

A preliminary proposal from SPOP Project: Towards a multidimensional assessment grid of smallholders’ oil palm holdings

By: A. Baudoin, P.-M. Bosc, C. Bessou, M. Moulin, J. Wohlfahrt, C. Jannot, K. Lé, S. Rafflegeau, R. Marichal, J.-P. Caliman

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ANR SPOP research project

Sustainable Palm Oil Production

- **Context**

Guidelines for sustainable production (RSPO, ISPO)
+ need tools to assess the impacts locally
+ need to account for the diversity of the systems



<http://spop.cirad.fr/>

- **SPOP strategy**

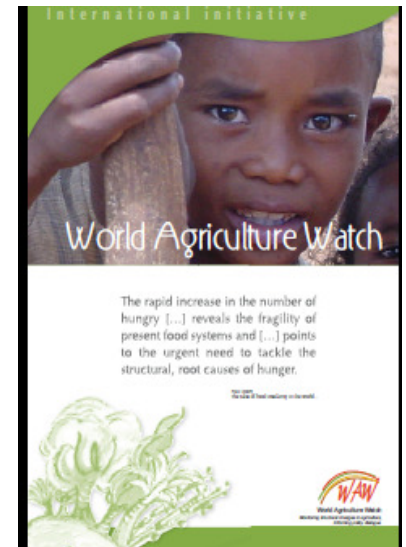
- Scientific knowledge on the 3D-performances of the systems (social, economic, environmental)
- Trans-disciplinary approach
- Identification of bottlenecks and positive drivers towards sustainability

- **SPOP partners**



Conceptual framework

- Based on the **World Agriculture Watch** (FAO, 2012) methodology applied to the specific context of oil palm smallholders
- Relying on an adaptation of the **Sustainable Rural Livelihoods** (Chambers and Conway, 1992) framework with two expected outputs:
 - Productive structures
 - 3 D performances: economic, social and environmental



Material & Methods

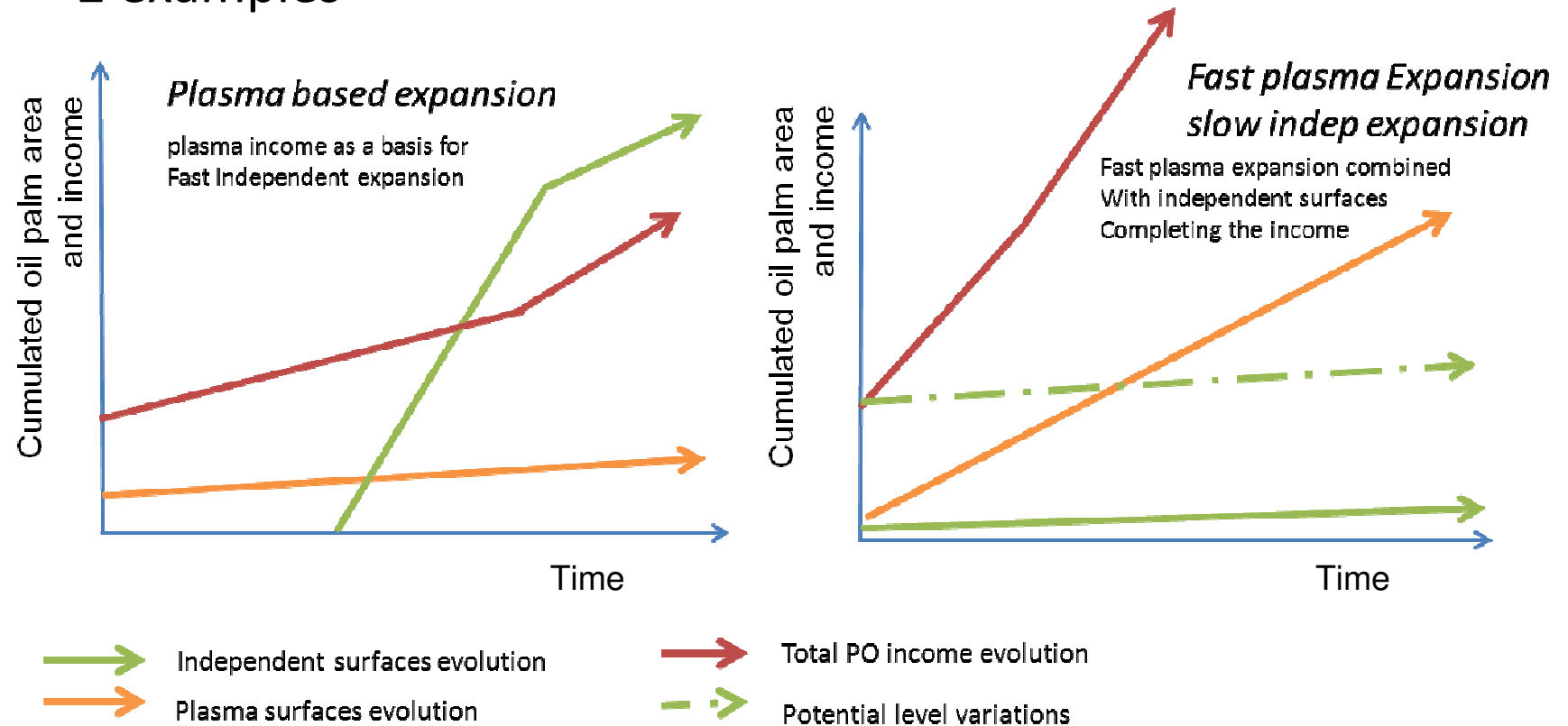
- **A dual approach**
 - At household and holding level (rationale of decision making regarding oil palm in a wider context)
 - At plot level (rationale of the technical choices linked to those at holding level)
- **Field survey**
 - Sumatra, Riau province: diversity and history
 - 43 oil palm growers => 33 complete questionnaires on 33 holdings and 40 oil palm plots (independent and semi-managed plasma)
 - Analysis with Sphinx software (preliminary results)

Core questions

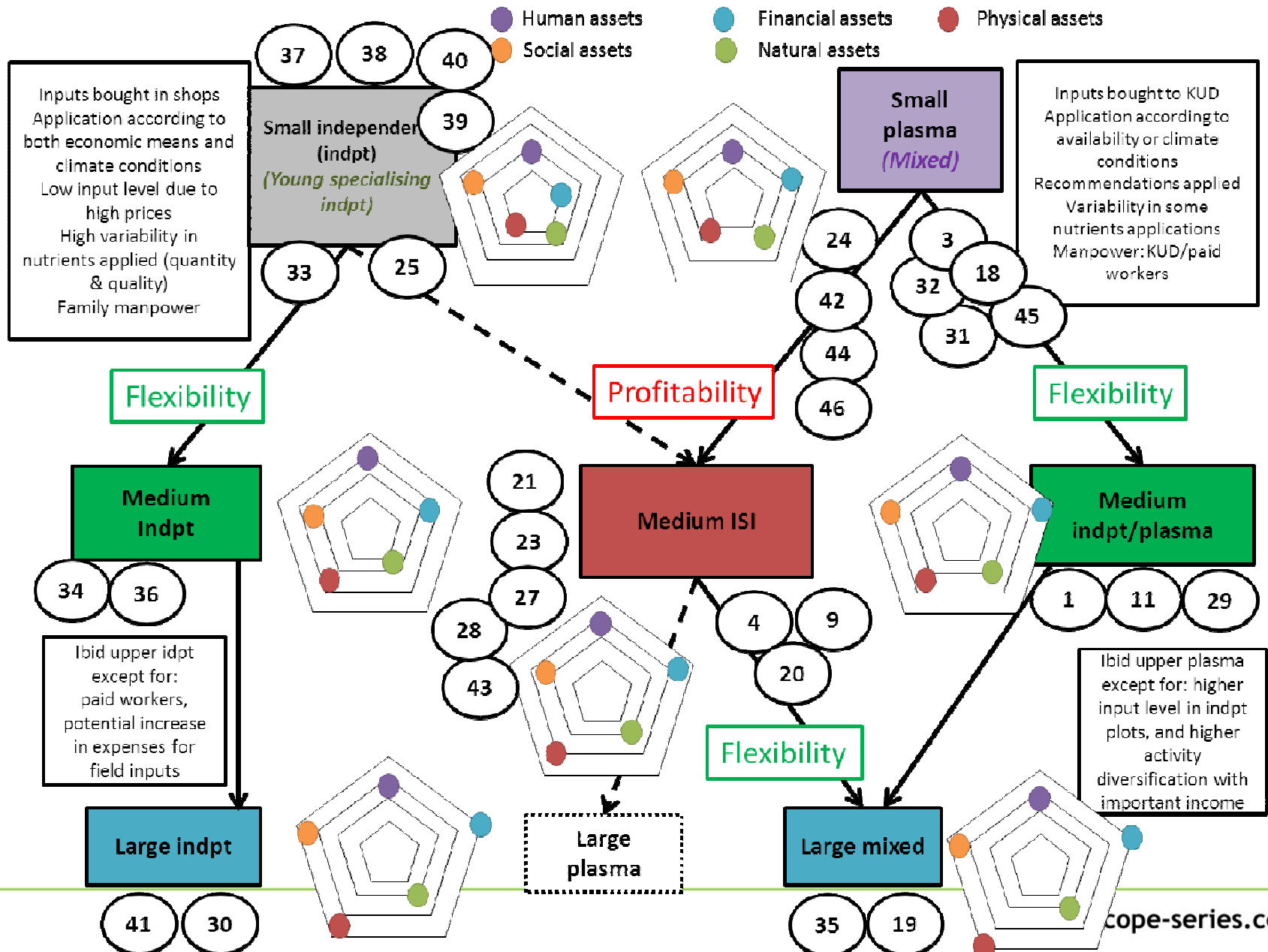
- **First observations confirm the need to go beyond an uniform view of smallholders’ systems**
 - Wide range of palm oil holding sizes (2-110 ha) and income generated
 - Combination of plasma and independent plots in most holdings
 - Existence of diverse activities within the household
- **Can we better understand the rationale of this differentiation process to characterise types of holdings?**
- **Can we link this diversity to a diversity in performances for oil palm production?**

Dynamics of oil palm plot accumulation

- 5 observed trajectories
- 2 examples

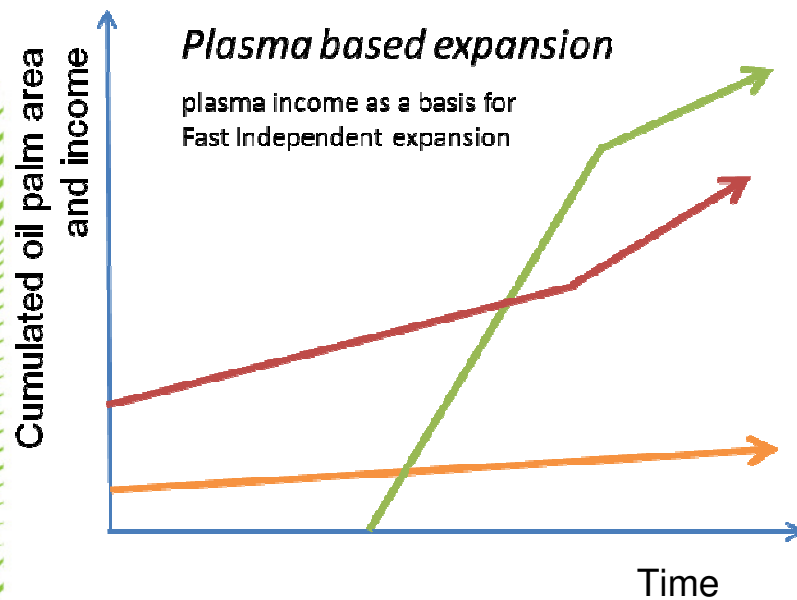


Potential strategic pathways for the holdings

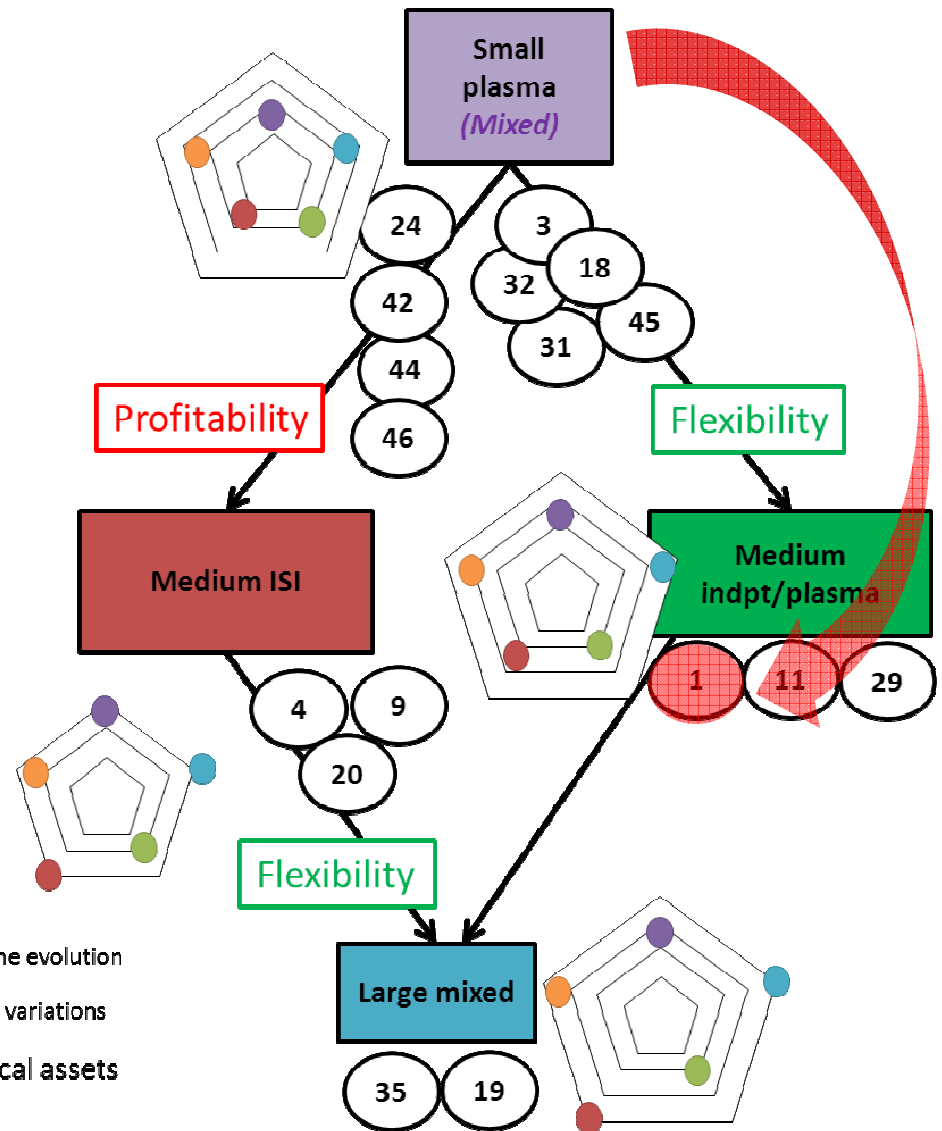


Potential strategic pathways for the holdings

Probable trajectory of holding n°1

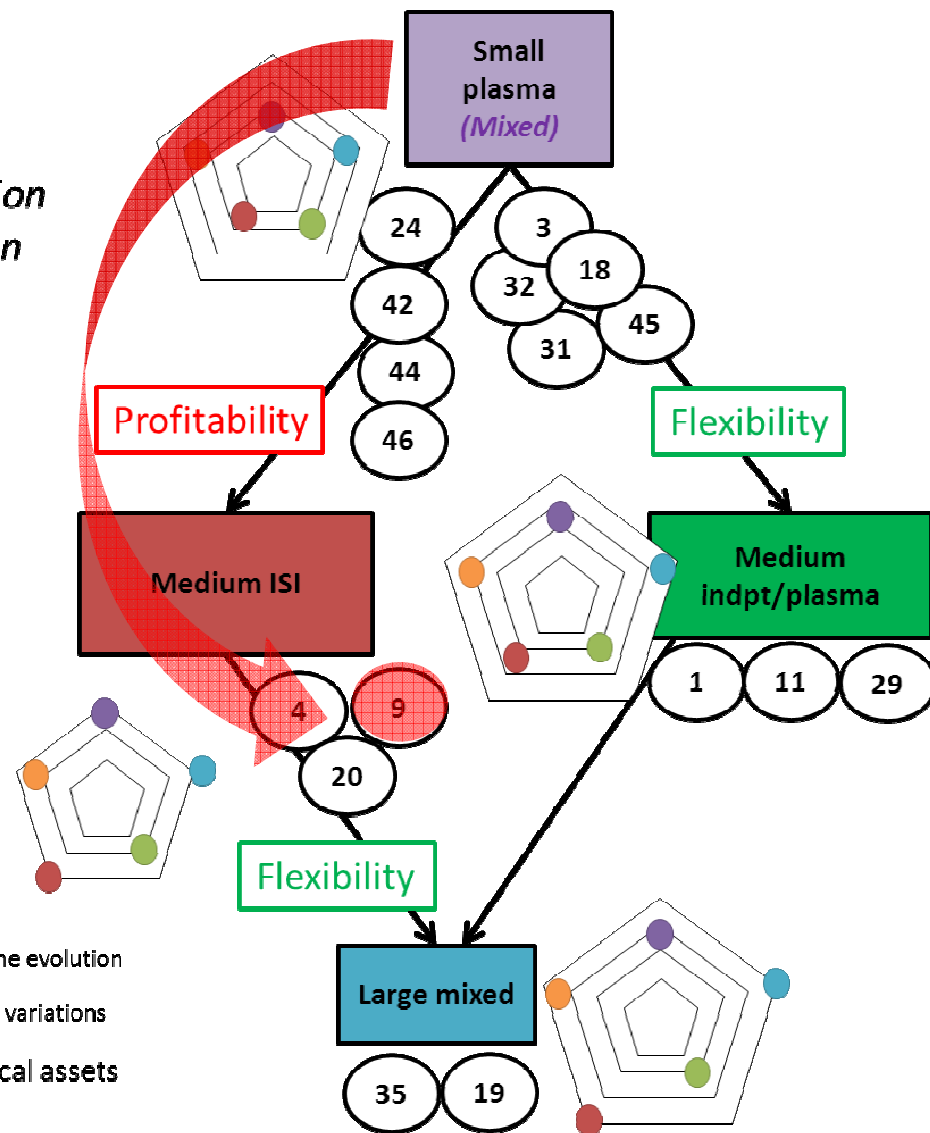
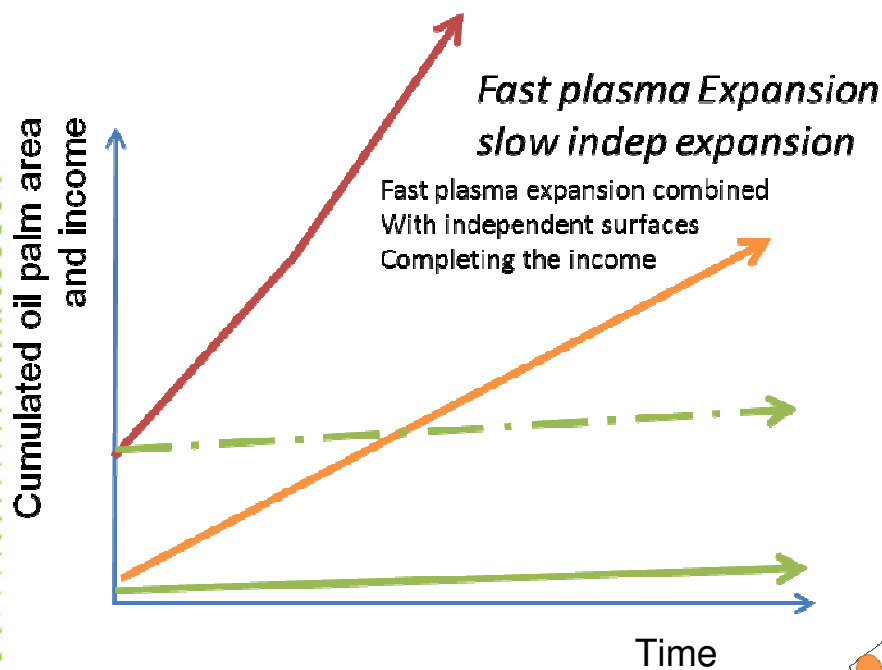


- Independent surfaces evolution
- Total PO income evolution
- Plasma surfaces evolution
- Potential level variations
- Human assets
- Financial assets
- Physical assets
- Social assets
- Natural assets



Potential strategic pathways for the holdings

Probable trajectory of holding n°9



- Independent surfaces evolution
- Plasma surfaces evolution
- Total PO income evolution
- Potential level variations
- Human assets
- Financial assets
- Physical assets
- Social assets
- Natural assets

Structural indicators

- 14 indicators based on the assets analysis in order to delineate the holding types without the whole strategic analysis
- 4 discriminating (significant with the current sample size)

Tested indicators	Type of Holdings				
	Large holdings	Medium ISI holdings	Medium EDA holdings	Mixed holdings	Young specialising holdings
Total OP surface (ha)	65	7.94	10.81	3.11	2.75
Plasma surface (ha)	6.5	6.11	1	2.67	0
Palm trees averaged age	9.5	14.11	13	17.56	5.83
Oil palm production starting year	1992	1996	1997	1997	2002

Significantly lower than average (pink) higher than average (blue)

- No robust thresholds yet!

Performances indicators

Holding <i>Economic & Social</i>	Total income/average expense	
	OP income/average expense	
	Total cost*/incomes	
	Azote price (\$ per kg), Phosphate price	
	Average aggregated yields (including not planted or immature area)	
	Time for new plasma acquisition (average price of 25000\$ per kapling=2ha) (in years)	
	Housing conditions (from 0 to 6)	
	Access to and quality of care services (both health center and hospital)	
	Social protection	
Plot <i>Economic</i>	Plasma (data per ha)	Independent (data per ha)
	OP C total* plasma/plasma net margin	OP C total*/indep net margin
	% of fertilisation cost/total costs	% of fertilisation cost/total costs
	% herbicides cost/total costs	% herbicides cost/total costs
	Income/workforce costs	Income/workforce costs
	Average yield (t/ha.year)	Average yield (t/ha.year)
	Net margin (\$)	Net margin (\$)
Plot <i>Environmental</i>	Azote fertilisation balance	
	Phosphate fertilisation balance	
	Quantity of active substances used (pesticides)/recommendations	
	Selective weed control Yes/No	

- On the 3 dimensions of sustainability
- At both holding and plot levels
- Both quantitative and qualitative
- Not all could be calculated yet due to some incomplete data

*Total costs include inputs costs, workforce costs, weighing and transportation costs and other costs relative to KUD functioning (for plasma only). OP: Oil Palm

Preliminary results on the 3D-performances

- At holding levels
 - 2 significant (Student-t, 5%) discriminating indicators in terms of socio-economic performances (Oil palm income/total expense, Time for plasma acquisition)
 - Large holdings performed better on these 2 indicators
 - At plots levels
 - Results for independent plots were more heterogeneous
 - Socio-eco: no efficiency difference between plasma and young independent
 - Env: across the holding types, most differentiated performances for pesticides treatment (more than for fertilisation ones)
- ⇒ Need further assessments (more data and statistical tests)

Conclusions

- We proposed a method to characterise the diversity of oil palm holdings and their 3D-performances
- The 5 types of holding must be further investigated and preliminary results consolidated (the goal was to test the method and tools)
 - Increasing the number holdings/plots surveyed
 - 1-2 plots surveyed when some holding reach 110 ha => need to be more exhaustive for each holding
 - Consolidating statistical analyses
 - Widening the area to cover more strategic pathways
- Consolidating/validating the tools with the stakeholders (workshop Friday 14. Feb. pm)

To deepen the analysis

- Establishing a linkage with agricultural statistics to widen the representativeness of the results
- Deepening the knowledge on agricultural practices and impacts based on the typology and permanent follow-up of some selected cases
- Developing a territorial approach
 - Cumulated/antagonist impacts
 - Influence of plot localisation
 - Oil palm spatial distribution model: workshop Friday 14. Feb. pm

Thank you for your attention!



Cécile Bessou

Company / Institution
Cirad

Position
Researcher

Contact
Av. Agropolis
34398 Montpellier, France

e-mail
cecile.bessou@cirad.fr

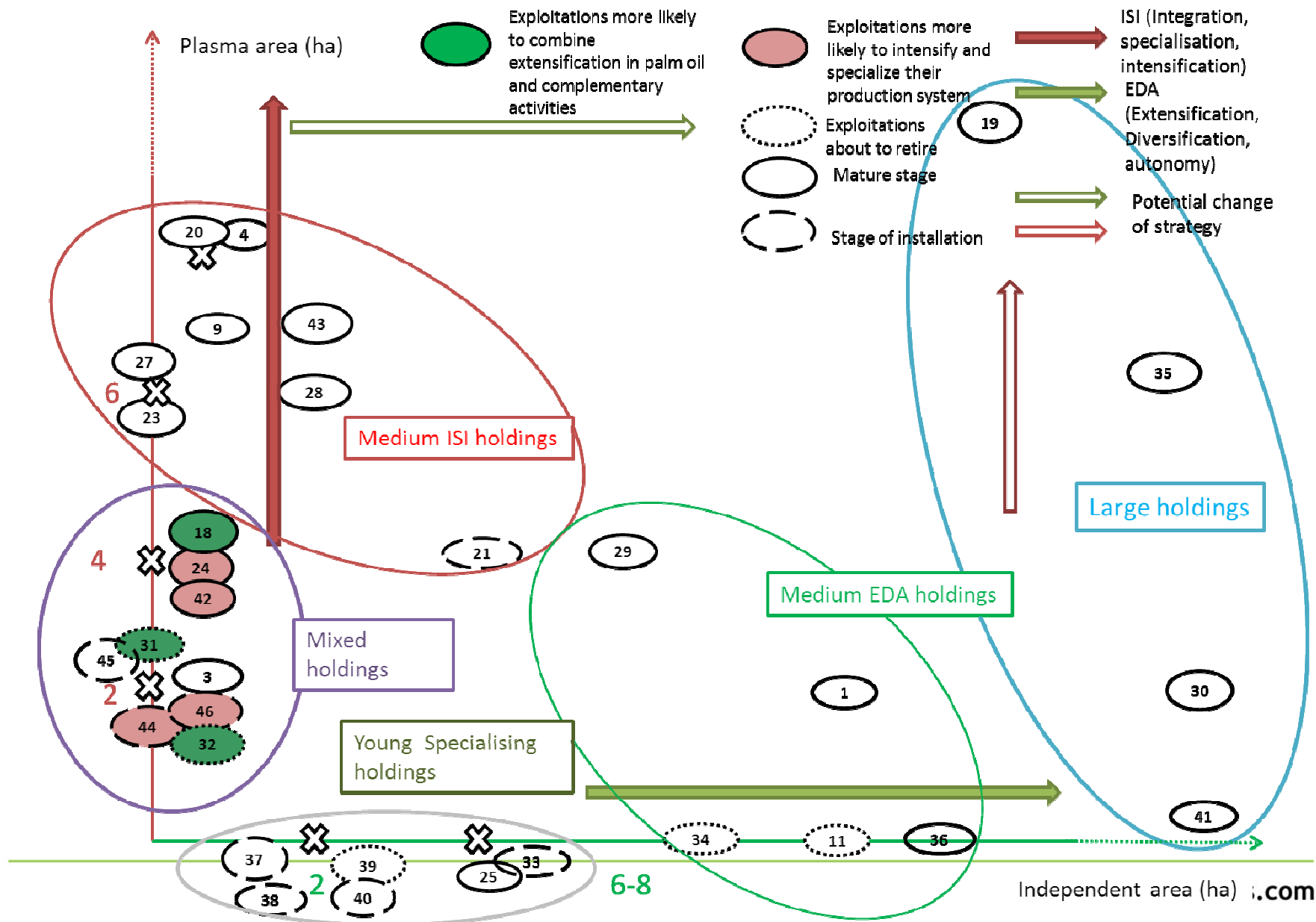
Experience

2010 Researcher at Cirad, Research Unit on Perennial Crops
2006 DED junior assistant in Burkina Faso

Web page

http://agents.cirad.fr/index.php/c%E9cile.bessou/cecile_bessou%20

Current situation of the holdings based on areas



The sustainable rural livelihoods framework

(adapted from Scoones 2009)

