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Are farmers interested in involving landscape complexity in their pest regulation strategies?

Nicolas Salliou, Cécile Barnaud, Claude Monteil, Aude Vialatte, Jean Philippe Choisis

► **To cite this version:**

Nicolas Salliou, Cécile Barnaud, Claude Monteil, Aude Vialatte, Jean Philippe Choisis. Are farmers interested in involving landscape complexity in their pest regulation strategies?. *Sfécologie-2016, International Conference of Ecological Sciences*, Oct 2016, Marseille, France. 19 p. <hal-01606388>

HAL Id: hal-01606388

<https://hal.science/hal-01606388v1>

Submitted on 5 Jun 2020

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Are farmers interested in involving landscape complexity in their pest regulation strategy?

Salliou Nicolas, Cécile Barnaud, Claude Monteil, Aude Vialatte, Jean-Philippe Choisis



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Engineering complex landscapes ?



A complex landscape favors natural enemies
(Chaplin-Kramer et al. 2011)

Landscape management?

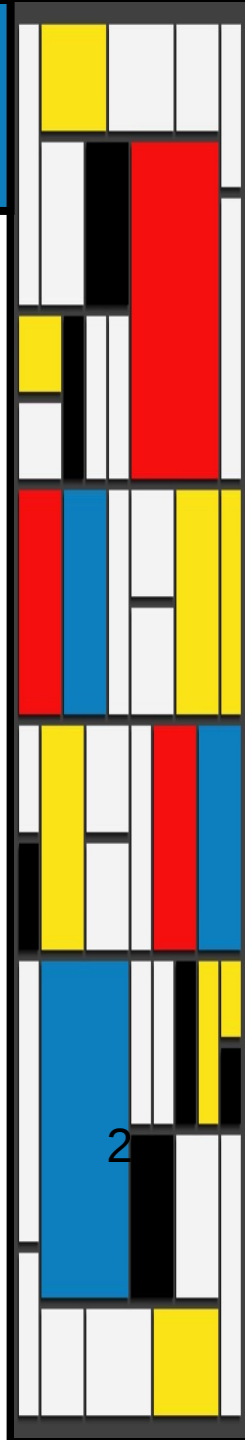
High potential for collective action
(Stallman 2011)



Ecological function



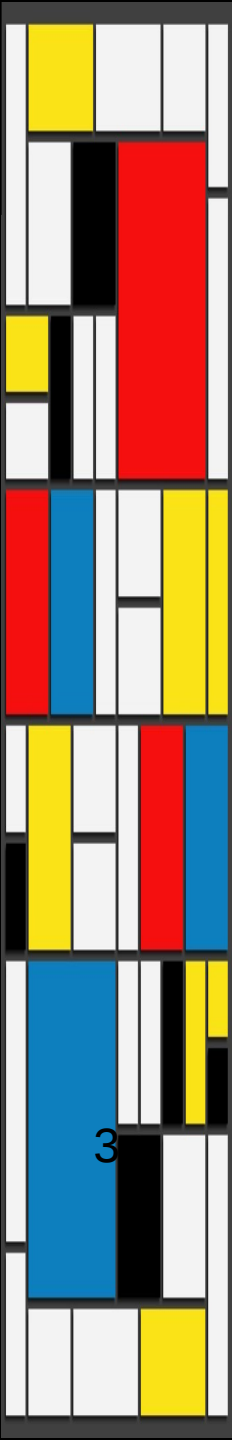
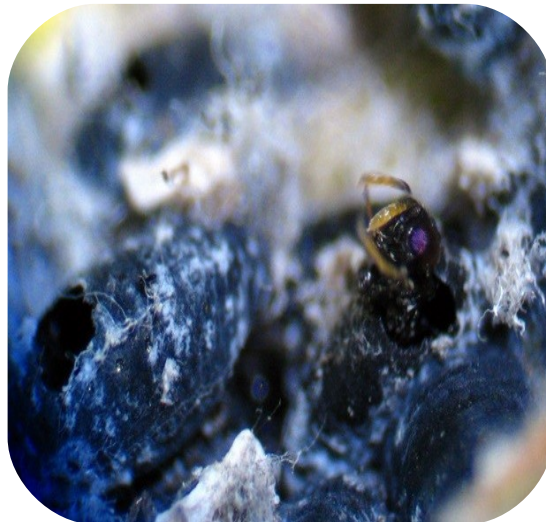
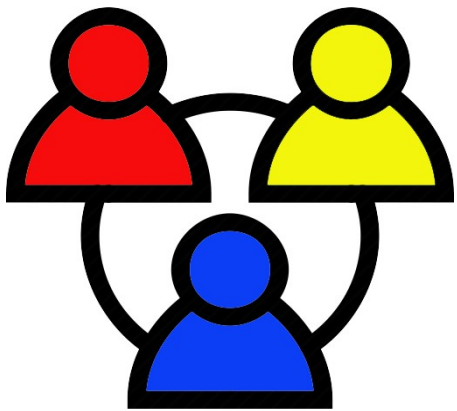
Benefit to Farmers (ES)



Innovation in agro-ecosystem design

Problema
tica

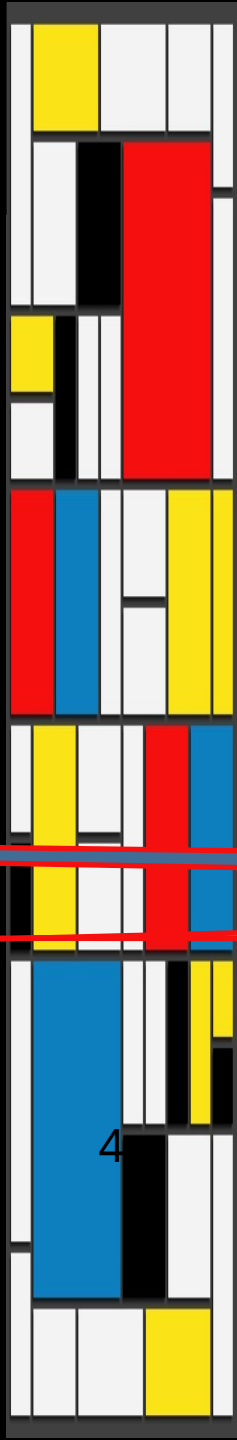
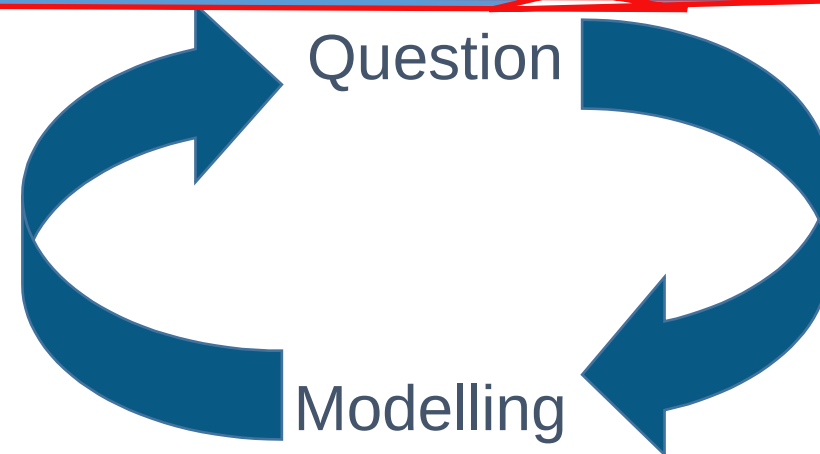
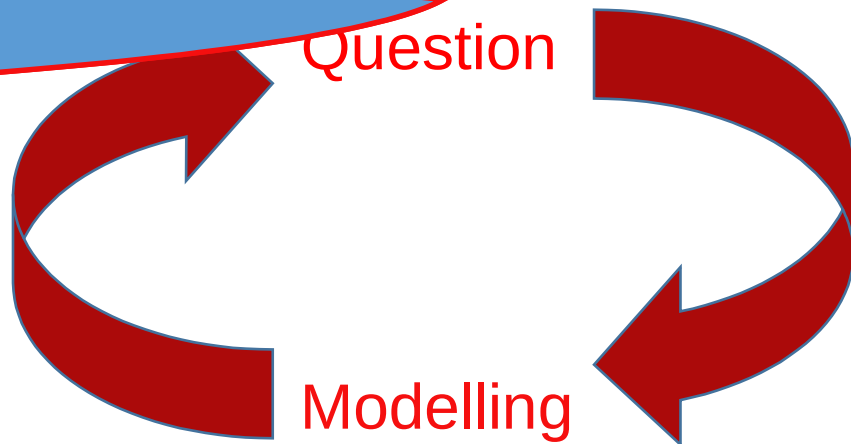
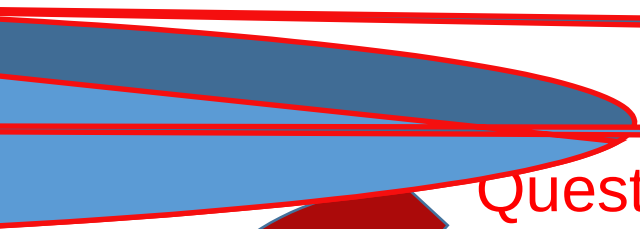
« Innovating in agro-ecosystem design often means that **groups and resources are to be built up** with stakeholders themselves » (Berthet 2013)



Modelling with stakeholders

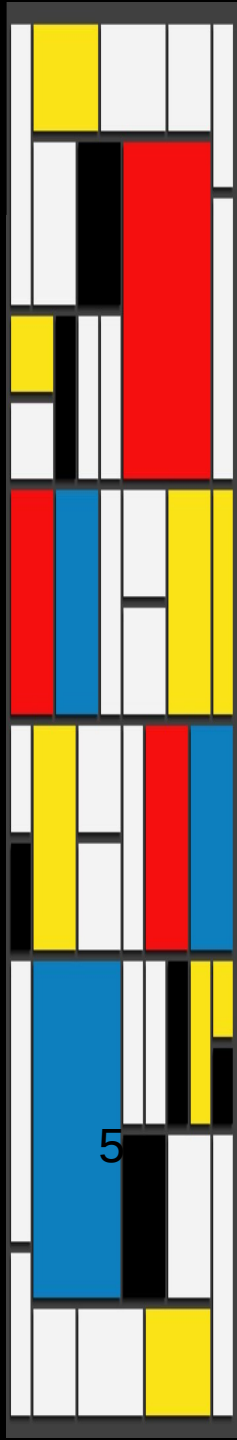
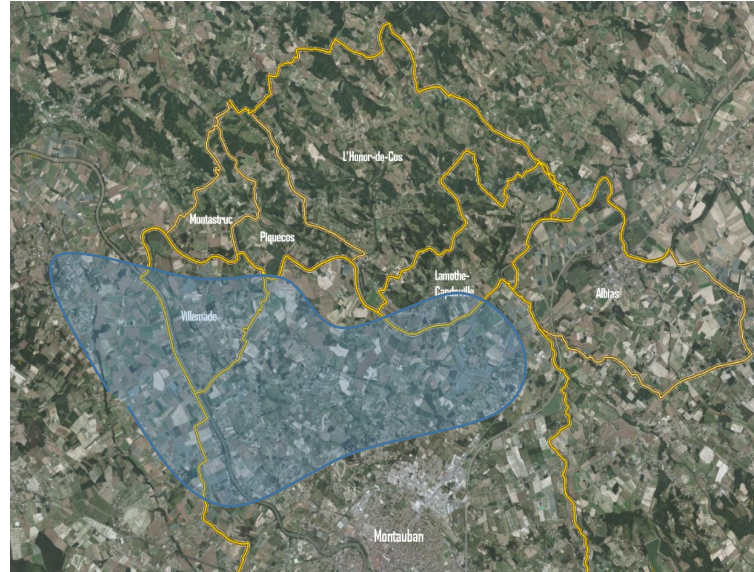
Methodology

- **A modelling attitude** (posture) which actively seeks to get involved with stakeholders and their social needs
- A modelling approach which is **iterative, adaptative** and **exploratory**



A intensive tree fruit production area

Study site

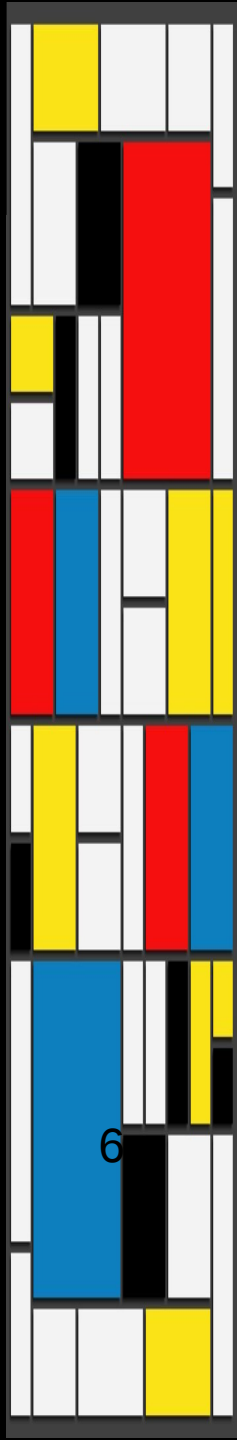


Ecosystemic dependances?

Modelling
#1

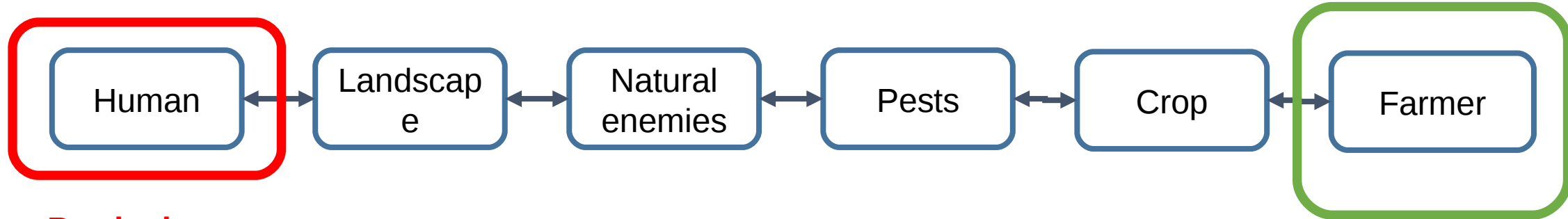
Question : Is there ecosystemic dependances regarding biological control by conservation ?

Modelling : Individual interviews and mental models of local stakeholders



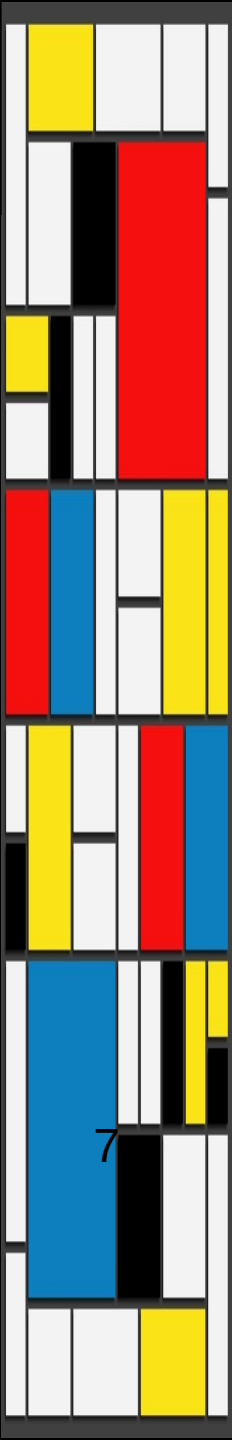
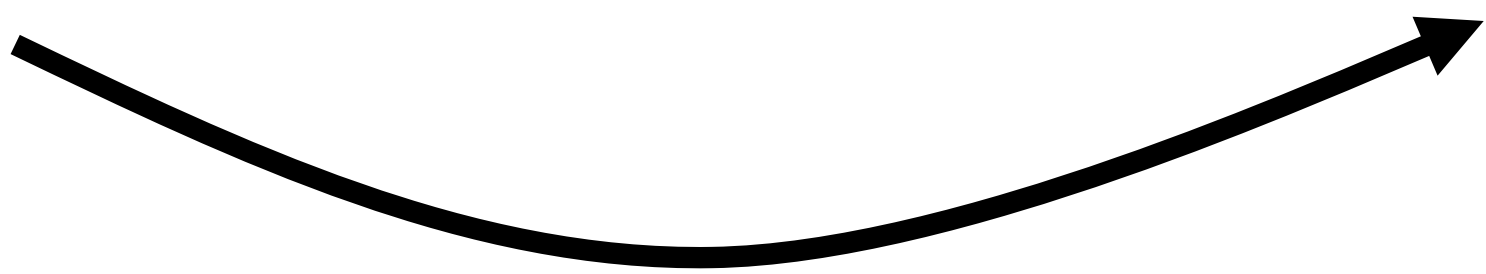
Ecosystemic dependances?

Modelling
#1



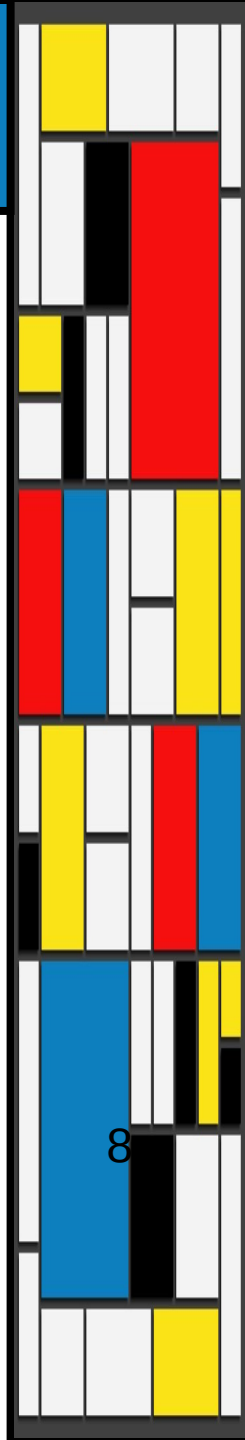
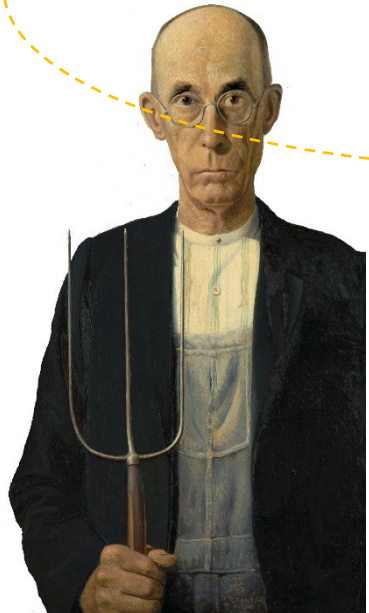
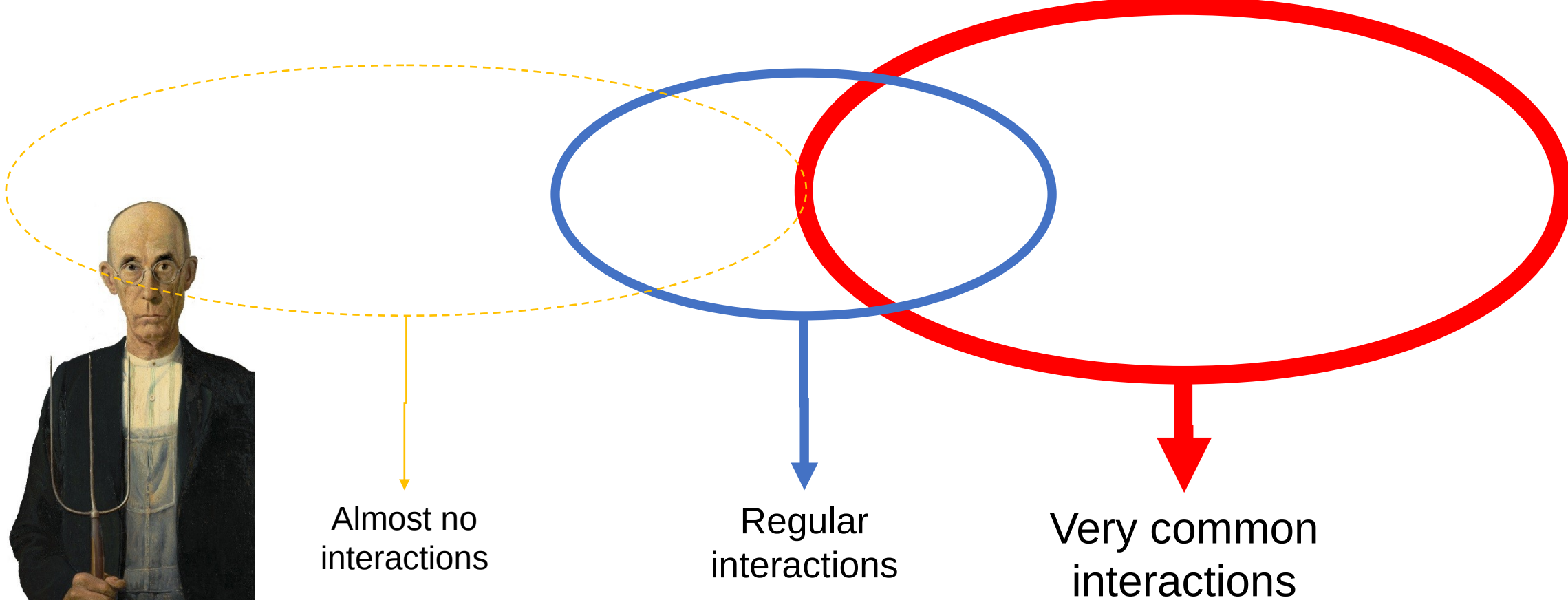
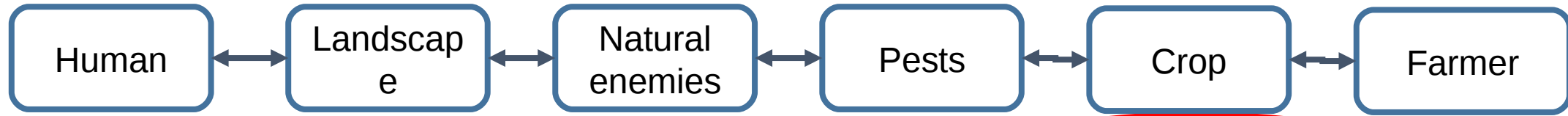
Producing an ecosystem service

Benefiting from the ecosystem service



Ecosystemic dependances?

Modelling
#1



Ecosystemic dependances?

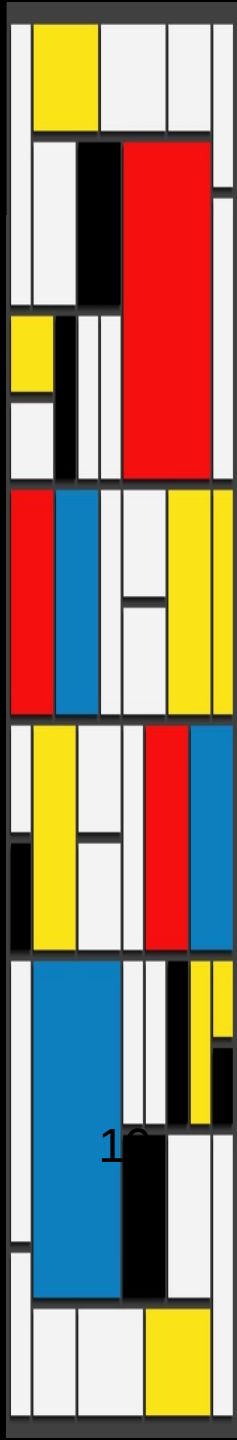
Modelling
#1

For interviewees
the landscape is
not source of
natural enemies
but potential
damages

New question :
Why such a knowledge gap between local stakeholders and landscape ecology findings?

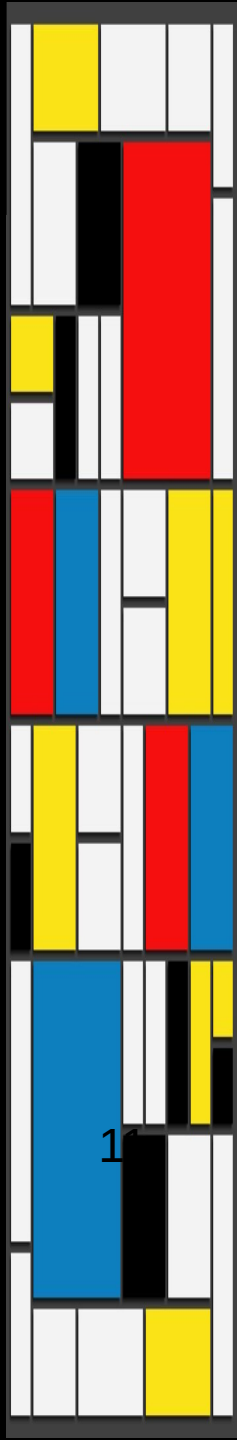
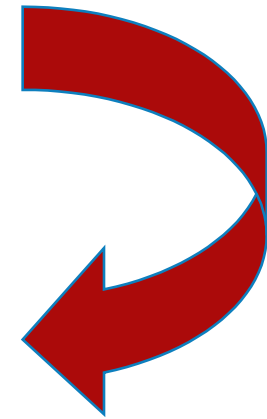
Are there ecosystemic dependances regarding biological control by conservation ?

Individual interviews and mental models of local stakeholders



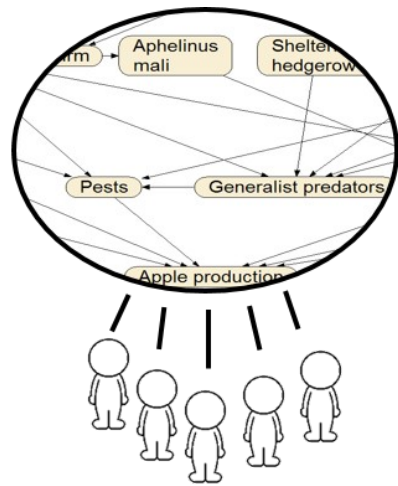
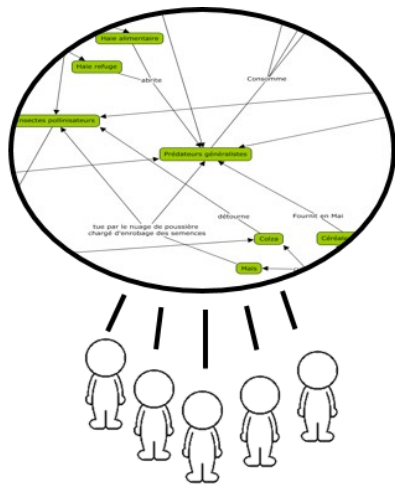
Question : Why such a knowledge gap between local stakeholders and landscape ecology findings?

Modelling: Participatory Bayesian modelling about individual stakeholder representations (Scientific vs. Locals)

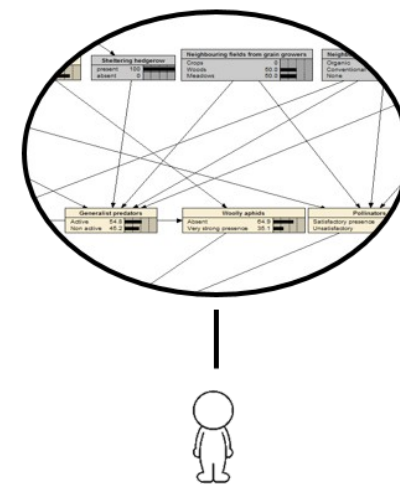


Towards individual Bayesian models

Modelling
#2

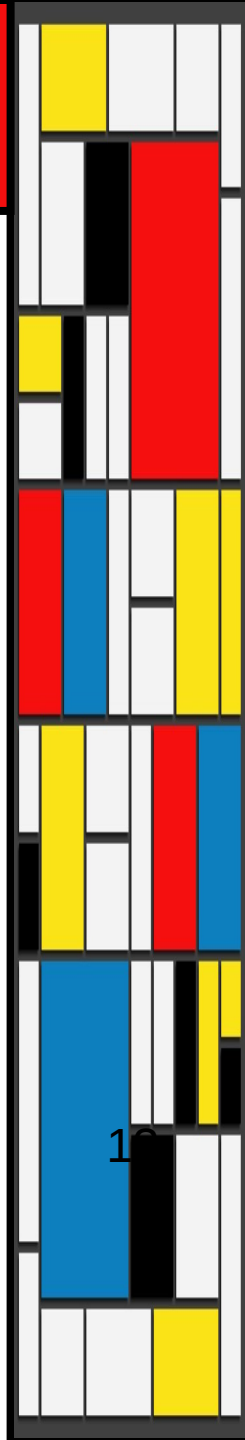


Category	Activity	Value 1	Value 2
Specific	Routique	Active	21.4
Specific	Routique	Non active	21.4
Specific	Not routique	Active	21
Specific	Not routique	Non active	21
Broad spectrum	Routique	Active	33.4
Broad spectrum	Routique	Non active	27
Broad spectrum	Not routique	Active	28.75
Broad spectrum	Not routique	Non active	73.25
Broad spectrum	Not routique	Active	14
Broad spectrum	Not routique	Non active	84
Dimensional	Routique	Active	14.25
Dimensional	Routique	Non active	49.75
Dimensional	Not routique	Active	13.8
Dimensional	Not routique	Non active	84.2
Dimensional	Routique	Active	29.3
Dimensional	Routique	Non active	70.2
Dimensional	Not routique	Active	13.8
Dimensional	Not routique	Non active	81.2
Dimensional	Routique	Active	31.8
Dimensional	Routique	Non active	49.2
Dimensional	Not routique	Active	15.1
Dimensional	Not routique	Non active	84.9
Dimensional	Routique	Active	31
Dimensional	Routique	Non active	49
Dimensional	Not routique	Active	13.2
Dimensional	Not routique	Non active	81.8
Dimensional	Routique	Active	27.23
Dimensional	Routique	Non active	42.76
Dimensional	Routique	Active	13.425
Dimensional	Routique	Non active	89.375
Dimensional	Not routique	Active	13.375
Dimensional	Not routique	Non active	84.625
Dimensional	Not routique	Active	13.125
Dimensional	Not routique	Non active	74.875
Dimensional	Not routique	Active	13.425
Dimensional	Not routique	Non active	74.575
Dimensional	Not routique	Active	13.175
Dimensional	Not routique	Non active	75.825
Dimensional	Not routique	Active	14.125
Dimensional	Not routique	Non active	74.875



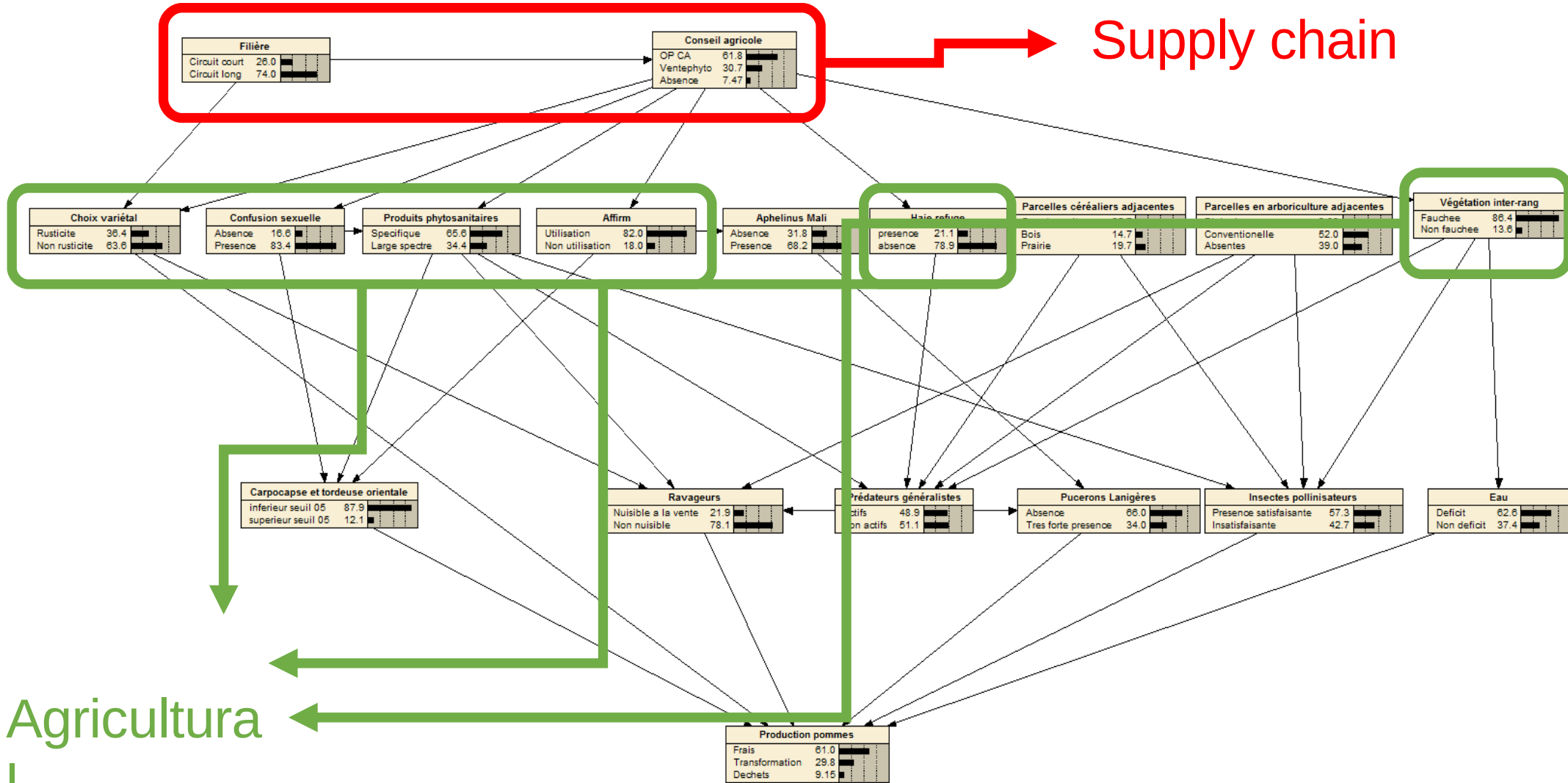
Collective construction
of a shared socio-
ecological conceptual
model

Individual
parameterization and
scenario exploration



Bayesian Network

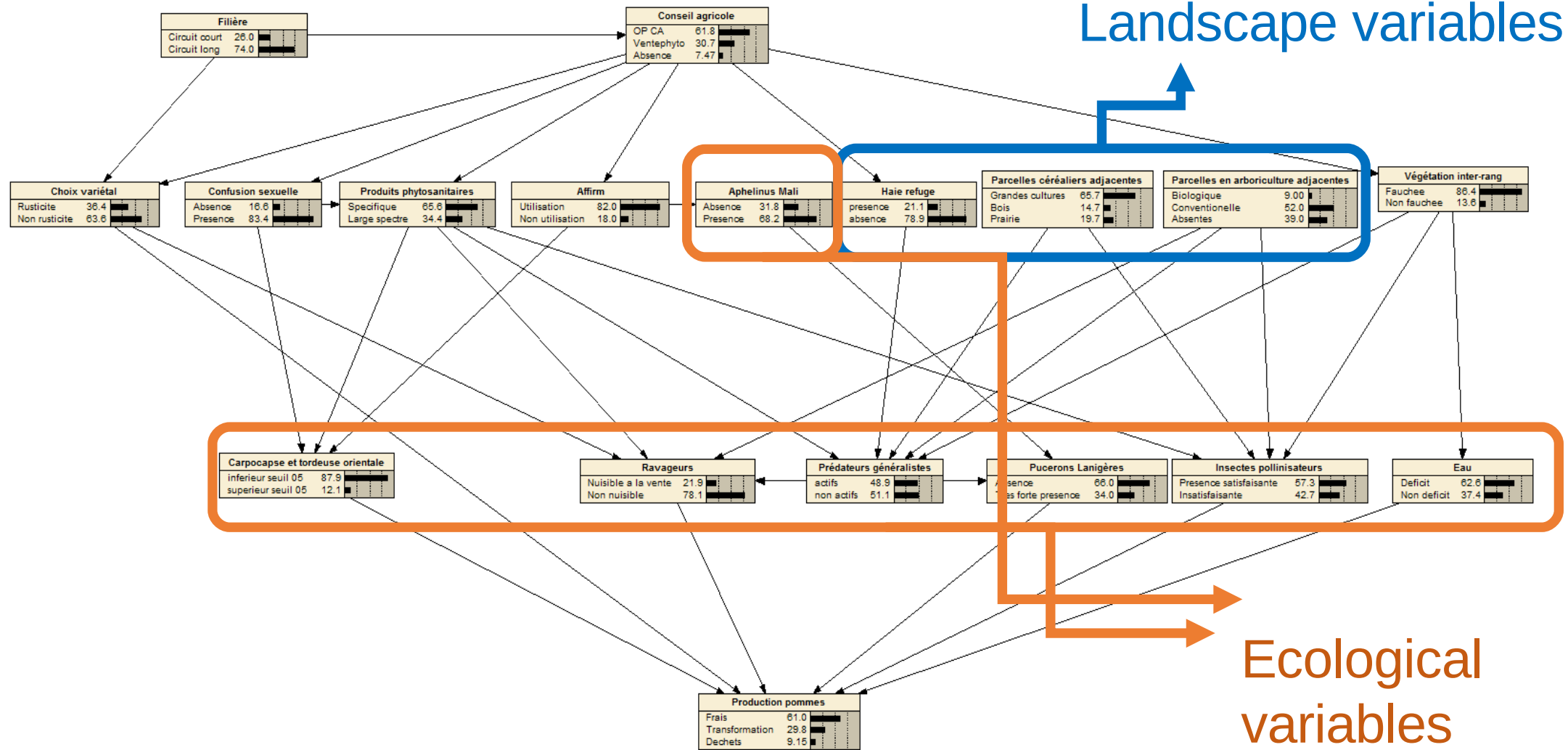
Modelling
#2



Agricultura
|
practicies

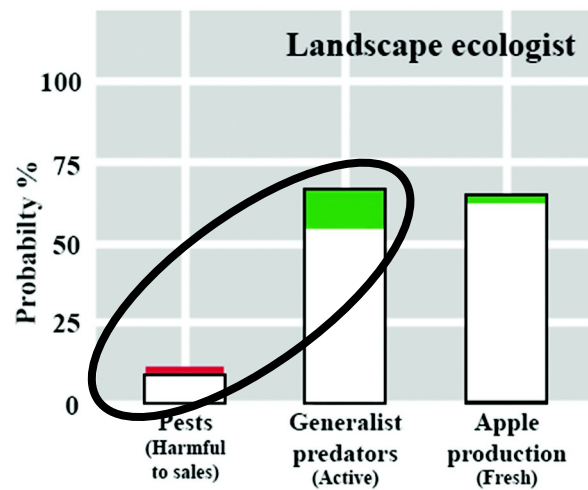
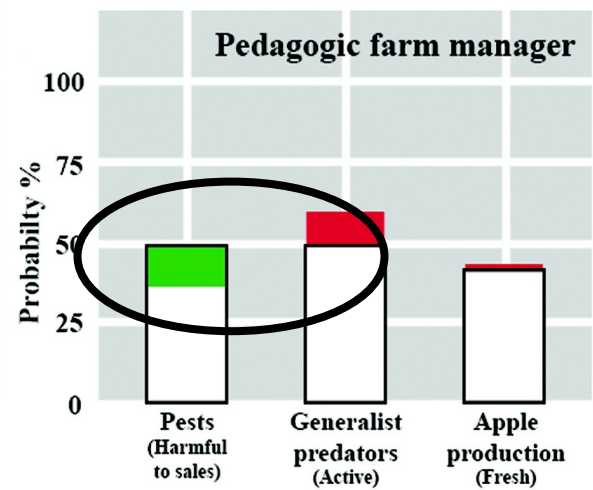
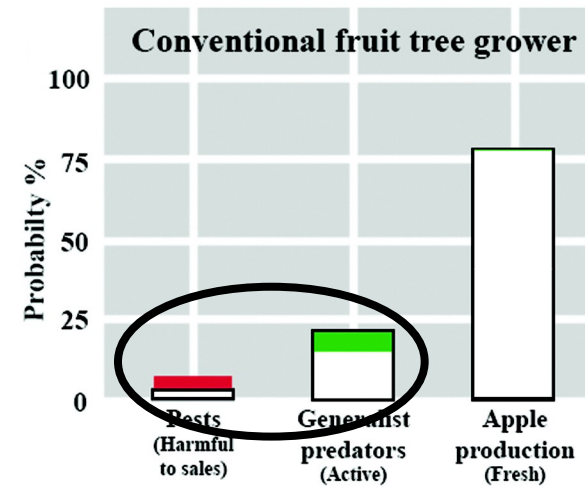
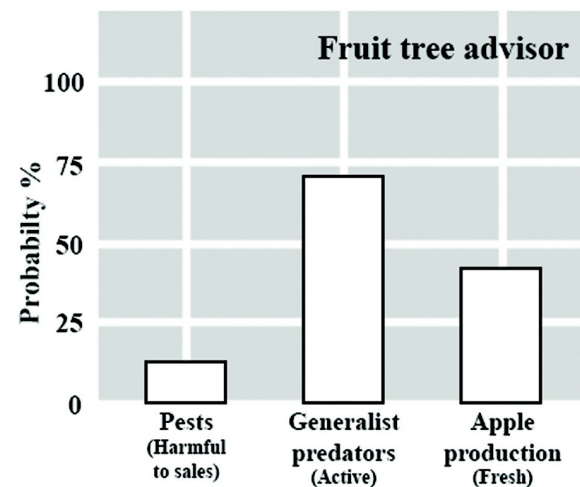
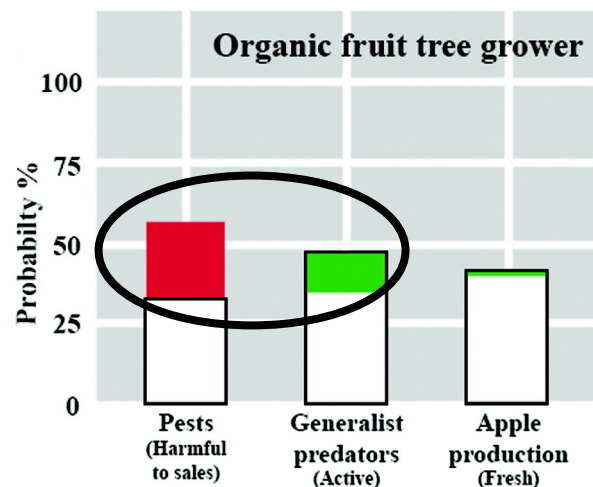
Bayesian Network

Modelling
#2

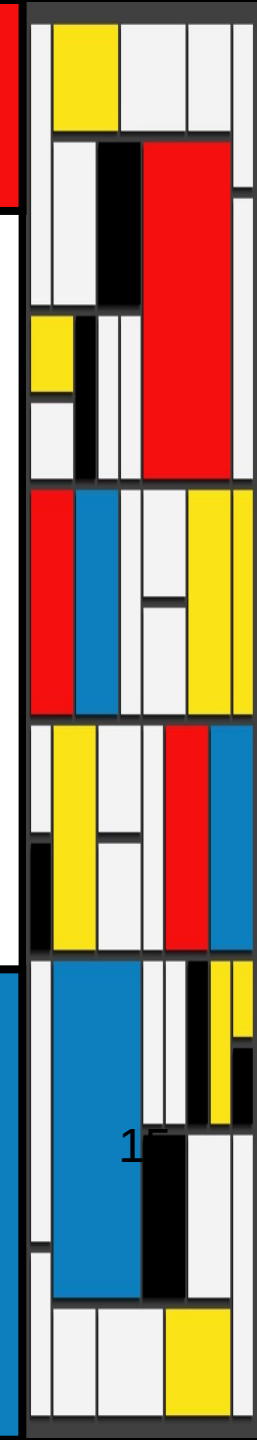


Scenario : complex landscape

Modelling
#2

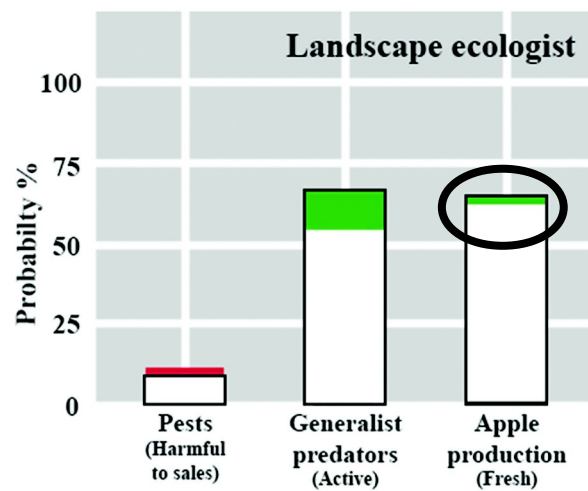
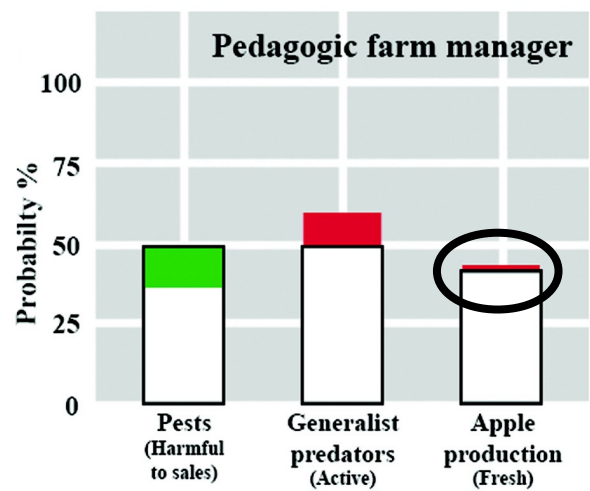
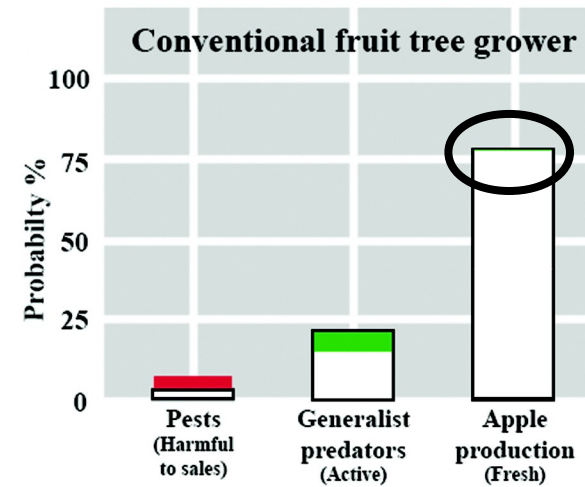
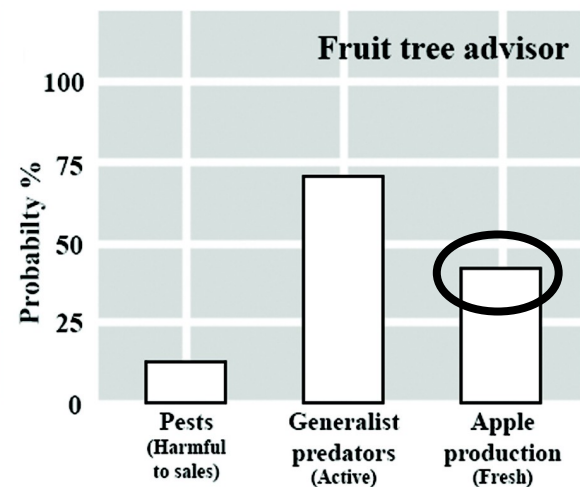
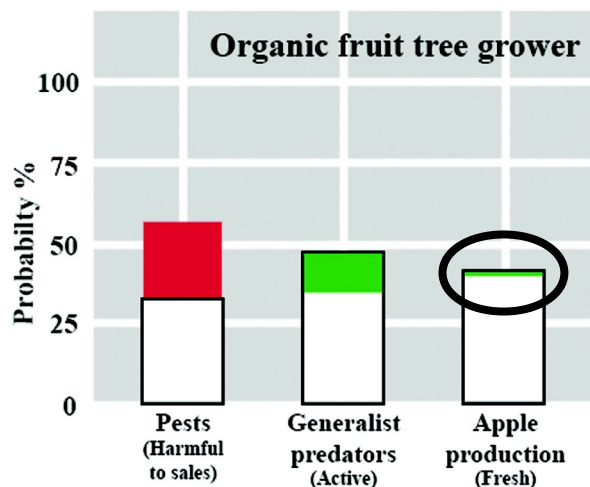


Most stakeholders have representation of a complex landscape having an effect on natural enemies variable and pests

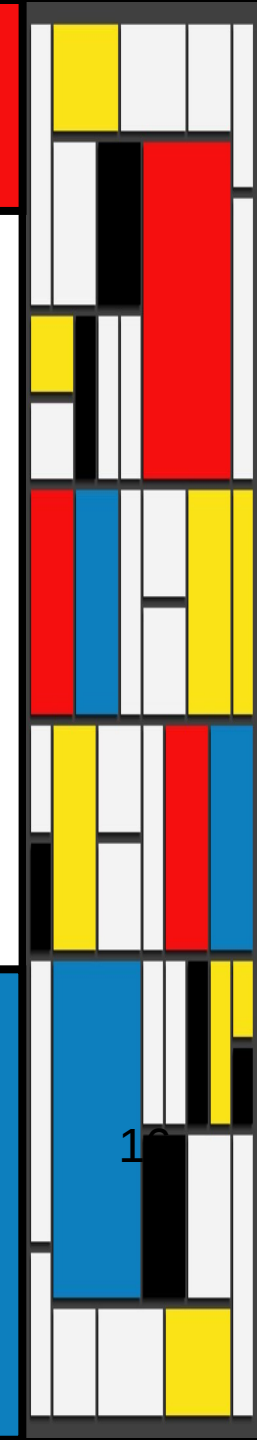


Scenario : complex landscape

Modelling
#2



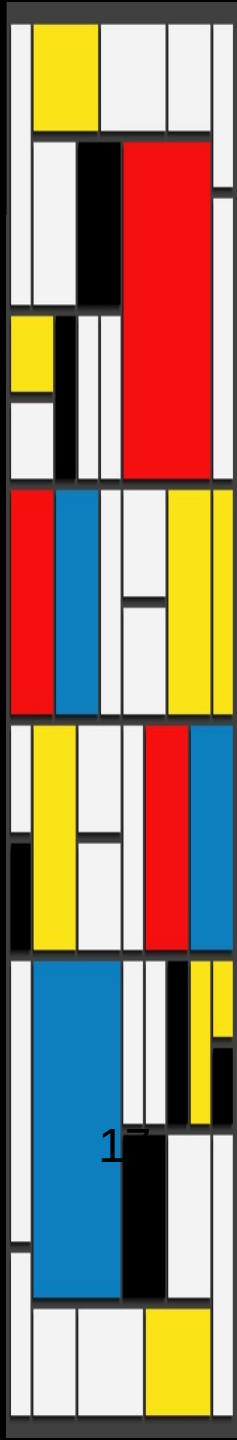
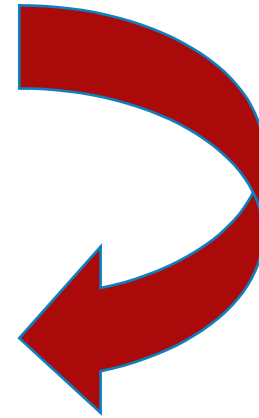
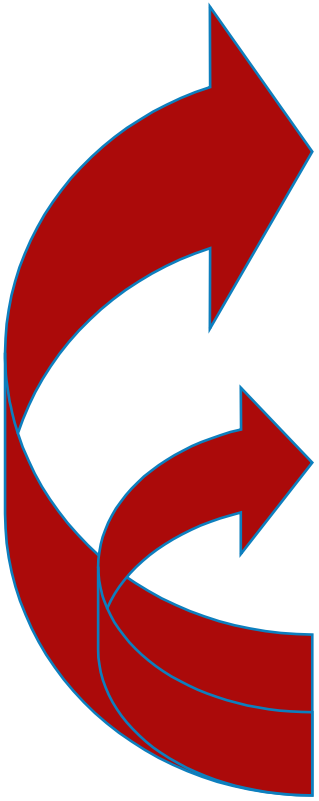
All stakeholders do not associate a complex landscape with significant benefits regarding the production variable



Difference of what is « significant »
between scientists and local stakeholders

Why such a knowledge gap between local
stakeholders and landscape ecology
findings?

Participatory Bayesian modelling about
individual stakeholder representations
(Scientific vs. Locals)



Conclusion

- Landscape complexity does not appear here to be in the interest of local stakeholders
- Need for more studies linking more explicitly potential ecological function with social demands
- Questioning the regular approximation that ecological function = ecosystem services.

Thank you for your attention

More information?

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