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The second generation of ecological economics: How far has the apple fallen from the tree

Gaël Plumecocq

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The Second Generation of Ecological Economics: How far has the apple fallen from the tree?

Why should we analyze EE?

- breaking-up with traditional disciplines (economics and ecology)
- intend to impact decision-making

How do the EE discourse have evolved within a generation period of time

Proposal: growing importance of ES and monetary valuation

Discourse analysis method applied to abstracts published between 1989 and 2013 in 5 academic journals



Gael Plumecocq

Fellow researcher - INRA (UMR AGIR)

EcoEco Seminar in Barcelona - 16-10-2013

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In what ways EE produces a discourse?



Post-Normality

EE is breaking with positive science

This comes with an ontology: at least, truth is influenced by problem structuring and pre-analytical choices

Account for the ways in which scientific knowledge are communicated

=> scientific discourses

What is this discourse
about?

Discourse is (also) about power

Not every discourse is
admissible within EE

in the conferences

David Pearce :
founding member and
associated-editor of
EE (1999)



ESEE conference in Versailles (1996) :
"EE is a Subdiscipline of Environmental
Economics"

internal discussions

in the journal

Clive Spash :
member of the
editorial board of
the journal in 2002



Few month afterward:
Outler Cleveland is
appointed editor-in-chief



external discussions

=> Rhetorical discourse

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GENERAL INFORMATION

Aims and scope. *Ecological Economics* is concerned with extending and integrating the study and management of "nature's household" (ecology) and "mankind's household" (economics). This integration is necessary because conceptual and professional isolation have led to economic and environmental policies which are mutually destructive rather than reinforcing in the long term. The journal is transdisciplinary in spirit and methodologically open.

Specific research areas covered include: valuation of natural resources, sustainable agriculture and development, ecologically integrated technology, integrated ecologic-economic modelling at scales from local to regional to global, implications of thermodynamics for economics and ecology, renewable resource management and conservation, critical assessments of the basic assumptions underlying current economic and ecological paradigms and the implications of alternative assumptions, economic and ecological consequences of genetically engineered organisms, and gene pool inventory and management.

Submission of articles. Manuscripts should be submitted in triplicate to the Editor-in-Chief, Dr. R.

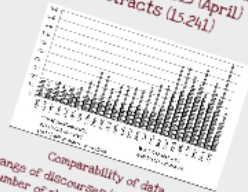
"Aims and Scope" have not changed since 1989

Very few changes in the editorial core team
(Costanza (89-02) ; Cleveland (02-07) ; Horwarth
(07-...), excepted for 2009

Data and method

Sample

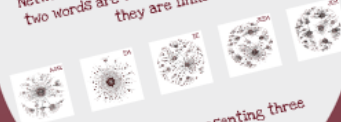
Five journals (AJAE, EE, EM, JEEM, JEM)
Period : 1989-2013 (April)
Abstracts (15,241)



Comparability of data
- range of discourses (2.5 - IF + 3)
- number of abstracts published

What are these journals all about?

Network of words used in the abstracts (if two words are used in the same abstract, they are linked)



Five journals representing three complementary trends

The Alceste method

Compressing information contained in large texts

Grouping of co-occurrent words in semantic classes (ie words used in the same context)

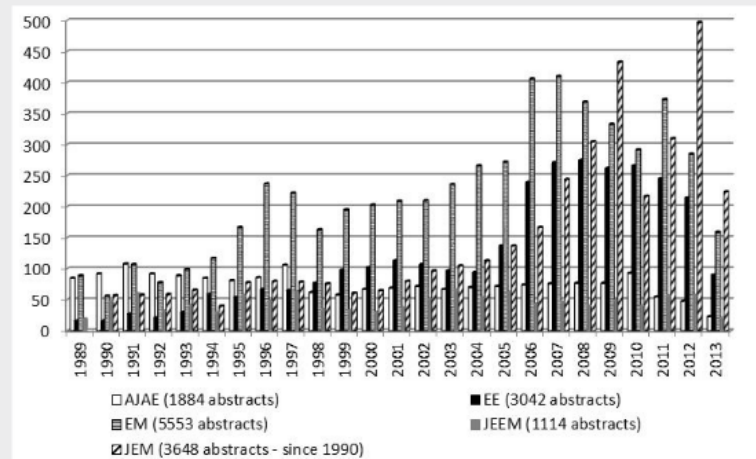
| | | | | |
|------------|-----|-----|-----|-----|
| category | 1 | 2 | 3 | 4 |
| abstract 1 | 0 | 1 | 0 | 0 |
| abstract 2 | 0 | 1 | 1 | 0 |
| ... | ... | ... | ... | ... |
| abstract n | 0 | 0 | 0 | 1 |

Grouping of abstracts - chi

Encoding of abstracts according to journals and years

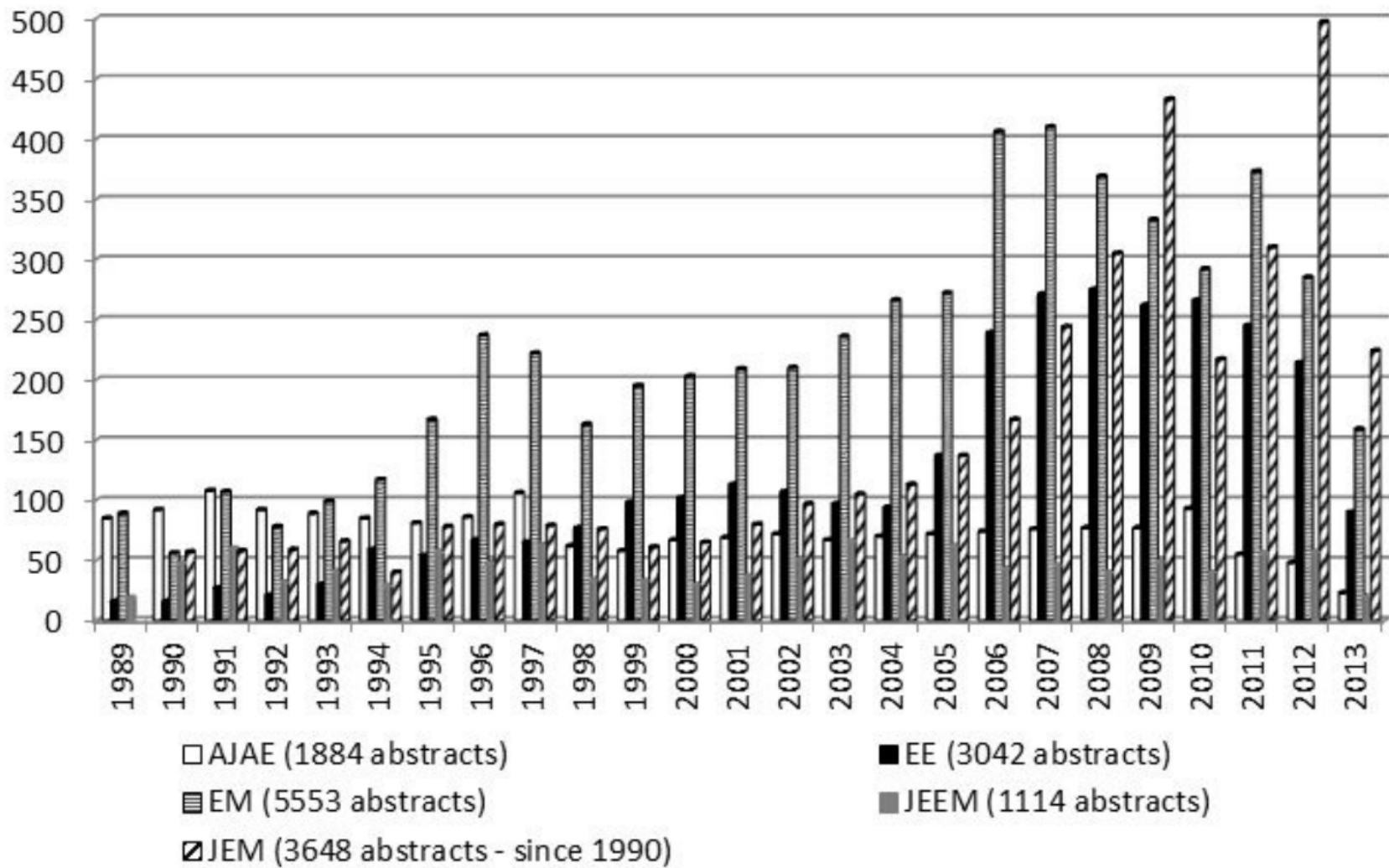
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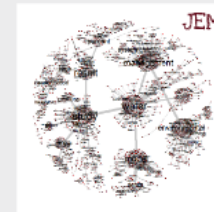
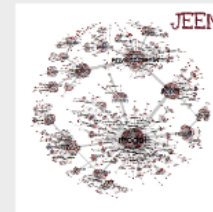
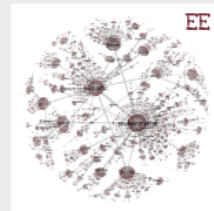
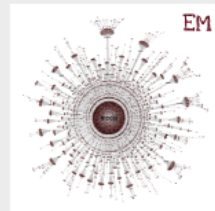


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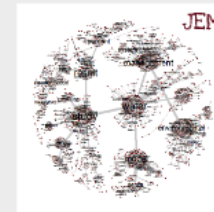
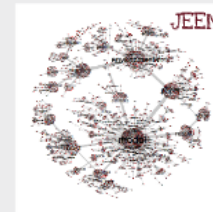
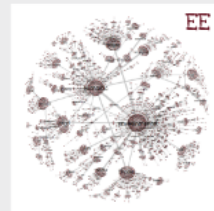
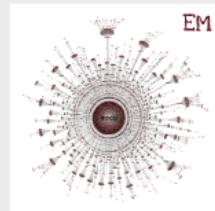
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| | word | word | word | ... | word |
|---------------------------|------|------|------|-----|------|
| Abstract 1/ Variable 1 | 9 | 6 | 0 | | 0 |
| Abstract 2 | 6 | 7 | 1 | | 0 |
| ... | | | | | |
| Abstract n | 2 | 0 | 9 | | 10 |

Grouping of abstracts \rightarrow χ^2

Encoding of
abstracts
according to
journals and
years

| | word | word | word | ... | word |
|---------------------------|------|------|------|-----|------|
| Abstract 1/ Variable 1 | 9 | 6 | 0 | | 0 |
| Abstract 2 | 6 | 7 | 1 | | 0 |
| ... | | | | | |
| Abstract n | 2 | 0 | 9 | | 10 |

Grouping of abstracts \rightarrow χ^2

Results

Evolution of EE in regard
to the context

Factor analysis:
the distance of the discourses of journals
(1990-2013)



Discourses in EE and in Environmental
economics tend to get closer

How is the EE discourse
evolving?

Textual processing on the EE abstracts
(1989 - 2013)

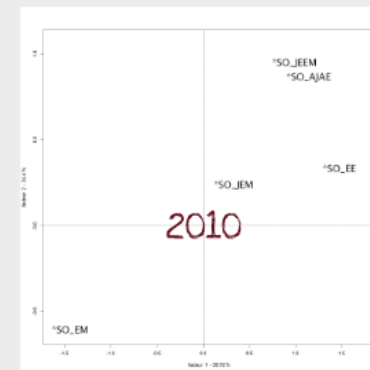
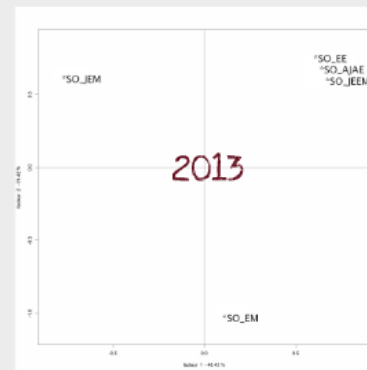
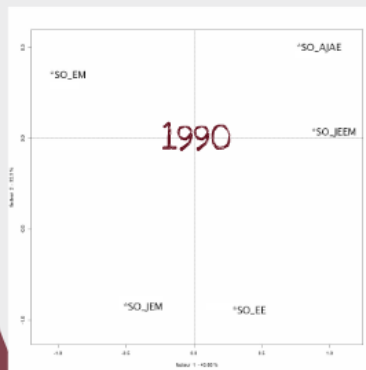
Definition of 7 periods
(1989-1993 ; 1994-2000 ; 2001-2005 ; 2006-2007 ;
2008-2009 ; 2010-2011 ; 2012-2013)

Vocabulary associated to each period

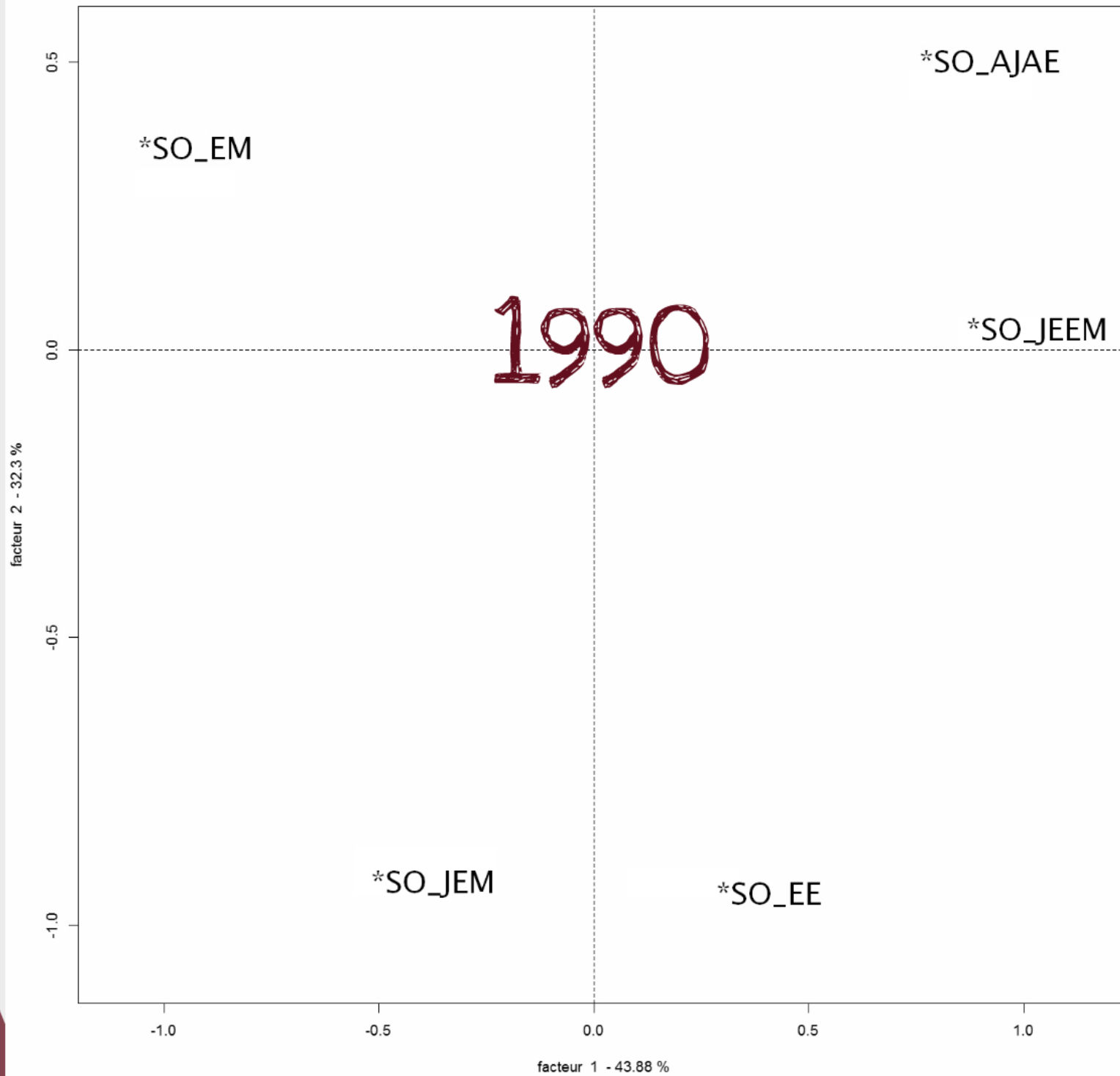
The table displays a list of words and their associated frequencies or weights across seven different time periods. The columns are labeled with the periods: 1989-1993, 1994-2000, 2001-2005, 2006-2007, 2008-2009, 2010-2011, and 2012-2013. The rows list various terms related to environmental engineering and economics, such as 'environment', 'economy', 'energy', 'pollution', 'climate', etc. The table shows how the usage of these terms evolves over time, with some terms becoming more prominent in later periods.

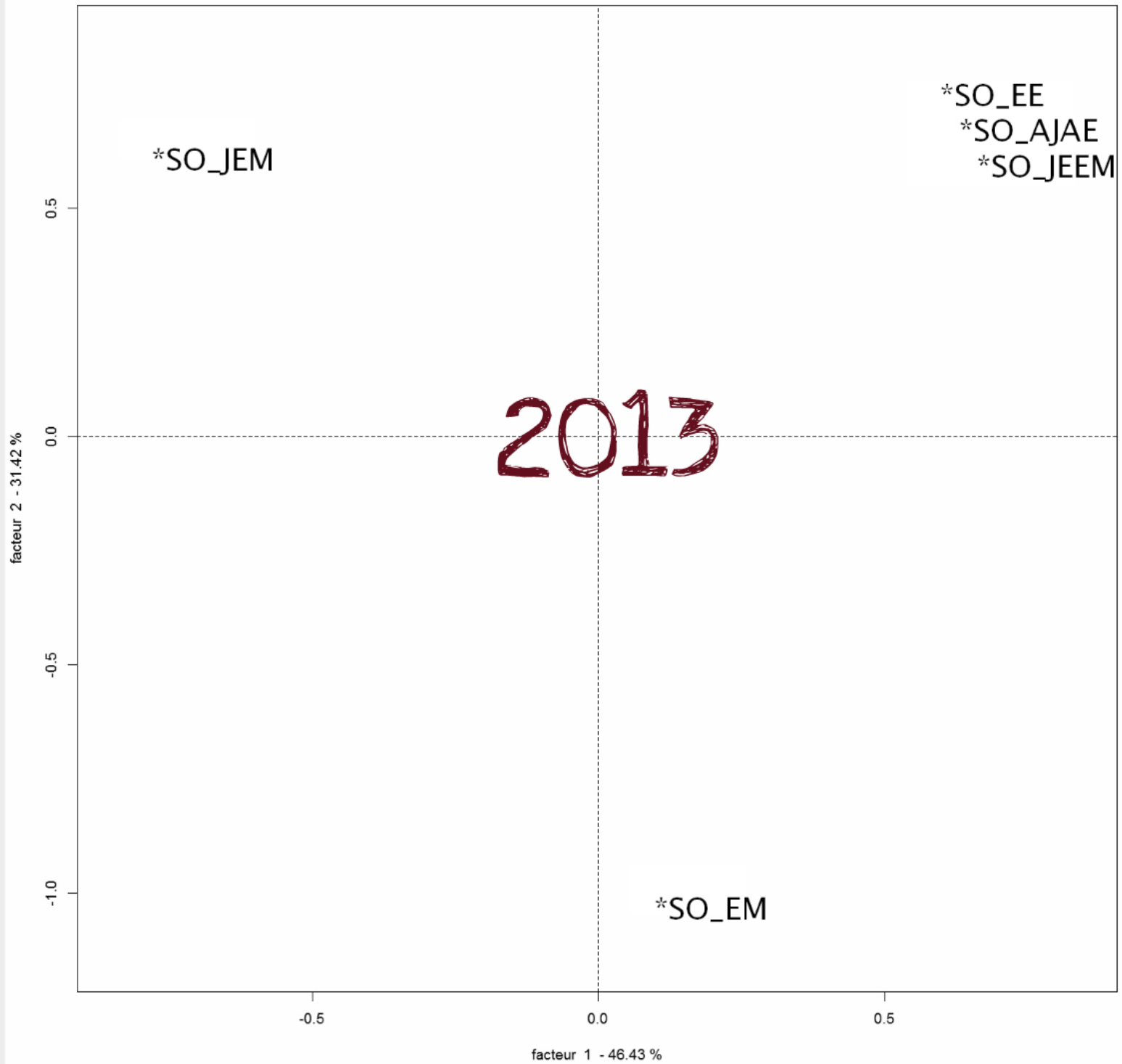
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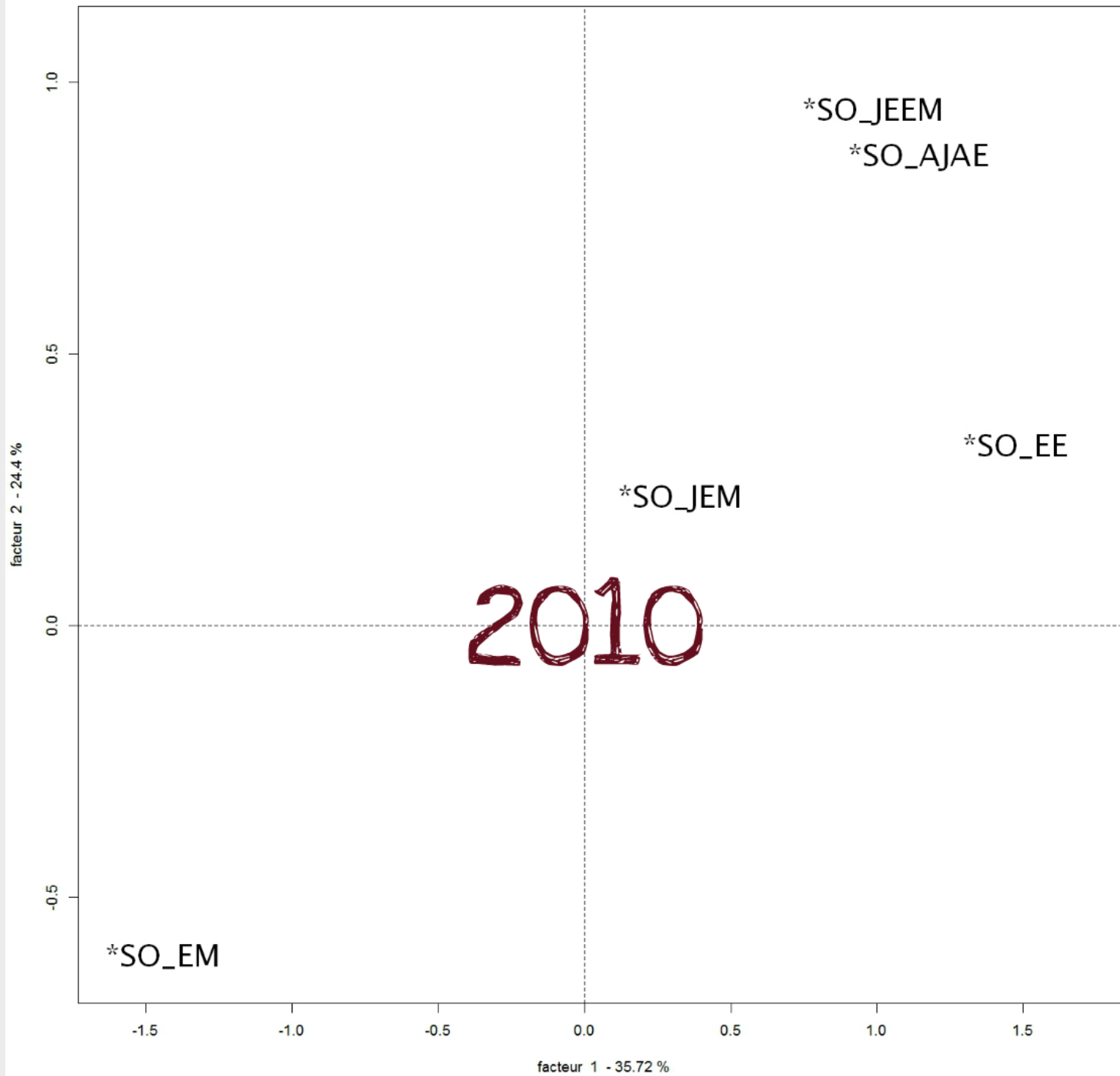
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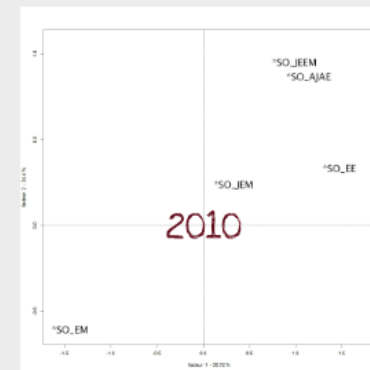
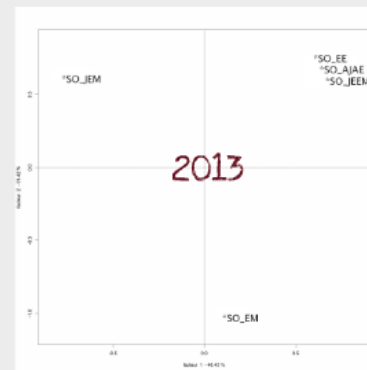
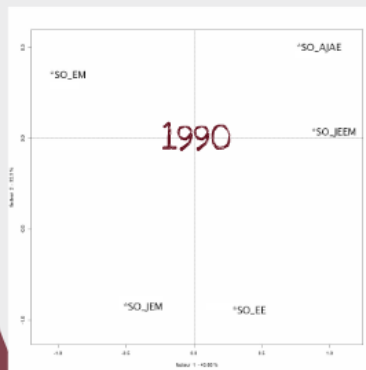






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Vocabulary associated to each period

| Conceptualizing 1989-1993 | | Economic positioning 1994-2000 | | Ecological positioning 2001-2005 | | Settlement 2006-2013 | | | | | | | |
|------------------------------|------|--------------------------------------|------|--|------|-------------------------|------|-------------|------|----------------|------|----------------|------|
| Words | KMI | Words | KMI | Words | KMI | Words | KMI | Words | KMI | Words | KMI | Words | KMI |
| "E_1 | 9133 | "E_2 | 9138 | "E_3 | 9139 | "E_4 | 9139 | "E_5 | 9138 | "E_6 | 9138 | "E_7 | 9149 |
| energy | 876 | science | 58 | energy | 87 | climate | 26 | business | 35 | energy | 159 | wp | 179 |
| environment | 48 | progress | 82 | land | 43 | wp | 32 | use | 27 | po | 77 | class | 40 |
| science | 47 | social | 38 | pollution | 44 | account | 29 | top | 27 | high | 53 | research | 34 |
| operation | 40 | concrete_direct | 35 | hiking | 59 | data | 18 | climate | 25 | ecosystem_serv | 45 | intergrowth | 30 |
| DBI | 39 | activities | 32 | abundance | 32 | over | 17 | data | 25 | evaluation | 49 | model | 30 |
| setting | 35 | units | 32 | gender | 25 | service | 17 | space | 21 | integration | 26 | performance | 25 |
| man | 33 | human | 30 | oil | 25 | migration | 15 | sector | 18 | partner | 29 | business | 24 |
| climate | 32 | city | 29 | divers | 21 | car | 15 | po | 18 | class | 25 | climate | 24 |
| market | 30 | energy | 35 | technology | 31 | method | 15 | model | 16 | performance | 24 | challenge | 23 |
| socialized | 30 | public | 25 | area | 29 | size | 15 | use | 16 | high | 22 | challenge | 20 |
| social | 30 | environmental | 23 | land | 19 | magnitude | 12 | basic | 15 | location | 21 | class | 19 |
| sector | 30 | concept | 31 | suburban | 16 | wp | 12 | feature | 14 | high | 17 | bc | 17 |
| service | 28 | workload | 20 | over | 15 | model | 11 | entire | 14 | energy | 17 | class | 16 |
| market | 28 | socialized | 19 | model | 14 | performance | 11 | performance | 14 | climate | 16 | model | 16 |
| land | 23 | deregulation | 18 | object | 14 | suburban | 10 | energy | 13 | concern | 16 | infrastructure | 15 |
| diversity | 22 | policy | 17 | oil | 13 | sector | 10 | space | 13 | concern | 16 | business | 15 |
| land | 22 | model | 17 | oil | 13 | sector | 10 | top | 13 | effect | 16 | land | 14 |
| class | 22 | model | 17 | oil | 13 | sector | 10 | track | 12 | experience | 16 | concern | 14 |
| class | 21 | collaboration | 16 | concern | 11 | land | 9 | policy | 12 | education | 15 | service | 14 |

Conceptualizing 1989-1993

Economics positioning 1994-2000

| Words | Khi2 | Words | Khi2 | Words |
|---------------|-------------|-------------------|-------------|--------------|
| *P_1 | 9533 | *P_2 | 9135 | *P_3 |
| entropy | 126 | econom | 58 | cop |
| thermodynamic | 48 | mangrove | 52 | bre |
| resource | 47 | natural | 38 | pre |
| equivalent | 40 | sustainable_devel | 35 | bio |
| think | 39 | argument | 32 | aba |
| ecolog | 33 | sustain | 32 | gen |
| man | 33 | ocean | 30 | co2 |
| deterior | 32 | ethic | 29 | div |
| natural | 30 | ecolog | 25 | tec |
| neoclassical | 30 | problem | 25 | ani |
| wetland | 30 | environment | 23 | bas |

Globalizing
1993

Economics
positioning
1994-2000

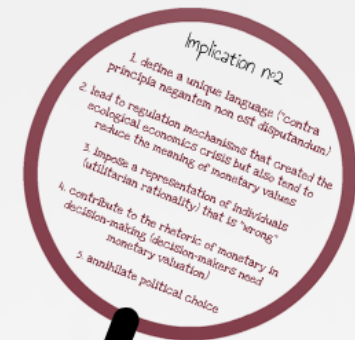
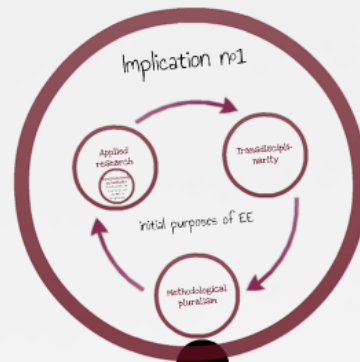
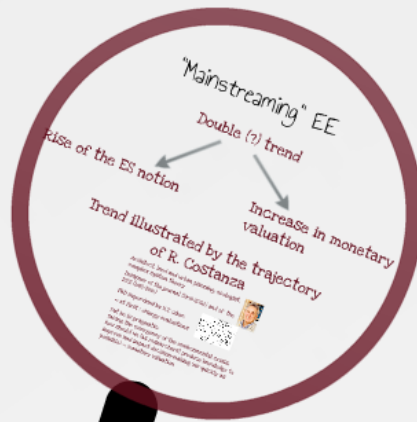
Ecological
positioning
2001-2005

| Khi2 | Words | Khi2 | Words | Khi2 | Words |
|-------------|-------------------|-------------|--------------|-------------|--------------|
| 9533 | *P_2 | 9135 | *P_3 | 9135 | *P_4 |
| 126 | econom | 58 | copper | 52 | disaster |
| 48 | mangrove | 52 | breed | 47 | ntfp |
| 47 | natural | 38 | predator | 44 | account |
| 40 | sustainable_devel | 35 | biolog | 39 | data |
| 39 | argument | 32 | abatement | 32 | cover |
| 33 | sustain | 32 | genetic | 25 | service |
| 33 | ocean | 30 | co2 | 23 | migratio |
| 32 | ethic | 29 | divers | 21 | car |
| 30 | ecolog | 25 | technolog | 21 | method |
| 30 | problem | 25 | animal | 20 | state |
| 30 | environment | 23 | basi | 18 | magnitu |

Settlement 2006-2013

| Words | Khi2 | Words | Khi2 | Words | Khi2 | Words | Khi2 |
|------------------|-------------|----------------|-------------|------------------------|-------------|-----------------|-------------|
| *P_4 | 9135 | *P_5 | 9135 | *P_6 | 9135 | *P_7 | 9549 |
| disaster | 38 | biomass | 35 | reserv | 156 | wtp | 179 |
| ntfp | 32 | case | 27 | pes | 77 | cities | 40 |
| account | 20 | npp | 27 | right | 53 | transact | 34 |
| data | 18 | climate | 25 | ecosystem_servi | 45 | heterogencit | 30 |
| cover | 17 | dairy | 25 | coevolution | 40 | resili | 30 |
| service | 17 | water | 21 | irrigation | 26 | payment | 25 |
| migration | 15 | occurr | 18 | justice | 26 | boundaries | 24 |
| car | 13 | pes | 18 | china | 25 | climate | 24 |
| method | 13 | result | 18 | payment | 24 | challenge | 23 |
| state | 13 | eco | 16 | logit | 22 | findings | 20 |
| magnitude | 12 | basin | 15 | location | 21 | urban | 19 |
| wtp | 12 | footprint | 14 | help | 17 | fee | 17 |
| coastal | 11 | outcome | 14 | origin | 17 | chain | 16 |
| province | 11 | payment | 14 | climate | 16 | norm | 16 |
| valuation | 11 | average | 13 | common | 16 | infrastructure | 15 |
| catchment | 10 | spain | 13 | communic | 16 | literature | 15 |
| measur | 10 | year | 13 | effect | 16 | bound | 14 |
| criteria | 9 | financial | 12 | experiment | 16 | communic | 14 |
| identify | 9 | predict | 12 | mitigation | 15 | services | 14 |

Interpretations and implications



"Mainstreaming" EE

Double (?) trend

Rise of the ES notion

Increase in monetary valuation

Trend illustrated by the trajectory
of R. Costanza

Architect, land and urban planning, ecologist,
complex system theory

Designer of the journal (1989-2002) and of the
ISEE (1988-1998)



PhD supervised by H.T. Odum

→ at first : eMergy evaluations



But he is pragmatic:

facing the emergency of the environmental crisis,
how should we (as researchers) produce knowledge to
improve and impact decision-making (as quickly as
possible) → monetary valuation

of R. Costanza

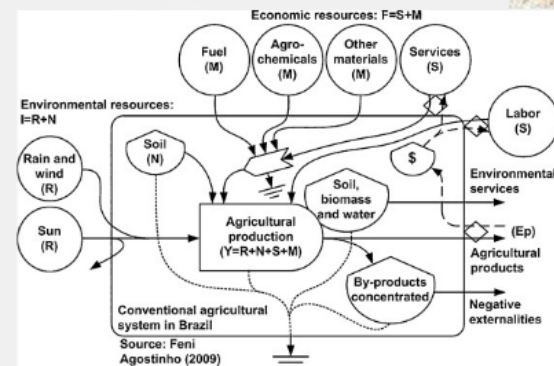
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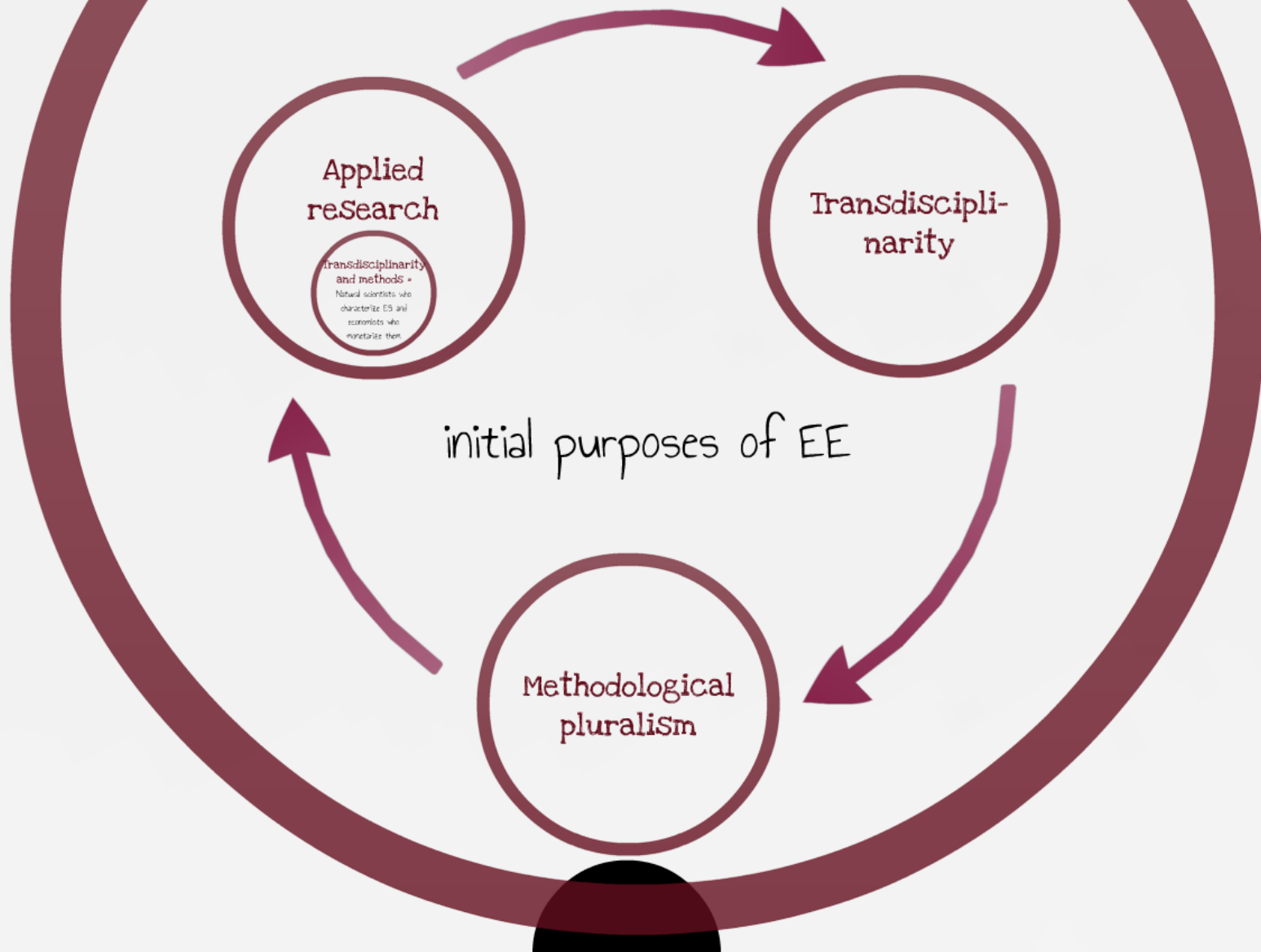
=> at first : eMergy evaluations



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Implication n°1



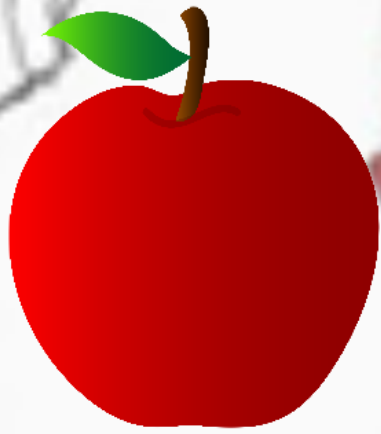
Applied reSearch

Transdisciplinarity
and methods =

Natural scientists who
characterize ES and
economists who
monetarize them

Implication n°2

1. define a unique language ("contra principia negantem non est disputandum")
2. lead to regulation mechanisms that created the ecological economics crisis but also tend to reduce the meaning of monetary values
3. impose a representation of individuals (utilitarian rationality) that is "wrong"
4. contribute to the rhetoric of monetary in decision-making (decision-makers need monetary valuation)
5. annihilate political choice



Conclusions

The apple is blowing in the wind

- EE is more and more concentrated on ES monetary valuation
- Main reason for this: have an impact on decision-making

Questions the relationships between ecologists and economists within EE but also outside of the community

Gracias por su atención



Any comments or critiques
Please send to:
gael.plumecocq@toulouse.inra.fr

Gracias por su atencion



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