

Biodiversity and human activities

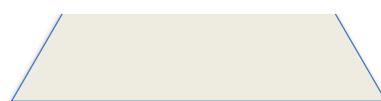
An innovative approach based on agroecology

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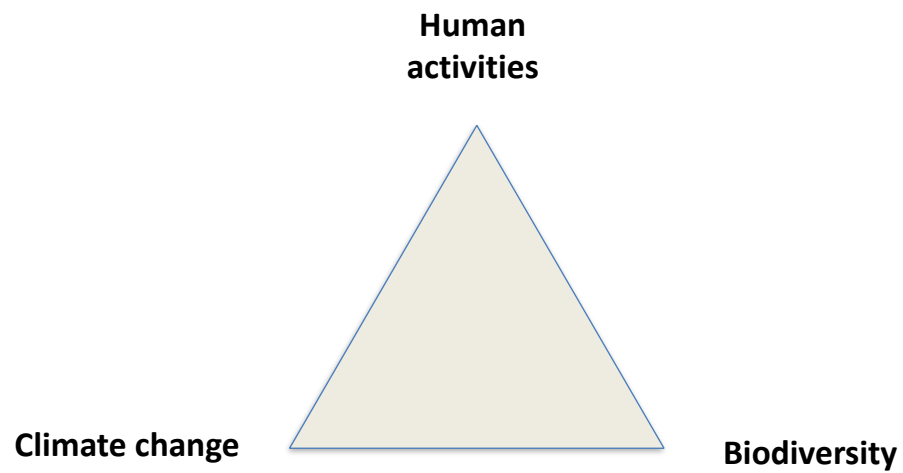
2 | A triangle

Climate change



Biodiversity

3 | A triangle



4 | Feeding the world is a matter of sustainability and equity

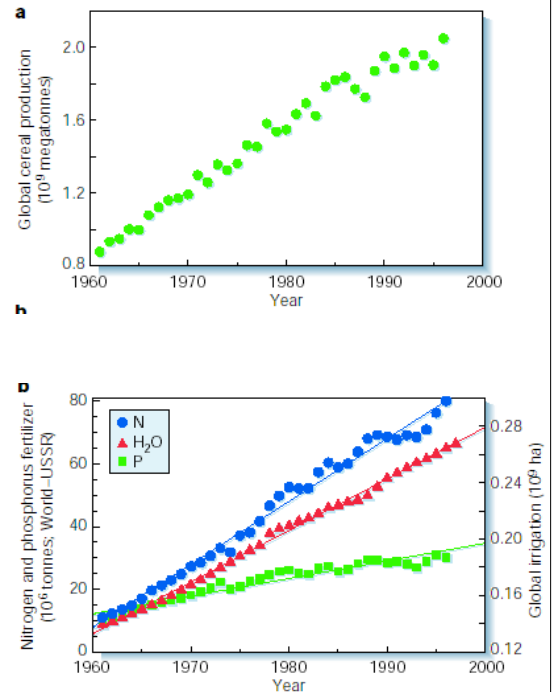


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1.1. New challenges of the XXIst century

- XXth century was marked by a dramatic increase in total productic
- With little attention to the renewability of resources and social and environmental impacts

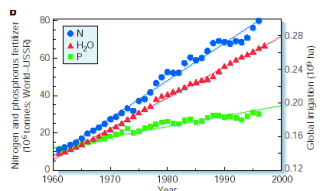
Tilman, 2002



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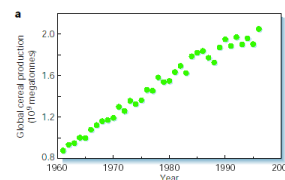
A two dimension discussion

Negative externalities
Incl. Loss of biodiversity



XXth century
Green revolution

Yield



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1.1. New challenges of the XXIst century (2)



Foley, 2011

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A new agenda for world agricultures

- Food systems must ensure the availability of food for everyone
- Agriculture must develop in ways that increase the incomes of smallholders
- Agriculture must not compromise its ability to satisfy future needs

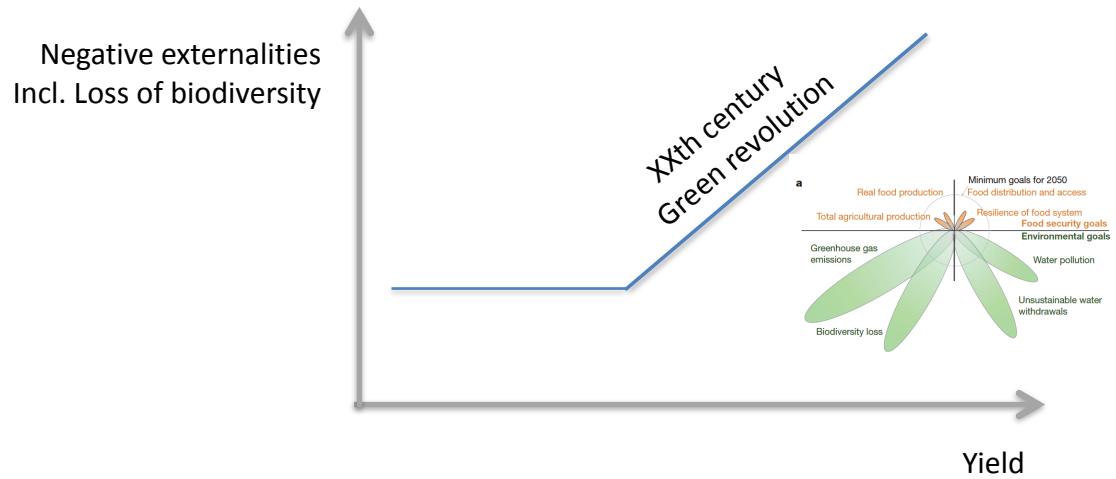
Right to food

Equity

Sustainability

Report submitted by the Special Rapporteur on the right to food, Olivier De Schutter (UN, 2010)

9 | A two dimension discussion



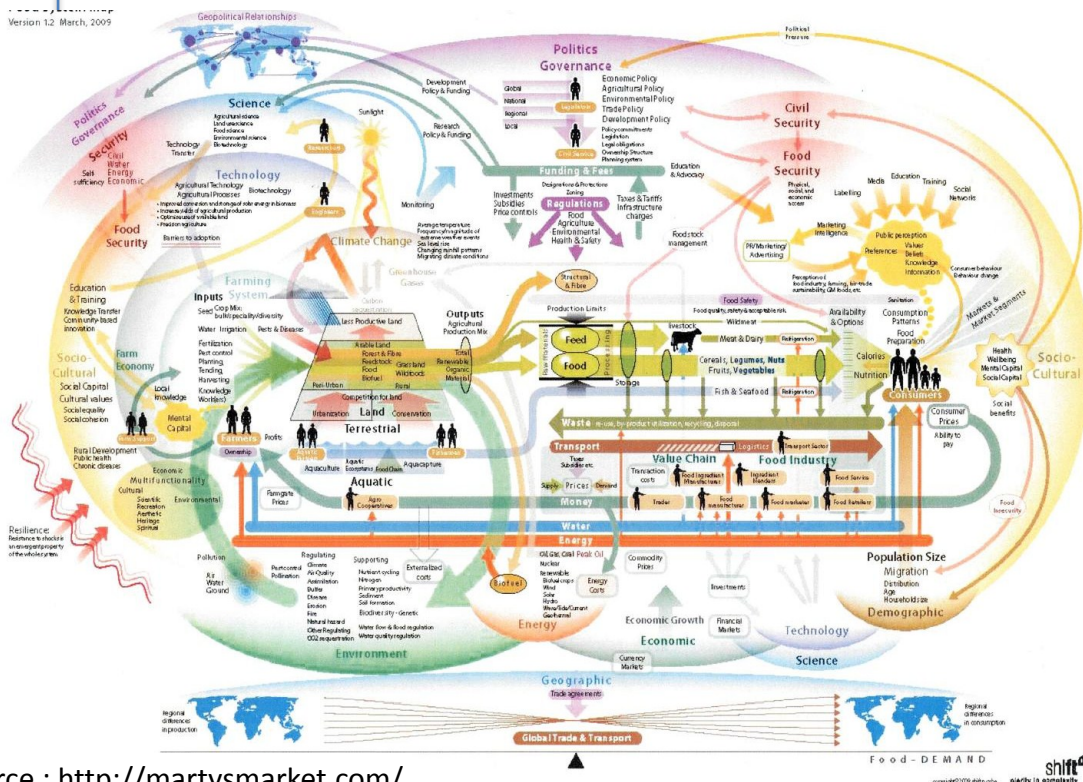
10 | Pathways for agriculture and food systems



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- Business as usual
- Sustainable intensification
 - An agriculture with less negative impacts
 - An ecologization of process
 - → new set of practices
- Agroecology
 - Agroecology is the application of ecological concepts and principles to the design and management of sustainable **food systems** (Gliessman, 2006)
 - Agroecology is both a science and a set of practices (...)
 - Agroecology is highly knowledge-intensive, based on techniques that are not delivered top-down but developed on the basis of farmers' **knowledge** and experimentation (De Schutter, 2010)

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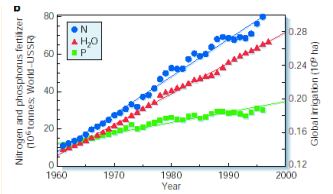


Source : <http://martysmarket.com/>

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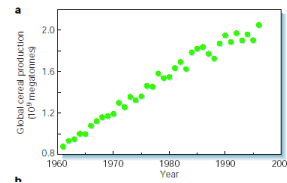
A two dimension discussion

Negative externalities
Incl. Loss of biodiversity



XXth century
Green revolution

Yield



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The two pathways

Negative externalities
Incl. Loss of biodiversity

XXth century
Green revolution

Path 1
Sustainable
intensification

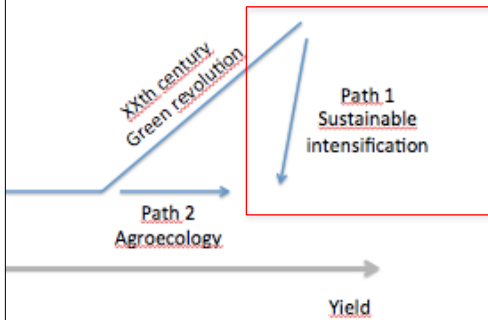
Path 2
Agroecology

Yield

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Along the sustainable intensification path

- Lock in effect



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The keyboard paradox



- The QWERTY keyboard : an innovation in a context
- Is it still relevant ?
- If not, why is it surviving ?
- Path dependency contribute to maintaining “irrelevant” systems



How agricultural research systems shape a technological regime that develops genetic engineering but locks out agroecological innovations

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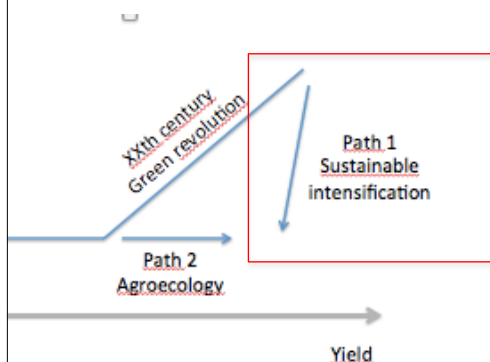
Transgenic plants

Lock-in

Path dependence

ABSTRACT

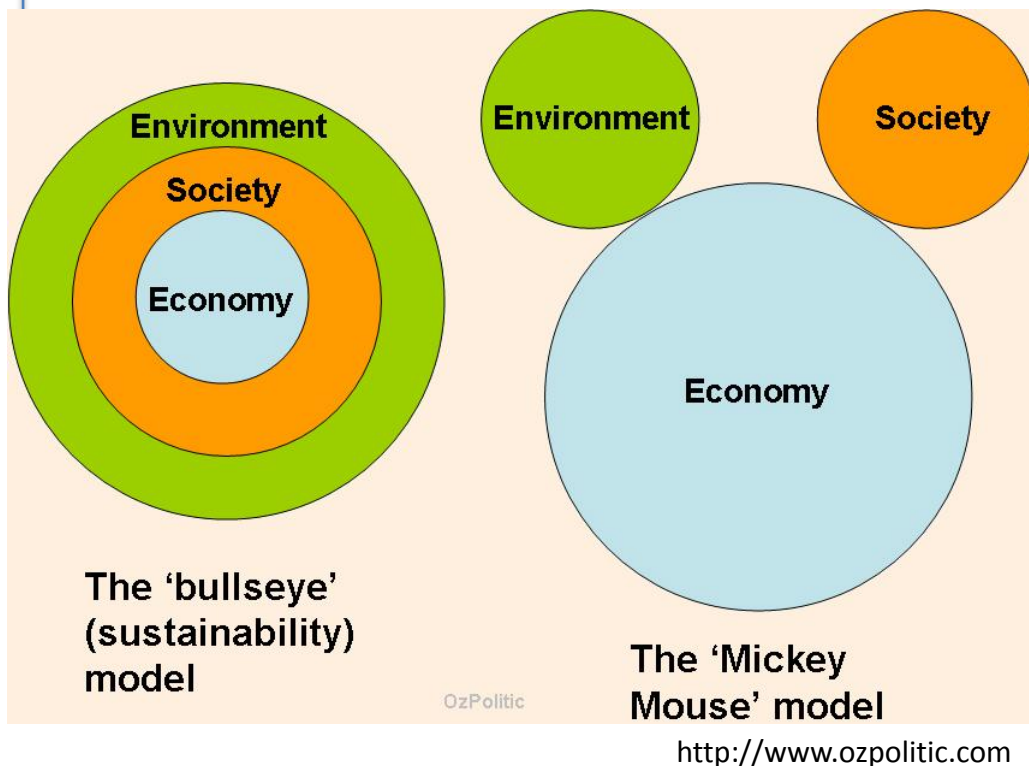
Agricultural science and technology (S&T) is under great scrutiny. Reorientation towards more holistic approaches, including agroecology, has recently been backed by a global international assessment of agriculture S&T for development (IAASTD). Understanding the past and current trends of agricultural S&T is crucial if such recommendations are to be implemented. This paper shows how the concepts of technological paradigms and trajectories can help analyse the agricultural S&T landscape and dynamics. Genetic engineering and agroecology can be usefully analysed as two different technological paradigms, even though they have not been equally successful in influencing agricultural research. We used a Systems of Innovation (SI) approach to identify the determinants of innovation (the factors that influence research choices) within agricultural research systems. The influence of each determinant is systematically described (e.g. funding priorities, scientists' cognitive and cultural routines etc.). As a result of their interactions, these determinants construct a technological regime and a lock-in situation that hinders the development of agroecological engineering. Issues linked to breaking out of this lock-in situation are



- Lock in effect
- Relevance of innovation
- Discussion on the nature of trade-offs
- Double performance is a myth !!

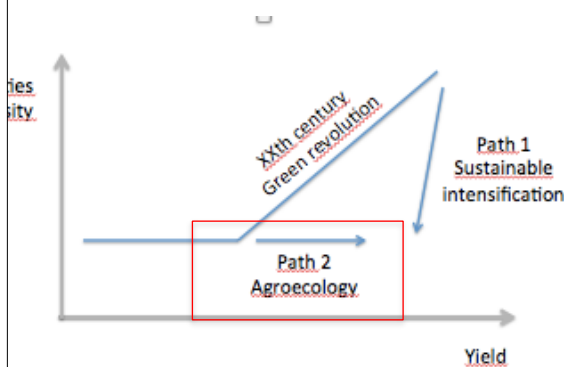
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Weak and strong sustainability



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Along the agroecology pathway



Why smallholders ?

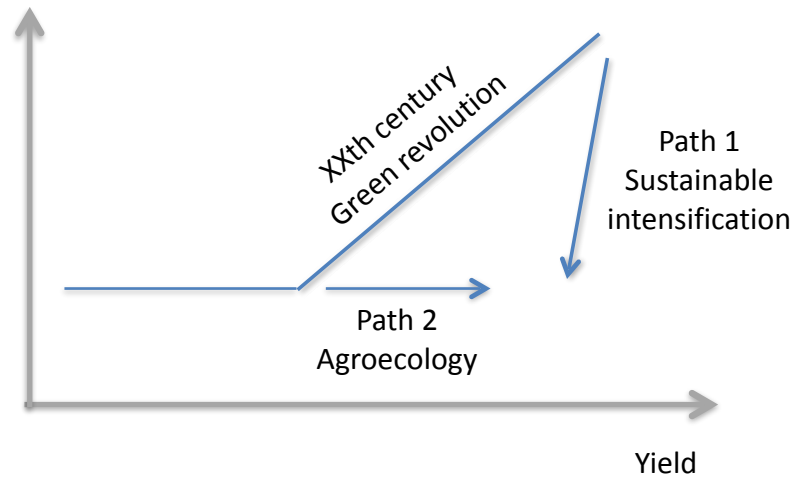
Objectivation of the present state

Smallholders ask for innovation

- Specific innovation
- Reappropriation of mainstream innovations
- Smallholders have specific knowledge
- Specific solutions are

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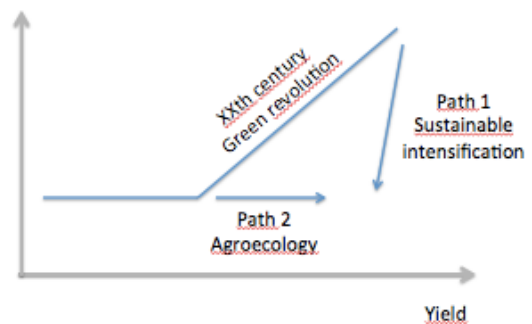
Let's do both ?



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How ?

- Objectivation
 - Targets
 - Competition/coexistence
 - Differential impacts of pathways
- Tools
 - Interdisciplinarity
 - Transdisciplinarity
- A matter of resources allocation



Elements for transdisciplinarity

- Outreach is not only communication
- Multidirectional interactions
- Complementarity of knowledges
- Which kind of partnership ?
 - Which partners ?
 - To do what ?
 - On which basis ? (convention, ...)

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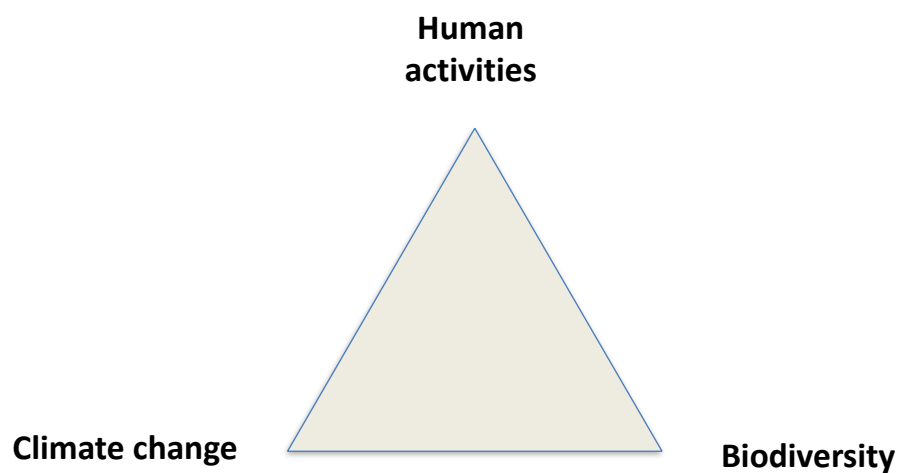
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Conclusion

- Recognize the diversity of pathways
- Compare solutions
 - On the right criteria
 - With the right people
- The balance between pathways will change over time

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A triangle





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