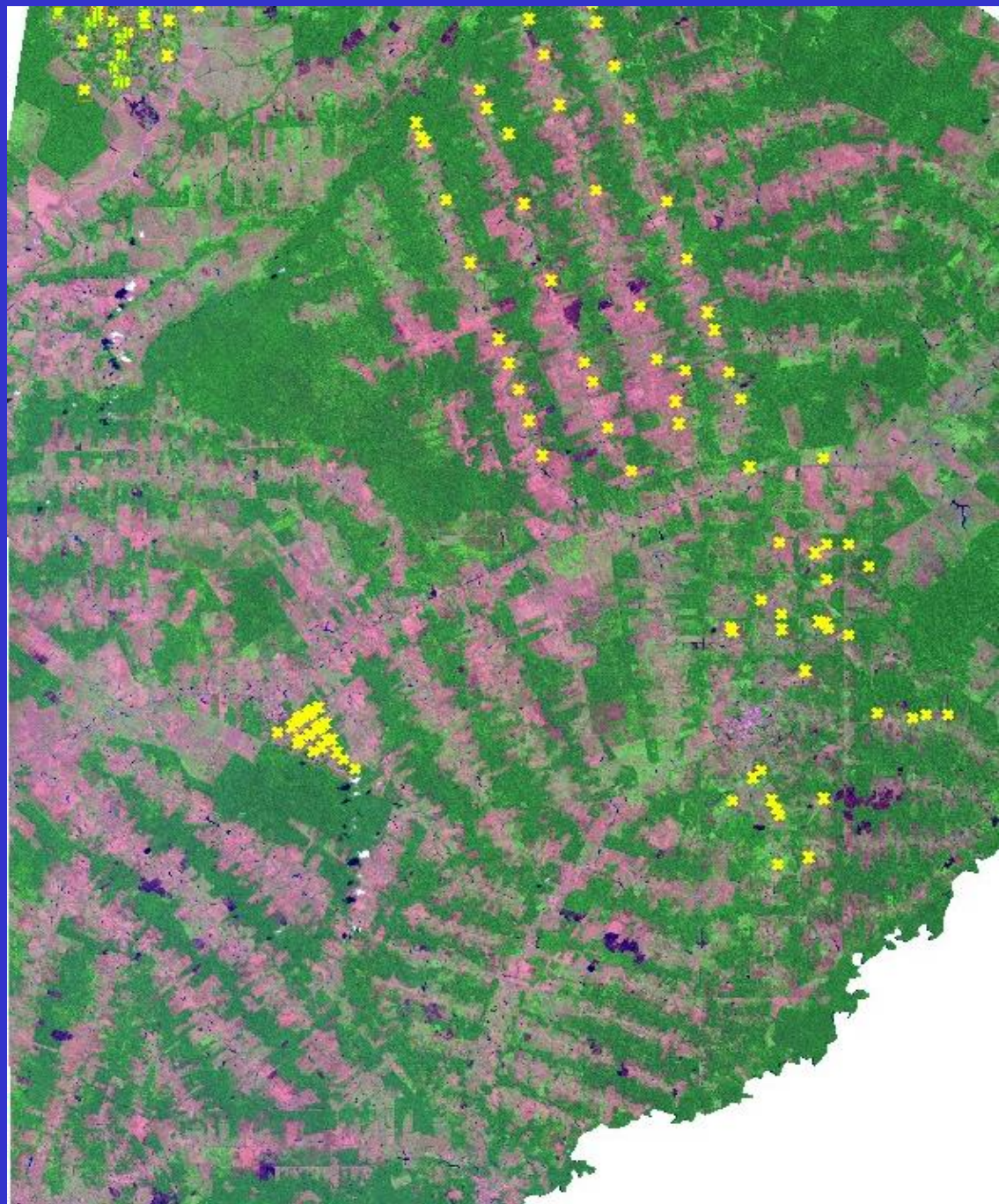


d) Fankui

2000

Linking household-level data to pixels





2015

Coffee cultivation



Shade coffee



Sun coffee

“Boom” in market differentiation

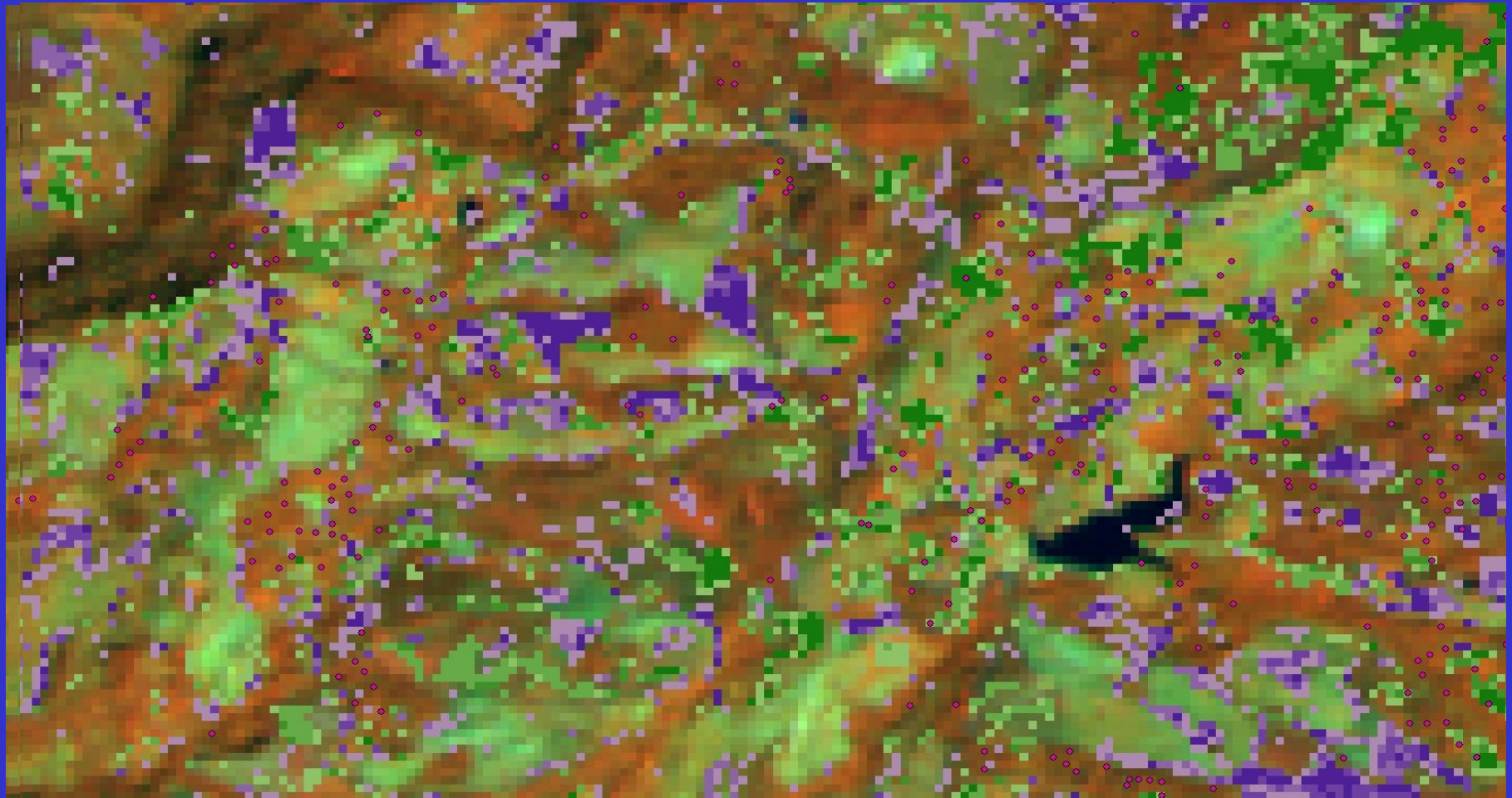


Consumers expressing interest on quality
but also on how food is produced
(sustainability)

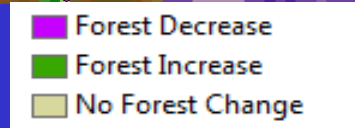


2015

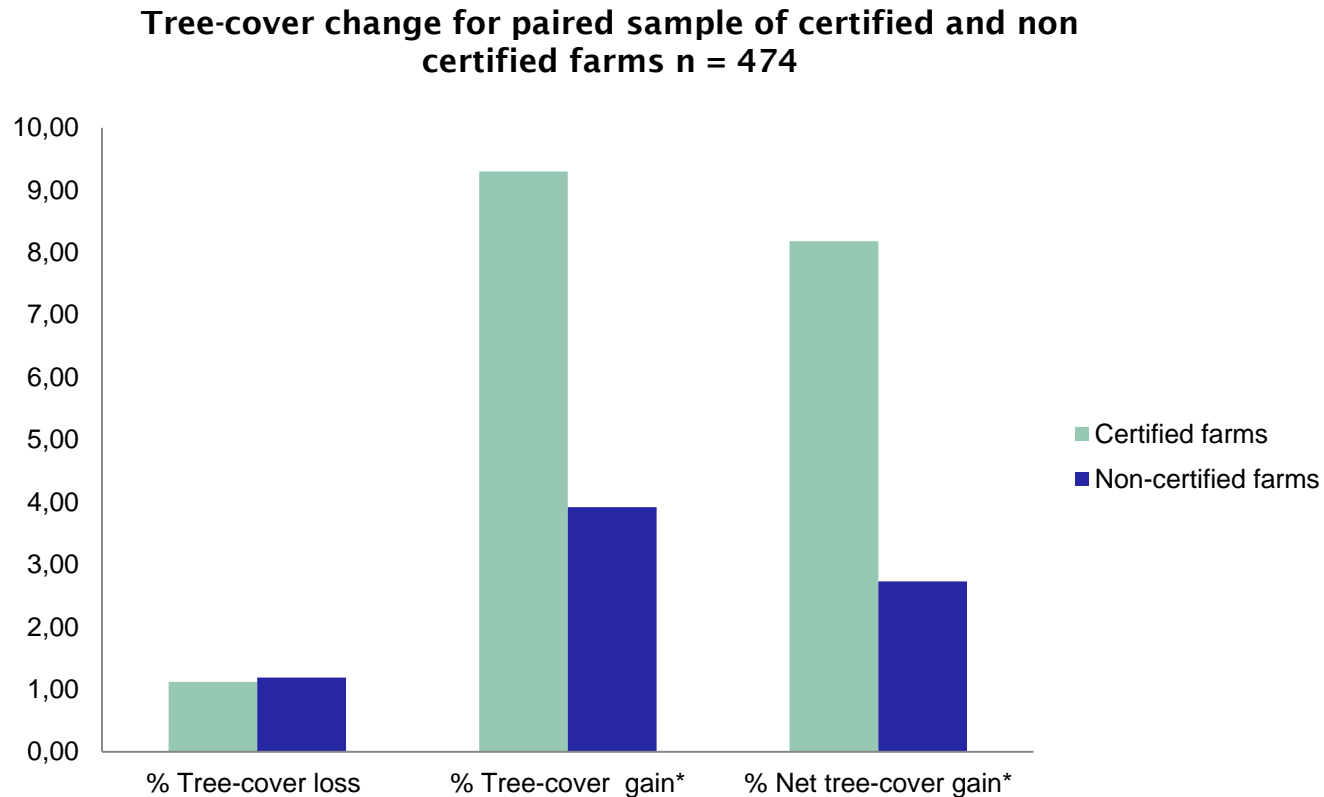
Change in fractional tree cover *Landsat 2003-2009*



Rueda, Thomas, Lambin, 2014



Certified farms have increased tree cover on their plots significantly more than non-certified farms



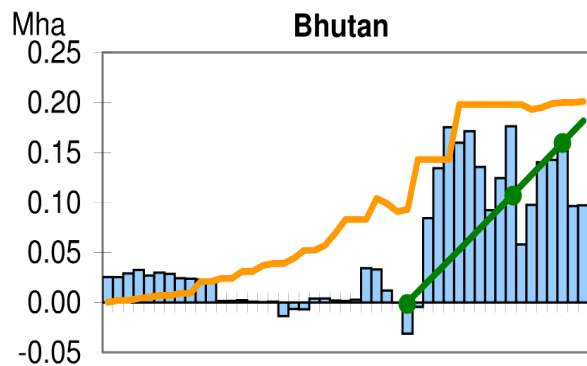
Certified farm:
shade-grown coffee



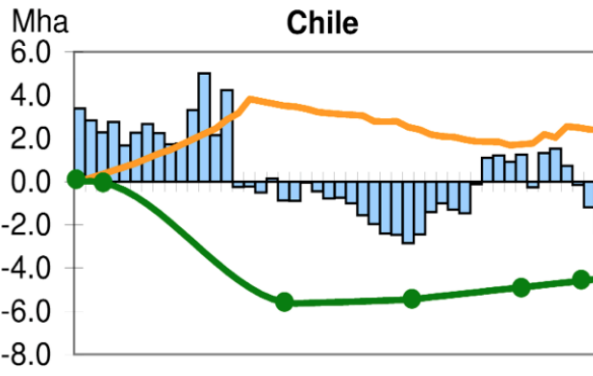


Woody vegetation change,
2001 – 2010,
MODIS data,
municipality scale

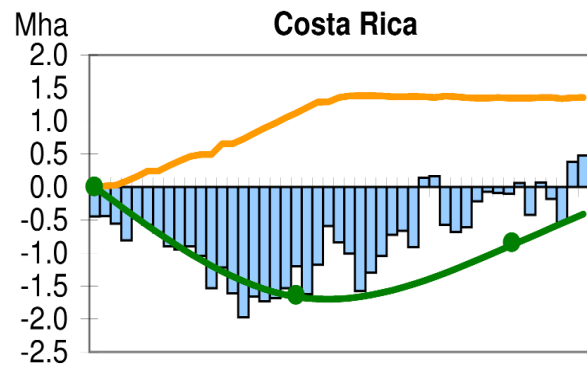
Aide et al., 2012



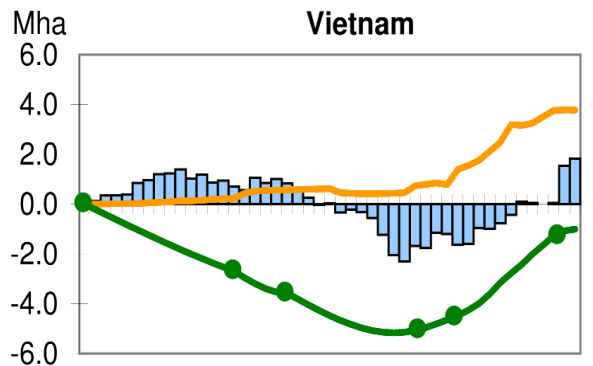
Year 1961 1968 1975 1982 1989 1996 2003



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Legend for net displacement and land use

- Total net displacement (Mha)
- Agricultural area change (base = 1961) (Mha)
- Forest area change (variable base year) (Mha)

cropland

forests

land use embodied in trade (exports - imports)

Looking back

- Unpredictable development of technology
- Potential unlocked by independent innovations
- Unexpected applications
- New frontiers: what is the new new thing?
- Long-term public support

**Thank you to Belpo, and to
TELSAT & STEREO officers!**