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Environmental Governance in Latin America and the Caribbean

SEVENTH FRAMEWORK PROGRAMME

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Origins and shifts in meaning of ENGOV's keywords. A bibliometric study

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EXECUTIVE SUMMARY

A. Aim of this Report and Methodology

1. Purpose

The aim of this Report is to tackle a big corpus of bibliographical data. The chosen bibliographical corpus is large enough to represent a variety of research approaches on governance and the environment. The survey has been conducted on a long term frame (from 40 to 50 years). Our goal is to connect the concepts and terminology used in ENGOV with a broader picture. We also focused on the different interests that historically motivated the research linked with those terms.

2. Methodology

We have followed two different strategies:

- By searching **keywords** associated to the project ENGOV.

We chose eight keywords: Nature, Environment, Sustainable development, Governance, Indigenous knowledge (or traditional knowledge), Biotechnology, Agro-[biology, ecology, forestry], GMO. We searched for the origins; historical trajectory (expansion, enthusiasm, decline); carriers (main authors, institutions, place of expression, funding agencies). We measured the relative weight of these terms in the whole indexed literature. We analyzed the polysemy associated with these terms (the terms are used beyond the field of environmentalist studies and even there the variety of approaches is considerable).

- By focusing on **a number of journals**, widely considered as major journals, and covering a variety of approaches in agriculture and environmental studies.

We scrutinized the space of reflection explored in these journals. We extracted words and expressions favored in each journal and followed their evolution. We are thus able to characterize some of the main prototypical interests in the field of studies. We have plotted graphs representing the space of thinking constructed by a journal by highlighting the links thus established inside a whole host of words and measuring the intensity and position (both proximity and mutual separation). Those graphs can now be freely accessed on the internet. There it is possible to zoom in on specific word clouds.

We have focused our study on social sciences and the humanities as they reflect most societal debates on the environment and are the proper area for the notion of governance. We have focused on academic

writing (even if academic vocabulary is rarely if ever a precursor in this domain). Academic writing is nevertheless a compulsory pass that notions need to go through in order to get legitimized. We have thus used the bibliographical data base of WoS (SSCI). This database is large, old and reliable enough in spite of well-known biases (English is the most favored language). Even though WoS has made an effort to correct those biases and index more Latin American author, we thought it would be useful as a next step to establish a comparison between these data and and a local database (in Portuguese or Spanish).

B. Results: Lexicon of keywords. Weights and trajectories

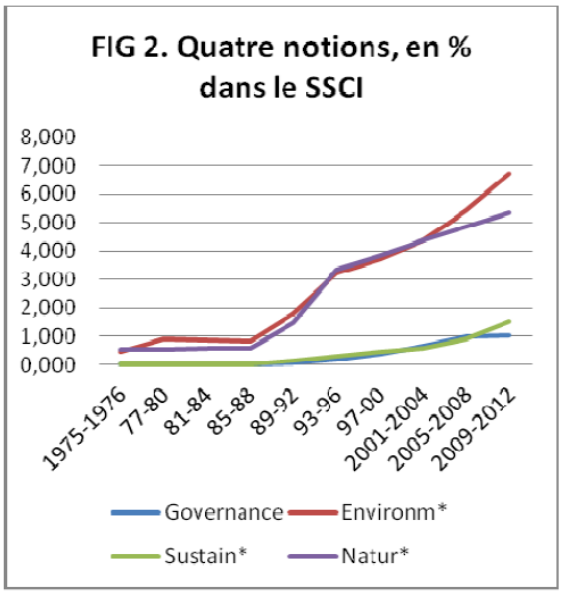
1. Weight of words

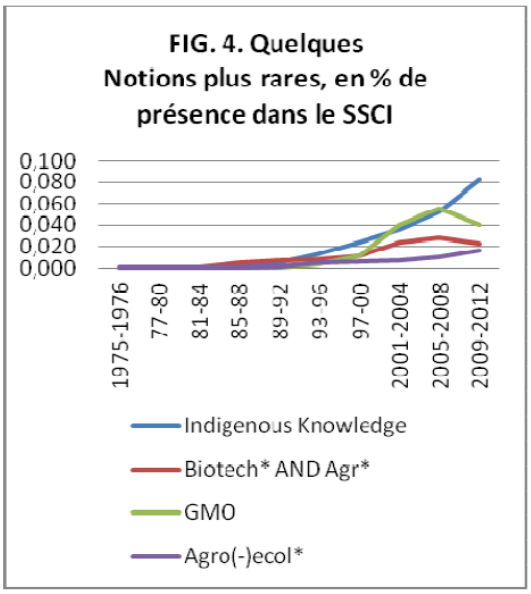
The keywords that pertain to our project have a very variable weight in social science. Two among them are frequent (from 1995 and specially from 2005): "*Nature*", and *"Environment*". Those are also the most polysemous. Their use is far from being limited exclusively to the researches here relevant. They can be found, independently, in psychology, medicine, urbanism, and many other fields. The notion of environment has encountered a strong expansion. It appears now in close to 7% of all indexed articles. The same term was almost invisible in 1975. This growth reflects an expansion of the field of environmental studies. This field is no longer concentrated almost exclusively on conservation or agriculture and it increasingly pays attention to energy crises, water management crises, climate change and the worries associated to unsustainable management of resources in a new threatening epoch for humanity: the "Anthropocene".

Two other notions have a lower score yet they are relatively important: "sustainability" and "governance". Those two notions aroused a high degree of interest starting in the 1990s. Diffusing from the USA they are now especially used in Europe.

It may be seen as surprising that certain words referring to resounding controversies – GMO, agricultural biotechnology vs. agro-[biology, ecology, forestry] – are mentioned rather sporadically and almost *en passant*. The notion of "indigenous knowledge" is paradoxically successful. It is also an older notion, carried by anthropologists, and in continuous growth, being present in 1 article of every 1000, twice as often as "OGM".

The following figures can summarize these data:





2. Trajectories of words

The historical trajectory of words (expansion, enthusiasm, decline) shows that in this field social science is rarely the motor that drives their history. With a few exceptions – the creation of an ecological economy, the revisiting of the notion of Nature by anthropology, the way philosophy incorporated more ethical studies and science and society studies) the evolution of these terms hardly ever comes from the internal dynamics of academic disciplines. It rather follows the intellectual trends carried by mavericks, encouraged by social movements, and adopted by official authorities or international organizations (Paris Conferences 1968, Stockholm 1972, Rio 1992). New fields of research are opened, informative studies are developed while bold innovations in the usage of words take place and often far-reaching shifts in meaning are implied.

3. Meaning of words

The notions that frame the ENGOV project have a diverse conceptual status.

The term of "**Nature**" is a long established concept essential mainly both to philosophy and anthropology (nature/culture divide). It pertains also to different trends in psychology working on representations. Questions concerning certain environmental or ecological problems have been attached to this issue. Such questions are present in about 11 000 of 50 000 articles mentioning the concept (recent period 2009-2012). That is approximately as many occurrences as those relevant to psychology and many more than those that can be linked to other general questions.

Under the entry “Nature”, linked with the labels ethics and philosophy, there is a significant amount of articles referring to GMOs as well as their alternatives Agro- (biology, ecology, forestry…). The controversies that link to these terms are discussed, as well as the differences in perception and legislation between Europe and the USA. As previously mentioned, the numbers of such articles is relatively low. More generally, the notion of “Nature” is now brought by the expansion of the notion of “environment”.

The term “**Environment**” has a more ambiguous status. In materials science and the life sciences, for long it has been a methodological tool, even a theoretical resource (catalysis chemistry, nanotechnology): the variations of the properties of a body in different environments are studied. In the life sciences, the reactions of a living being to its environment are studied. Environmental sciences specialists prefer to use then the better defined concepts of ecology or ecosystem.

In social sciences, the term designs rather a subject or a field of study. It has become trendy, but in a rather pragmatic fashion and not as much by its intellectual scope. A small trend of ecological critique maintained a low profile in the years 1960s and 1970s. It has been amplified following the publication of certain impactful books (*Silent Spring*, 1962), international Conferences, and a growing concern in public opinion. In science, the word does not expand before the 1980s. It is used then as a theoretical tool in the elaboration of an ecological economy. This one does not so much try to rebuild economy from scratch as it criticizes and tries to renovate neo-liberal theory. It tries to fix certain some of its weaknesses: its limitation to capital and work “factors”, its neglect of activities outside the market or priceless factors, its difficulties to estimate the long run. The discipline of management also follows the trend by trying to accommodate these criticisms.

The term “**Sustain***” (robustness, endurance) has deeper intellectual roots. It is linked to old trends (18th century). In a more timely fashion, these ideas have regained meaning in the 1950s by encouraging reflection on the future of humanity. Caught in other debates (on justice and freedom), and other subjects (class struggle, social movements, urbanization, identities…), academia had barely paid full attention to these ideas. Non-academics and mavericks have been the first to raise the alarm on the threat of a growing demography and its consequences for the third world. Different trends are intensified then: a first one underlines the limits of ecological plasticity and the risks associated with the depletion of natural resources. This trend gains support by academics in the natural sciences (botany, pedology, geography, hydrology). Facing the conquering expansion of molecular biology they reunite under a different approach: ecology and conservation of nature. Public opinion will incorporate this perspective twenty years later; a second trend pursues the critique of consumerism of the 1970s, underlines the waste of resources and defends a slow growth or degrowth. In the USA and the rest of the world this trend will influence certain political figures facing the economic crisis and the energy crisis; a third trend advances a form of skepticism on the infinite potentiality of science to overcome all problems. This trend criticizes technological alienation (J. Ellul), and its uncivilized, even brutal, consequences (A. Nandy).

These movements are supported by activists and decision-makers working in sectorial policy or international organizations. The social sciences world finally catches up. Impactful works are published

and commented (*Blueprint for Survival*, 1972, *The Limits of Growth*, 1978, and the influent *State of the World)*. New perspectives are proposed and they attract considerable attention in the social sciences world: “environmental studies” makes its debut in indexed journals in the early 1980s.

It is however economics that captures the question from 1985 as a rethinking of the discipline is pursued. Ecological economics appears as a creative and constructive enterprise. Its reach will persuade certain decision-makers. It opens new roads for field studies that are carried in an increasing number from 1995. A growing enthusiasm follows and finds application in certain concrete problems of management, markets and “what” and “how to” approaches (“best practices”). Observational studies (about environments or certain projects) are developed. A special place is given to studies in environmental engineering.

The notion of “**Indigenous Knowledge**” expands in the 1990s and blooms in the 2000s. It will end up being appropriated by the “environmental studies” and the anthropologists working in this domain.

It demarcates itself from other, more frequent, notions such as “local knowledge” and “traditional knowledge”. The expression “local knowledge” is more linked to certain problems of memory, cognition, adaptation, but also innovation and learning (technological).

“Indigenous knowledge” is launched around 1980 by engaged agronomists working in development projects as they reassess farmers’ know-how. Starting in the 1990s, the notion acquires a more militant meaning that highlights the dependency and marginalization in which “indigenous” populations are kept. It aims to support a struggle for fair participation in the benefits of development (juridical dispute). More radically, it may call for emancipation.

The term “indigenous knowledge” begins from a profound debate: is modern science just another form of ethnoscience? Respect for “indigenous know-how” (or “local knowledge”) embodies a challenge directed towards the exclusive legitimacy reached by conventional forms of scientific knowledge. These forms of scientific knowledge are sometimes suspected as foreign, imported by force, and not being more expert than other forms of knowledge. However it is not sure that a true debate on the plurality of forms of knowledge is here at stake. Perhaps this debate has not even been started. The expression “indigenous knowledge” is often used as an extra argument, in the lobbying done by agronomists, environmentalists for the consideration of public opinion, decision-makers and funding agencies. This is done in a similar fashion as “scientific knowledge” is used by other communities (for instance, the biotechnology community). Indigenous knowledge is hardly an instrumental concept applied to development projects, with some exceptions such as medical practices, particularly in psychiatry.

The term “**Governance**” is almost absent from the SSCI until the beginning of the 1990s. Its origins are to be found in the preoccupation of university officials, medical services, innovative urbanism projects, aiming to conducting change with a minimum of internal tensions. They suggest a friendly conflict management at a microinstitutional level, mainly in the public sector. Towards the end of the 1980s the word is imported in the domain of law and organizational science. Its aim is firstly to find a solution to dissent among shareholders and CEOs. The joining of Harvard (and its Business School) marks a turning point in the popularity of the notion. By transposing and generalizing the notion of “regime” (applied to

states) to all kinds of domains, scales and organizations, the notion is opposed to that of “government”. It hints to a restriction of the domains of intervention of the powers of the state, and a rethinking of the forms of democracy, not just in its representative nature (parliamentary system) but also in its participatory nature (including facing the power of lobbies), even in its direct form (through the intervention of “social networks”). Several American universities join the cause.

However, it is only from the early 2000s that environmental studies start making a significant use of the term. European Universities call the shots then: they will success in persuading the European Community to pay special attention to this flagship. The notion of governance first mainly used in the context of corporations, public administration and political science, becomes then highly successful. Part of this success comes from its expansion in the field of environmental studies (2nd main field of usage in 2012). The notion diffuses then even more widely. Europe (especially Northern Europe) remains the main diffusion center. The opinion leaders (the most published and cited authors) come from this geographic area. Every debate on environmental questions must now incorporate the notion of governance. The points of interest are extended: these relate to the evolution of the Earth (depletion of resources, climate change, water crises and energy crises, etc.) and the quest for a supranational form of government in the new epoch of the “Anthropocene”.

C. Results. Words associations in a set of journals

We have delved into the titles and abstracts of all articles published from 1975 in seven prestigious journals offering a variety of approaches to agriculture and the environment.

1. **On some methodological paradoxes (see illustrations in the text):**

a) In spite of what may appear as a tempting option, it is highly unadvisable to delve into the content of a mixture of journals that may appear to cover the notion in their title. As an example, a set of 6 big journals that include the word Natur* in their title offers a very incongruous view, neither clear nor definite. The most relevant points in such a picture would be biased due to the relative weights of each journal (certain journals publish many more articles in a same period).

b) As a research strategy, one should not trust the mere title of the journal. Although well known to researches, certain important differences may nonetheless be disregarded by a non-specialist. Thus, the Journal of Natural Products focuses on the industrialization of the products of gathering and related research in this area. However, the Journal of Natural Resources is a “conservationist” platform, much more interested in preservation of species than in the praxis and development of populations in their environment.

c) Our tests have shown that the extraction of uni-terms reveals the editorial policy of a Journal and the weight of the major concerns in its pages. But taking bi-or tri-terms into account offers a better understanding of meanings of terms.

2. Editorial stability and compartmentalized areas of reflection

a) Stability at the level of the editorial policy gives each journal a strong identity. Each journal takes care of this editorial policy and keep it more or less unchanged for decades. This is due to the need of a stable readership, and to attract contributions from a specific approach in an oriented way.

b) Thus, there exist only a few journals where opposed approaches meet. In the best of cases, the covered field is a discipline (for instance, agronomy) which does not cover the concerns of related disciplines (for instance, molecular biology or biotechnology). Those concerns are expressed in other journals, reference points in their community.

c) Concerning the debates that bring us here, the important journals are "meta-journals" (in as much as they periodically collect reviews on different topics to obtain a broad picture of the field. Of special interest are also those journals that focus on values over technology (two examples are: Agriculture *Agriculture & Human Values*, or *Science, Technology & Human Values)*

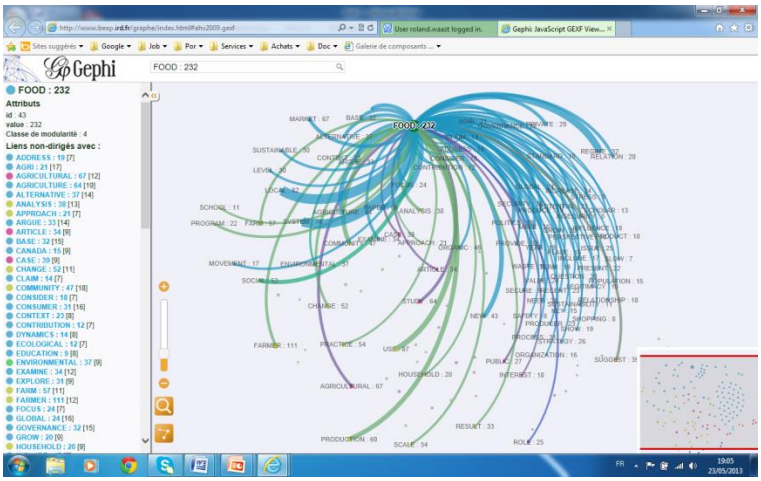
3. Graphs *(see figures in the main body of the text):*

a) Results can be found in the figures presented in the main body of the text.

b) Journal after journal, the most informative graphs are those concerning the links between words and the classification of those words into categories according to proximity. Every interested reader may visit the URL containing the graphs. A simple procedure is proposed which allows the interested reader to explore relations between words inside each journal.

c) The following ones are a few examples:

Most frequently used terms in "*Agriculture & Human Values" from 2008 to 2012*



PART I:

ORIGINS AND SHIFTS IN MEANING OF ENGOV'S KEYWORDS: VIEW FROM THE NORTH

Introduction

1. Objective

This report is an outcome of the ENGOV European project on *environmental governance* in Latin America. It is part of the subsection of the project referred to as (BekonAl), which considers the **knowledge** such governance makes use of. It looks not only at modern and traditional knowledges, but also at the 'meta-knowledge' that frames subjects of discussion and negotiation.

BekonAl uses a variety of qualitative analyses (case studies), which are mostly anthropological and sociological, and are based on field observations and participant interviews carried out in several countries across Latin America.

The present report has a complementary role. It is **bibliometric**. It should not be expected to offer true 'discoveries': those, if any, will come from the case studies. But detailed, close analyses chosen for their very 'typicality' (heavily showing up patterns that go unnoticed elsewhere) indeed need to be related to the big picture, and to the driving concerns of all the actors involved. This is our objective: one of ***framing*** the case studies.

We will thus tackle *a vast corpus* of data on our subject; one broad enough to represent the variety of approaches that exist at a given time, and to show how such approaches have evolved over time.

Out study focuses on the *vocabulary* commonly used in the context of environmental studies and governance questions and the *word associations* that serve to frame positions on problems. We set out to evaluate, *across all of the relevant literature,* the weighting of notions used in diverse schools of thought and different action areas. We present a history of keywords: their origins, combinations, successes and declines. We identify their leading authors and allies, the institutions which have championed them, and the media they have used.

2. Methodology

We had to make choices; these are briefly explained here.

- Our interest here is in **words** (or expressions and brief formulations), rather than speeches or complex theses, which would call for other analytical methods. But we do maintain that *words are important for action*. They are essential in order to *identify a situation*, and to draw up initiatives and convince others of their appropriateness. At the same time, while framing action, words also *exclude* alternative approaches ("out of the frame").
- We focused our investigation on ***academic language*.** Action words rarely originate in academia, but from campaigners, social movements, managers and decision-makers inspired by idea propagators ('think tanks'…). However, in order to attain *legitimacy*, these words must at some point be taken up by academia.
- Our study focuses on discourse from ***the humanities and social sciences*.** Debates *on governance* take place first and foremost within these disciplines.

  The natural and life sciences are of course rich in discoveries, both big and small, but rarely tackle environmental management. They have published so many advances that our tools are ill suited to unravel which ones break away and alter the conventional terms of political debate, and which ones (often belatedly) lead those terms to evolve. If such change happens, their authors are then called upon to participate as experts, and their positions are labelled as such. When they see fit to take a public stand, they speak through journals that straddle the social and natural sciences (e.g. *Agriculture & Human Values*); or use powerful lobbies (on the conservation of the natural environment, climate change, genetic engineering…) as mouthpieces, the themes of which eventually attract the attention of specialised social science journals.
- We retrieved our corpus from a particular database: ***the WoS*** (World of Science). This database claims to search through the best journals in the world. It has well-known biases, which are an inconvenience for us in that it gives the most space to English-language studies and material (of which very little comes from Latin American journals). But for over twenty years now, across almost the whole of Latin America, a remuneration system closely linked to researchers' publications records has been adopted, favouring the same 'Category A' journals that the WoS uses. High-quality researchers are thus highly motivated to publish in these journals, and the WoS has no shortage of authors from the Americas. We offer a detailed analysis of the biases in the WoS as an Annex, and moreover argue that *a future report should make a comparison with other, truly Latin American corpuses*. But the WoS is nonetheless an abundant, well-maintained source that has recently extended its coverage to the South, and remains the database of reference for bibliometricians. At its heart is the famous '***Citation Index***', which tallies the citations that have been made of every item it searches for, which allows to measure the 'impact' of an article, author, journal or institution. While perhaps falling short of showing what is the best of global science, it certainly gives a full account of the march of current (mainstream) science, of trends for certain research themes, and the visibility that particular authors and institutions enjoy. This is a question of 'normal' but not necessarily revolutionary science: controversies and new ideas get drowned

out by a mass of information. To trace such 'weak signals', one must be well informed, and search in the right specific places of expression.

3. In practice

Our interest here is in:

- **Key words** (the same ones that frame the parameters of the ENGOV project). We used the WoS's resources to find out where the key words originated, where they slipped into new research areas, what their primary institutional disseminators were, the manner and location in which they became established, their leading authors (be these their creators or idea intermediaries), and their successes and declines. We ***measured*** their sphere of influence, including in relation to any 'competitive' terms for explaining a situation and offering alternative measures or procedures to address it. Ultimately, we offer an '***Archaeology***' of the words evaluated.

- The ways these key words **combine** (in terms of attractions or repulsions) were examined in the context of controversies and in a choice of media (as most scientific journals are vested in a single approach, given their distinctive editorial policies). To this end, we **searched through** the content of specialised journals (for example, through all of the abstracts of articles published over several decades within a given journal), looking for the issues they raised over time, their variations, the words they chose to set out problematics, and the (stronger or weaker) connections these words made to other terms.

This report thus has **two parts**:

- **A)** A **lexicon** of the words that problematize the ENGOV project and our own enterprise, namely:
  'Governance', 'Environment, 'Sustainable' development. The terms' origins, areas of use, the actors who champion them and their areas of evolution are all recorded. For this first report (the WoS search necessarily being in English) the investigation focused on:

  Governance

  Sustain* for 'SUSTAINABLE'

  Environment*

And a few words that have experienced controversy such as:

GMO, GM* for 'genetically modified [organisms]'

Indigenous knowledge; Traditional Knowledge

Agro-Forest*; Agro-Ecolo* for Agroforestry, Agroecology

We will see how the dominant concepts in deciding the direction of debates and practices have had unexpected origins, unusual paths, shifts in meaning, losses of credibility (due to competing concepts) and sometimes recovered their meanings (due to new actors re-appropriating them, or unexpected events). Their trajectories have forged the state of a field at a given time, making for a topology of positions that has set the parameters for the strategies open to actors, decision-makers, and campaigners with different world visions and maxims for action.

- **B)** A **map Library** of ***word associations*** accounting for the spaces of reflection where the aforementioned key words can be found. This contextual study used *selected journals* to highlight how their concerns changed over time while sticking to distinctive approaches.

  We narrowed down our investigation to a range of widely cited journals from our area of study with very different approaches:

Agriculture & Human Values

The Journal of Natural Products

The Journal of Environmental Studies

The Journal of Natural resources,

Agriculture & Sustainable Development,

And for some quick cross-referencing, a few Latin American journals like:

Agrociencias (Mexico)

Interciencia (Venezuala)

This process showed that the journals' names can be deceptive[1]. Moreover, while the journals' themes all slightly changed over time, they all stuck to the narrow parameters of their original editorial lines. A detailed table of the 200 main uni- and multi-word terms used each year highlights the subjects that trended in each journal in a lasting or short-term way, along with the dates of these terms' emergence and declines.

Finally, we made an *expressions graph* of the journals' key words, to highlight their variably strong connections to other terms and the groups into which they can be classified. This cloud extends over several precisely described galaxies, which are made up of graphs that can be put on the Internet. The aforementioned 'star terms' (our key words and expressions) serve as captions. By clicking on a word of

[1]For example, the Journal of National Resources is exclusively interested in water and wildlife conservation.

interest (even a rarely-used one), the reader can access a zoom to see the word's position and its connections to the rest of the cloud. Illustrations of the graphs and zoom functions feature in this report.

1.2. Weighting of frame-setting concepts: *Natur*, Environm*, Governance and Sustainab**

*Here we present **the results** of the WoS query for the selected key words. Let's give a reminder of what they were:*

a.: **Main words** 'Governance', 'Environment', 'Sustainable' development. For each word we set out their origins (oldest works cited), areas of use (and evolution over time), the actors to champion them and their supporting institutions (via affiliation or funding).

b.: We also investigated several words that have been connected to controversy such as: 'GMO, GM*' for 'genetically modified [organisms]' '*Indigenous' and 'Traditional Knowledge'*, 'Agro-' [ecology, forestry], and 'Biology AND Agriculture' for agro-biology.

The search, which was done in English, used word truncations which allowed not only to clearly enter the nouns searched for, but also their related adjectives and verbs.

These were:

'**Governance**' (using the English language search term GOVERNANCE)

'**Sustainable** [development]' (using SUSTAINAB*, which includes sustainable, sustainability, etc.)

'**Environment**' (using ENVIRONMENT*, which includes environment, environmental, environmentalism, etc.)

'Traditional **Knowledge**' and "Scientific knowledge" (using INDIGENOUS KNOWLEDGE or TRADITIONAL KNOWLEDGE)

We included a quick inventory of the word 'Natur*' (which includes Nature, Natural, etc.)

a) We also *combined certain words* to narrow down the search to areas of special interest (e.g. 'Governance" AND "Environment*…')
b) We moreover looked at data for *marginal approaches or questions* which seemed important to us for their involvement in *controversies of interest to us* (GMO, Agro-bio or Agro-forestry, agricultural biotechnology, Agro(-)ecology…: using GM* and GMO ; and Agro-forest* ; Agro-bio* ; Agro-ecolog* ; Biotech* AND Agr*

Frame-setting words: origin, rise, success

Four of our expressions have a particularly high profile in the SSCI:

Natur*, Environm*, Governance and Sustainab*

The other expressions that we tracked featured far more rarely, namely:
Indigenous knowledge, as well as: GMO, Agro-bio* or (Biotech* AND Agr*), Agro-ecol*

We measured the visibility of each concept in terms of the number of articles to use them over a set period (**Fig 1**).

This said, because the SSCI has extended its coverage of the literature over time, the visible growth observed of the scores could be misleading. This is why the graphs also show the 'trend' (the total number of articles searched by the SCCI over a set period divided by 100, because the database is vast, and the notions of interest to us are the equivalent of entries in a great dictionary of the concerns of social science as a whole).

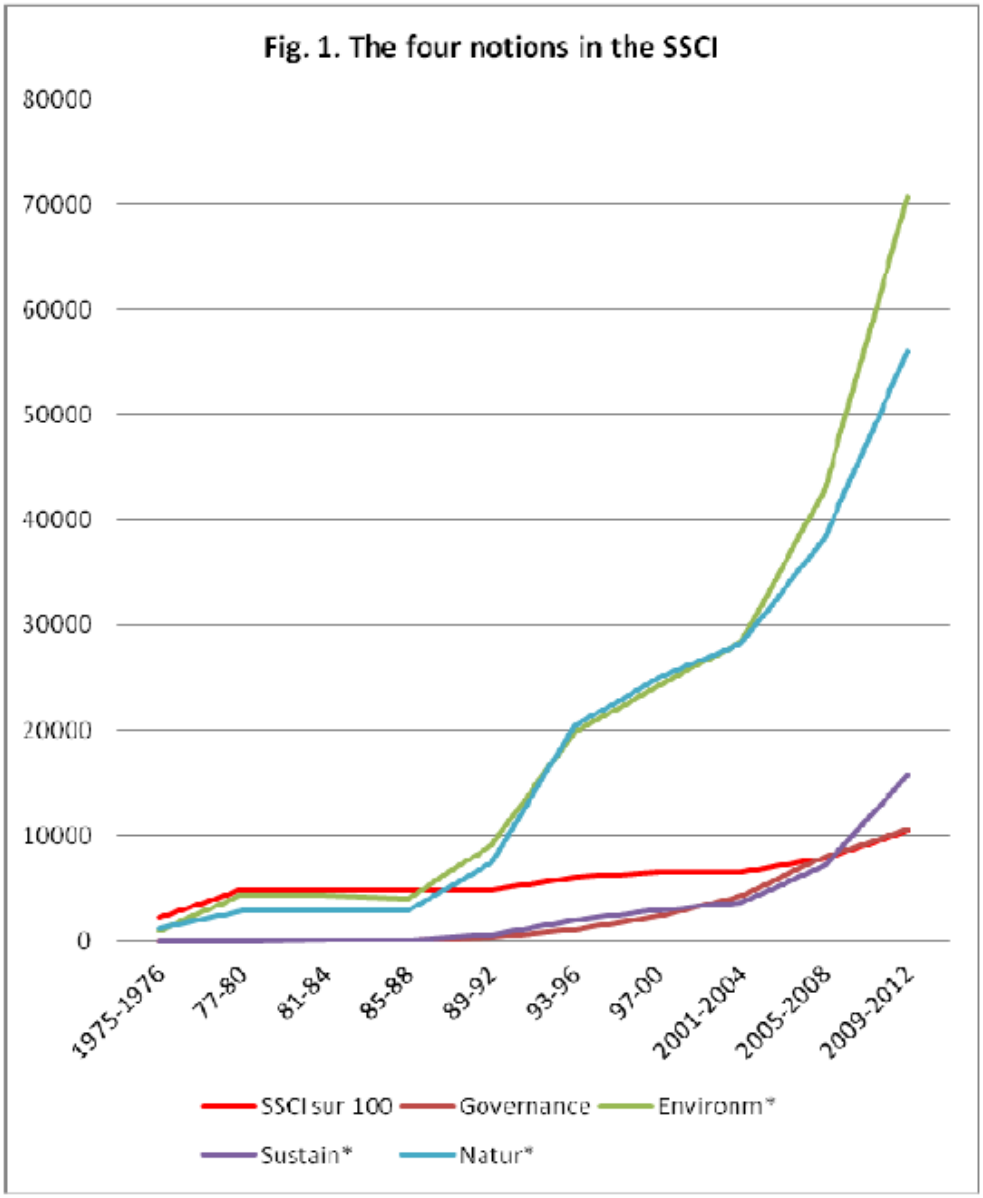
The best approach for observing the relative presence in the SSCI of our project's 4 'frame-setting' notions, is still to compare the total of articles where they feature with the total number of articles searched by the database over each set period (**Fig 2**).

Some remarks:

- From the beginning (in 1975), the notions of 'Nature', and already by this point 'Environment' were commonly used in the social sciences and could be called 'mainstream' rather than revolutionary. They were admittedly the most polysemic (we will specify how in due course). Each term appeared in about 0.5% of the articles in the whole database (which is reasonably significant given the SSCI's size and multi-disciplinary character).

- Environment* was the first concept to take off, first in the late 1970s and again in the late 1980s, and once more from 2000 to 2005 and beyond. The notion of Natur* was swept along in this movement, with a consistent time lag each time.

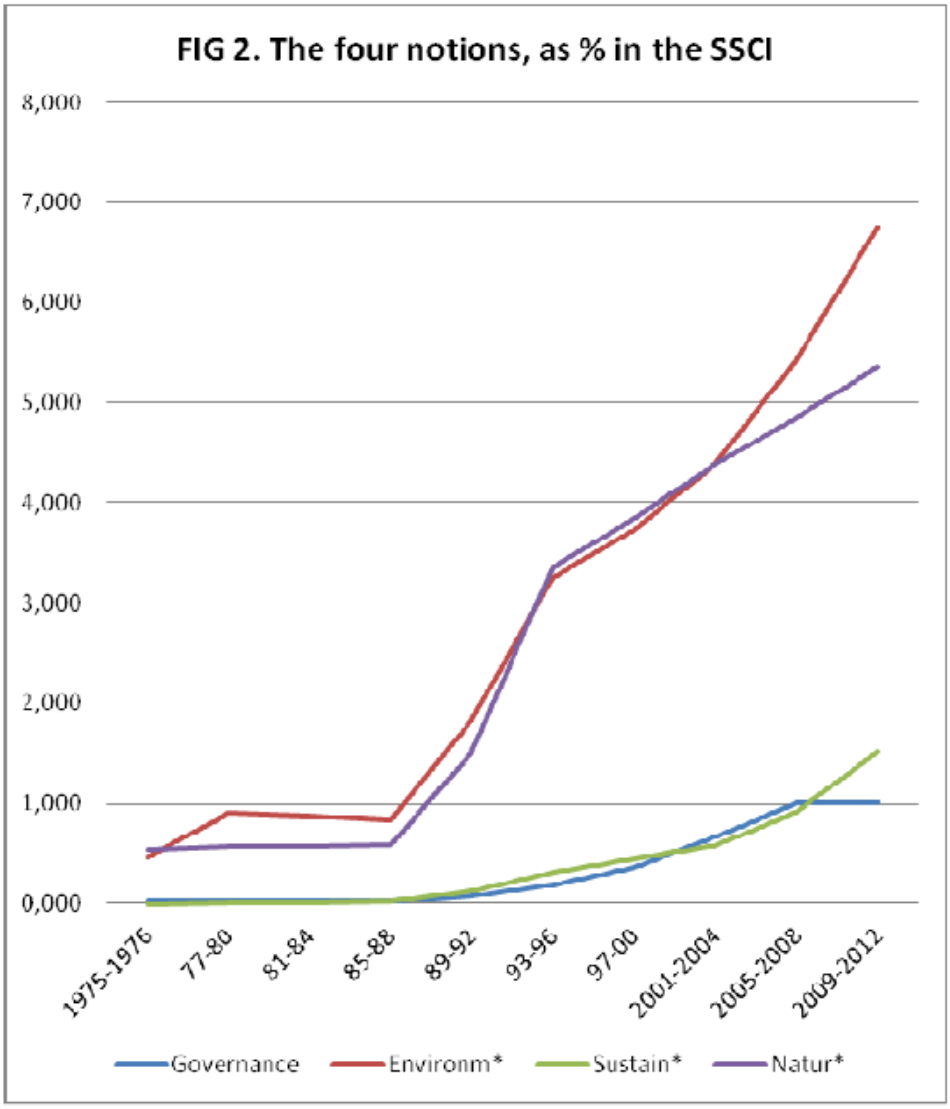
- The more focused and initially little-used notions of 'Governance' and 'Sustainability' made a prodigious, sustained breakthrough in the 1990s: their scores rose by 100 (for governance) in comparison to the early 1980s, and even by 1000 (for Sustainability), compared to a growth of *'only'* a factor of 20 for Environment and Nature.



	1975-1976	77-80	81-84	85-88	89-92	93-96	97-00	2001-2004	2005-2008	2009-2012
Total SSCI : 100	2205	4963	4947	4895	4952	6083	6502	6467	7897	10454
Governance	44	119	127	112	337	1139	2369	4284	7937	10626
Environm*	1025	4461	4316	4092	9053	19781	24263	28380	42832	70627
Sustain*	4	21	64	94	637	1917	2891	3698	7165	15780
Natur*	1179	2769	2816	2896	7414	20439	24962	28314	38266	56064

Observed scores (the number of articles where the notion was used).

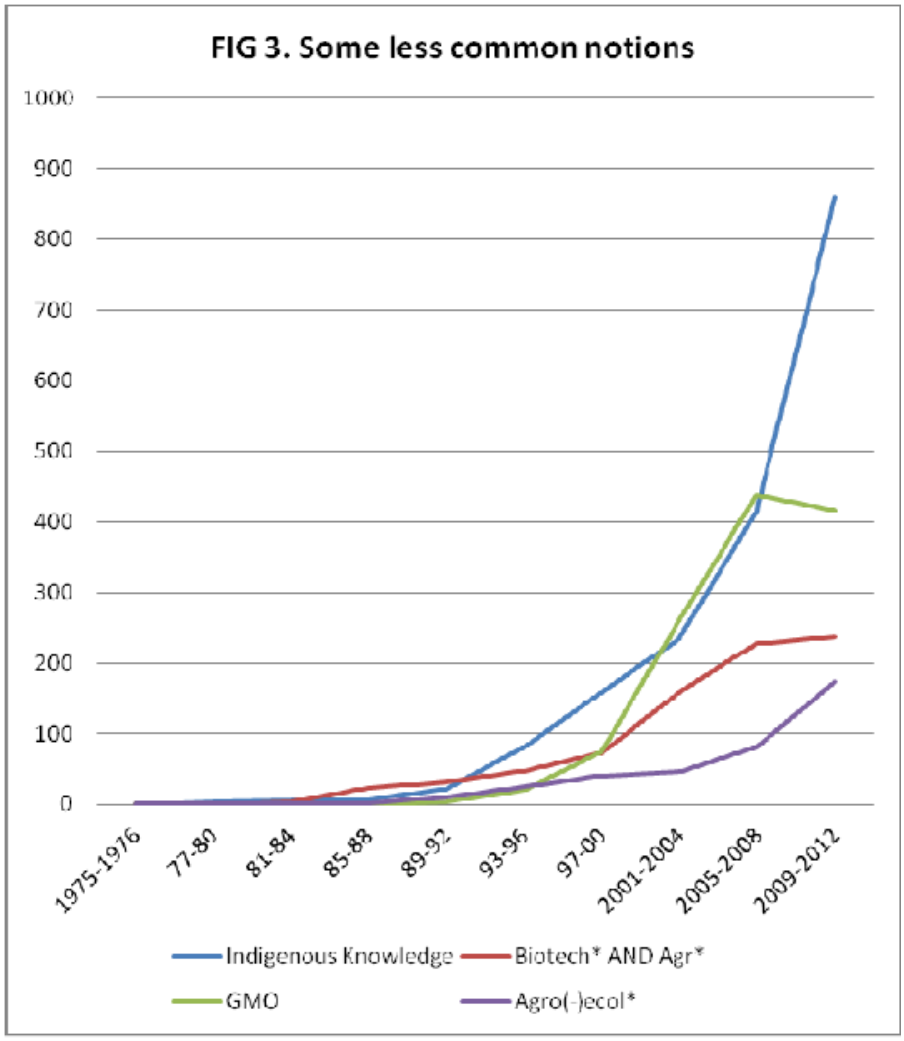
N.B. The total articles searched through by the database is **divided by 100** (1st Line: SSCI/100)



% in the SSCI	1975-1976	77-80	81-84	85-88	89-92	93-96	97-00	2001-2004	2005-2008	2009-2012
Governance	0.020	0.024	0.026	0.023	0.068	0.187	0.364	0.662	1.005	1.016
Environm*	0.465	0.899	0.872	0.836	1.828	3.252	3.732	4.388	5.424	6.756
Sustain*	0.002	0.004	0.013	0.019	0.129	0.315	0.445	0.572	0.907	1.509
Natur*	0.535	0.558	0.569	0.592	1.497	3.360	3.839	4.378	4.846	5.363

Per concept: % presence in the SSCI (the number of articles containing the notion divided by the total number of articles searched by the database over that period)

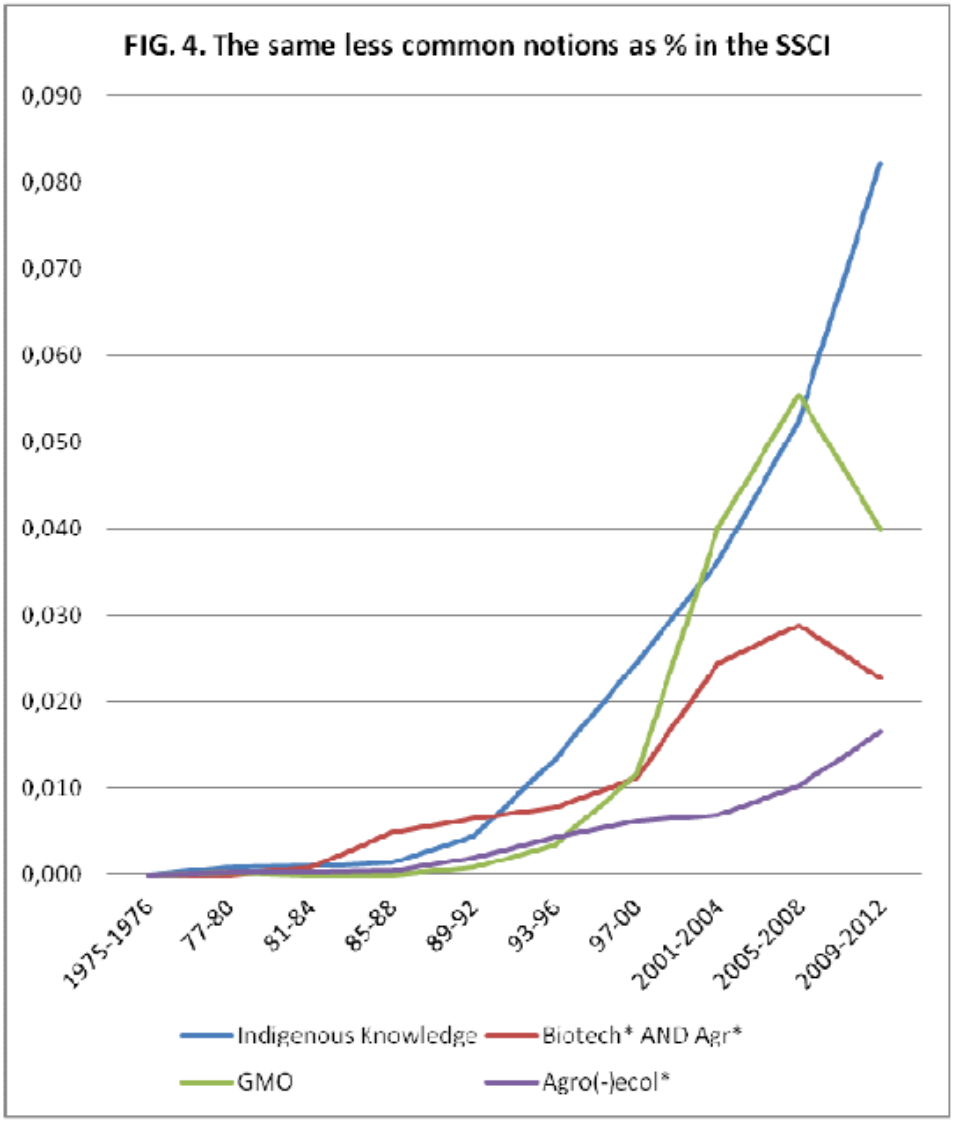
In comparison to these four 'framing' notions, **other expressions** important to us were reflected in a **marginal** way in the SSCI. This was notably the case of "**Indigenous Knowledge"**, and controversial items such as agricultural biotechnology, GMOs, or by contrast Agro-ecology (and Agro-forestry). We will see the extent of this in Fig. 3 (and in the table where we show, for comparison, the scores for Governance and (the more precise) Governance AND environment). 'Biotech* AND agric*', 'GMO' [= genetically modified organisms] or 'Agroecol*".



SSCI	1975-1976	77-80	81-84	85-88	89-92	93-96	97-00	2001-2004	2005-2008	2009-2012
Indigenous Knowledge	0	4	5	7	22	81	159	234	414	860
Biotech* AND Agr*	0	0	4	24	32	47	72	158	227	238
GMO	0	1	0	0	4	21	75	259	438	417

Agro(-)ecol*	0	1	1	2	10	26	40	45	81	173
Gov & Environm*	0	0	3	3	28	102	287	505	1235	2910

The same data used again after taking out the SSCI bibliographic coverage trend.



Note that:

- All the expressions are virtually absent until the mid-1980s
- Some attention was initially given to the promises of agricultural biotechnology, which then took off with the GMO controversy (a blessing or a threat for farmers? The problems of patenting 'life forms'.) The debate then subsided as GMOs became commonplace.

- In the face of this, the alternative offered by Agro-(ecology, forestry) continued to take shape, but did not yet have as high a profile as biotechnology.
- Finally the ***discussion of traditional knowledge,*** which started out in the late 1970s, focused on other, initially ethnographic issues, before moving on to the defence of 'indigenous people', and later their 'intellectual property rights'. The expression began to take off in the late 1980s, found growing success, and then achieved a very high profile from the 2000s.

1.3. Polysemy and the halo of terms setting the frame of the project

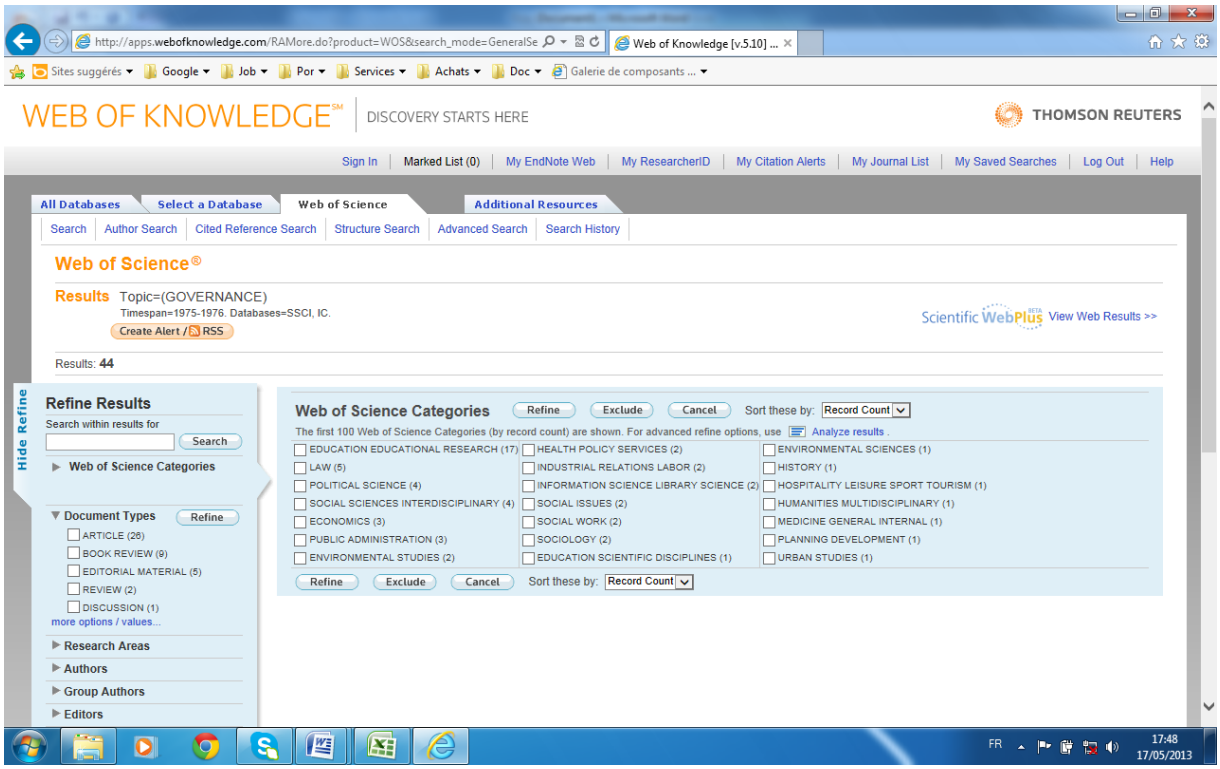
We will now return to the frame-setting notions that we studied. We will look at *their areas of application, their leading authors and the institutions that championed them*. The concepts indeed all come from areas of research different from environmental questions and have continuously taken on new uses. As this happens, they acquire a new set of harmonics that serve as an evocative **halo**, making them gain in **authority** when prestigious institutions sanction them, or when high-profile authors disseminate them.

A. Governance: History and polysemy

History. First stage: 1975-1990. From small projects to business organisation: conflict mitigation

The term 'Governance' was virtually missing from the SSCI until the early 1990s. It started out with the concerns of **managers working mostly in a university setting** who were looking for a doctrine of amicable dispute management for their institutions; as this screen shot shows:

Fig 5: Main research fields where the term of "Governance" is used (SSCI: 1975_1976)



In the same way, out of the most widely cited texts the following articles are to be noted:

References:

Title: **EXPERIMENT IN GOVERNANCE - OHIO-FACULTY-SENATE**
Author(s): MOORE, MA
Source: JOURNAL OF HIGHER EDUCATION Volume: **46** Issue: **4** Pages: **365-379** DOI: **10.2307/1980666** Published: **1975**

OR: Title: **MYTHS AND REALITIES OF UNIVERSITY GOVERNANCE**
Author(s): LADD, DR
Source: COLLEGE & RESEARCH LIBRARIES Volume: **36** Issue: **2** Pages: **97-105** Published: **1975**

The term is also picked up by *town planners*, chiefs of clinic in *hospitals*, and persons in charge of *local policies* when they represent the way they try to implant new practices and devices or a new organization as the following titles show:

Title: **MAYORS IN ACTION - 5 APPROACHES TO URBAN GOVERNANCE - KOTTER,JP AND LAWRENCE,PR**
Author(s): ALDERFER, HF

Source: ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE Volume: **418** Issue: **MAR** Pages: **213-213** Published: **1975**

Title: **CONSOLIDATION OR DIVERSITY - CHOICES IN STRUCTURE OF URBAN GOVERNANCE**
Author(s): YOUNG, DR
Source: AMERICAN ECONOMIC REVIEW Volume: **66** Issue: **2** Pages: **378-385** Published: **1976**

Title: **CURRENT PERSPECTIVES ON HOSPITAL GOVERNANCE**
Author(s): PRYBIL, LD; STARKWEATHER, DB
Source: HOSPITAL & HEALTH SERVICES ADMINISTRATION Volume: **21** Issue: **4** Pages: **67-75** Published: **1976**

Title: **PARTICIPATORY GOVERNANCE - MODEL FOR SHARED DECISION-MAKING**
Author(s): HIRSCH, S; SHULMAN, LC
Source: SOCIAL WORK IN HEALTH CARE Volume: **1** Issue: **4** Pages: **433-446** Published: **1976**

The term of Governance was thus used in the beginnings by **practitioners** concerned with amicable (or 'participative') management on a micro-**institutional** scale, primarily in the **public sector.**

The environmental question was practically **out of the picture** at the time**.** The only article to raise it was on urban planning:

Title: **MODEST PROPOSAL FOR GOVERNANCE OF AMERICAS METROPOLITAN AREAS**
Author(s): MOGULOF, MB
Source: JOURNAL OF THE AMERICAN INSTITUTE OF PLANNERS Volume: **41** Issue: **4** Pages: **250-257** DOI: **10.1080/01944367508977887** Published: **1975**

With time, the term shifted to new fields and acquired a **very different halo.**

In the late 1980s, just before the term started to take off, it had quite disparate areas of application (see the Figure on the following page, in comparison to its equivalent a decade earlier):

- Its areas of origin (Health, Education, Urban planning, Local action) were starting to use the term more, but the total share of use had gone down.
- The new, now most common use was in the fields of ***Law, Economics and business organisation*****.**
- Many universities, including the most prestigious in their fields, championed its use (see the following Fig. 7): most notably the University of California, Texas A.M and Washington.

Figure 6: Fields of application of the term *Governance* in the SSCI **from 1985-1988**

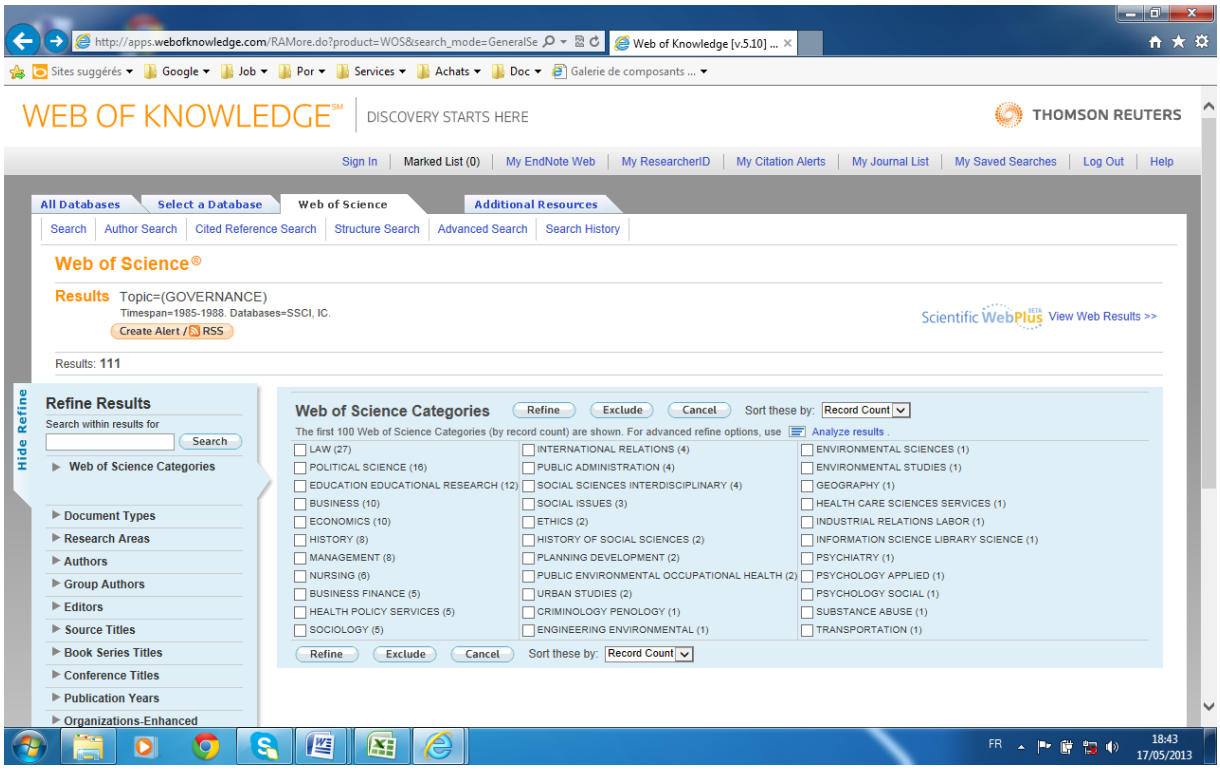
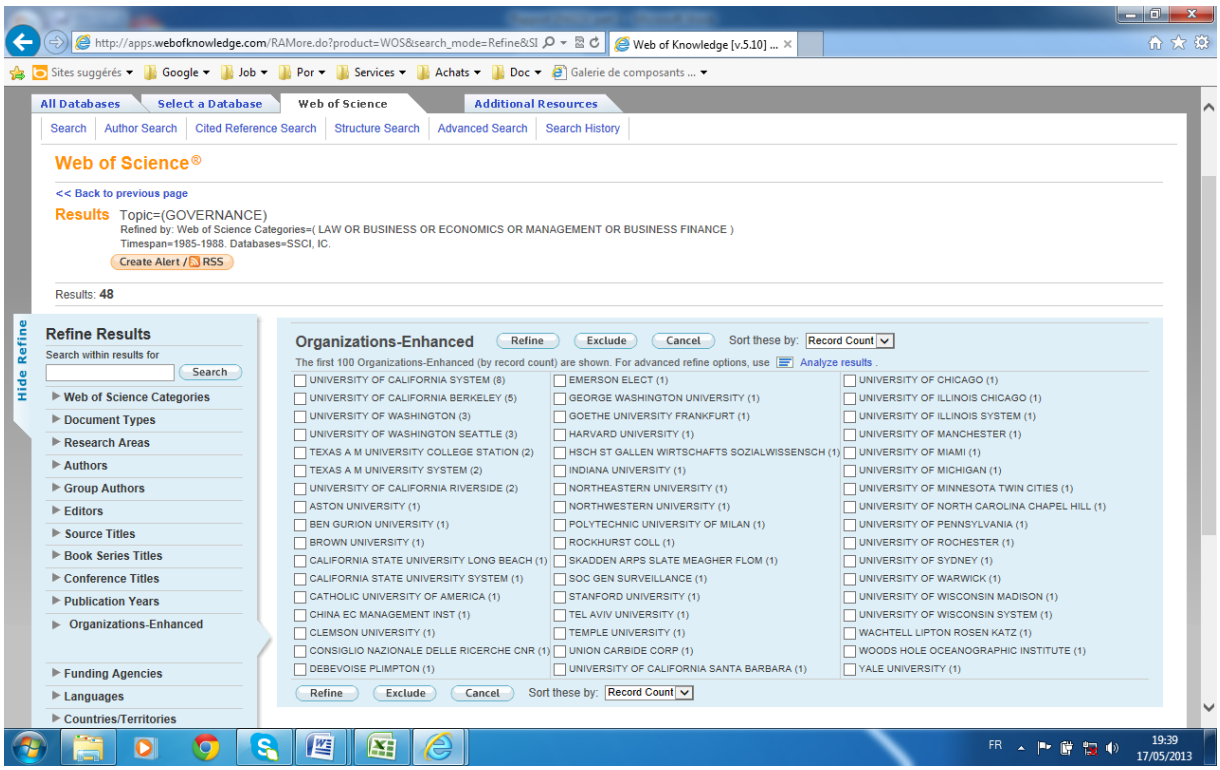


Figure 7: Institutions championing the use of the term *Governance* **in Business Law and Economics from 1985-1988**



History. Second stage: 1990-2000. Harvard enters the running. Broadened acceptance

The arrival of **Harvard** (and its **Business** School) into the running however marked a turning point in the popularisation of the concept. This started in 1990 and attracted other renowned universities such as Columbia, Illinois (Chicago), M.I.T, Michigan, and many others (Fig 9). Many universities across the world started to use the word, albeit in a scattered, sporadic pattern.

Figure 8. Championing institutions for the term *Governance* in the SSCI **from 1990-1995. Abbreviated list**

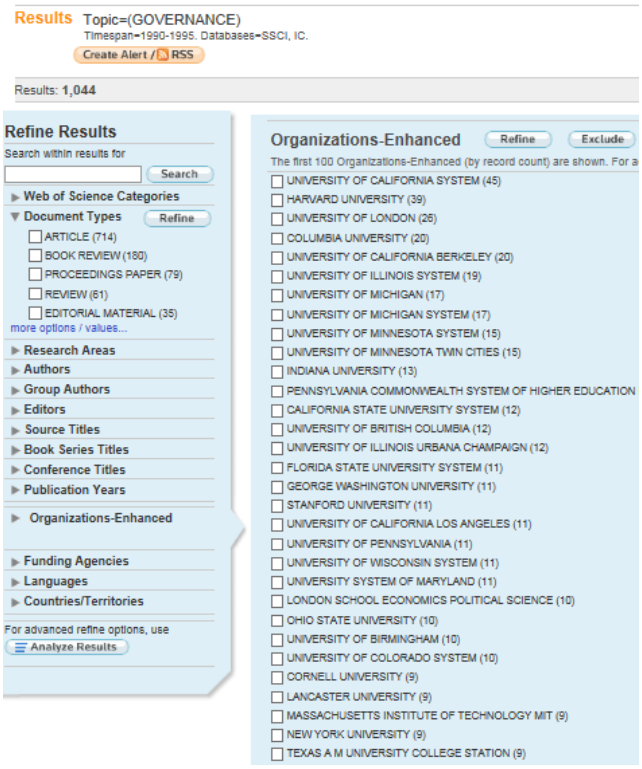
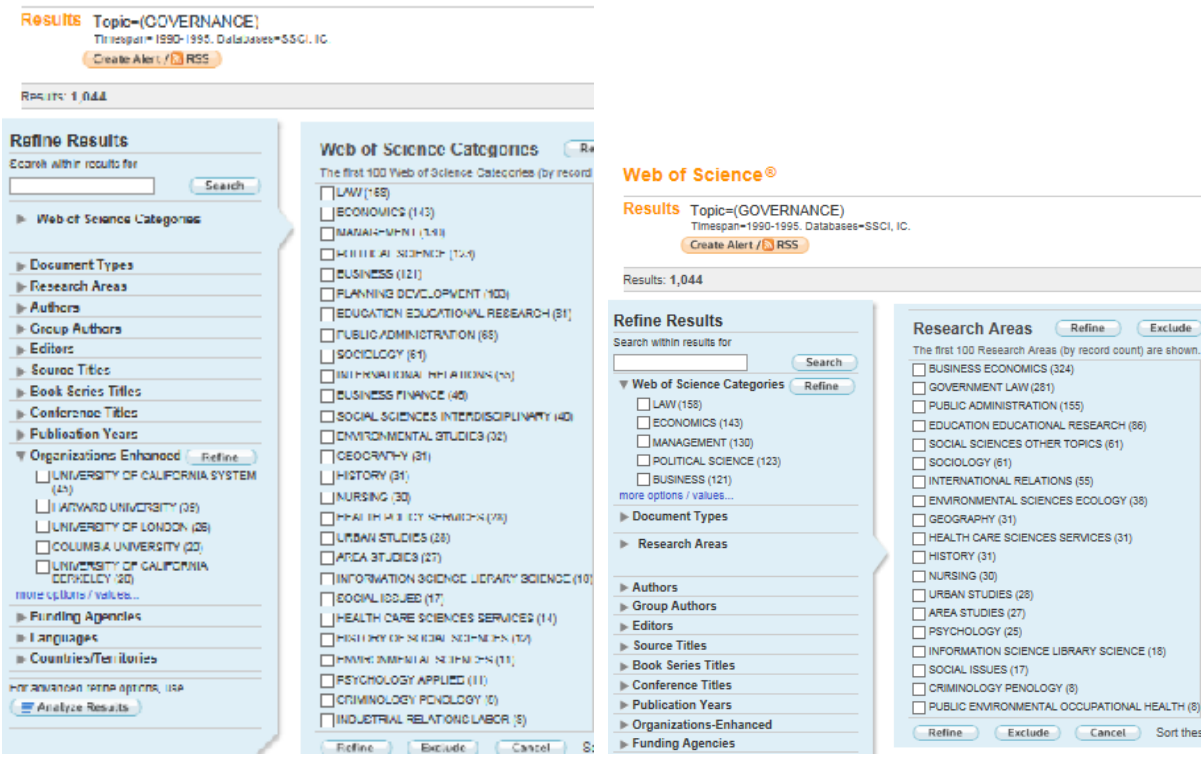


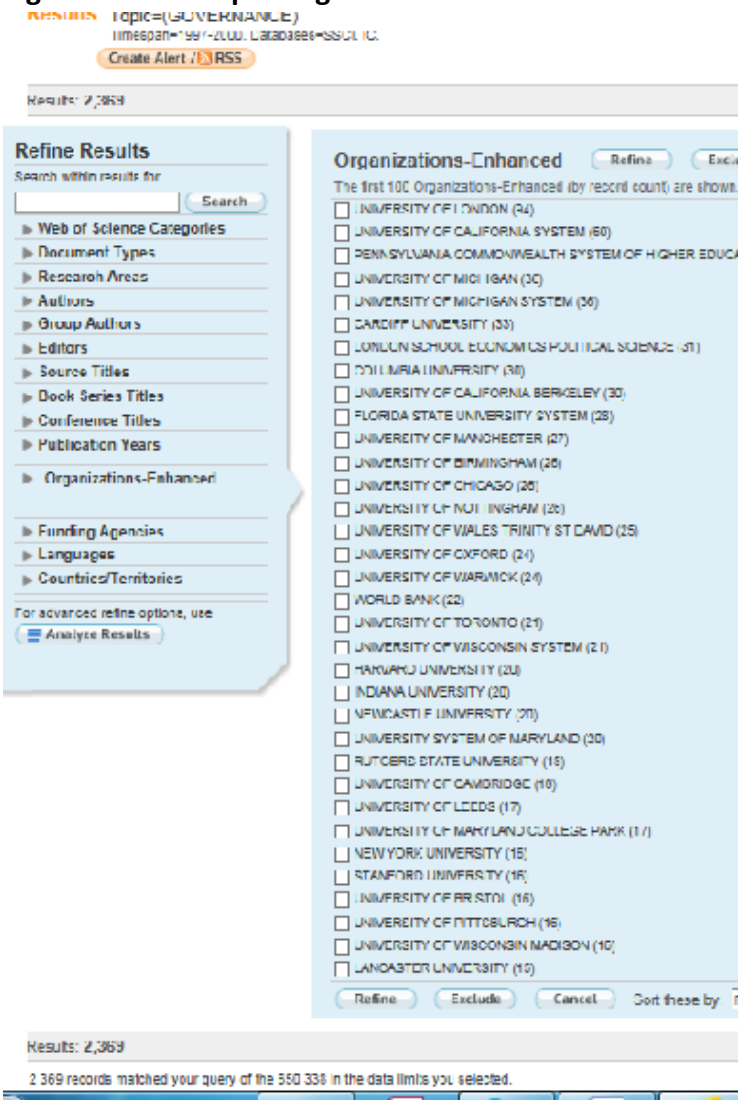
Figure 9. Disciplines and Fields using the term *Governance* in the SSCI **from 1990-1995** (Abbreviated)



Its major areas of application were management and business. The expression however gained ground in the areas of public administration behaviour, legislating, diplomacy ... Environmental sciences began to take an interest (ranked 13th as a discipline, and 9th as a field of application).

10 years later (1997-2000) its field of application had grown further: *political science* and *public administration* (management) made an appearance shortly after business studies. ***Environmental studies*** finally made an important appearance (in 5th place, with 200 out of 2369 articles referring to governance). The landscape of its championing institutions had also changed. European (and particularly English) universities led the dance (London, Cardiff, Manchester, Birmingham, Warwick, Nottingham...). Those cited made it their battle horse, persuading ***the European Union*** to pay particular attention to it.

Figure 10. Championing institutions for the term *Governance* in the SSCI **from 1997-2000.**



History. Third stage: 2000-2012. Conquest of Europe and the world. Concern for the environment

These tendencies were confirmed throughout the 2000s, which saw the notion's *prodigious success*, particularly in Europe, as well as its spread throughout the world, the multiplication of its areas of use, and the particular enthusiasm of environmental studies.

By this latter stage, Europe was its main site of dissemination, while the opinion leaders (i.e. the most published and cited authors, at least in the SSCI) were also European.

All this was reflected **at the end of the decade** (2009-2012) in the list of funders mentioned in the articles searched; the main authors' home institutions; and the most cited articles **(Fig 11 to 13)**.

Fig 11. The main funders of studies on Governance (2009-2012)

Country	% of articles	% of funding for the studies
USA	31 %	33 %
Canada	08 %	15 %
China	04 %	01 %
Europe	44 %	47 %
Australia	08 %	04 %
Others	05 %	

N.B.1. USA Funding: 52 % public, 48 % Foundations

N.B. 2. European Funding = **European Union: 60 %,** Scandinavian countries 20 %, United Kingdom 14 %, Others 6 %

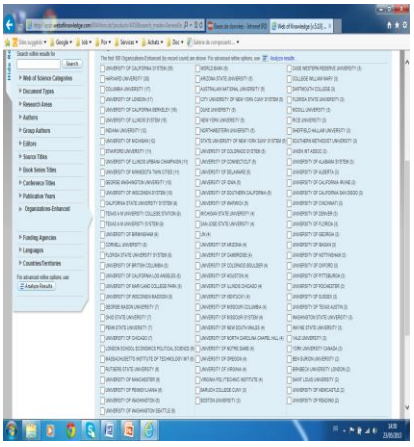
N.B. 3. European articles (by % of total articles searched by the SSCI from 2009-2012): United Kingdom: 20 %, Netherlands: 6%, Germany: 6%, Spain: 3%, Sweden: 3%, France: 2 % ; Others: 4 %.

Fig 12. Leading institutions on Governance (at the beginning and end of the 2000s)

12 a. Leading Institutions and ideas conveyers « Governance » as an example

Most frequent Labels in 1990-1994

Note Harvard's rank and emergence of the World Bank



Most frequent abels lin 2009-2012

Top of the list only. Note the extension to the world, and ample room for European institutions

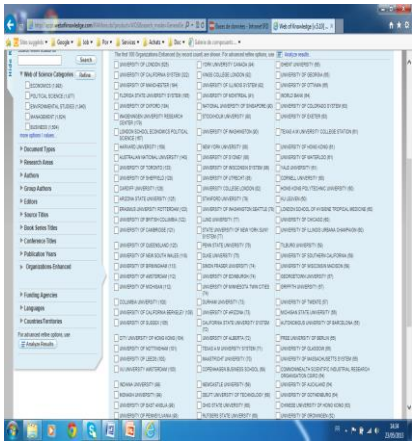


Fig 12 b. Leading institutions, 2000_2010

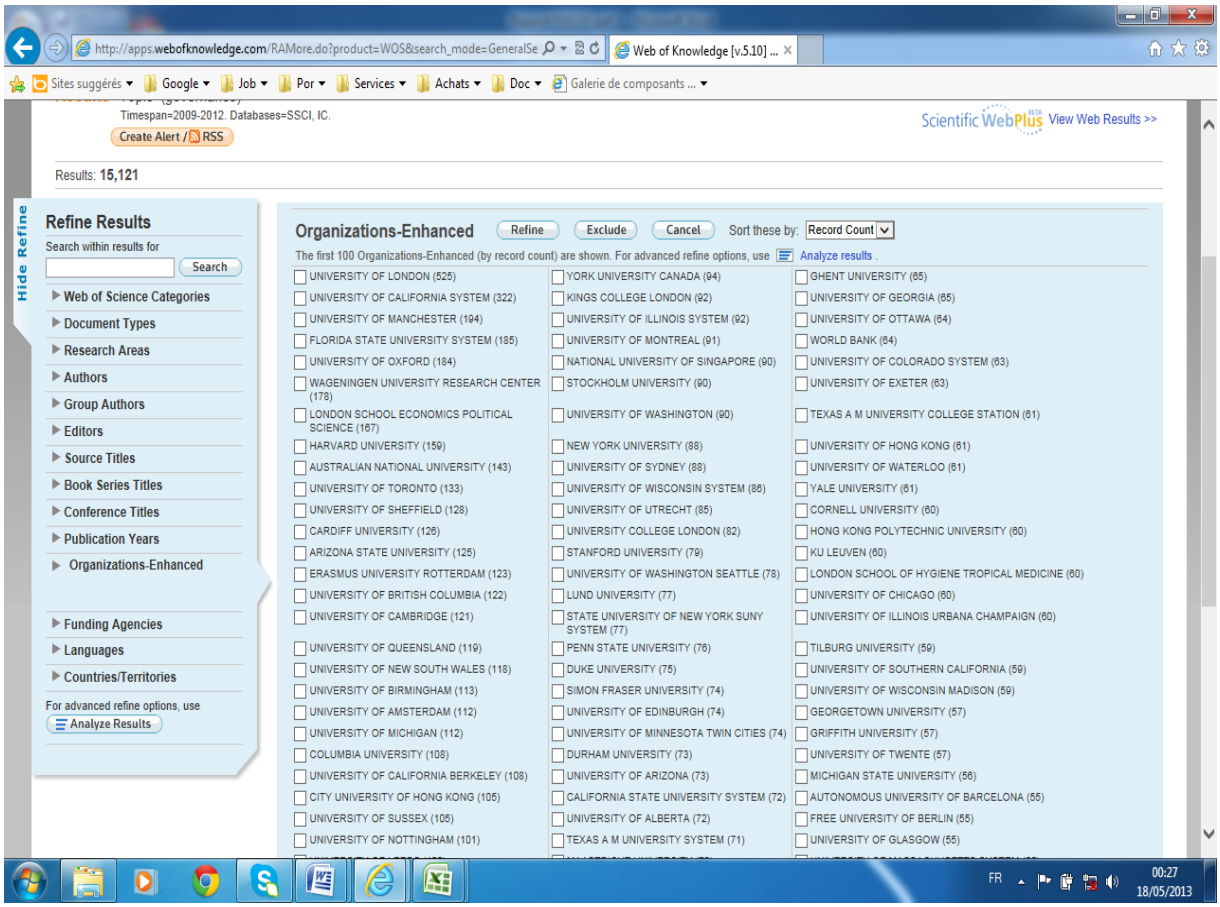


Fig. 13. Most published / cited authors in the SSCI (2009-2012) [Key word: Governance]

Most published authors				Most cited authors			
Rank	Name	Specialty	Institution	Rank	Name	Specialty	Institution
1	Wright M.	Economics	Nottingham UK	1	Bebchuk L	Economics	Harvard
2	Filatotchev I	Economics	Nottingham UK	2	Meyer KE	Economics	U Bath UK
3	Biermann F	Political Science	Vrije Amsterdam	3	Estrim E	Corporate Stratedy	London Sch Ec
4	Jordan A	Environmt	U East Anglia UK	3	Bhaumik SK	Management	U Brunei UK
5	Mol APJ	Political science	U Wageningen ND	5	Peng MW	Corporate Economics	Texas Sch Mana
6	Bulkeley H	Political science + Envir	U. Durham UK	6	Pahl-Wostl C	Environmt	U Osnabruck DE
7	Folke C	Envir	U. Stockhom	7	Levine R	Financial Economics	U Brown USA
8	Lebel L	Envir	U Chiang Maï THL	8	Laeven L	Financial Economics	FMI
9	Nilsson M	Envir	Stockholm Envir Inst	9	Rockstrom J	Environmt	U Stockholm
10	Olstrom E	Economics	Indiana U	10	Shove E	Environmt	U Lancaster UK
11	Sovacool BK	Energy Economics	Nat U Singapore	11	Norgaard RB	Environmt	U Calif Berkeley
12	Chrisman JJ	Corporate Economics	Mississipi U	12	Rands MRW	Economics	U Cambridge UK

13	Gupta A	Environment	U Wageningen ND	13	Adams WM	Botanical Science	U Cambridge UK
14	Judge W	Management	Norfolk U. UK	14	Lenschow A	Social Science	U Osnabruck DE
15	Newell	Dev Studies	U Sussex UK	15	Gow ID	Accountancy	North-Western U
15	Pahl-Wostl C	Environmt	U Osnabruck DE				

By the end of this decade (2009-2012), '***environmental studies'*** had gained a lot of ground. It ranked as the number three area of application for the notion of governance, which was admittedly still after economic studies (including business studies) and politics (which it almost tied with); but it came in front of all other issues relating to public administration, Law, and sectoral management (urbanisation, health, education... the relative importance of which dropped a great deal: they seemed to be dropping the concept).

Of the 20 most cited articles of this period, 10 dealt with environmental questions (see Annex).

The list of highly published and cited authors confirms this position. Areas of concern increased, and evoked the worry of planetary change (over-exploitation, climate change, water and energy crises...) and the search for a government for the new '**Anthropocene'** era.

It's interesting to note the coalitions of authors which contributed to this, and to cite the abstracts of a certain number of highly read articles. Here are a few examples

- A coalition of big European and American names in the field at the Stockholm initiative:

Planetary Boundaries: Exploring the Safe Operating Space for Humanity

Author(s): Rockstrom, J (Rockstrom, Johan)[1,2]; Steffen, W (Steffen, Will)[1,3]; Noone, K (Noone, Kevin)[1,4]; Persson, A (Persson, Asa)[1,2]; Chapin, FS (Chapin, F. Stuart, III)[5]; Lambin, E (Lambin, Eric)[6]; Lenton, TM (Lenton, Timothy M.)[7]; Scheffer, M (Scheffer, Marten)[8]; Folke, C (Folke, Carl)[1,9]; Schellnhuber, HJ (Schellnhuber, Hans Joachim)[10,11,12]; Nykvist, B (Nykvist, Bjorn)[1,2]; de Wit, CA (de Wit, Cynthia A.)[4]; Hughes, T (Hughes, Terry)[13]; van der Leeuw, S (van der Leeuw, Sander)[14]; Rodhe, H (Rodhe, Henning)[15]; Sorlin, S (Sorlin, Sverker)[16]; Snyder, PK (Snyder, Peter K.)[17]; Costanza, R (Costanza, Robert)[1,18]; Svedin, U (Svedin, Uno)[1]; Falkenmark, M (Falkenmark, Malin)[1,19]; Karlberg, L (Karlberg, Louise)[1,2]; Corell, RW (Corell, Robert W.)[20]; Fabry, VJ (Fabry, Victoria J.)[21]; Hansen, J (Hansen, James)[22]; Walker, B (Walker, Brian)[1,23]; Liverman, D (Liverman, Diana)[24,25]; Richardson, K (Richardson, Katherine)[26]; Crutzen, P (Crutzen, Paul)[27]; Foley, J (Foley, Jonathan)[28]

Source: ECOLOGY AND SOCIETY **Volume:** 14 **Issue:** 2 **Article Number:** 32 **Published:** 2009

Times Cited: 107 (from Web of Science)

Cited References: 159 [view related records] Citation Map

Abstract: Anthropogenic pressures on the Earth System have reached a scale where abrupt global environmental change can no longer be excluded. We propose a new approach to global sustainability in which we define planetary boundaries within which we expect that humanity can operate safely. Transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental- to planetary-scale systems. We have identified nine planetary boundaries and, drawing upon current scientific understanding, we propose quantifications for seven of them. These seven are climate change (CO2 concentration in the atmosphere <350 ppm and/or a maximum change of +1 W m(-2) in radiative forcing); ocean acidification (mean surface seawater saturation state with respect to aragonite >= 80% of pre-industrial levels); stratospheric ozone (<5% reduction in O-3 concentration from pre-industrial level of 290 Dobson Units); biogeochemical nitrogen (N) cycle (limit industrial and agricultural fixation of N-2 to 35 Tg N yr(-1)) and phosphorus (P) cycle (annual P inflow to oceans not to exceed 10 times the natural background weathering of P); global freshwater use (<4000 km(3) yr(-1) of consumptive use of runoff resources); land system change (<15% of the ice-free land surface under cropland); and the rate at which biological diversity is lost (annual rate of <10 extinctions per million species). The two additional planetary boundaries for which we have not yet been able to determine a boundary level are chemical pollution and atmospheric aerosol loading. We estimate that humanity has already transgressed three planetary boundaries: for climate change, rate of biodiversity loss, and changes to the global nitrogen cycle. Planetary boundaries are interdependent, because transgressing one may both shift the position of other boundaries or cause them to be transgressed. The social impacts of transgressing boundaries will be a function of the social-ecological resilience of the affected societies. Our proposed boundaries are rough, first estimates only, surrounded by large uncertainties and knowledge gaps. Filling these gaps will require major advancements in Earth System and resilience science. The proposed concept of "planetary boundaries" lays the groundwork for shifting our approach to governance and management, away from the essentially sectoral analyses of limits to growth aimed at minimizing negative externalities, toward the estimation of the safe space for human development. Planetary boundaries define, as it were, the boundaries of the "planetary playing field" for humanity if we want to be sure of avoiding major human-induced environmental change on a global scale.

Accession Number: WOS:000278707200010

Document Type: Article

Language: English

Author Keywords: atmospheric aerosol loading; biogeochemical nitrogen cycle; biological diversity; chemical pollution; climate change; Earth; global freshwater use; land system change; ocean acidification; phosphorus cycle; planetary boundaries; stratospheric ozone; sustainability

KeyWords Plus: SOCIAL-ECOLOGICAL SYSTEMS; OCEAN ACIDIFICATION; CLIMATE-CHANGE; ENVIRONMENTAL-CHANGE; ATMOSPHERIC CO2; REGIME SHIFTS; CORAL-REEFS; ANTHROPOGENIC CO2; WATER-RESOURCES; FOOD-PRODUCTION

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- Another global coalition which inaugurates the striking expression *'Anthropocene'* (Amsterdam initiative)

Navigating the Anthropocene: Improving Earth System Governance

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Source: SCIENCE **Volume:** 335 **Issue:** 6074 **Pages:** 1306-1307 **DOI:** 10.1126/science.1217255 **Published:** MAR 16 2012

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- A prestigious multidisciplinary coalition at Cambridge (UK)

Biodiversity Conservation: Challenges Beyond 2010

Author(s): Rands, MRW (Rands, Michael R. W.)[1]; Adams, WM (Adams, William M.)[2]; Bennun, L (Bennun, Leon)[3]; Butchart, SHM (Butchart, Stuart H. M.)[3]; Clements, A (Clements, Andrew)[4]; Coomes, D (Coomes, David)[5]; Entwistle, A (Entwistle, Abigail)[6]; Hodge, I (Hodge, Ian)[7]; Kapos, V (Kapos, Valerie)[8,9,10]; Scharlemann, JPW (Scharlemann, Joern P. W.)[8]; Sutherland, WJ (Sutherland, William J.)[10]; Vira, B (Vira, Bhaskar)[2]

Source: SCIENCE **Volume:** 329 **Issue:** 5997 **Pages:** 1298-1303 **DOI:** 10.1126/science.1189138 **Published:** SEP 10 2010

Times Cited: 95 (from Web of Science)

Cited References: 89 [view related records] Citation Map

Abstract: The continued growth of human populations and of per capita consumption have resulted in unsustainable exploitation of Earth's biological diversity, exacerbated by climate change, ocean acidification, and other anthropogenic environmental impacts. We argue that effective conservation of biodiversity is essential for human survival and the maintenance of ecosystem processes. Despite some conservation successes (especially at local scales) and increasing public and government interest in living sustainably, biodiversity continues to decline. Moving beyond 2010, successful conservation approaches need to be reinforced and adequately financed. In addition, however, more radical changes are required that recognize biodiversity as a global public good, that integrate biodiversity conservation into policies and decision frameworks for resource production and consumption, and that focus on wider institutional and societal changes to enable more effective implementation of policy.

Accession Number: WOS:000281657300025

Document Type: Review

Language: English

KeyWords Plus: PROTECTED-AREA NETWORK; CLIMATE-CHANGE; HABITAT FRAGMENTATION; DEVELOPING-COUNTRIES; ECOSYSTEM SERVICES; DIRECT PAYMENTS; LAND-USE; SUSTAINABILITY; DEFORESTATION; GOVERNANCE

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[6] Fauna & Flora Int, Cambridge CB1 2JD, England
⊞ [7] Univ Cambridge, Dept Land Econ, Cambridge CB3 9EP, England
[8] World Conservat Monitoring Ctr, United Nations Environm Programme, Cambridge CB3 0DL, England
⊞ [9] Univ Cambridge, Dept Zool, Cambridge CB2 3EJ, England
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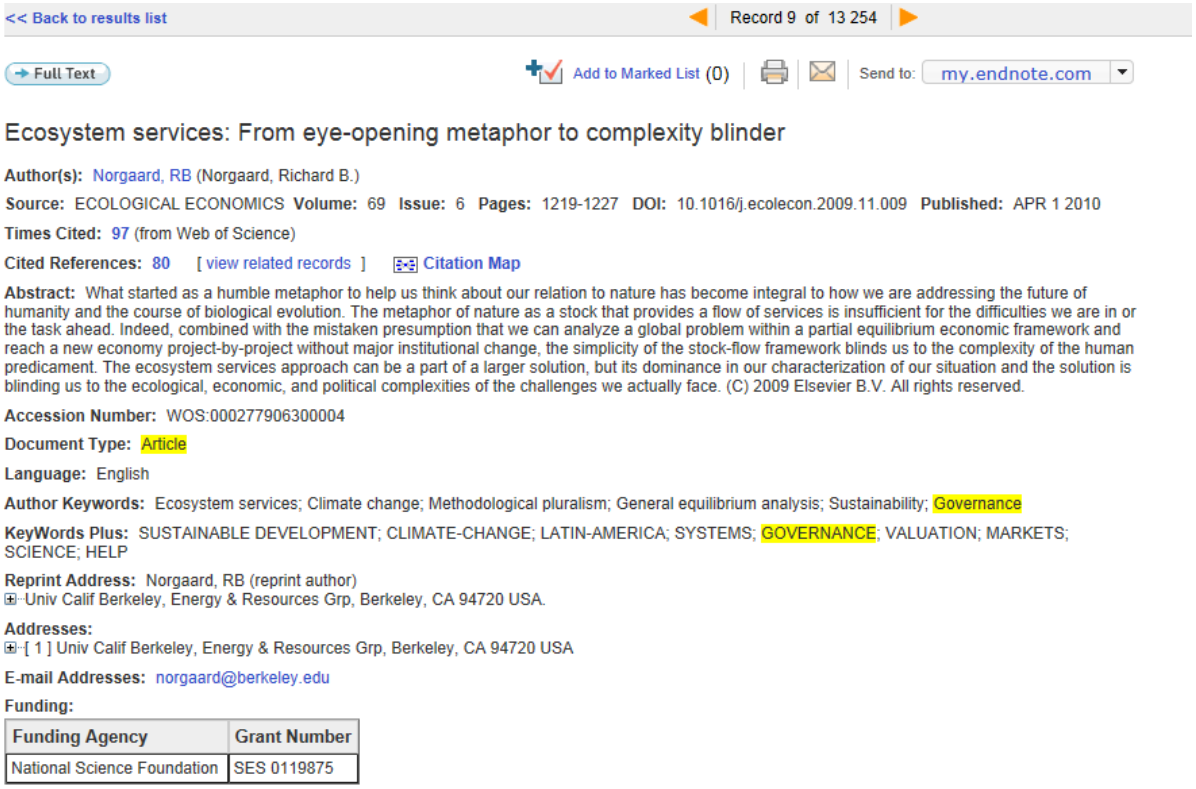
⊞ **Author Identifiers:**

- A highly cited article challenging environmental economics as the Doxa it had become



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Ecosystem services: From eye-opening metaphor to complexity blinder

Author(s): Norgaard, RB (Norgaard, Richard B.)

Source: ECOLOGICAL ECONOMICS **Volume:** 69 **Issue:** 6 **Pages:** 1219-1227 **DOI:** 10.1016/j.ecolecon.2009.11.009 **Published:** APR 1 2010

Times Cited: 97 (from Web of Science)

Cited References: 80 [view related records] Citation Map

Abstract: What started as a humble metaphor to help us think about our relation to nature has become integral to how we are addressing the future of humanity and the course of biological evolution. The metaphor of nature as a stock that provides a flow of services is insufficient for the difficulties we are in or the task ahead. Indeed, combined with the mistaken presumption that we can analyze a global problem within a partial equilibrium economic framework and reach a new economy project-by-project without major institutional change, the simplicity of the stock-flow framework blinds us to the complexity of the human predicament. The ecosystem services approach can be a part of a larger solution, but its dominance in our characterization of our situation and the solution is blinding us to the ecological, economic, and political complexities of the challenges we actually face. (C) 2009 Elsevier B.V. All rights reserved.

Accession Number: WOS:000277906300004

Document Type: Article

Language: English

Author Keywords: Ecosystem services; Climate change; Methodological pluralism; General equilibrium analysis; Sustainability; Governance

KeyWords Plus: SUSTAINABLE DEVELOPMENT; CLIMATE-CHANGE; LATIN-AMERICA; SYSTEMS; GOVERNANCE; VALUATION; MARKETS; SCIENCE; HELP

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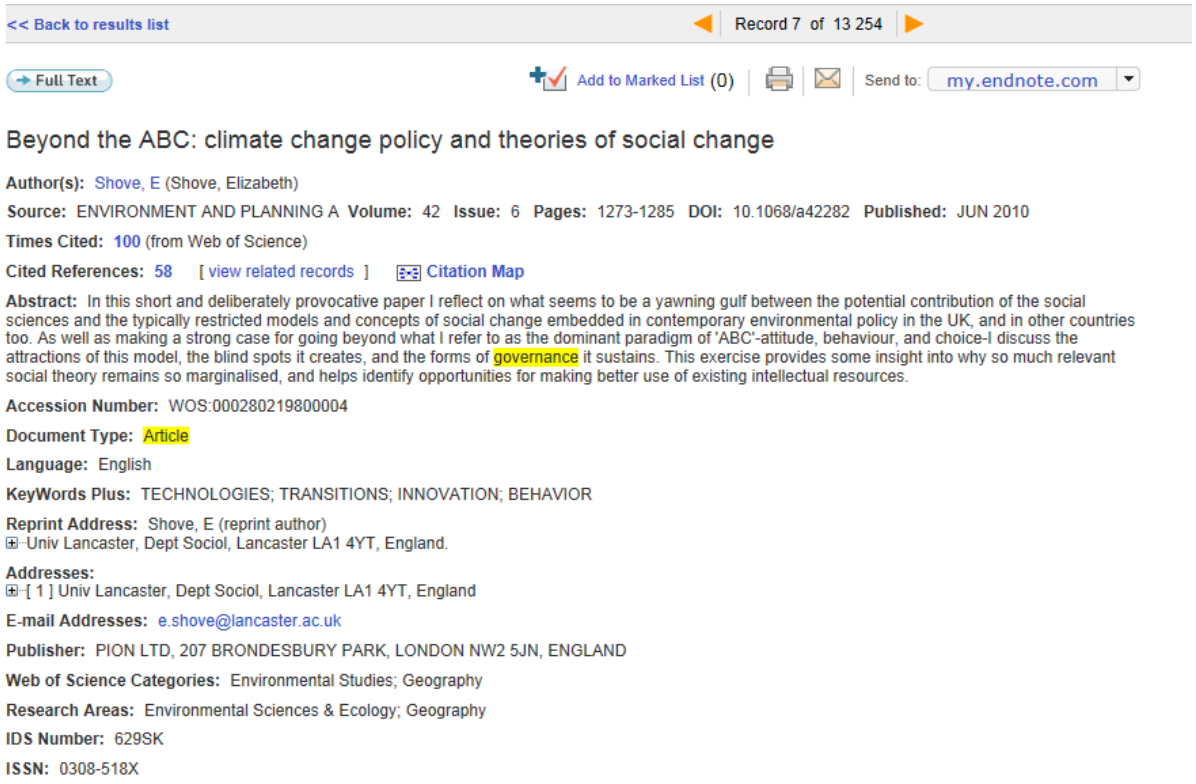
Funding:

Funding Agency	Grant Number
National Science Foundation	SES 0119875

- In the same vein, a critique of the reductive economicalisation of environmental problems



<< Back to results list Record 7 of 13 254

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Beyond the ABC: climate change policy and theories of social change

Author(s): Shove, E (Shove, Elizabeth)

Source: ENVIRONMENT AND PLANNING A **Volume:** 42 **Issue:** 6 **Pages:** 1273-1285 **DOI:** 10.1068/a42282 **Published:** JUN 2010

Times Cited: 100 (from Web of Science)

Cited References: 58 [view related records] Citation Map

Abstract: In this short and deliberately provocative paper I reflect on what seems to be a yawning gulf between the potential contribution of the social sciences and the typically restricted models and concepts of social change embedded in contemporary environmental policy in the UK, and in other countries too. As well as making a strong case for going beyond what I refer to as the dominant paradigm of 'ABC'-attitude, behaviour, and choice-I discuss the attractions of this model, the blind spots it creates, and the forms of governance it sustains. This exercise provides some insight into why so much relevant social theory remains so marginalised, and helps identify opportunities for making better use of existing intellectual resources.

Accession Number: WOS:000280219800004

Document Type: Article

Language: English

KeyWords Plus: TECHNOLOGIES; TRANSITIONS; INNOVATION; BEHAVIOR

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Publisher: PION LTD, 207 BRONDESBURY PARK, LONDON NW2 5JN, ENGLAND

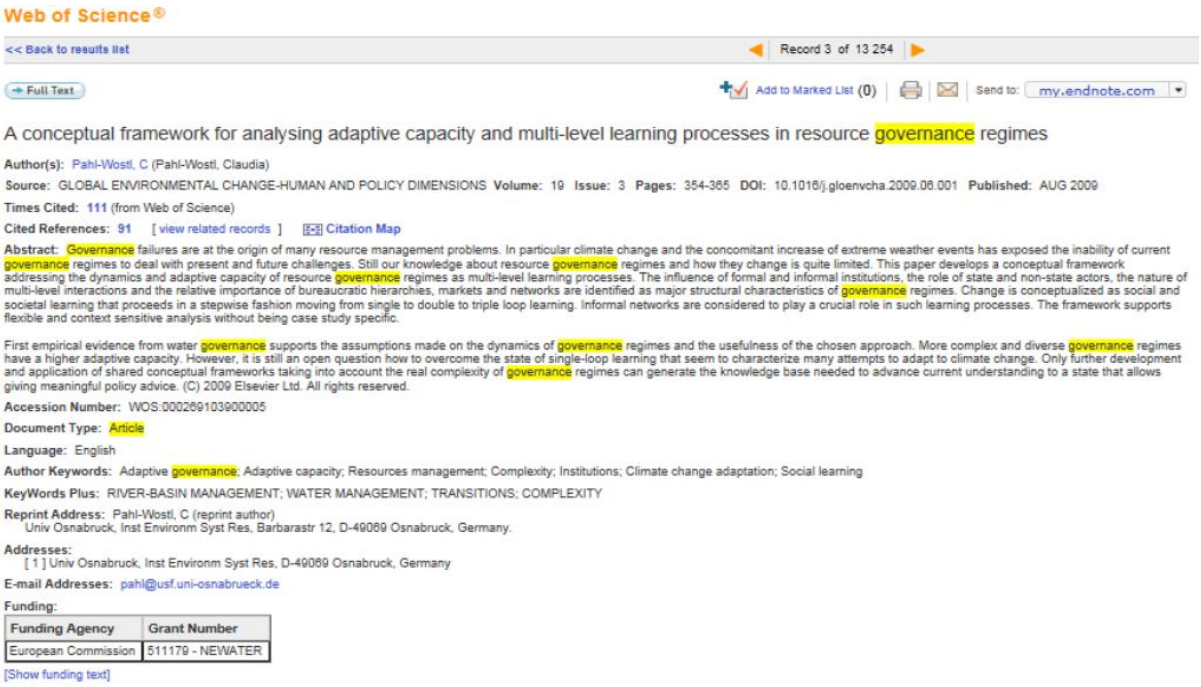
Web of Science Categories: Environmental Studies; Geography

Research Areas: Environmental Sciences & Ecology; Geography

IDS Number: 629SK

ISSN: 0308-518X

- And concern for the trials and errors of global governance



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A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes

Author(s): Pahl-Wostl, C (Pahl-Wostl, Claudia)

Source: GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS Volume: 19 Issue: 3 Pages: 354-365 DOI: 10.1016/j.gloenvcha.2009.06.001 Published: AUG 2009

Times Cited: 111 (from Web of Science)

Cited References: 91 [view related records] Citation Map

Abstract: Governance failures are at the origin of many resource management problems. In particular climate change and the concomitant increase of extreme weather events has exposed the inability of current governance regimes to deal with present and future challenges. Still our knowledge about resource governance regimes and how they change is quite limited. This paper develops a conceptual framework addressing the dynamics and adaptive capacity of resource governance regimes as multi-level learning processes. The influence of formal and informal institutions, the role of state and non-state actors, the nature of multi-level interactions and the relative importance of bureaucratic hierarchies, markets and networks are identified as major structural characteristics of governance regimes. Change is conceptualized as social and societal learning that proceeds in a stepwise fashion moving from single to double to triple loop learning. Informal networks are considered to play a crucial role in such learning processes. The framework supports flexible and context sensitive analysis without being case study specific.

First empirical evidence from water governance supports the assumptions made on the dynamics of governance regimes and the usefulness of the chosen approach. More complex and diverse governance regimes have a higher adaptive capacity. However, it is still an open question how to overcome the state of single-loop learning that seem to characterize many attempts to adapt to climate change. Only further development and application of shared conceptual frameworks taking into account the real complexity of governance regimes can generate the knowledge base needed to advance current understanding to a state that allows giving meaningful policy advice. (C) 2009 Elsevier Ltd. All rights reserved.

Accession Number: WOS:000269103900005

Document Type: Article

Language: English

Author Keywords: Adaptive governance; Adaptive capacity; Resources management; Complexity; Institutions; Climate change adaptation; Social learning

KeyWords Plus: RIVER-BASIN MANAGEMENT; WATER MANAGEMENT; TRANSITIONS; COMPLEXITY

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Funding:

Funding Agency	Grant Number
European Commission	511179 - NEWATER

[Show funding text]

'*Governance*' Summary Sheet

While 'Governance' was almost absent as a term from the SSCI until the early 1990s, it originated with the concerns of managers working mostly in universities who were trying to find a doctrine for **dispute management** in their institutions. Other managers in charge of setting up *new projects* (innovative medical services, city district renovation...) also adopted it as vocabulary to express their methodology in order to manage change with a minimum of conflict between leaders and employees (or managers and service users). This was the limited usage seen from 1960-1980. **The term was used by practitioners** concerned for **amicable** (or participatory) **conflict resolution** on a micro-**institutional** scale, primarily in the **public sector.**

Towards the end of the 1990s, the term's applications increased. New usage, which rapidly expanded, came in the fields of economics and **business organisation.** Management sciences here transposed the concept of 'Regime', which had been used in history and macro-politics to talk about the *mode of government* of long-lasting societies. Their particular focus was the long-term reduction of conflict between company shareholders and management (and between management and employees). Various universities took up this new use (California, Texas A.M., Washington...). But the arrival of *Harvard* (and its business school) to the running marked a turning point in the popularisation of the concept. It extended it to public administration and governments' action. This happened in 1990 and attracted many other renowned American universities (California, Columbia, Illinois (Chicago), Texas A.M., M.I.T, Michigan and many others... Many universities across the world began to use the word, but in a scattered, sporadic pattern.

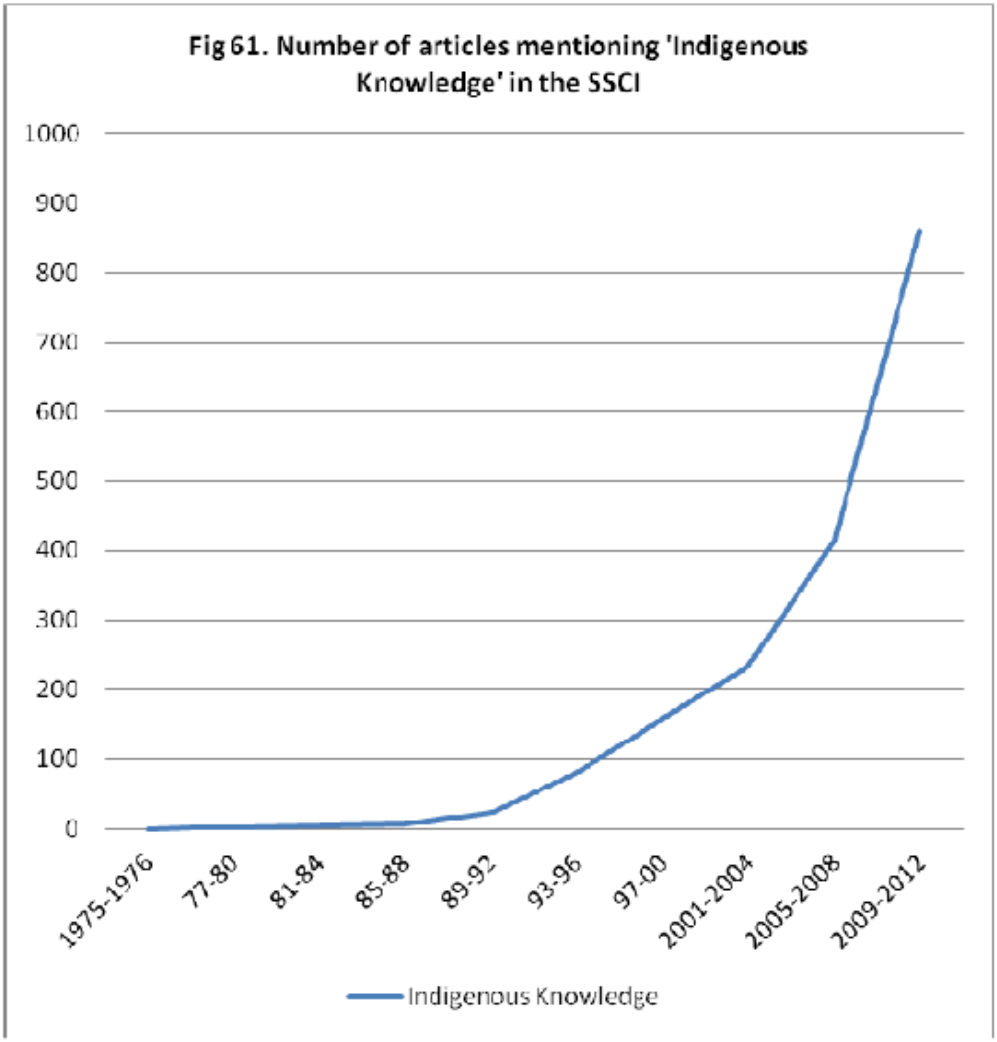
It should be noted that up to the end of the 1990s, 'governance' *was in no way concerned with environmental issues.* It was only from the 2000s, ten years after the term took off, that ***environmental studies*** began to make significant use of it (coming 5th for areas of use). Meanwhile its areas of application extended further, and *Political Science* and *public administration* management ranked just after *business* studies. Thus there were more or less determined attempts to move a number of issues away from the field of 'government' (the State), towards business and civil society initiatives. ***Environmental Studies*** finally made a strong showing (coming 5th in areas referring to 'governance'). The landscape of the 'championing' institutions had also changed. European (and particularly English) universities now set the pace (London, Cardiff, Manchester, Birmingham...). These latter made it a central cause, persuading the *European Community* to pay particular attention.

The **2000s** saw the *prodigious success* of the concept confirmed, especially in Europe but also, by extension, across the world. Its areas of application continued to grow, and a particularly high degree of interest came from Environmental Studies, which became its 2nd largest area of application, behind Business-Economics, and equal with Political science, but far ahead of other public administration issues in the fields of law and sectoral management (urbanisation, health, education...), whose relative weighting fell considerably: they appeared to be dropping the concept.From this point onwards, all debate on the *environment seemed obliged to refer to the question of governance*, both on local questions (including the criticism and mitigation of conflict that business intervention tends to lead to); and on issues of concern to all humanity such as climate change, which exceed State capacities to regulate separately like isolated individuals or non-governmental actors.

Europe was the main site of dissemination over this final period. The opinion leaders (the most cited authors, at least in terms of the SSCI), were also European.
By the end of the decade (2009-2012) these developments could be witnessed in terms of: the list of funders mentioned by the indexed articles (with the European Commission in the lead); the home institutions of the main authors (Dutch, English and Scandinavian universities in the lead); and the most widely cited articles: areas of concern had grown and moved on to concerns about planetary change (over-exploitation, climate change, water and energy crises...) and the search for a government for the new age of *'**Anthropocene***'.

B. Traditional knowledge, Indigenous Knowledge: History and polysemy

'Indigenous Knowledge' as an expression was absent from the SSCI at the outset, and made its first tentative appearance in **1979.** It kept a low profile throughout the 1980s. A sudden stimulus came from 1988-1999 and it then took off **throughout the 1990s and 2000s** (Graph: Fig. 61).



The expression's appearance echoed the calls of *researchers and agricultural extension workers*, who were beginning to re-evaluate local technical knowledge and the interest in using it. They drew attention back to the detailed, vigorous recommendations of great colonial experts of the past (including such French geographers as Labouret and Gourou). Development studies joined the movement (particularly social scientists from the IDS in Brighton). A few anthropologists also worked hard to contribute their perspectives (as for example Brokensha, D.; Warren, D.; Werner, O. With the highly cited work they edited in 1980 at University Press of America, New York).

Examples of titles:

Title: **INDIGENOUS TECHNICAL KNOWLEDGE - ANALYSIS, IMPLICATIONS AND ISSUES**
Author(s): HOWES, M; CHAMBERS, R
Source: IDS BULLETIN-INSTITUTE OF DEVELOPMENT STUDIES Volume: **10** Issue: **2** Pages: **5-11** Published: **1979**
Times Cited: **11** (from Web of Science)

Title: **USES OF INDIGENOUS TECHNICAL KNOWLEDGE IN DEVELOPMENT**
Author(s): HOWES, M
Source: IDS BULLETIN-INSTITUTE OF DEVELOPMENT STUDIES Volume: **10** Issue: **2** Pages: **12-23** Published: **1979**
Times Cited: **6** (from Web of Science)

Title: **SELECT ANNOTATED-BIBLIOGRAPHY - INDIGENOUS TECHNICAL KNOWLEDGE IN DEVELOPMENT**
Author(s): OKEEFE, L; HOWES, M
Source: IDS BULLETIN-INSTITUTE OF DEVELOPMENT STUDIES Volume: **10** Issue: **2** Pages: **51-58** Published: **1979**
Times Cited: **1** (from Web of Science)

This rehabilitation experienced a period of limited regard, which began to soar ***in the 1990s.*** It was a time when local practices were being particularly valued, and legitimised by a change of values (the journal ***Science, Technology & Human Values***[2] ***played a keyrole***). It began to attract the attention of experts, research centres and even international organisations. At times, the term became hemmed in by meaningless repetition, or impounded within a clique of fervent defenders. From the outset, there was a call for a genuine debate on the plurality of knowledge and how they may connect up[3]. Criticism came from elsewhere that local knowledge was becoming fetishised and simplified as a development formula doing nothing to help 'indigenous people' to become less dependent[4].

The 1990s were also a time when ***anthropologists*** started to appropriate the term, gradually taking the lead over agricultural practitioners and development studies generalists. This approach had two faces. Most anthropologists welcomed the renewed interest in traditional knowledge and saw potential for a new area of applied research that could attract funding and offer consulting to national and international leaders. At the same time, a more critical, politically engaged school of thought emerged whereby some anthropologists highlighted the dependency and marginalisation in which 'indigenous' people were stuck, helping (or launching) campaigns for their emancipation.

Sample titles:

1) **The development of indigenous knowledge - A new applied anthropology**

[2] See for example the article of Chambers et al. published in this journal in 1988: "An examination of colonialism in establishing negative values and attitudes towards indigenous agricultural knowledge systems", STHV, 13 (2), pp. 109-110.

[3] For example: **From 1979, Martin BELL** (IDS Brighton) made the point that 'indigenous people' know how to resort to every type of knowledge, asking himself: "Whose Use of What for What?: *Exploitation of Indigenous Knowledge or the Indigenous Exploitation of Knowledge?*"

[4] The most widely cited text from the whole 'Indigenous Knowledge' section was by **A. Agrawal** (Univ of Florida, Politics department), published in Development and Change in 1995 and was called: "*Dismantling the Divide between Indigenous and Scientific Knowledge*". It argued as follows: "In the past few years scholarly discussions have characterized indigenous knowledge as a significant **resource for development**… The article suggests that *both the concept of indigenous knowledge, and its role in development, are problematic issues* as currently conceptualized. To productively engage indigenous knowledge in development, we must go beyond the dichotomy of indigenous vs. scientific, and ***work towards greater autonomy for 'indigenous' peoples".***

Author(s): Sillitoe, P (Sillitoe, P)

Source: CURRENT ANTHROPOLOGY **Volume:** 39 **Issue:** 2 **Pages:** 223-252 **DOI:** 10.1086/204722 **Published:** APR **1998**

Times Cited: **146** (from Web of Science)

Abstract: The widespread adoption of bottom-up participation as opposed to top-down modernisation approaches has opened up challenging opportunities for anthropology in development. The new focus on indigenous knowledge augurs the next revolution in anthropological method, informants becoming collaborators and their communities participating user-groups, and touches upon such contemporary issues as the crisis of representation, ethnography's status with regard to intellectual property rights, and interdisciplinary cooperation between natural and social scientists. Indigenous-knowledge studies are challenging not only because of difficulties in cross-cultural communication and understanding but also because of their inevitable political dimensions. Contributing to development which intervenes in people's Lives, these studies engage with them in novel ways.

Document Type: Review

KeyWords Plus: ON-FARM RESEARCH; AGROFORESTRY DEVELOPMENT; NEPAL; SOIL; CONSERVATION; PERSPECTIVES; PERCEPTION; TECHNOLOGY; SCIENCE; STATE

Reprint Address: Sillitoe, P (reprint author), Univ Durham, Durham DH1 3HN, England

2) DISMANTLING THE DIVIDE BETWEEN INDIGENOUS AND SCIENTIFIC KNOWLEDGE

Author(s): AGRAWAL, A (AGRAWAL, A)

Source: DEVELOPMENT AND CHANGE Volume: 26 Issue: 3 Pages: 413-439 DOI: 10.1111/j.1467-7660.1995.tb00560.x Published: JUL 1995

Times Cited: 289 (from Web of Science)

Author(s): Sillitoe, P (Sillitoe, P)

Source: CURRENT ANTHROPOLOGY Volume: 39 Issue: 2 Pages: 223-252 DOI: 10.1086/204722 Published: APR 1998

Times Cited: 146 (from Web of Science)

Cited References: 214 [view related records] Citation Map

Abstract: The widespread adoption of bottom-up participation as opposed to top-down modernisation approaches has opened up challenging opportunities for anthropology in development. The new focus on indigenous knowledge augurs the next revolution in anthropological method, informants becoming collaborators and their communities participating user-groups, and touches upon such contemporary issues as the crisis of representation, ethnography's status with regard to intellectual property rights, and interdisciplinary cooperation between natural and social scientists. Indigenous-knowledge studies are challenging not only because of difficulties in cross-cultural communication and understanding but also because of their inevitable political dimensions. Contributing to development which intervenes in people's Lives, these studies engage with them in novel ways.

Document Type: Review

KeyWords Plus: ON-FARM RESEARCH; AGROFORESTRY DEVELOPMENT; NEPAL; SOIL; CONSERVATION; PERSPECTIVES; PERCEPTION; TECHNOLOGY; SCIENCE; STATE

Reprint Address: Sillitoe, P (reprint author)
Univ Durham, Durham DH1 3HN, England.

In the 1990s the term also started to shift from *agriculture* to *environmental studies*. The focus was less on production or productivity than on conservation and '***natural resource'*** *management,* with awareness growing of the inherent vulnerability and finite nature of these resources.

Ultimately, **the notion broke away from the (more commonly used) 'traditional knowledge' and 'local knowledge',** which were dropped for being implicitly pejorative: the former for its insistent modernising ambitions and the latter for its universalising approach to 'scientific knowledge'. Let's take a moment to cover these differences.

The concept of **'*Traditional knowledge*'** (which featured 7121 times in the SSCI while 'Indigenous Knowledge' appeared 1853 times) conveys some of the central themes of psychology (cognition, memory...), and even more so of organisational sociology as applied to companies (***technological learning,*** *the ability to change, to adapt to new technology,* to *apply* as well as retain both explicit and tacit knowledge...) and public policies for supporting innovation (clusters, collective knowledge acquisition...). Its main areas of application were, significantly, **education** in 1st place, business economics in 2nd place, psychology in 3rd place, health and health professions in 4th place (Nursing, Midwifery...). Environmental and ecological sciences only came 5th, and were closely followed by computing (human and machine learning...).

The concept of '***Local knowledge***' (which featured 8230 times in the SSCI) was initially connected to **economic management:** knowledge transfer and dissemination (through 'spillover'), the role of geographic proximity in these 'spillovers' (which takes us back to the question of 'clusters')... But environmental studies had a large share here (2nd place in terms of volume).
Anthropology was also prominent (see the widely cited work by *C. Geertz published in 1983: "Local knowledge: Further Essays in Interpretive Anthropology*"). And Geography, Psychology (sorting information, gaining knowledge from information...), public health, administration and law were of course always in evidence.

These two concepts, and especially local knowledge, served as a *halo* (and not just as a point of contrast) to **the more 'politically engaged' term of 'Indigenous Knowledge')**. The latter term ***politicised*** (and/or took to a *legal challenge* level) recognition of local knowledge as regards ***intellectual property rights*** (or more generally the ***rights to one's own culture****).* It called for action by drawing on the ethnographic corpus and taking advantage of the renewed use of 'local' knowledge as a term by all sorts of practitioners from a wide range of fields: this culminated in a concept that was widely familiar and legitimised.

The final decade (2001-2012) only brought a few changes to the table (other than the considerable rise of the notion of Indigenous knowledge (which was used 1508 times in this decade, in contrast to 345 times over the 25 preceding years). The notion was largely appropriated by anthropologists (who debated the term fiercely), and by ***Environmental Studies.***

The following are some of the most widely cited works:

Title: **Who knows? On the importance of identifying "Experts" when researching local ecological knowledge**
Author(s): Davis, A; Wagner, JR
Source: **HUMAN ECOLOGY** Volume: **31** Issue: **3** Pages: **463-489** DOI: **10.1023/A:1025075923297** Published: **SEP 2003**
Times Cited: **129** (from Web of Science)
[Anthropology, Canada]

Title: **Life after death**
Author(s): Woods, C
Source: PROFESSIONAL GEOGRAPHER Volume: **54** Issue: **1** Pages: **62-66** DOI: **10.1111/0033-0124.00315** Published: **FEB 2002**
Times Cited: **93** (from Web of Science)
[Geography, Area Studies; USA]

Title: **How to unlock regional economies from path dependency? From learning region to learning cluster**
Author(s): Hassink, R
Conference: **Conference on Regionalization of Innovation Policy** Location: **Berlin, GERMANY** Date: **JUN 04-05, 2004**
Source: EUROPEAN PLANNING STUDIES Volume: **13** Issue: **4** Pages: **521-535** DOI: **10.1080/09654310500407134** Published: **JUN 2005**
Times Cited: **88** (from Web of Science)
[Geography, Environment; Germany]

Title: **Knowledge, learning and the evolution of conservation practice for social-ecological system resilience**
Author(s): Berkes, Fikret; Turner, Nancy J.
Source: **HUMAN ECOLOGY** Volume: **34** Issue: **4** Pages: **479-494** DOI: **10.1007/s10745-006-9008-2** Published: **AUG 2006**
Times Cited: **63** (from Web of Science)
[Environment, Canada]

Title: **Living on the edge: Ecological and cultural edges as sources of diversity for social-ecological resilience**
Author(s): Turner, NJ; Davidson-Hunt, IJ; O'Flaherty, M
Source**: HUMAN ECOLOGY** Volume: **31** Issue: **3** Pages: **439-461** DOI: **10.1023/A:1025023906459** Published: **SEP 2003**
Times Cited: **57** (from Web of Science)
[Anthropology, Environment. Canada]

Title: **The effect of market economies on the well-being of indigenous peoples and on their use of renewable natural resources**
Author(s): Godoy, R; Reyes-Garcia, V; Byron, E; et al.
Source: ANNUAL REVIEW OF ANTHROPOLOGY Book Series: **Annual Review of Anthropology** Volume: **34** Pages: **121-138** DOI: **10.1146/annurev.anthro.34.081804.120412** Published: **2005**
Times Cited: **49** (from Web of Science)
[Politiques sociales, Anthropology, USA]

Title: **Indigenous people incorporated? Culture as politics, culture as property in pharmaceutical bioprospecting**
Author(s): Greene, S
Source***: CURRENT ANTHROPOLOGY*** Volume: **45** Issue: **2** Pages: **211-237** DOI: **10.1086/381047** Published: **APR 2004**
Times Cited: **42** (from Web of Science)
[ICBG, USA]

Title: **Incorporating Fishermen's local knowledge and behavior into geographical information systems (GIS) for designing marine protected areas in Oceania**
Author(s): Aswani, S; Lauer, M
Source: HUMAN ORGANIZATION Volume: **65** Issue: **1** Pages: **81-102** Published: **SPR 2006**
Times Cited: **41** (from Web of Science)
[Geography; Anthropology; USA]

Title: **Environmental disaster, "Culture loss," and the law**

Author(s): Kirsch, S
Source: ***CURRENT ANTHROPOLOGY*** Volume: **42** Issue: **2** Pages: **167-198** DOI: **10.1086/320006** Published: **APR 2001**
Times Cited: **41** (from Web of Science)
[Anthropology; UK, USA]

(And three of the works in more detail, including the 2 most highly cited):

Title. Who knows? On the importance of identifying "Experts" when researching local ecological knowledge

Author(s): Davis, A (Davis, A); Wagner, JR (Wagner, JR)
Source: HUMAN ECOLOGY Volume: 31 Issue: 3 Pages: 463-489 Published: SEP 2003

Times Cited: 129 (from Web of Science)

Abstract: Documenting local ecological knowledge (LEK) has recently become a topic of considerable interest within the social research, development, and indigenous rights communities. For instance, LEK is thought to offer a substantial alternative to existing, largely "top-down," natural resource management regimes. LEK informed resource management systems would acknowledge peoples' experiences and priorities, while also providing people with additional means of empowerment. Given these qualities, one might reasonably expect that rigorous design and methodological attributes will characterize LEK research, particularly respecting the procedures employed to identify and to select " local knowledge experts." Our review of the recent social research literature suggests that insufficient attention is given both to reporting the methods employed and to employing systematic approaches, especially with regard to the critical issue of how local experts are identified. We detail a research design that systematically solicited peer recommendations of fisheries local knowledge experts in a study focused on two northeast Nova Scotian embayments. Finally, we argue that in order to achieve the stated purposes and potentials of LEK research, researchers need to become more attentive to reporting on the methods employed and to employing systematic approaches than is currently the case.

Author Keywords: local ecological knowledge; research methods

KeyWords Plus: WHALES DELPHINAPTERUS-LEUCAS; ARCTIC TUNDRA CARIBOU; INDIGENOUS KNOWLEDGE; ENVIRONMENTAL ASSESSMENT; TRADITIONAL KNOWLEDGE; RESOURCE-MANAGEMENT; POPULATION; INUIT

Title : Life after death

Author(s): Woods, C (Woods, C)

Source: PROFESSIONAL GEOGRAPHER **Volume:** 54 **Issue:** 1 **Pages:** 62-66 **Published:** FEB 2002

Times Cited: 93 (from Web of Science)

Abstract: Predictions of the death of impoverished and actively marginalized racial and ethnic communities are premature. Many core African American societies have been devastated by the state, capital, and cultural policies of the last two decades. Simultaneously, geography and the other social sciences have been mobilized in order to prevent a fuller understanding of these communities and of the need for social equity. The further development of several approaches is required to open geography and the otter disciplines up for community-building, rather than community destruction. The incorporation of research in the following areas holds out the promise of revitalizing both: human rights; the ethnic movements underlying restructuring; the social construction of regions; due reproduction of social power; building ethnic alliance; and indigenous knowledge systems.

Address: Univ Maryland, Dept Afroamer Studies, College Pk, MD 20742 USA
Research Area: Geography

Title: Indigenous people incorporated? Culture as politics, culture as property in pharmaceutical bioprospecting

Author(s): Greene, S (Greene, S)

Source: CURRENT ANTHROPOLOGY **Volume:** 45 **Issue:** 2 **Pages:** 211-237 **Published:** APR 2004

Times Cited: 42 **(from Web of Science)**

Abstract: The ongoing debate over indigenous claims to intellectual and cultural property reveals a series of indigenous strategies of mobilization that both appropriate from and work against the logic of the market. Of particular significance in this regard are the various indigenous strategies used in contemporary pharmaceutical bioprospecting activities to address claims to traditional medical knowledge as cultural property. This article presents field data on a controversial ethnopharmaceutical project among the Aguaruna of Peru's high forest and offers a comparative analysis of the outcomes with attention to several other cases in and beyond South America. In particular, questions are raised about the forms of legitimating authority in the burgeoning international indigenous movement, the role of NGOs, researchers, bureaucracies, and corporations in this process, and the dilemmas that emerge from the politicization and privatization of indigenous culture and identity.

KeyWords Plus: WIPOS EXPLORATORY PROGRAM; TRADITIONAL KNOWLEDGE; INTELLECTUAL PROPERTY; CONSERVATION; BIODIVERSITY; IDENTITY; ANTHROPOLOGY; FOLKLORE; AMAZON; ICBG

Reprint Address: Greene, S (reprint author) Univ Chicago, MAPSS, Pick 301,5828 S Univ Ave, Chicago, IL 60637 USA.

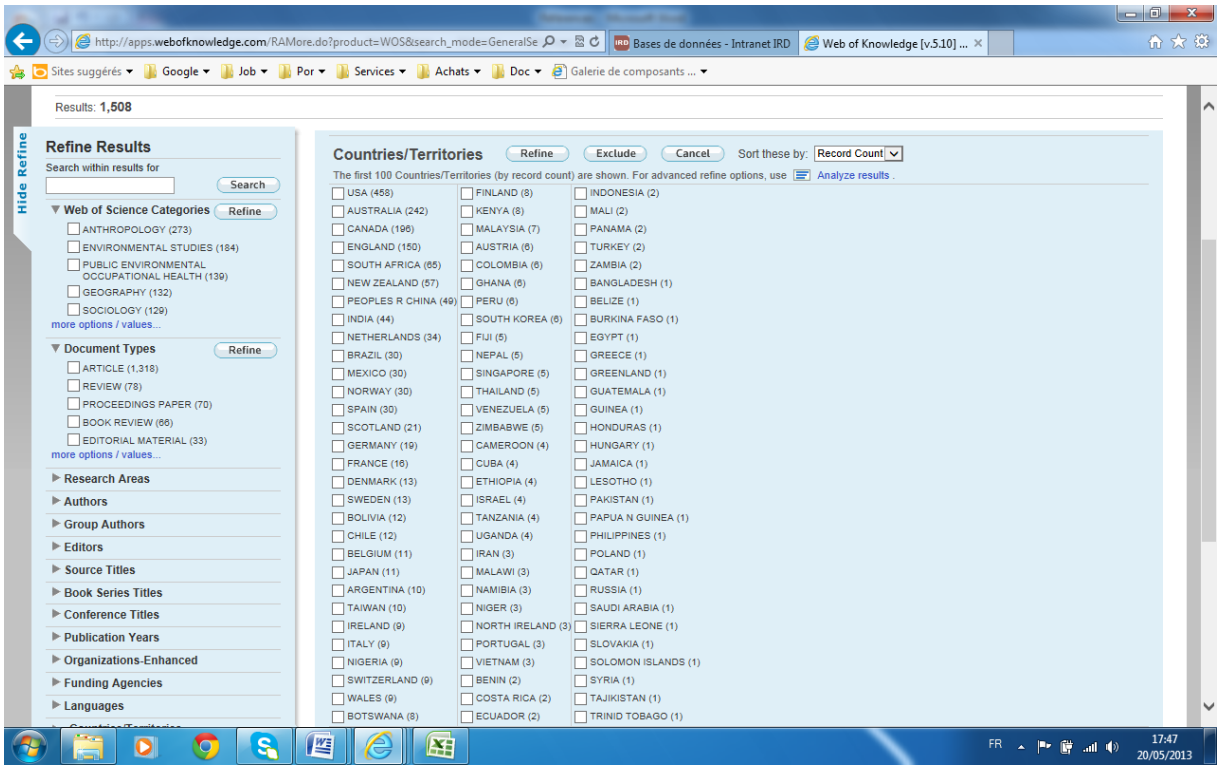
Research Areas: Anthropology, **Web of Science Categories:** Anthropology

N.B. The journal "***HUMAN ECOLOGY"*** was a **major source** at the time, with highly cited articles written by environmentalists and many anthropologists.

These texts highlight the major place of anthropology and environmental studies in the use of the term *Indigenous Knowledge*. Geography, sociology and economics also contributed major developments: this much more so than public administration, agriculture or public law, where the term remained marginal; meanwhile it was *barely used in development planning* and ***pharmacology and pharmacy***).

By this stage, its areas of interest and application were quite clear. Its sources and leading institutions were still often North American. The *Canadians* were notably interested in the concept and produced *influential articles.*

Interest also spread across the world, however. The most notable was probably the interest taken in Indigenous Knowledge in *emerging countries with composite societies*, such as Asia (India, China), Latin America (Brazil, Mexico, Andean countries) and South Africa. The following screen shot shows this. Notably: Australia took 2nd place in terms of number of publications; Bolivia and Chile took 19th and 20th place, etc. For Europe on the other hand, beyond England (which took 2nd place), the Netherlands and Norway stood out (albeit only in 9th and 10th places); after which came a small rearguard led by Spain taking 13th to 18th places).



It is also worthwhile to highlight the most loyal sources (the journals where the terms were used the most) and institutions, as the following table shows:

SOURCES 2001-2012 *Indigenous Knowledge* : **1508 items**	Nb Articles	Institutions 2001-2012 [5]	Nb articles
Human Ecology	57	**U California**	72
Ecology & Society	24	*U of London*	31
Human Organization	23	*Australian Nat Un*	25
Int Social Sc J	20	*Un of British Columbia*	25
Society Natural Resources	19	Florida State Un	25
Canadian Geographer	15	Un of Melbourne	24
American Anthropologist	14	Autonomous Un of *Barcelona*	22
Current Anthropology	14	…	
Agriculture & HV	14	Un of *Witwatersrand* (South Africa)	10
100 others	3 à 12	*UNAM (Mexico)…*	9

[5] This table is greatly abridged. Out of the 20 institutions with the highest profile, there are 2 American 'leaders' (California and Florida, which are both great 'environmental' specialists), but more strikingly, no less than 8 Australian and 5 Canadian universities. Just 2 European establishments feature (U. London and Autonomous U. Barcelona with its leading author: *V Reyes Garcia*). If we continue down the rankings (to the 50 most visible institutions), we find a range of establishments from the USA (with various fields of research) and another 2 Australian and 3 Canadian universities. Only 3 more English universities and 1 Belgian university can be found. Meanwhile there are universities from the Caribbean, Latin America (UNAM Mexico), central Africa (Johannesburg, Witwatersrand; Un Botswana).

Over the same period, the notions of *local knowledge* and *traditional knowledge* experienced their own developments.

'Local Knowledge' showed quite a similar pattern to 'indigenous knowledge', albeit with a few important differences. The notion was dominated by environmental studies, but also featured widely in works on business, education and health. Anthropologists used it, but made up a smaller share of its users than for 'indigenous knowledge': 8% in comparison to 40%. They made space for ***agronomists and environmental technicians***, as was reflected by the championing institutions: **'agricultural' universities** - such as several American 'land-grant universities' and above all ***Wageningen*** (Netherlands), were at the top of the rankings[6]. These major sources highlight the polysemy of the concept. The following table gives the main sources, grouping the publications by closely related field (for health, notably):

SOURCE 2001-2012 *Local Knowledge* **6714 items**	Nb Articles	50 Other sources 2001-2012	Nb Articles
European Planning Studies	81	[Various] Health Care	118
Ecology and Society	70	[Various] Policy	95
Human Ecology	64	[Various] Management, Organisation	97
Research Policy	60	[Various]Business, Innovation	69
Regional Studies	59	[Various] Rural Studies	35
Social Science Medicine	56	[Various] Urban Studies	50
Environment and Planning	52	[Various] Geography	85
Geoforum	48	[Various] Humanities	87
Society Natural Resources	45	[Various] Anthropology	33
Entrepreneurship and Regional Development	39		
Urban Studies	35	[Various] Environment, Ecology	37
BMC Public Health	34		
J. of Advanced Nursing	32		
J. of Environmental Management	31		

'Traditional knowledge' featured in **5309 items.** The areas concerned were, in order: education, business (innovation, management), health, and in 4th place Environmental Studies (331 items, making 6% of the total). The expression was strongly connected to *concerns for learning.* Anthropology was more in evidence than other social science disciplines (economics, sociology, geography; 200 to 230 items each). But here it did not automatically accompany environmental studies: it also had a high profile as regards health and employment issues, as well as industrial questions.

The leading authors were often the same as those for 'local knowledge': the two concepts were used fairly interchangeably. This was for example the case with the most high profile author, V. Reys-Garcia from Barcelona.

[66] Scattered amongst the rankings are several American and English universities and even NUS Singapore, who are there for works on business and health.

The most involved countries by far were the United States and England, followed by the Scandinavian countries and northern Europe. Here however, the attention of emerging countries (or candidate countries for this status) for the concept is also noteworthy, particularly as regards Asia (China, India, Taiwan, Singapore, Malaysia, Thailand, Vietnam...); this even more so than Latin America (Brazil, Mexico, Argentina, Columbia...) and Africa (South Africa, and to a lesser extent Nigeria and east Africa).

The championing institutions and main sources are given in the following table:

SOURCES 2001-2012 *Traditional Knowledge*: **5309 items**	Nb Articles	Institutions 2001-2012	Nb articles
Human Ecology	58	U California system	254
Computers Education	51	U State Florida	95
Ecology and Society	45	U of London	95
Social Science Medicine	42	U of Toronto	77
Science Education	32	Harvard U.	58
J. of Advanced Nursing	31	U Wisconsin	53
J. of the Am. Sty for Information S&T	29	U British Columbia	49
Internat. J. of Science education	25	U Michigan & Michigan State U	47 + 36
Research Policy	25	U Sydney	42
…		U Indiana	37
100 others	7 to 24	U Illinois…	37

Publication was spread out across a variety of journals. Those most open to the expression (listed above) show up the variety of areas that were covered, including the field of training as a recurrent concern for the term. Out of the 100 main leading institutions, there were 40 US universities, 11 Canadian, 8 Australian, 10 from the United Kingdom, 9 from Benelux, 6 from Scandinavian countries, 1 from southern Europe (Barcelona) and 5 from emerging countries (Hong Kong, Singapore and South Africa).

'*Indigenous Knowledge*' Summary Sheet

The notion of 'Indigenous Knowledge' took off in the 1990s (and to an even greater extent in the 2000s). It was eventually appropriated by 'environmental studies' and by the anthropologists working in this field.

It broke away from the more commonly used notions of 'local knowledge' and 'traditional knowledge'. The main point of interest for 'Local knowledge' as an expression was knowledge dissemination. As such it was found in works on industry, as well as public health, administration and law. Anthropologists studying systems of representations were in evidence, as were agronomists looking to re-legitimise ancient cultural practices. The expression 'traditional knowledge' was more closely related to questions of memory, cognition, adaption, innovation and *(technological*) *learning*.

'Indigenous Knowledge', which started out around 1980 among agronomists working on development projects which involved re-evaluating peasant know-how, turned into a more *militant* notion from 1990, highlighting the dependency and marginalisation of 'indigenous' people. It looked to support the fight for indigenous people to fairly benefit from development (a legal conflict), or more radically, for their emancipation.

This focus on 'indigenous knowledge' (or 'local' knowledge) was a challenge to the exclusive legitimacy of conventional scientific knowledge, which faced critique for being foreign, imported and no more expert than any other ethno-science (see the debates on this subject in South Africa on Aids, and Reference 1) below: Sandra HARDING).

But it is unclear whether debate on the plurality of knowledge and how it connects was on the agenda, or if it was even ever raised. The expression 'Indigenous Knowledge' was often a 'booster' argument for particular forms of agronomic or environmental lobbying, just as other communities used 'scientific knowledge' (biotechnological communities, for example). It served as leverage to encourage mobilisation and as a legal argument in defence of oppressed or marginalised communities, rather than as a working tool for regular action (See references 2 below). Few development projects were created on the basis of these forms of knowledge (Reference 3), except probably for *medical practice*, and in particular psychiatry (References 4 below).

References:

1) For example: Sandra HARDING "*Is Modern Science an Ethnoscience*?" in Shinn et al. ed, *Yearbook of the Sociology of Sciences, (19)*, Kluwer, 1997, pp 37-64.
2) Articles by Martin BELL and A. AGRAWAL, as presented earlier in this chapter
3) See for example, from the 1960s-1970s, the journal *Psychopathologie Africaine* and the works of H. COLLOMB, M-C. ORTIGUES (*Œdipe Africain*), ZEMPLENI et al.

C. Sustainable (Sustainab*): History and polysemy

We have already discussed **the weighting of this word** in the SSCI, and its considerable growth over time. We have evaluated its rise in comparison to other ENGOV key words: Nature, Environment (which are of course much more common terms); and Governance. The term 'Sustain*' was almost non-existent in the 1970s and made its first tentative appearance in the 1980s. By the early 1990s it had broken away from what it had been 10 years earlier. The word's success grew unabated from this point onwards, to a *considerable* extent. In *2010* the word *Sustain** featured in 1.5% of the articles indexed by the SSCI: barely 4 times less than 'Nature' or 'Environment', and more than "governance" (which originated earlier, but was overtaken in 1990).

Let's turn to the schema summed up by this data, and its corresponding table:

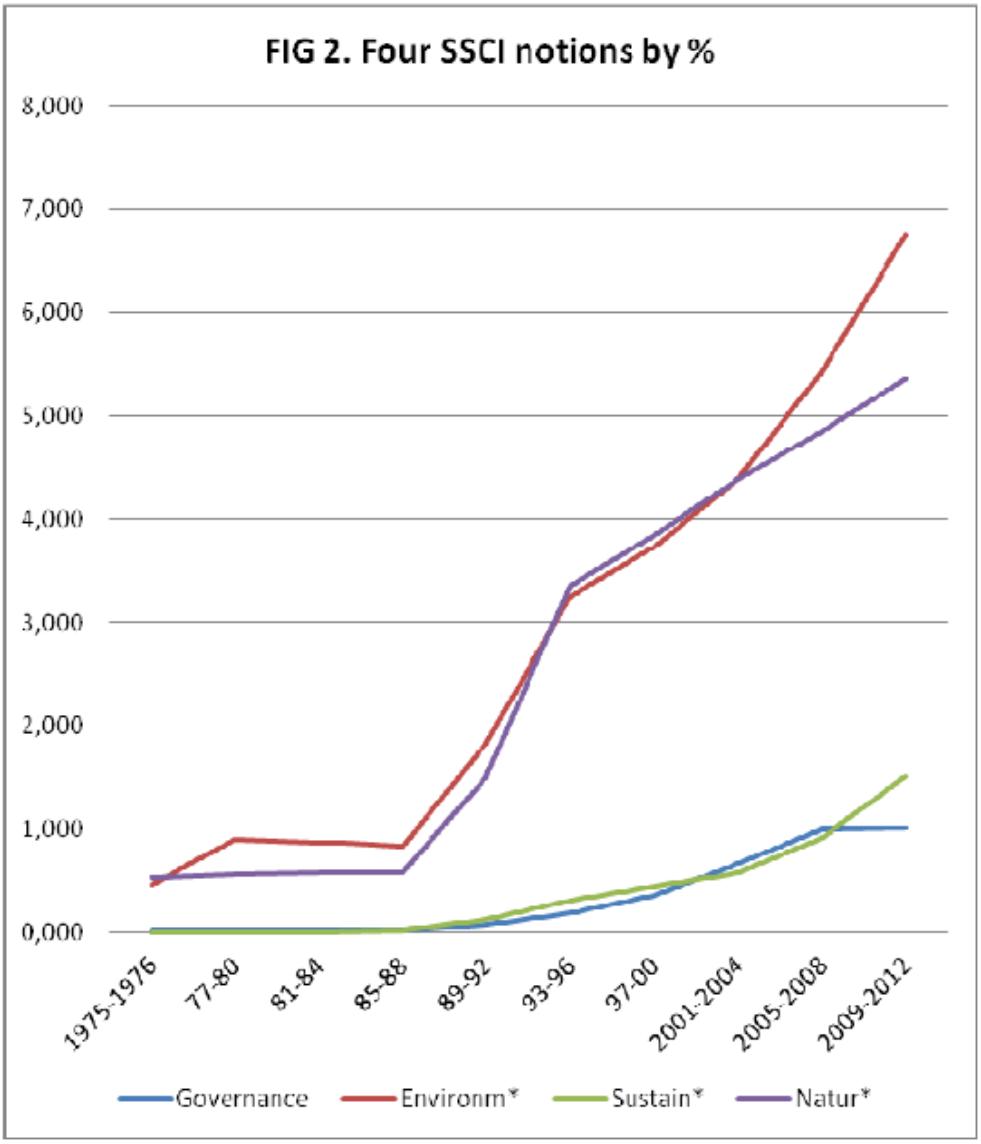


Table of presence in the articles indexed in the SSCI:

by % in the SSCI	1975-1976	77-80	81-84	85-88	89-92	93-96	97-00	2001-2004	2005-2008	2009-2012
Governance	0.020	0.024	0.026	0.023	0.068	0.187	0.364	0.662	1.005	1.016
Environm*	0.465	0.899	0.872	0.836	1.828	3.252	3.732	4.388	5.424	6.756
Sustain*	0.002	0.004	0.013	0.019	0.129	0.315	0.445	0.572	0.907	1.509
Natur*	0.535	0.558	0.569	0.592	1.497	3.360	3.839	4.378	4.846	5.363

For each notion: % SSCI presence (number of articles featuring the notion divided by the total number of articles searched through by the database over that period)

We will now look at the figures in more detail.

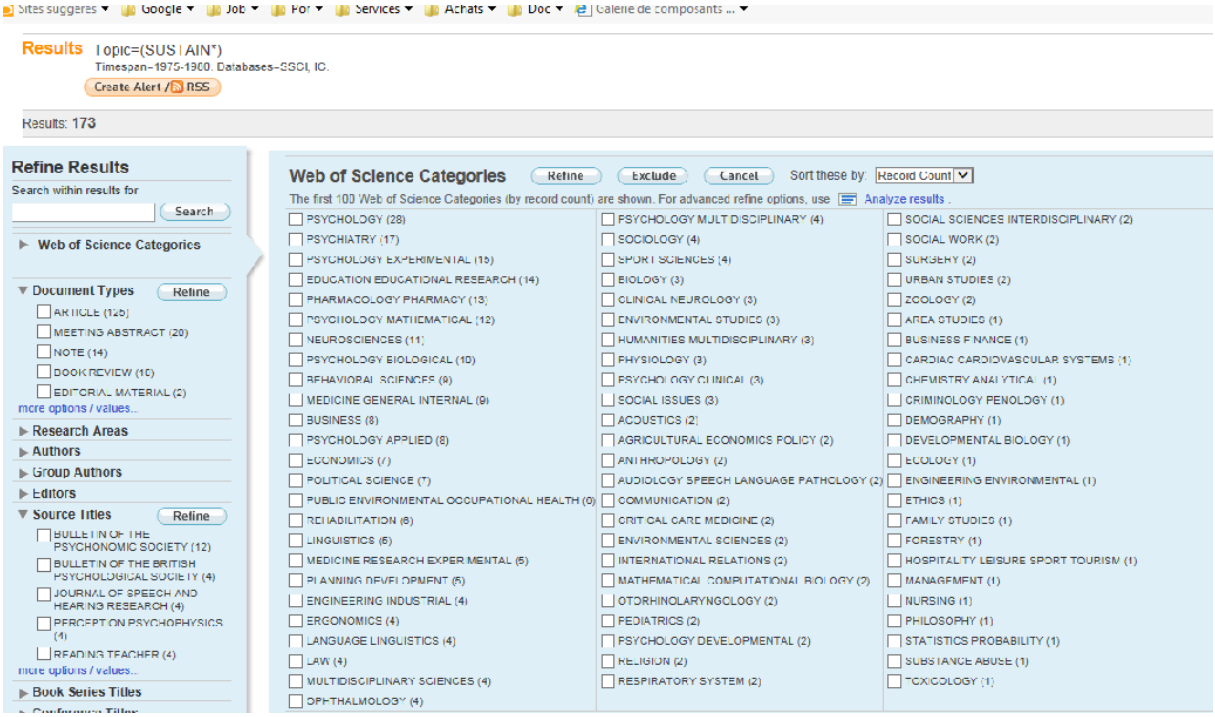
We will analyse **4-year sets of periods from the end of each decade.**

1975-80: Sustain* as a rare term. Very low share in environmental concern

173 items referred to Sustain* (Articles and selected conference papers)

The **disciplines** to use the term were mostly **medical** and particularly related to psychology (see screen capture):

1. Psy (-cho, -chiatry, behavioural…) = 70; Neuro (-logy, -sciences) = 30
2. Other medical fields = 40
3. Coming far behind: Education = 14, Linguistics = 5, Sociology and social issues = 6, … *Environmental (-sciences, -studies):* 2.



These (medical) concerns were mostly on problems of attention or sustained effort, or else to query the thoroughness of certain treatment and testing methods.

Examples of these concerns (Titles of articles):

1. Title: SUSTAINED AND TRANSIENT MECHANISMS IN HUMAN-VISION - TEMPORAL AND SPATIAL PROPERTIES
   Author(s): LEGGE, GE
   Source: VISION RESEARCH Volume: 18 Issue: 1 Pages: 69-81 DOI: 10.1016/0042-6989(78)90079-2 Published: 1978
   Times Cited: 312 (from Web of Science)
   Full Text

2. Title: SUSTAINED ATTENTION IN CHILDREN AT RISK FOR SCHIZOPHRENIA - REPORT ON A CONTINUOUS PERFORMANCE-TEST
   Author(s): RUTSCHMANN, J; CORNBLATT, B; ERLENMEYERKIMLING, L
   Source: ARCHIVES OF GENERAL PSYCHIATRY Volume: 34 Issue: 5 Pages: 571-575 Published: 1977
   Times Cited: 173 (from Web of Science)

3. Title: **MEMORY LOAD AND EVENT RATE CONTROL SENSITIVITY DECREMENTS IN SUSTAINED ATTENTION**
   Author(s): PARASURAMAN, R
   Source: SCIENCE Volume: **205** Issue: **4409** Pages: **924-927** DOI: **10.1126/science.472714** Published: **1979**
   Times Cited: **150** (from Web of Science)

4. Title: SUSTAINED VIEWING OF TELEVISION
   Author(s): KRUGMAN, HE
   Source: JOURNAL OF ADVERTISING RESEARCH Volume: 20 Issue: 3 Pages: 65-68 Published: 1980
   Times Cited: 14 (from Web of Science

7. Title: ELECTROMYOGRAPHIC STUDY OF MUSCLE FATIGUE IN SUSTAINED ISOMETRIC CONTRACTIONS
   Author(s): SATO, H
   Source: JOURNAL OF THE ANTHROPOLOGICAL SOCIETY OF NIPPON Volume: 85 Issue: 2 Pages: 83-94 Published: 1977
   Times Cited: 6 (from Web of Science

It may be more enlightening to look at **areas** of research. We find, in order:

1. Psy*: 60; Various medical branches: 47; Pharmacology: 14… **TOTAL** from these categories: **104**
2. Public administration, Public Law: 16
3. Linguistics 9; Engineering (energy, water): 6
4. **Science and society. Futurology**: 4
5. Sport 4; Sociology 4… Economics 4 (Sources: Fortune, Asian survey..)
6. **Environmental sciences & ecology 3**
7. **Urban studies 2**

As far as the environment is concerned**,** it is interesting to pinpoint **the first institutions to back the concept. Namely: the Universities of California, Wisconsin, and the State University of New York.**

Also noteworthy are **the pioneering journals** to give space to Sustain* as a concept. The major sources were: **Journal of Environmental Management, Urban Ecology;**

Some selected article titles:

Title: **LINEAR-PROGRAMMING APPROACH TO OPTIMAL SUSTAINABLE HARVESTING OF A FOREST**
Author(s): RORRES, C
Source: JOURNAL OF ENVIRONMENTAL MANAGEMENT Volume: **6** Issue: **3** Pages: **245-254** Published: **1978**
Times Cited: **12** (from Web of Science

Title: INDUCTION OF SUSTAINED RECYCLING BEHAVIOR THROUGH FOOT-IN-DOOR TECHNIQUE
Author(s): ARBUTHNOT, J; TEDESCHI, R; WAYNER, M; et al.
Source: JOURNAL OF ENVIRONMENTAL SYSTEMS Volume: 6 Issue: 4 Pages: 355-368 Published: 1977
Times Cited: 4

But what is most noteworthy is the weight in these beginnings of cogitations about **the Future of Humanity** (much more than about the environment),and the links between science and the society.

Here are the titles of some sample articles:

Title: **SPECULATIONS ON THE TRANSITION TO SUSTAINABLE ENERGY**
Author(s): PERELMAN, LJ
Source: ETHICS Volume: **90** Issue: **3** Pages: **392-416** DOI: **10.1086/292170** Published: **1980**
Times Cited: **5** (from Web of Science)

Title: **SUSTAINABLE SOCIETY - ETHICS AND ECONOMIC-GROWTH - STIVERS,R**
Author(s): PITCHER, A
Source: JOURNAL OF RELIGION Volume: **57** Issue: **4** Pages: **426-428** DOI: **10.1086/486580** Published: **1977**
Times Cited: **1** (from Web of Science

Title: **REMARKS ON SOME SPECULATIONS ABOUT A SUSTAINABLE SOCIETY AND ITS REVIEW**
Author(s): ARKUSZEWSKI, J
Source: SPECULATIONS IN SCIENCE AND TECHNOLOGY Volume: **3** Issue: **3** Pages: **343-344** Published: **1980**

Title: **ALTERNATIVES TO GROWTH - A SEARCH FOR SUSTAINABLE FUTURES - MEADOWS,DL**
Author(s): DASGUPTA, J
Source: ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE Volume: **450** Issue: **JUL** Pages: **301-303** Published: **1980**

Title: **SUSTAINABLE SOCIETY - IMPLICATIONS FOR LIMITED GROWTH - PIRAGES,DC**
Author(s): ROSA, E
Source: CONTEMPORARY SOCIOLOGY-A JOURNAL OF REVIEWS Volume: **9** Issue: **1** Pages: **83-84** Published: **1980**

Title: **SOME SPECULATIONS ABOUT A SUSTAINABLE SOCIETY**
Author(s): SEIFRITZ, W
Source: SPECULATIONS IN SCIENCE AND TECHNOLOGY Volume: **3** Issue: **3** Pages: **339-343** Published: **1980**

Title: **SUSTAINABLE SOCIETY - ETHICS AND ECONOMIC-GROWTH - STIVERS,RL**
Author(s): AYRES, RU
Source: TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE Volume: **15** Issue: **2** Pages: **157-158**

Title: **ALTERNATIVES TO GROWTH .1. SEARCH FOR SUSTAINABLE FUTURES - MEADOWS,DL**
Author(s): DRIVER, ED
Source: SOCIAL FORCES Volume: **57** Issue: **3** Pages: **1013-1014** Published: **1979**

Title: **EKISTICS AND ENERGETICS - SUSTAINABLE FUTURE PLANNING APPROACH**
Author(s): JOHNSTONE, IM
Source: URBAN ECOLOGY Volume: **4** Issue: **3** Pages: **227-233** Published: **1979**

Title: **TOWARD A SUSTAINABLE GROWTH STRATEGY**
Author(s): KEFALAS, AG
Source: BUSINESS HORIZONS Volume: **22** Issue: **2** Pages: **34-40** DOI: **10.1016/0007-6813(79)90049-1** Published: **1979**

Title: **ALTERNATIVES TO GROWTH .1. SEARCH FOR SUSTAINABLE FUTURES - MEADOWS,DL**
Author(s): LAPPING, MB
Source: GROWTH AND CHANGE Volume: **10** Issue: **2** Pages: **50-50** Published: **1979**

Title: BASIC HUMAN NEEDS AND SUSTAINABLE GROWTH
Author(s): MCHALE, J; MCHALE, MC
Source: FUTURIST Volume: 13 Issue: 1 Pages: 13-& Published: 1979

Title: TRANSITION TO SUSTAINABLE EXPANSION
Author(s): [Anonymous]
Source: FORTUNE Volume: 94 Issue: 3 Pages: 17-& Published: 1976

Although (outside the medical sciences) the volume of items indexed was low over this period, those articles that were published (or more specifically *their bibliographies*) allow to **explore the roots,** which are old, of an issue which was to remain constant (and stable over a long period) as to the resources available for the planet.

The following Summary Sheet details its origins, which go back to the 1950s.

Sustainab* = Sustainability: the ROOTS of the issue

- The term struck a chord in *1972* with the publication of an article heavily cited in the SSCI, "*Blueprint for Survival*"; and the book by Meadows et al.: "*The Limits of Growth*". These coincided with the first large-scale conference on ecological questions as a global issue: the United Nations Conference on the Environment in Stockholm (1972).

- This in fact harked back to *debates that had begun earlier (in the 1950s*), in the run-up to the great controversies of the time over individual freedom and the necessity for social revolution. Perhaps in a bid to get around (or go beyond?) these issues, a line of argument developed on the question of the future of humanity, deliberately returning to Malthusian concerns: what are the relations between demographic growth and pressure on 'resources'?
- 5 primary schools of idea took root at this time, whose variations and overlaps came together in the early 1970s in the concept of 'Sustainability'; namely:
- The limits of ecological plasticity;
- Resource depletion;
- Resource wastage;
- The violence of science and technology;
- Slow Growth or No-Growth as an ideal;
- The concept of biosphere, which became widespread in the wake of a 1968 UNESCO conference
- We should perhaps add to these the subsequent emergence of the notion of Eco-development (as developed by the United Nations in the 1980s); as well as Poverty (which was highlighted in the 2000s) and Resilience (the means to cope with and learn to 'manage' disasters)

N.B. **The initiative** did not come, during (or prior to) this founding period, from social science academics, but from biologists and naturalists [concepts such as biosphere, which emerged in 1920, and was later developed and formalised by geochemists; ecology in 1926 (both terms were created by Vernadsky); and ecosystem from 1935. **International Organisations** played an important role: in 1968, the *UNESCO* conference on the use and preservation of natural resources was followed by the launch of the MAB Programme: ecology and biosphere terms became part of everyday language. In 1972 there was the United Nations Conference in Stockholm on 'Human Environment'. Unquiet scientists played an eminent role at the beginning (cf. Bulletin of the Nuclear Atomist), as did environmental **campaigners** and **politicians.** Meadow's book for example was the outcome of a request from the Club of the Rome, which was passed on to M.I.T....

1985-88: Environmental concerns build momentum: Economists take centre stage.

270 items (Articles and selected Conference papers) refer to Sustain*

(1.5 times greater than for the late 1980s)

The first signs of movement from within the social sciences came in about 1985. These were however limited in comparison to what was to come. Notably, there was the start of **lively debate among economists on the very question of taking environmental problems into account.**

Nonetheless, as for the previous period, **the disciplines** to use the notion were psychology and medicine, unsurprisingly.

If we look at the most involved **disciplines**, we find, in order:

1. Psy* 82; Various medical branches (including neuro-): 76. Total: **123**
2. **Economics**: [**theory** far more than planning, management, business, or finance, which still showed little interest] **57**
3. **Environment* + Ecology:** 29**; Agriculture and Forests** [politics, economics] 20; **Total: 44**
4. Sociology and social issues 15;
5. Political science 8; Engineering (energy, water) 5
6. Urban Studies 4. Etc.

Environmental and Economic issues (mostly relating to earlier ones) were by far the two disciplines to increase their use of the term Sustain*

The areas of research confirm this result. We find, in order:

1. Psy*: 74
2. Economics: 57
3. Public Administration, Public law: 45
4. **Environment + Ecology**: 27 + Agriculture: 5. **Total**: 32
5. Sociology and social issues: 15, **Geography** 13… ; various medical specialties (including neuro-sciences: 20)
6. Engineering 8, Anthropology 5, Area studies 4, Food Sciences & Technology 4, Nutrition 4 ; various medical specialties…
7. **Science and Society: 4** [particularly abstracts of books which had just come out on the *future* of the Earth and humanity, and made an impact. Of note in *Nature* and *Science*: abstracts of books on *the future* of the Earth and humanity: for example on the annual Reports of the state of the world: "*Progress towards a* ***Sustainable Society*****,** SD **LR BROWN)**; **LB LAVE**'s book calling for "The *sustainable* development of **BIOSPHERE**" [**BIOSPHERE**: a concept which had recently been popularised by the **UNESCO,** which gave it as the name for one of its biggest programmes].

Sources

As far as the **environment and ecology** are concerned, several **Journals** showed sustained interest and became mouthpieces: Landscape & Urban Planning, the Annals of Regional Science, Energy Policy, Urban Studies; alongside the emergence of a few **specialised** Journals:; J. of Environmental Management [which was already in publication at the beginning of the 1980s]; Environmental Conservation; J. of Soil & Water

Conservation; Ambio; Ecological Modelling; Ecology Law Quarterly; Environment; Environment & Planning; Human Ecology; J. of Environmental Economics; Resources Policy.

Not all of these survived. But **this flowering** of journals with well-defined editorial policies was indicative that dedicated ***young scientific communities*** were starting to get organised. They were willing to get involved in scientific discussions and public debate. Over the same period, specialised *Societies* were created, such as the Society for Development Alternatives (which was initially based in India), the ISHE (the International Society for Ecosystem Health, which was highly multi-disciplinary; and most especially the World Research Institute ***publishing house***, which produced highly influential forecasts in their Annual Reports.

Institutions

The crucible of this initial surge of momentum in the social sciences was to be found in a series of largely provincial American universities (Iowa, Pennsylvania), and with some leadership at *The University of California* (Berkeley and -System). Research centres were also concerned, and some important ones were based ***outside the boundaries of academia*****,** as was the above-cited World Research Institute.

Authors and Themes

There are no real leaders among authors, who take part in a lively debate around such themes as: ¨Sustaining agriculture near cities¨; ¨Sustaining landscape¨; and ¨*Progress toward a Sustainable Society*¨ [a regular title from the influential World Research Institute Reports, which many Journals reviewed[7]].

But **the controversy peaked in Economics.** Intense debates opened up on the 'public/private goods' distinction. Neo-liberal economics was criticised for its inability to take the general interest into account or to take a long-term view. This school of thought was also criticised for failing to tackle the 'Nature Factor' (in terms of the belief that other factors, namely Capital and Labour, could substitute it to the extent of there being no further need for natural raw materials...); and for discounting the costs of 'Natural Capital' (the non-commercial goods and services rendered by the ecosystem at no cost, such as biodiversity, forests, help with climate regulation, water and soil preservation, carbon absorption, etc). These critiques challenged the very principles of mainstream economics (the idea of an apolitical, modelling Economics which 'optimises the satisfaction' of individuals who are believed to make free choices and to take rational approaches to cost - the idea of market values that exclude all non-commercial factors). Thus along with naturalists, 'environmental economists' inventively backed the beginning of debate on the environment. They highlighted the ghost costs of 'services rendered by nature' and gave indicators that were capable of

[7] Including *Nature*, although it was not particularly enthusiastic about the theme. In total, *Nature* published a first article referring to sustainability (Sustain*) in 1985, then 1 in 1992, 2 in 1994, and then nothing more until 2005, followed by a large number from 2010 on.

winning over politicians and planners[8]. While abandoning growth was not on their agenda (other than a few exceptions) the issue was how to make growth 'sustainable', or compatible over the long term with the environmental constraints they had identified. These areas moreover opened up a vast programme for their naturalist colleagues.

Notable among the most highly cited articles are **EB BARBER**'s paper in *Environmental Conservation,* "*The concept of Sustainable Development*" and papers by **R.GOODLAND** & G LEDE (ˆ*Neoclassical Economy and the Principles of Sustainable Development*ˆ), by **R. REPETTO** (ˆ*Economic Incentives for Sustainable Production* ˆ), and **N. MENZIES** (ˆ*300 years of Taungya: System forestry in China*ˆ). 'New economics' was clearly stepping beyond the cloistered walls of research centres (theory and modelling laboratories) to nourish discussions on 'typical' observable counter-examples, like those in particular evidence in the Antipodes.

Out of the other articles cited, the following titles give an idea of the kind of concerns raised and their means of publication (note the interest of the World Bank's journal: '*World Development*', and of the Worldwatch Institute '*Futures*').

Article titles:

Title: **SUSTAINABLE DEVELOPMENT - DIFFERING PERSPECTIVES OF ECOLOGISTS AND ECONOMISTS, AND RELEVANCE TO LDCS**
Author(s): TISDELL, C
Source: **WORLD DEVELOPMENT** Volume: **16** Issue: **3** Pages: **373-384** Published: **MAR 1988**
Times Cited: **51** (from Web of Science

Title: **SUSTAINABLE DEVELOPMENT - A CO-EVOLUTIONARY VIEW**
Author(s): NORGAARD, RB
Source: **FUTURES** Volume: **20** Issue: **6** Pages: **606-620** Published: **DEC 1988**
Times Cited: **46** (from Web of Science)

Title: **SUSTAINABLE DEVELOPMENT IN PACIFIC MICRO-ECONOMIES**
Author(s): BERTRAM, G
Source: WORLD DEVELOPMENT Volume: **14** Issue: **7** Pages: **809-822** Published: **JUL 1986**
Times Cited: **37** (from Web of Science

Title: **ECONOMICS, EQUITY AND SUSTAINABLE DEVELOPMENT**
Author(s): PEARCE, D
Source: FUTURES Volume: **20** Issue: **6** Pages: **598-605** Published: **DEC 1988**
Times Cited: **36** (from Web of Science)

Mavericks and non-academic authors

We have already mentioned ***the weighting of non-academic authors,*** whose writing appears in the SSCI for having attracted many book reviews. Their ideas were influential (and remained so for over fifty years) for political strategists and politicians at the highest level (the presidency of the United States... - until Clinton!) One of the most remarkable of these idea intermediaries was **L.R. BROWN**, who deserves a brief

[8] For example, shortly after our period came the calculation of an ***ecological imprint*** *[W. Rees 1992, and then Wackernagel 1995]*, which sparked numerous debates but became an authority in international debate: it was adopted by the non-governmental organisation WWI, perfected by think tanks, and seized upon by lobbies.

portrait. In 1975 he joined the *Overseas Development Council,* and maintained consistently good links with the American administration. In *1976* he founded the ***Worldwatch Institute*** (which was launched in Washington and soon had its own publishing house, World Future Society and a magazine: *Futures*). He gave conferences in Europe (Germany, the UK...) and lobbied in Washington. He took an interest in demographic growth (he was pro-abortion worldwide) and on how to feed growing populations (publishing an article in *Science* entitled "World Food Prospect"). His *forecasting* spoke to officials and the general public, as well as attracting the attention of the American National Academy of Sciences and the American Association for the Advancement of Science. It was published and discussed in Journals read widely by 'concerned' scientists, such as the Bulletin of the Atomic Scientists and the Bulletin of the American Scientists). He was among those concerned by environmental damage from intensive agricultural production. His Institute published papers, reports and works on the issue. In **1976** he invented as a term (and called for) "***Global Food Security*****."**

From 1985 to 1992 his *State of the World* attracted attention and discussion in the academic scientific press (including in the social sciences, notably from economists and geographers). But his articles were rarely published in the mainstream journals the WoS covered (an average of 1 a year) and they were also rarely cited (in the WoS). The *State of the World* continued until 2002, but received less attention than from 1985-1992 (the period prior the Rio Conference, in which they actively participated).

L.R. BROWN is probably one of the early public promoters of an 'eco-economic' development model and was an influential 'voice'. In 1985, his thought inspired an influential article entitled "Ecology meets Economics". He worked for the ***IFPRI*****,** and always kept close links with the big international organisations (and think tanks): FAO, BIRD, IFPRI... as well as the US governmental authorities and American learned societies.

1997-2000: Sustainable Development and Environment: the momentum finally reaches the social sciences

The total volume of items making reference to **Sustain* grew considerably over 10 years:**

6638 items (Articles and selected Conference Papers from the 4-year period 1997 to 2000)

The dominant **disciplines**:

'**Environmental** studies' moved up to **1st place** as users of the term. Economics came 2nd and focused mostly on Eco-Economics. Geography used the term as a new warhorse: urban studies had long been bringing this concern to the SSCI; anthropology saw the promise of a new demand for the discipline and of new areas of struggle; sociology noted the social movements that were moving into the area.

Only medical disciplines and those related to psychology kept a clear distance, but no longer dominated the use of the term.

1. **Environmental** Studies + Environment Sciences + Ecology 1545
2. Economics 898
3. Psy-* 671
4. Planning & Development 660 + Management 450
5. Geography 436
6. Urban studies 333
7. Sociology & Social issues 326

Behind this was the theme's success at the Rio Conference (1992) and the increased momentum of environmental issues, which were no longer confined to economic debate. It fed into different kinds of action: planning, management, and more rarely, development and social issues.

The main **areas** of research were as follows:

1. Business Economics 1488
2. Environmental Sciences & Studies 1050
3. Psychology, Psychiatry, Neuro 994
4. Public administration & Government Law 973
5. Various social sciences 812 (including geography, sociology, and multidisciplinary areas)
6. ***And coming much further down*:**
7. Education 219
8. Engineering 205
9. International Relations 145
10. … *Agriculture* 132; *Area studies* 126; *Anthropology* 114; … Social issues 91; … Energy 58…

From this point on. We proceed to the restriction: Sustain* AND Environment* (Period: 1997-2000)

1030 useful items were left (out of 6638)

The most active **disciplines** were:

1. Environmental Studies 925; Environment Sciences 385; Ecology 332
2. Urban studies 183; Geography 144; Development Planning 96
3. Sociology 81;
4. Energy 48;
5. Ethics 50; History & Philosophy of sciences 12
6. *And much further down:*
7. Agriculture (multidisciplinary) 16; Biodiversity conservation 12; Environmental engineering 8…

No project **funders** are mentioned.
6 indexed references are however signed by the 'European Community' and 8 others by the United States Department of Agriculture (USDA).

The championing **institutions** were mostly in the United States, Canada, England and the Netherlands. *Europe* had a slight lead. We note (in order):

1. University of London 58
2. University of California 48 (Berkeley + System)
3. University of Amsterdam 34, along with the highly active (agricultural) University of Wageningen 13
4. In Canada: University of British Columbia 18, university of East Anglia 14,
5. University of Michigan 16; University of Wisconsin 14; University of Florida 10 ;
6. *And then many* English, American and Australian universities
7. *For France*: The INRA 4 and the University of Saint Quentin en Yvelines 6
8. *There are few references from developing countries,* except*: **UNAM** 5*

The major sources are:

Rank	Title	Score	Rank	Title	Score
1	**Ecological Economics**	188	14	Ecosystem Health	19
2	**Landscape & Urban Planning**	67	14	Human Ecology	19
3	Environment & Planning	48	14	Marine Policy	19
4	(Sty) Natural Resources	47	17	Population & Environment	16
5	Energy Policy	42	18	J. of Environmental Management	13
6	Tourism Management	41	19	Environmental Resource Economics	12
7	Environment & Urbanization	34	19	Pollution	12
8	Land Use Policy	31	19	Resources Policy	12
9	Environmental Values	29	22	Environmental Management	11
10	Urban Studies	28	22	J. of Agric & Environmental Ethics	11
11	Habitat International	27	22	J. of Natural Resources	11
12	Int J of Sustainable Dev & World Econ	22	25	Environmental Ethics	10
12	Regional Studies	22	26	Environmental Conservation	7
			ETC		

The journals' titles show up ambitions to quickly reach practical solutions. Some journals dedicated to social issues, ethics and values were emerging, however. **Only one title** explicitly refers to the 'sustainability' of development. 4 or 5 titles were clearly dominant, as well as among the most heavily cited, making them highly influential.

Finally, none of the leading **authors** can be said to overwhelm the publications. The most prolific is **P.Nijkamp,** (11 indexed articles), a geographer from the University of **Amsterdam**, who focuses on urban studies; **R.Costanza** of the Maryland **Institute for Ecological Economics** comes next (7 articles): she frequently works in collaboration with the University of Wisconsin. It's notable that in this area, the most cited authors *often work in small, international groups* of at least **two or three members** who often co-sign articles together. Examples are:

- J. M. **Gowdy** (7 articles, Professor of Economics at the Rennselaere Polytech Institute (New York), and M. **Giampetro** researcher at the National Italian Centre for Demographic Studies (5 articles, including on 'demographic pressure and the environment)' work also with K. *Mayumi* of the Tokoshima School of Arts et Literature (4 articles).

- **W.E. Rees** of the University of British Columbia notably works with M. **Wackernagel** (this one being for while at the University of Xalapa in Mexico), and they publish on ecological development and local communities.
- **J. Cairns** is a member of an important multidisciplinary consortium on disease and public health dangers from pollution and other environmental abuses.
- Others, such as T. Jackson (University of Surrey) discuss the concrete progress of *wellbeing* with colleagues by using 50 years of statistics; JJ Vanden Berghe created a *pool of competencies* between the Netherlands (Amsterdam) and the Swedish Academy of Sciences (on the paths to a sustainable development).

Among the most heavily cited texts are notably:

References

A resource-based perspective on corporate environmental performance and profitability

Author(s): Russo, MV (Russo, MV); Fouts, PA (Fouts, PA)

Source: ACADEMY OF MANAGEMENT JOURNAL **Volume:** 40 **Issue:** 3 **Pages:** 534-559 **DOI:** 10.2307/257052 **Published:** JUN 1997

Times Cited: **719** (from Web of Science)

Cited References: **95** [view related records] **Citation Map**

Abstract: Drawing on the resource-based view of the firm, we posited that environmental performance and economic performance are positively linked and that industry growth moderates the relationship, with the returns to environmental performance higher ire high-growth industries, We tested these hypotheses with an analysis of 243 firms over two years, using independently developed environmental, ratings. Results indicate that "it pays to he green" and that this relationship strengthens with industry growth. Mle conclude by highlighting the study's academic and managerial implications, making special reference to the social issues in management literature.

Entering the Century of the Environment: A New Social Contract for Science

Author : **Jane Lubchenco**
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Abstract. As the magnitude of human impacts on the ecological systems of the planet becomes apparent, there is increased realization of the intimate connections between these systems and human health, the economy, social justice, and national security. The concept of what constitutes “the environment” is changing rapidly. Urgent and unprecedented environmental and social changes challenge scientists to define a new social contract. This contract represents a commitment on the part of all scientists to devote their energies and talents to the most pressing problems of the day, in proportion to their importance, in exchange for public funding. The new and unmet needs of society include more comprehensive information, understanding, and technologies for society to move toward a more sustainable biosphere—one which is ecologically sound, economically feasible, and socially just. New fundamental research, faster and more effective transmission of new and existing knowledge to policy- and decision-makers, and better communication of this knowledge to the public will all be required to meet this challenge.

The source for this article is ***Science*** 23 January 1998: Vol. 279 no. 5350 pp. 491-497 and it was cited **360 times**

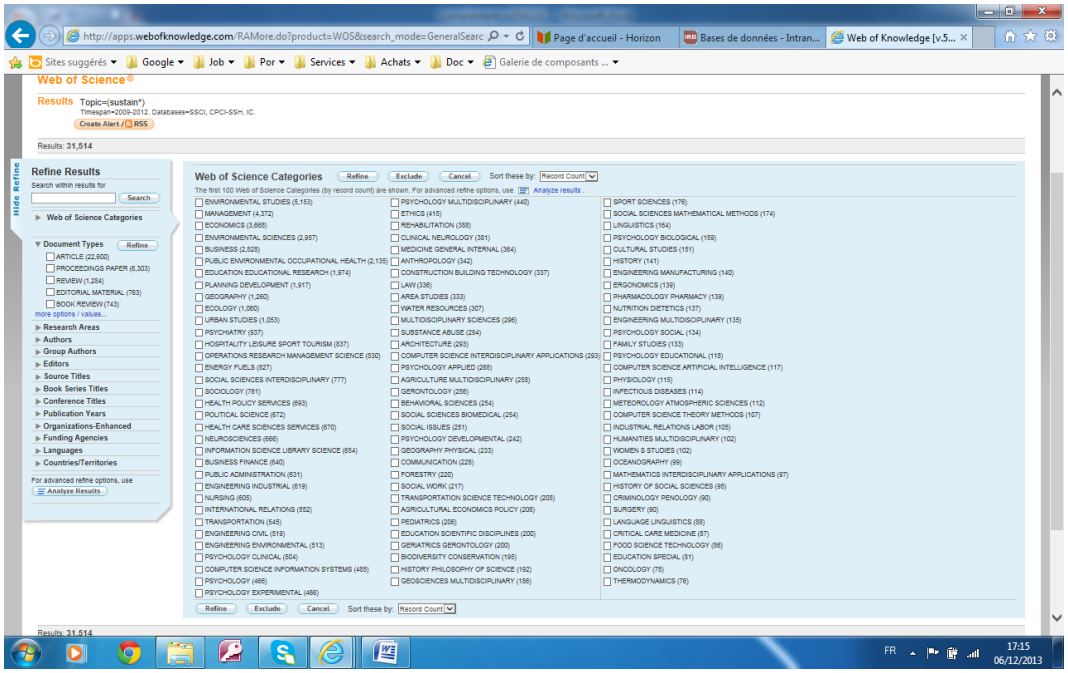
It might be felt that these final texts bring little new to the contributions of economists from the previous period (which **W.E. Rees** and M. **Wackernnagel** continue to translate into original and surprising indicators). The fact that these were the two most cited texts shows that over the decade the concept of Sustain* had entered the social sciences ***Doxa***. Many authors strain to 'prove' that everyone - even businesses - has something to win by going 'green'. Less attention is given to field studies pointing out contradictions or challenges).

2009-2012: the Business age? Or a new Planetary age?

The word 'sustain*' met with ever greater success: 31,541 items were indexed in the 4-year period 2009-2012, which was almost 5 times greater than for the same period a decade previously.

The most closely involved **disciplines** remained environmental studies and sciences (5143 items in total). This was still followed by economics, which as an area moved beyond fierce theoretical debate (which nonetheless continued) to *more practical approaches in which market and private initiatives gained a lot of ground* (Management in 2nd place, Business in 5th place). The other rankings were largely unchanged: the term's success in psychology and medicine declined further. Significantly, other issues concerning 'human' development, such as health and education, emerged.

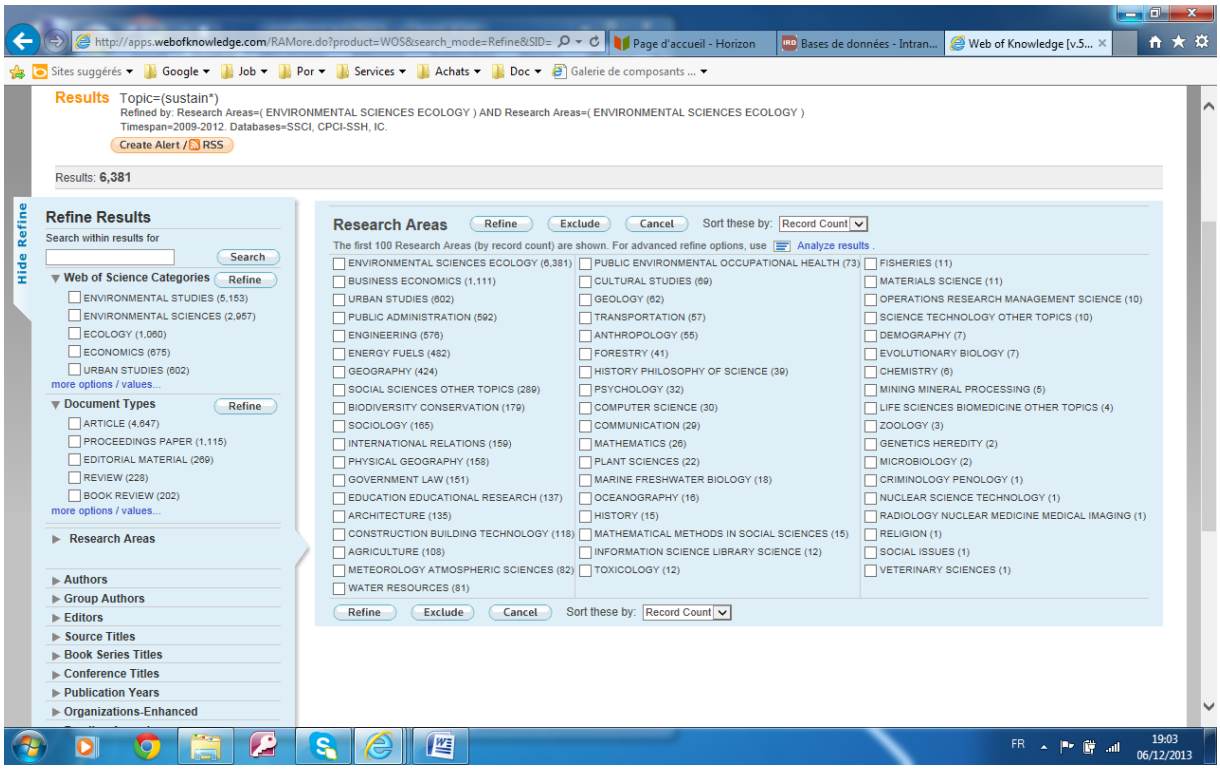
1. Environmental Studies: 5153
2. Management: 4372
3. Economics: 3668
4. Environmental Sciences: 2957
5. Business: 2828
6. Public health: 2135
7. Education: 1974
8. Development Planning 1917
9. *Grouped together*: Psychiatry 937 + Neurosciences 666 + Psychology 466 = 2554 different items
10. ***And much further down***:
11. … Ethics 4, … Anthropology 2,… Social Issues 1



The **research areas** allow us to specify these issues:

The rankings were as follows:

1. '**Business economics'** came top: Micro-economics, business economics: **8590** items = 1/4 of the corpus. Only 1111 items from this area were directly related to environmental concerns and theoretical debate on the area; the notion of 'services rendered by the environment' (Nature + the people who preserve it) gained a lot of ground; in this respect *Ecological Economics* remained the most innovative and influential journal. But the 2nd biggest source of reflection was now *Business strategy and the Environment.*
2. This was followed by **environmental sciences**, along with ecology: **6381** items
   Their most common angle of approach was that of *'Business Economics'* (1111), in contrast to the less popular angles of public administration (592) and government regulation (151). *Engineering* was well represented (578), most notably as regards the over-consumption of resources (water and above all energy), and building techniques. *Urban studies* and architecture moreover accounted for over 1/10 of the fields of application (678), *which was more than biodiversity conservation (179) and much more than agriculture (108), forests (41), fisheries* and their environments (40). Also noteworthy was that conversely, some previously marginal concerns had come to take up significant space. These addressed the '**human factor**' (science and social problems: 289, international relations: 159, education: 137, cultural and anthropological studies: 124, the history and philosophy of science: 54, ethics: 206. In total: 717 items..
3. The areas of medical research and practice came 3rd out of the areas to use the concept 'sustainab*': a total of 5683 items. The largest share (3346) was taken by psychology-related disciplines (which had become heavily dominated by neuroscience and behavioralism). But every branch of medical practice was more or less querying the sustainability of their interventions, and considering whether it was appropriate to engage into them, on a case-by-case basis.



From here one: Narrowing down on Sustain* AND Environment*

7477 useful items remained [6419 excluding conference papers = only articles] out of 31541

Disciplines:

- 'Environmental studies' won big share (2131 items/7477). A high proportion of these studies was driven by 'environmental sciences' (707) and ecology (348); but management (218) and *business* (160) also had a place, as did geography (220) and urban studies (208). There were *few studies from international relations (41), public administration (19) or Law (25).* Paradoxically, just as few of the studies dealt directly with agriculture, plants, forests or fisheries (1 to 10 each).
- 'Environmental sciences' followed very closely, and of course mainly consisted of environmental and ecological studies; but environmental *engineering* had its place, as welle as economics and *energy.* Biodiversity conservation only came 6th (108 items), and (multidisciplinary) agriculture 10th (29 items). The rest was dispersed.
- In 3rd, 4th and 5th place came management, business and economics; ecology only came 6th in a tie with geography; (multidisciplinary) agriculture came 21st; Forestry 30th...

Areas of research:

Environmental sciences and ecology naturally came top (2913 items). They were however quite closely followed by '*Business economics*' (1670 items), which highlights a favourite angle of attack. Public administration came next (but far behind, with 542 items), in a tie with *engineering* (532) and the field of energy (532). Further down still came urban studies (10th place = 238), and finally all the domains of agriculture (238).

Sources:

The following table ranks the source journals by *decreasing* order of article numbers over this period (2009-2012) for the (combined) issues of 'Environment* + Sustainab*'.

In *Table a),* '*New*' journals are highlighted in yellow: i.e. those that did not feature in the rankings a decade earlier (1997-2000).

The *table b*) shows the journals which 'disappeared' from the rankings.

Arrows next to the journals' rankings indicate whether they stayed in the same position (→), went up (↑) or went down (↓). The score is for 2009-2012. It is followed (between brackets and in smaller figures) by the score from 10 years earlier (1997-2000).

Table a

Rank	Title	Score	Rank	Title	Score
1 →	**Ecological Economics**	188(188)	16 ↑	Ecological Indicators	57 (0)
2 ↑	**Energy Policy**	172 (42)	16 ↑	Global Envir Change: Human & Policy dimensions	57 (0)
3 ↑	**Sustainable Development**	128 (0)	16 →	Int J of Sustainable Dev & World Ecol	57 (22)
4 ↑	**Sustainabilty**	102 (0)	19 ↑	Environmental Science Policy	53 (0)
5 ↑	**Business Strategy & the Environment**	98 (0)	20 ↓	Environmental Management	48 (11)
6 ↑	Ecology & Society	91 (0)	21 ↓	Marine Policy	41 (19)
7 ↑	J of Business Ethics	89 (0)	22 ↑	J of Environ Planning & Management	40 (0)
8 ↑	J. of Environmental Management	75 (13)	23 ↓	(Sty) Natural Resources	38 (47)
9 →	Land Use Policy	68 (31)	24 ↑	Environmental Politics	36 (0)
10 ↓	Landscape & Urban Planning	67(67)	25 ↑	Amfiteatru Economics (Bucarest)	35 (0)
11 ↑	Environmental Impact Assessment	66 (0)	26 ↓	Environment & Planning	35 (48)
12 ↑	J of Sustainable Tourism	64 (0)	27 ↓	Habitat International	32 (27)
13 ↑	Renewable Sustainable Energy Review	62 (0)	27 ↑	African J of Business Management	32 (0)
14 ↑	Problemy Ekorozwoju (Lublin, POL)	61 (0)	29 ↑	Environment policy & Governance	31 (0)
15 ↑	Environmental Education Research	60 (0)	30	Applied Geography	30

Table b

	Gone from the rankings				
Rank	Title	Score	Rank	Title	Score
OUT	Tourism Management	?? (41)	OUT	Population & Environment	(16)

OUT	Environment & Urbanization	?? (34)	OUT	Environmental Resource Economics	(12)
OUT	Environmental Values	?? (29)	OUT	Pollution	(12)
OUT	Regional Studies	?? (22)	OUT (19)	Resources Policy	(12)
100 ↓	Urban Studies	12 (28)	OUT ()22	J. of Agric & Environmental Ethics	(11)
OUT	Ecosystem Health	(19)	OUT (22)	J. of Natural Resources	(11)
OUT	Human Ecology	(19)	OUT (25)	Environmental Ethics	(10)
			OUT (26)	Environmental Conservation	(7)

This table calls for a few remarks:

First a few technical words:

- Given that the SSCI widened its coverage of journals in 2005, some of the 'new' journals may in fact be pre-existing journals which haved only just been judged 'worthy' of inclusion in the database.
- The SSCI only ranks the 100 sources with the greatest volume over a particular time frame. Some journals ranked in 1997-2000 thus no longer featured in 2009-2012, as they were ranked below 100th place: but they had not necessarily completely abandoned the subject. One example is the highly respected 'Urban Studies', which came 100th in the early 2010s, as opposed to 10th a decade previously. While the subject now took up less space (12 rather than 28 articles), it had not completely disappeared.
- Of course, some journals did cease publication, or (rarely) changed their names, or conversely were launched for the first time. The abundance of yellow highlighting gives grounds to think that this last case (new launching) is most frequent, and the 'Sustain*' area become a 'promising' theme.
- Finally, even when a journal publishes a large *quantity* of articles in the area, this does not guarantee it will become an **authority** on its topics. It is essential to check the journals' '*impact factors*' in order to determine which ones had the highest profiles.

And now a few *key remarks*:

- Over half of the journals ranked were 'new' in comparison to the previous decade: most often they were *recently created*. This shows that (Sustain* + Environment*) as a subject had become a 'mainstream' theme, and was now well established in the scientific community.
- A further sign: while 10 years previously only 1 journal ranked had the word Sustain* in its title, there were now 5 (out of 30; the word environment* was still the most common and was found 10 times).
- It is quite significant that the term *'Business*' featured in these titles almost as often as Sustain*. It featured in 3 titles, while '*Management*' appeared in 3 others. Conversely, only two titles evoke the human and social dimensions of the issue (*Ecology & Society*, and *Global Change*…).
- While not the whole world is represented in the first 30 places in the rankings, *the origins of the journals had diversified.* The theme was notably taken up in Poland and Romania (certainly owing to the importance the European Union gave it), as well as in Africa (African J of Business Management).
- The new generation journals rapidly reached high positions in the rankings. The first generation journals by contrast (*non-highlighted* in our table), had fallen in the rankings, even though they had given a greater place to the subject. The paradox can be explained through the emergence of a host of new specialised journals completely dedicated to the subject. But the two highest ranking

journals were first generation, authoritative (high-impact) journals, and were in a clear lead at the top: **Ecological Economics** (which had already been there - and fighting - 10 years previously), and **Energy Policy**, which was attracting increasing amounts of attention - including as regards the 'Sustain*' problematic.

Institutions

The rankings of institutions publishing the most on the issue remained quite stable. These were mostly universities. Departments (dedicated to the environment) had clearly been created, as had posts, and there were more students. ***The pioneers had shown the way***, (for example in Canada, in the universities of British Columbia and East Anglia where the professors who had taught there had become prestigious); the volume of publications reflected this.

On the contrary, some establishments, which initially took the lead, have not capitalised on their momentum. 40 % out of the forerunners (though not in the uppermost ranks) have made little effort, or focused on other priorities. Ecology has not set up there a school of thought, and newcomers, some of whom were unexpected, are replacing them.

The following table shows **the 60 institutions that published most** on Sustain* AND Environment over the period (2009-2012). Their score is given in column 3. Column 4 indicates their position 12 years before (by their rank between [square brackets] and their score of the time (between brackets). **In bold:** notable progressions. Highlighted **in yellow**: new entries. Those ranked for 1997-2000 but which disappeared for 2009-2012 are not mentioned. They make up 5/30 of the highest 30 ranked in 1997-2000, which is quite low; then 14/35, and 23/35 from the two following tiers (i.e. 30th to 65th place and 66th to 100th place).

Rank	Institution	Score	1997-2000	Rang	Institution	Score	1997-2000
1	Univ California System + Berkeley	170	[1°] (50)	30	Univ of Toronto	43	[39°] (7)
2	Univ London	110	[2°] (41)	32	Univ Lund	41	OUT] (≤ 4)
2	Univ **Wageningen**	110	[22°] (13)	32	National Univ Singapore	41	OUT] (≤ 4)
4	Florida State Univ	88	[5°] (16)	32	Stanford Univ	41	[39°] (7)
5	U **Queensland**	87	[25°] (9)	35	Penn State Univ	40	[24°] (10)
6	**Chinese Academy of Sciences**	75	OUT] (≤ 4)	35	Simon Fraser Univ	40	OUT] (≤ 4)
7	Arizona State Univ	71	[29°] (8)	35	Un Washington at Seattle	40	[29°] (8)
8	**Monash** Univ	68	[39°] (7)	38	Un of Cardiff	39	[22°] (10)
9	**Univ of British Columbia**	63	[39°] (7)	38	Imperial College London	39	OUT] (≤ 4)
9	CSIRO	63	OUT] (≤ 4)	38	Un of Sheffield	39	[39°] (7)
9	Oregon State Univ	63	[39°] (7)	38	Un of Wisconsin	39	[5°] (16)
12	**Leeds University**	62	OUT] (≤ 4)	42	Cornell Univ	38	OUT] (≤ 4)
13	**Autonomous Univ of Barcelona**	61	[9°] (15)	42	Univ of Illinois	38	[14°] (14)
13	University of East Anglia	61	[5°] (16)	44	Univ of Indiana	37	[25°] (9)
15	Pennsylvania Sysem PSCHE	57	[9°] (15)	44	Un of Sydney	37	[29°] (8)
16	Manchester Univ	56	[18°] (11)	46	Un of Stockholm	36	OUT] (≤ 4)
16	Oxford Univ	56	[18°] (11)	46	Un of South Australia	36	[29°] (8)
18	Australian Nat Univ	55	[18°] (11)	48	Swedish Un of Agriculture	35	OUT] (≤ 4)
18	California Berkeley	55	[9°] (15)	48	Univ of Amsterdam	35	[57°] (6)
19	Cambridge Univ UK	54	[53°] (6)	50	Univ of Utrecht	34	OUT] (≤ 4)
20	Vrije Univ of Amsterdam	52	[3°] (22)	51	Norwegian Univ of Sc & Tech	33	OUT] (≤ 4)
21	**Polytek Zurich (Suisse)**	51	OUT] (≤ 4)	51	Univ of Gothenburg (Sweden)	33	OUT] (≤ 4)
22	**Univ Louvain (Belgique)**	49	OUT] (≤ 4)	53	Beijing Normal Univ (**China**)	32	OUT] (≤ 4)
22	Univ Melbourne	49	[39°] (7)	53	INRA (France)	32	[99°] (4)
22	Minnesota System Univ	49	[39°] (7)	53	Texas A.M. Univ	32	[39°] (7)

25	Griffith Univ	48	[84°] (5)	53	Univ of Exeter	32	OUT] (≤ 4)
25	Harvard Univ	48	[9°] (15)	53	Univ of Sussex	32	[57°] (6)
27	Michigan State Univ	46	[9°] (15)	58	Bucharest Ac of Economic Sc.	31	OUT] (≤ 4)
28	Univ of Michigan	45	[9°] (15)	59	Univ of Sao Paulo (Brazil)	31	OUT] (≤ 4)
29	Univ New York	44	[99°] (4)	60	Hong Kong Polytech Univ	30	OUT] (≤ 4)
30	Univ of Yale	43	[99°] (4)	61	Univ Lancaster	30	[39°] (7)

European countries are clearly among the top contributors. The *United Kingdom* alone is equal to the United States (with 7 institutions each in the 30 top places). Also on the European side, and in the 30 top places, are the universities of **Wageningen** and Vrije Amsterdam (Netherlands), Barcelona (Spain), Lund (Sweden), and the Zurich Polytechnic Institute (Switzerland), which over a few years developed considerable competences in science and *environmental engineering*.

The rest of the rankings (up to 100th place) confirm this distribution. First emerge a multitude of English and American institutions, as well as further European institutions, which are Dutch, Swedish and Belgian; and further down: Norwegian, German, and even Irish or Romanian. France is still represented by only one institution (the INRA, 60th place).

Australia and Canada are still closely involved, and often part of the top of the list.

In terms of *notable new developments,* the first thing to note is the great leap forward made by the Dutch agricultural University of ***Wageningen*****,** which went from 22nd to the 2nd place worldwide, and to the top in Europe (in a tie with the University of London). But just as impressive was the sudden appearance of the ***Chinese*** *Academy of Sciences* in 6th place.

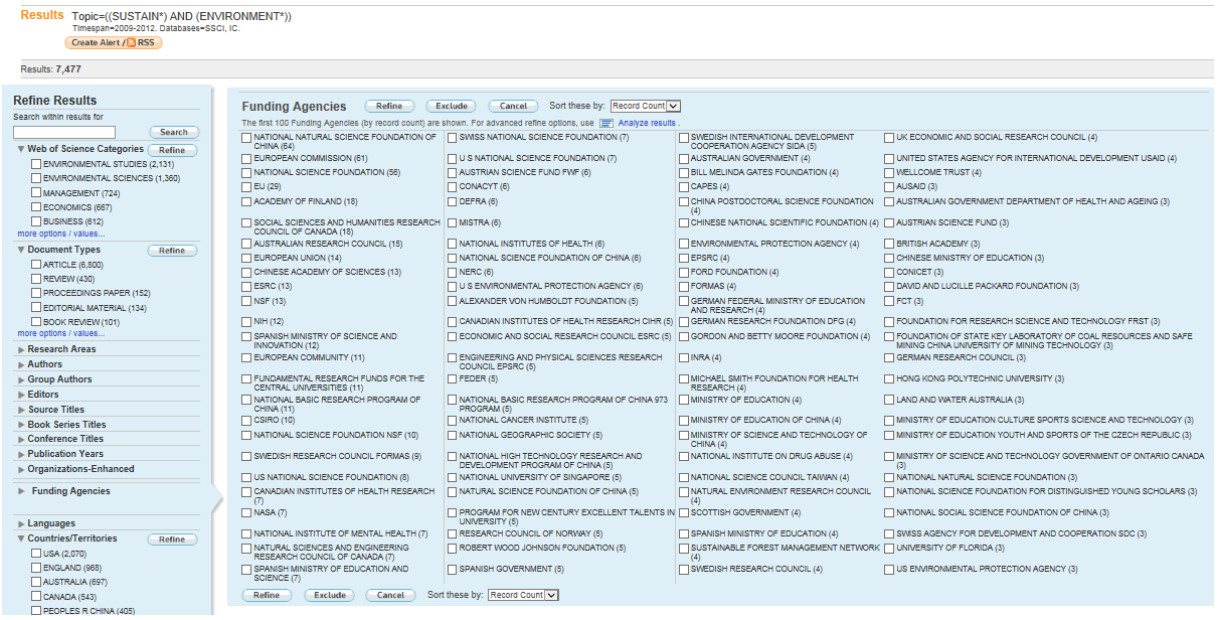
Also noteworthy is the appearance of several institutions from *emerging countries*. If we look below 30th place we can find 6 Asian institutions (1 in Singapore in a very good rank = 38th-; 2 in Hong Kong and 3 in China); 1 comes from Latin America (Sao Paulo, Brazil[9]); one is located in South Africa (Cape Town University). Finally, in Europe itself, there are a number of active institutions established in a greater diversity of countries (Ireland, Romania, Poland...).

Funders:

Not all of the researchers specify the funding behind their research. This 'obligation' is quite well met by 'Anglo-Saxon' countries; variably so elsewhere. The SSCI has a special section on this matter. It should not be taken too literally (or numerically!) but is nonetheless of real interest.

We can for example see that over 10 years (the decade from 2000-2010), funds allocated to studies on 'Sustain* & Environment*' grew enormously. They also diversified. The screen shot gives an idea of this:

[9] By contrast, Mexico's UNAM dropped out of the rankings.



If we group contributors by country (or into broader groupings), we can see the following:

- **Europe** was the largest funder on the subject. It came ahead of the United States' official organisations, which were closely followed by **China.**
- But *few European countries* added their own contributions (Scandinavian countries, Spain and the United Kingdom were notable exceptions). In the United States by contrast, a host of competitive funds were available (going from private Foundations to funding from rich or specially dedicated universities).
- This shows in the publications record: by the number of articles published, the countries of the EU as a whole certainly took the lead (3008 articles, which is almost half of the articles indexed). The United States came next (1616 articles). But *the rare European countries* which gave the theme (and its social science approach) earmarked funds stand out: the UK: 828 articles, Scandinavian countries: 560, the Netherlands: 349, Germany: 328, Spain: 315. Meanwhile other countries contributed much less in relation to their size (France, for example: 203 articles). *The same tendencies show up on a larger scale in the SCI.*
- It is worth highlighting the support of *less expected countries* for the theme, such as Austria (124 articles) and Belgium (426 articles) in Europe, and Australia and New Zealand (685 articles), who were some of the most involved with the theme (along with Scandinavian countries and the Netherlands, as previously highlighted).
- *Emerging countries* made much fewer contributions, by contrast. ***China*** was the exception, with 384 articles: this was well above any European country other than the UK. Its powerful entrance was accompanied by strong financial backing; the SCI corroborates this trend, indexing both its scientific and technical contributions.
- Elsewhere, **Latin America** as a whole 'only' contributed 339 highly unevenly distributed articles: over half (168) were from *Brazil*; and only two other countries made a noticeable impact: Mexico (65) and Chile (41). *In Africa*, the theme was rare and poorly covered (a total of 211 contributions,

of which over half were from South Africa (109), followed much further down by Kenya and Nigeria: 21 articles each). This was even more striking for *North Africa and the Middle East,* which only had *38 articles indexed*, discounting the help of Turkey (96), Israel (30) and Iran (30). In total: 185 articles

- *In Asia* there was more interest (357 articles, *excluding China: 384 and Japan: 108)*. At the top of the concerned countries came Taiwan (105 articles), India (92) and in proportion to its size, Singapore (45 articles). The latter had made technical excellence in the field of the environment one of its strategic niches. The SCI confirmed its activity on this front, including for engineering. Also of mention, albeit astonishingly further down the list: Malaysia (60 articles) and South Korea (50), followed by several other countries, which contributed 2 to 15 articles each.

The table below reflects this:

Table: Number of articles indexed by country or region (2009-2012)

Region	Score 2009-2012	Countries
Europe	3 008	UK: 828 Scandinavian countries: 560 The Netherlands: 349 Germany: 328 Spain: 315 … France: 203 … Austria: 124 Belgium: 93 Denmark: 90 …
Europe excluding the EU		Switzerland: 139 … Russia: 7
North America		United States: 1616 Canada: 462
Australasia		Australia: 585 New Zealand: 115

Region	Score 2009-2012	Countries
Latin America	339	Brazil: 169 Mexico: 65 Chilli: 41 Argentina: 25 Columbia: 20 Costa Rica: 12 Peru: 9 Venezuela: 9 Cuba: 5 Equator: 5 …
Africa	211	South Africa: 109 Kenya: 21 Nigeria: 21 Tanzania: 13 …
North Africa and the Middle East	185	Turkey: 98 Israel: 30 Iran: 23 Egypt: 9
China & Japan	462	China: 364 Japan: 108
Other Asian countries	357	Taiwan: 106 India: 92 Malaysia: 60

					South Korea: 47 Singapore: 45 Thailand: 35 Indonesia: 21 Philippines: 15 Vietnam: 15 …

Authors and Themes:

Some References:

Constructing a network of the social-economic consumption system of China using extended exergy analysis

Author(s): Dai, J (Dai, Jing)[1,2]; Fath, B (Fath, Brian)[2,3]; Chen, B (Chen, Bin)[1]
Source: RENEWABLE & SUSTAINABLE ENERGY REVIEWS **Volume:** 16 **Issue:** 7,**Pages:**4796-4808,SEP 2012
Times Cited: 4 (from Web of Science)
Abstract: The prominent conflict between consumption and environmental resources is acknowledged as a significant force in affecting the social-ecological community balance. The whole process of resource allocation, utilization, efficiency and outcome are crucial clues in uncovering the structural and functional characteristics in complex consuming systems. Herein, network relationship provides a system-oriented modeling technique for examining the structure as well as flow of materials or energy from an input-output perspective. Meanwhile, extended exergy, the only currently available thermodynamic based metric for social-economic environmental impacts associated with energy consumption, manpower and monetary operation as well as environmental emission, is an extension of the labor theory of value and a possible sustainability metric. The core purpose of this research is to construct a network of the social-economic consumption system of China using extended exergy analysis to explain the interrelationship among different sectors within a thermodynamic metric. Therefore, we firstly make a database of extended exergy accounting in the Chinese consumption system. Data are available for 2007, which can be divided into seven sectors based on the reclassification of the regularly published 42-sector Input-Output Table, namely, (1) Agriculture, (2) Extraction, (3) Conversion, (4) Industry, (5) Transportation, (6) Tertiary, and (7) Domestic sectors. Then we will construct an extended exergy network to gain insight into the thermodynamic distribution within sectoral criterion. Lastly, the network results and indicator analysis are explained for China's social metabolism maintained by a large quantity of energy, resources, and labor, as well as the environmental costs, within an exergy foundation. (c) 2012 Elsevier Ltd. All rights reserved
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Author Keywords: Ecological accounting; Extended exergy; Social system; Network construction; China
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Reprint Address: Chen, B (reprint author),Beijing Normal Univ, Sch Environm, State Key Lab Water Environm Simulat, 19 Xinjiekouwai St, Beijing 100875, Peoples R China
Other authors' affiliation: Int Inst Appl Syst Anal, A-2361 Laxenburg, Austria; Towson Univ, Dept Biol Sci, Towson, MD 21252 USA
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'SUSTAINABLE' ('Sustainab*') SUMMARY SHEET

The concern for 'sustainable' development originated in very old approaches, which got back their meaning and vigour at the end of the Second World War. Some thinkers rebelled against the predominating debates of the period (on freedom and social justice) to ask questions about the extent of demographic growth (particularly in developing countries) and the pressures this risked bringing to bear on the resources available to humanity. They were sceptical about science having an infinite capacity to overcome problems, and were critical of technical alienation, looking for lucid solutions for the future of humanity.

Soon afterwards (in the 1960s), several natural science disciplines (botany, soil science, geography, hydrology), which had used to reign supreme but had been weakened by having to make room for new approaches (molecular biology...) came together to found a 'landscape science' (which ultimately proved unworkably complex), and then a multidisciplinary approach: *ecology*.

On the basis of this, several schools of thought developed from 1950-1980 (although they kept a low volume in the concert that was 'mainstream' social science): the first school emphasised the limits of ecological plasticity and the dangerous depletion of resources; the second school, in the wake of critiques of consumer society in the 1970s, highlighted resource wastage and advocated slow or zero growth; the third one highlighted technical alienation and the violence or barbaric acts to which it had led.

As the initiative developed it attracted naturalists, as well as maverick authors who were able to translate its advances into terms that society could use. They found a large audience, if not so far in terms of public opinion, then certainly among sectoral policy leaders (or even general policy leaders), as a way to respond to human catastrophe (Bhopal), or to serious growth crises (petrol crises...). The determined efforts of Scandinavian governments notably led to a United Nations conference on the 'Preservation of the Environment' in Stockholm in 1972. The Club of Rome ordered a report on the question from M.I.T., which became a landmark text (Meadows, 1987, *The Limits of Growth*, and previously: *Blueprint for Survival,* 1972, *Silent Spring*, 1962).

Concern for the environment then made a small step into the 'mainstream' social sciences. But the key advance in this field dates from 1985-90, when *economists* became involved in a strongly voiced and reasoned critique of reigning neoclassical liberal economics. They forged the basis of a new, more realistic 'ecological economics', which they strove to quantify and model in a convincing operational manner for decision makers.

From 1995, a field of 'ecological studies' developed and provided the economists with subject matter. Ten years later (2007-2012), management and business had taken back a solid position in the field. The question of the market competed with that of alternative economics, while ecological studies provided arguments for both sides. The debate remained heated, and the field had won a strategic place in the social sciences.

Europe played an important role in this process. The European Union was the biggest funder of studies on the topic. Institutions from across Europe were opinion leaders and the top publishers in the field. The

issues also reached the rest of the world (notably China, which developed strong competences and devoted large amounts of funds to it).

1.4. Map Library of the Word Associations

Objective and Methodology

The second part of this report gives the results of ***a further method*** used in our research.

It involved **'searching through'** the whole length of **journals** published over an extended period. Each journal was searched individually[10]. Every search used **the titles** of articles in their corpus, including, as much as possible, their **abstracts**[11].

This methodology is applicable to ***all kinds of literature***, academic or otherwise.

Our objective was to highlight the *area of reflection* unique to each journal.

We first ascertained which words and expressions were the most used in the journals. This allowed us to pinpoint major concerns or particular schools of thought. We then looked for ***the connections*** *in the journal* from one word (or expression) to another. Looking at these main components revealed the relationships the journal creates between particular facts (or concepts), and how they come together into a dense 'cluster'. The space of a field of reflection consists of several clusters. These are distinct, but linked by pivotal words and hinge expressions (which are however less densely connected than those to be found

[10] It is also possible to search through a combined 'cocktail' of journals. We will however show that this leads to unclear results.

[11] Many of the journals have only recently begun to offer abstracts (since around twelve years ago).

in the same cluster). Of course, as 'competing' facts and schools of thought are often absent from one particular Journal, they are excluded from its 'frame'.

Our work paid particular attention to the ***graphic representation*** of the results, with the objective of giving a clear visual picture.

The tests were done on a variety of journals from the field, while looking to avoid an overload of material so as to best investigate and then share the findings.

We selected journals widely cited by the WoS, dealing with the central focus of our area of study, but which take very distinctive approaches:

Agriculture & Human Values

The Journal of Natural Products

The Journal of Environmental Studies

The Journal of Natural resources,

The Journal of Environmental Studies,

Agriculture & Sustainable Development,

Agrociencias (Mexico)

Interciencia (Venuezuela)

Leading authors from various schools of thought publish the most frequently in these journals, as our previous research has shown (Part One: the key words framing our field of study). These journals also offer (via the WoS, where they have long been listed) the greatest possible *historical depth* (the WoS goes back 40 to 50 years, which is rare for a bibliographic database).

After a period of trial and error, we divided the journals' corpuses into 4-year periods, which gave us sizeable sub-corpuses while allowing us to see their evolution clearly. These periods were:

1) Prior to 1977; and then
2) 1977-80; 1981-84; 1985-88; 1989-92; 1993-96; 1997-2000; 2001-04; 2005-08; 2009-12

It is of course possible to re-aggregate these periods if necessary for a study. We can also restrict the search to the past 12 years (or to a pivotal period), or to periods of great change as indicated by the work in Part One (to times when particular key words were taking off or on the decline; as well as times when a word was shifting in meaning or starting to be replaced with another one...)

Let's finally highlight that the work covered in this second part was primarily methodological. The process consisted of *perfecting search tools* and **testing** them, and then perfecting them in preparation for

subsequent projects (such as examining a Latin American corpus or a corpus of material backing a particular cause...).

In the following pages we will set out some of our **results**.

- We extracted *the key words* of a journal's main preoccupations over a short time frame, and mapped them.
- We compared this graph to earlier periods to measure the extent to which context changes and competing approaches had made an impact.
- We repeated this process for characteristic *expressions* rather than words (bi-terms, tri-terms or n-terms). We compared the results to what we found through the simple extraction of uniterms.
- We created a table of the 200 'n-grams' (multi-term expressions) used in a journal, which also allowed us to show what had changed over time. The graphs' colour schemes allow to see consistent preoccupations (stemming from the journal's editorial policy), as well as any passing, fading or emerging themes and the date of their occurrence.
- We set out *the connections* that are made between the words, classified them into clusters and measured their weighting. This graph allows readers to make *'personalised'* readings. It can be consulted **on the Internet** as a schema within a given URL**.** The 'journal words' are listed on one side. Interested readers can click on a word of their choice and see its importance and 'cluster space', as well as its weaker links to expressions from other 'clusters'. The screen shots illustrate this process. Readers will find at the end of this report a list of the URLs available.

Results

For each of the above points, we will briefly introduce the method used, show the result, and offer relevant remarks.

1) Retrieving a journal's most common uniterms

There are various freely available tools for retrieving a text's significant words (only nouns, verbs and adjective were examined, and it was possible to exclude - after reviewing the results - banal or irrelevant terms). The challenge was that many of these tools only worked with English vocabulary. We developed some small programmes that made it possible to use other languages: these however only work for one language at a time, making it necessary to sort and search through the texts on this basis. We also created some programmes for linking up to the *graphic representation tools*, for which we also had to work with one language at a time.

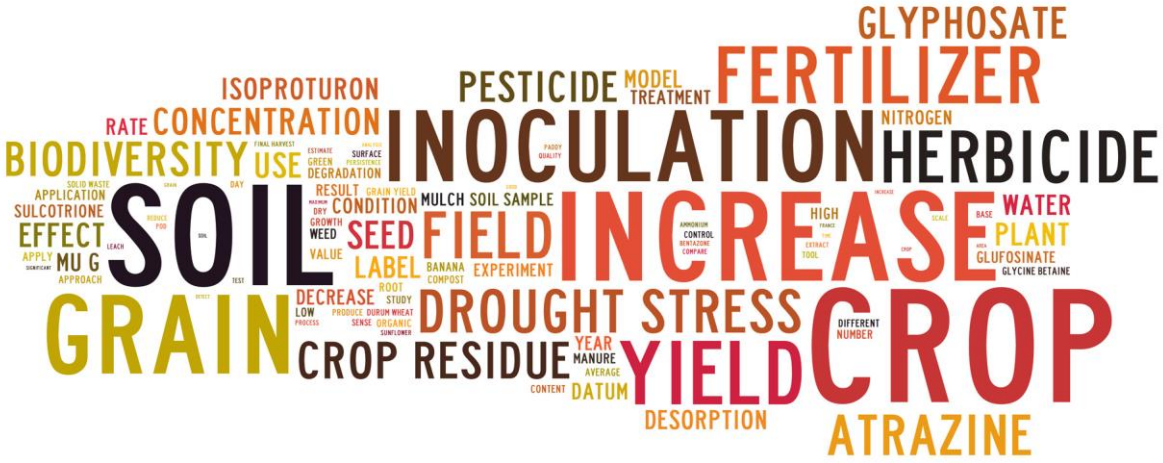
We decided to search one journal at a time rather than look at supposedly coherent 'cocktails of journals' from the outset. It was difficult to manage the heterogeneity of this kind of cocktail because some journals

are published more frequently than others, or are bigger, giving them a greater weighting with respect to the whole. It was difficult to work out to whom or what the notable changes of the period were due. Thus before working with any cocktails of journals, it seemed important to look at their individual components. It was then easier to make sensible combinations that had the correct parameters for the research hypotheses, which were well centred, for instance, on the differences between the 'spaces of reflection'.

A single journal can moreover present a sufficiently wide corpus. To be sure of this, we only searched journals to have published abstracts for at least 10 to 15 years, making for collections of 300 to 400 titles and abstracts.

As an example, we will show what we found by searching the journal ***Agriculture and Sustainable Development*** **in 2005.** This is a well-defined, fair sized corpus.

Fig. 1. Uniterms in the journal *Agriculture and Sustainable Development* in 2005



This figure 'shows' the preoccupations of the journal *Agriculture and Sustainable Development* as it stood in 2005. The words' sizes reflect how frequently they featured in the corpus[12]. The journal is a classic agronomy publication in substance, although it has a specific 'focus'. It particularly looks at *soil fertility* and the chances of renewing (or conserving) it by various methods. It also looks at issues on biodiversity conservation, seed quality (and the goal of boosting yields, as well as dealing with threats to plants (notably from water stress), and on avoiding the mass use of aggressive pesticides and herbicides. No particular key word points to the scope of the phenomena it addresses; it however clearly focuses on the scale of farms (rather than regions and countries), with what appears to be a greater emphasis on small and medium-scale farming.

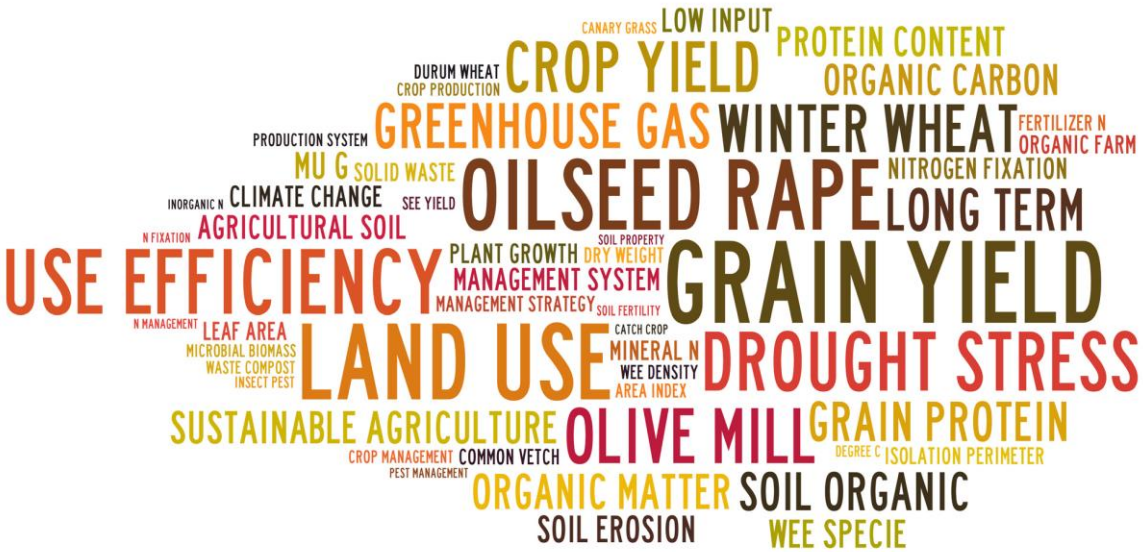
[12] But their position on the schema has no particular significance. It is simply meant to aid legibility.

2) Extracting multiterm expressions

We will not go into the technical details of 'expression' retrieval here: bi-terms, tri-terms (or even n-terms) which often feature side by side in the text. We will simply highlight that:

- Looking at multi-terms allows for *a much better understanding of content* (even though uniterms as a whole naturally appear more often, identifying the journal's field of preoccupations). The following figure illustrates this, looking only at multiterms from the same journal (*Agriculture and Sustainable Development* from 2005 to 2011).
- Empirically, we found that taking bi-terms (or at most bi and tri-terms) into account aided comprehension (but n-terms gave added 'noise' which confused the intelligence from the texts).

Fig. 2. Bi- and Tri-terms in *Agriculture and Sustainable Development* from 2005 to 2011



3) Changes in preoccupations over time (in a given journal).

We can continue by showing similar schemas to the previous one, over various periods. Here, for example, are the figures (uni- AND multiterms) for the same journal in 2005 and 2011:

Fig. 3. Main themes in the journal *Agriculture and Sustainable Development* in 2005

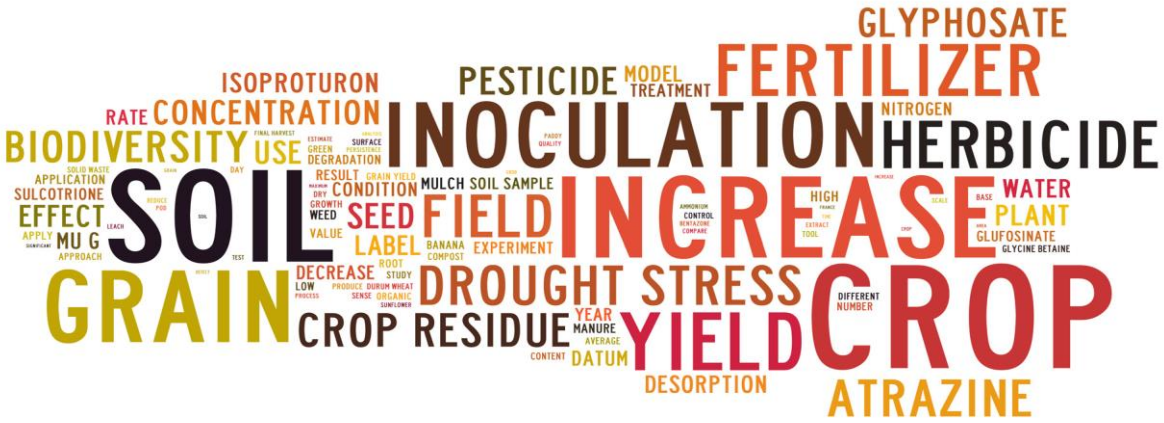
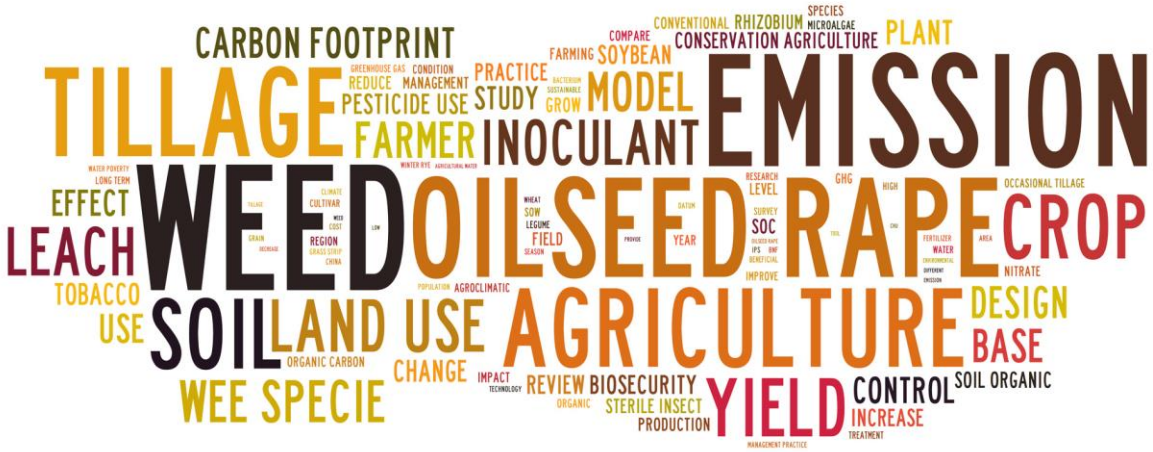


Fig. 4. Main themes in the journal *Agriculture and Sustainable Development* in 2011



There were some clear shifts: the main focus had become *cultivation practices* (labour, weed management, land use), and there was a well-defined focus (which was indeed on farming and farmers), but larger scale phenomena were also addressed (land degradation through leaching, carbon footprints and climate change). Organic farming, biosecurity, biological monitoring of parasites (sterile insects...) were also mentioned. But the studies now focused on *a few commercial crops* (tobacco, soya and, above all, rapeseed), some of which now offered the alternative of genetically modified seeds[13].

[13] Although there seems to be no specific debate on this subject in the journal.

4) Table of uni- and multiterms (n-grams)

The aforementioned tools made it possible to create visually informative graphs. Their 'transparency' can however be deceptive. The effect of trends (or the specific weighting of an author) can make particular preoccupations stand out for a time, only for them to die away. And the list of the most important words can change over the years, despite the fact that some words remain very constant. For this reason, we made a table of the (long) list of uniterms and multiterms to recur in a given journal, and measured *their frequency of appearance year by year*. The colour scheme highlights spikes in use (dark shade), emergences and losses of influence (through a lighter shade found next to the peaks) and declines (a very light shade, which continue up until any re-emergences). We can also find terms that last over a long period (the top of the table: terms which appear over the greatest number of years), while others are dated or only used occasionally (appearing for just one or at most 2 years, e.g. 'crop residue' or 'olive mill' in the bi-term table. Finally we identify those terms which have recently emerged (with the final year showing an unprecedented level of dark shading, e.g. 'fossil fuel' and 'carbon footprint'. Reading these tables in close detail (one for uniterms and the other for bi-terms) is certainly more painstaking a process than the 'quick glance' that the previous graphs offer. But it can be worthwhile in order to precisely situate the space of current debates and the most up-to-date aspects of the themes of a particular recognised journal[14].

Our example here is the first page of the table of bi-terms for the journal ***Agriculture and Sustainable Development,*** **which we looked at from 2005 to 2011**

Fig. 5 ***Agriculture and Sustainable Development*** Table of bi-terms, **from 2005 to 2011**

	2005	2006	2007	2008	2009	2010	2011	Total	
grain_yield	0.00180	0.00082	0.00000	0.00076	0.00026	0.00031	0.00048	44.28267	6
land_use	0.00000	0.00054	0.00000	0.00098	0.00026	0.00020	0.00204	40.34837	5
use_efficiency	0.00033	0.00000	0.00000	0.00066	0.00066	0.00112	0.00084	36.06366	5
crop_yield	0.00049	0.00000	0.00080	0.00000	0.00053	0.00061	0.00096	33.94	5
winter_wheat	0.00033	0.00000	0.00048	0.00000	0.00185	0.00020	0.00048	33.42873	5
organic_matter	0.00098	0.00000	0.00000	0.00022	0.00053	0.00082	0.00060	31.45	5
sustainable_agriculture	0.00000	0.00000	0.00064	0.00044	0.00066	0.00051	0.00084	30.9	5
agricultural_soil	0.00065	0.00082	0.00032	0.00066	0.00000	0.00020	0.00000	26.5	5
mineral_n	0.00000	0.00054	0.00112	0.00022	0.00000	0.00031	0.00024	24.30334	5
leaf_area	0.00082	0.00000	0.00032	0.00076	0.00026	0.00020	0.00000	23.7	5
oilseed_rape	0.00000	0.00000	0.00000	0.00033	0.00066	0.00061	0.00228	38.81818	4
greenhouse_gas	0.00000	0.00000	0.00032	0.00044	0.00000	0.00112	0.00144	33.21251	4
grain_protein	0.00033	0.00109	0.00048	0.00000	0.00132	0.00000	0.00000	32.17895	4
protein_content	0.00049	0.00082	0.00032	0.00000	0.00132	0.00000	0.00000	29.49052	4
soil_erosion	0.00098	0.00082	0.00000	0.00066	0.00000	0.00031	0.00000	27.58	4
low_input	0.00000	0.00000	0.00128	0.00055	0.00026	0.00000	0.00060	26.92668	4
organic_farm	0.00000	0.00000	0.00000	0.00033	0.00066	0.00123	0.00024	24.5449	4
dry_weight	0.00098	0.00054	0.00000	0.00022	0.00000	0.00051	0.00000	22.54	4
fertilizer_n	0.00033	0.00000	0.00000	0.00022	0.00000	0.00092	0.00072	21.84	4
drought_stress	0.00180	0.00000	0.00096	0.00000	0.00093	0.00000	0.00000	36.85267	3
soil_organic	0.00000	0.00000	0.00000	0.00000	0.00119	0.00051	0.00156	32.60722	3
organic_carbon	0.00000	0.00000	0.00000	0.00000	0.00145	0.00041	0.00120	30.62161	3
nitrogen_fixation	0.00000	0.00000	0.00096	0.00000	0.00053	0.00000	0.00108	25.70914	3
plant_growth	0.00065	0.00136	0.00000	0.00055	0.00000	0.00000	0.00000	25.59804	3
solid_waste	0.00131	0.00000	0.00080	0.00000	0.00000	0.00020	0.00000	23.13831	3
durum_wheat	0.00147	0.00000	0.00000	0.00000	0.00026	0.00000	0.00036	20.95309	3
WEE_density	0.00049	0.00000	0.00000	0.00000	0.00106	0.00000	0.00036	19.07641	3
production_system	0.00000	0.00000	0.00000	0.00044	0.00000	0.00061	0.00084	18.9	3
crop_management	0.00000	0.00000	0.00096	0.00000	0.00066	0.00000	0.00024	18.63	3
waste_compost	0.00098	0.00000	0.00064	0.00000	0.00000	0.00020	0.00000	18.26	3
microbial_biomass	0.00000	0.00109	0.00032	0.00000	0.00040	0.00000	0.00000	18.05843	3

[14] Or a cocktail of such journals, in order to find the quintessence of the approaches used at a particular time.

canary_grass	0.00000	0.00000	0.00048	0.00000	0.00040	0.00061	0.00000	14.91	3
insect_pest	0.00000	0.00000	0.00000	0.00022	0.00000	0.00031	0.00096	14.84	3
soil_fertility	0.00000	0.00000	0.00000	0.00022	0.00000	0.00020	0.00096	13.82	3
soil_property	0.00000	0.00000	0.00000	0.00000	0.00066	0.00020	0.00048	13.45	3
inorganic_n	0.00000	0.00000	0.00080	0.00022	0.00000	0.00020	0.00000	12.24	3
pest_management	0.00000	0.00000	0.00000	0.00066	0.00000	0.00020	0.00024	10.99	3
olive_mill	0.00000	0.00245	0.00000	0.00098	0.00000	0.00000	0.00000	34.30648	2
climate_change	0.00000	0.00000	0.00000	0.00000	0.00185	0.00082	0.00000	26.67873	2
isolation_perimeter	0.00000	0.00000	0.00144	0.00087	0.00000	0.00000	0.00000	23.17001	2
common_vetch	0.00049	0.00000	0.00176	0.00000	0.00000	0.00000	0.00000	22.53668	2
management_practice	0.00000	0.00000	0.00000	0.00000	0.00079	0.00000	0.00144	22.32885	2
gm_maize	0.00000	0.00000	0.00144	0.00076	0.00000	0.00000	0.00000	22.07001	2
foliar_application	0.00082	0.00136	0.00000	0.00000	0.00000	0.00000	0.00000	21.76804	2
cover_crop	0.00000	0.00000	0.00000	0.00098	0.00000	0.00112	0.00000	21.06366	2
mill_wastewater	0.00000	0.00136	0.00000	0.00044	0.00000	0.00000	0.00000	17.96804	2
crop_protection	0.00114	0.00000	0.00000	0.00055	0.00000	0.00000	0.00000	16.90352	2
maize_field	0.00000	0.00000	0.00112	0.00055	0.00000	0.00000	0.00000	16.68334	2
methane_emission	0.00000	0.00082	0.00000	0.00076	0.00000	0.00000	0.00000	15.8	2
crop_model	0.00000	0.00109	0.00000	0.00000	0.00000	0.00000	0.00024	13.27843	2
carbon_sequestration	0.00000	0.00054	0.00000	0.00000	0.00000	0.00061	0.00000	11.57	2
fossil_fuel	0.00000	0.00000	0.00032	0.00000	0.00000	0.00000	0.00072	10.41	2
wild_oat	0.00000	0.00000	0.00000	0.00000	0.00040	0.00061	0.00000	10.1	2
nodule_number	0.00033	0.00000	0.00000	0.00066	0.00000	0.00000	0.00000	9.82	2
air_pollutant	0.00000	0.00000	0.00000	0.00000	0.00000	0.00020	0.00072	9.24	2
anaerobic_digestion	0.00000	0.00000	0.00000	0.00000	0.00066	0.00020	0.00000	8.65	2

5) The stability of editorial policies

A remarkable feature is the editorial stability of journals over one or several decades. This is probably due to the need to retain a long-term readership and to attract contributions that stick to a chosen, sometimes very precise line. It is ultimately very rare for generalist journals to introduce rival approaches (or for rival approaches to clash on their pages). Their scope is at best that of a whole discipline (such as agronomy - although this does not include molecular biology or biotechnology, which are covered by other recognised journals in their community).

This is notably illustrated in the graphs of common uniterms in ***Agriculture & Human Values***, which, a priori, is of particular interest to the ENGOV project. We show these for a 10-year period broken down into 3 sub-periods. The first figure shows the years 2003 to 2005.

Fig. 6. The most common uniterms in the journal *Agriculture & Human Values* from 2003 to 2005.

The two following figures are from the years 2006 to 2008, and are followed by 2009 to 2011.

Fig. 7. The most common uniterms in the journal *Agriculture & Human Values*, from 2006 to 2008.

Fig. 8. The most common uniterms in the journal *Agriculture & Human Values*, from 2009 to 2011.

Fig. 10. The most common multi-terms in the journal *Agriculture & Human Values*, from 2009 to 2011.

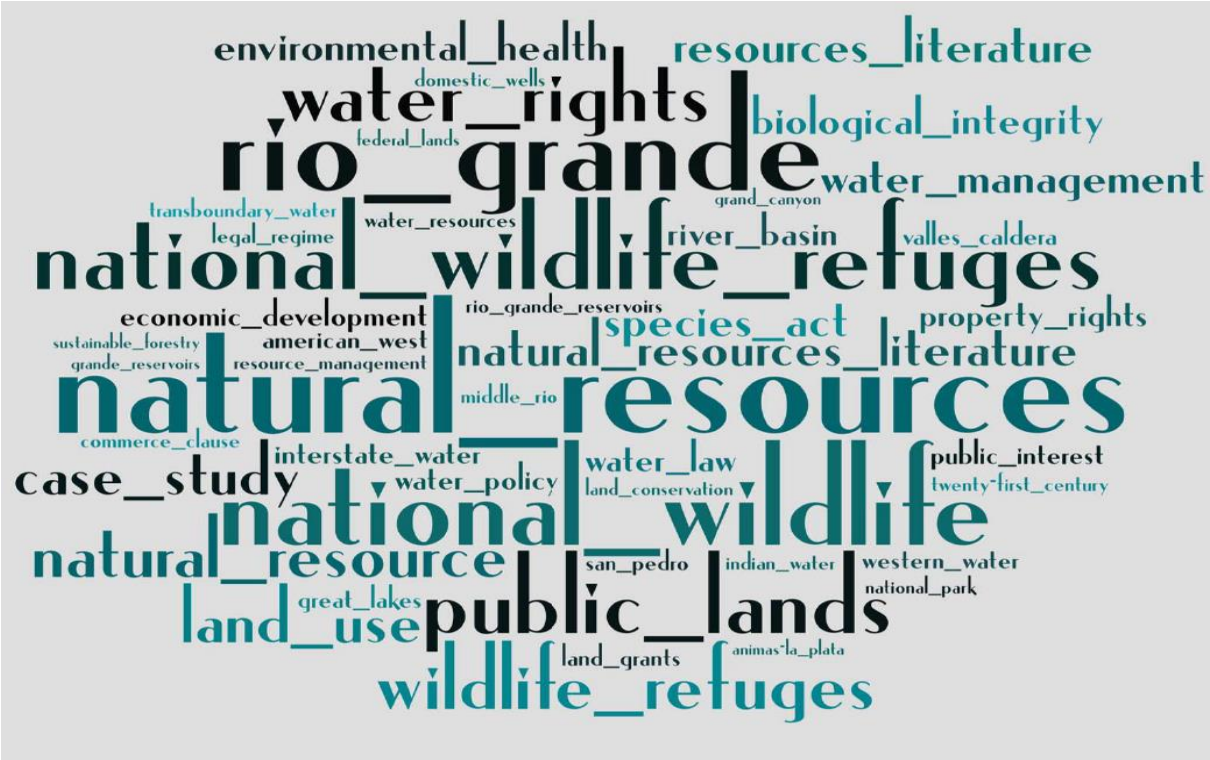
The notable stability of the journal's editorial policy gives it *a strong identity.* The journal tackles 'meta-agricultural' questions, focusing on (small) producers (farmers caught between family consumption and the market), local knowledge, the role of women and their real 'participation' in the management of development projects, while also looking at practices of (good) 'governance'. Its focus is however primarily on (small) production, while opening up gradually to the wider field of consumption, consumer interests, quality of food supply and the global sector of 'agrifood'. We will also see that it takes a much less precisely technical approach than other journals such as *Agriculture and Sustainable Development* (although it is well-informed).

At first approximation and paradoxically, debates on agrobiology, GMOs and alternative practices to the market find here a weak echo. One could believe that the positions taken stem from ethical or intellectual recommendations, more than taking inspiration from relevant social movements. But this would be a mistake that taking the bi-grams into account can rectify. This effectively highlights *the important added meaning that the multi-terms can offer*. The journal proves to be committed, pragmatic, close to the ground and well informed about alternative experiments.

6) Journal title and editorial policy

These scientific journals have a distinctive identity that they want to maintain. But it would be wrong to believe that a journal's title subsumes or even accurately reflects its contents. While this is apparently the case for *Agriculture & Human Values* (with some clear biases), there are many counter-examples. We were interested in respected journals with expressions such as 'Natur*' in their titles; and most particularly in two publications; the *Journal of Natural Products* and the *Journal of Natural Resources*. Both have very different approaches and fields of preoccupation, however. The first ('Products') is interested in the industrialisation of wild harvests and research on to achieve this objective. The second ('Resources') is 'conservationist' and more interested in preserving species within natural ‘parks’ than in human action and environmental development.

Example: Journal of Natural Resources, 2000-2010



7) The ambiguity of journal 'cocktails'

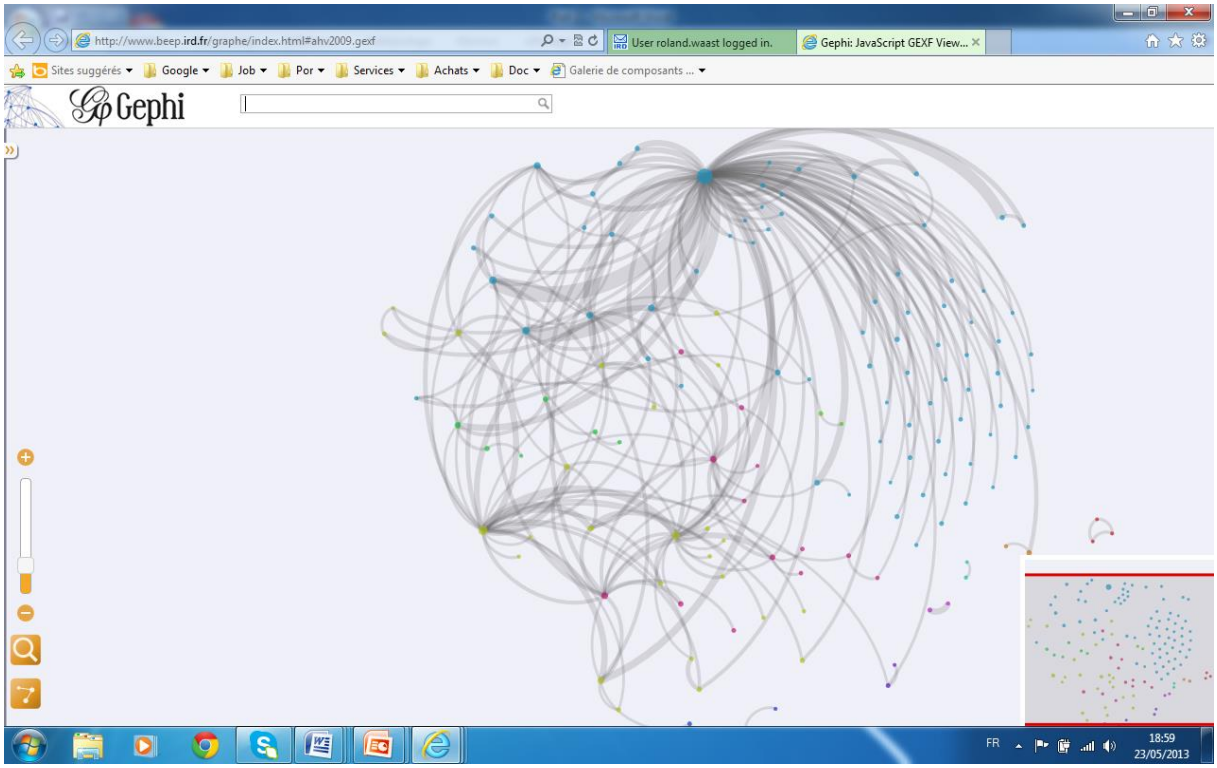
This observation led us to think about the analysis of 'cocktails of reviews', and the variety of approaches and debate at a given moment. Each journal has a highly focused field while their titles can be deceptive. We tested this ambiguity by bringing together respected journals with the expression 'Natural' (Resources, Products, etc.) in their titles. The result was surprising. Water management emerged to dominate the space of reflection, as did the (separate) issue of 'conservationism' to defend 'wildlife' and a commitment to natural parks (perhaps due to the weighting of the *Journal of Natural Resources.)* In contrast, we found little mention of 'human' integration into the ecological system, or concerns for 'Sustainable Development'. There was thus a sort of 'confiscation' of the expression 'Nature' by some scientific lobbies, which is well known by specialists trying to publish articles, but could confuse the uninitiated. We should thus beware 'common sense' combinations, and **we had to search through the journals one by one before we could make a satisfactory 'cocktail'.**

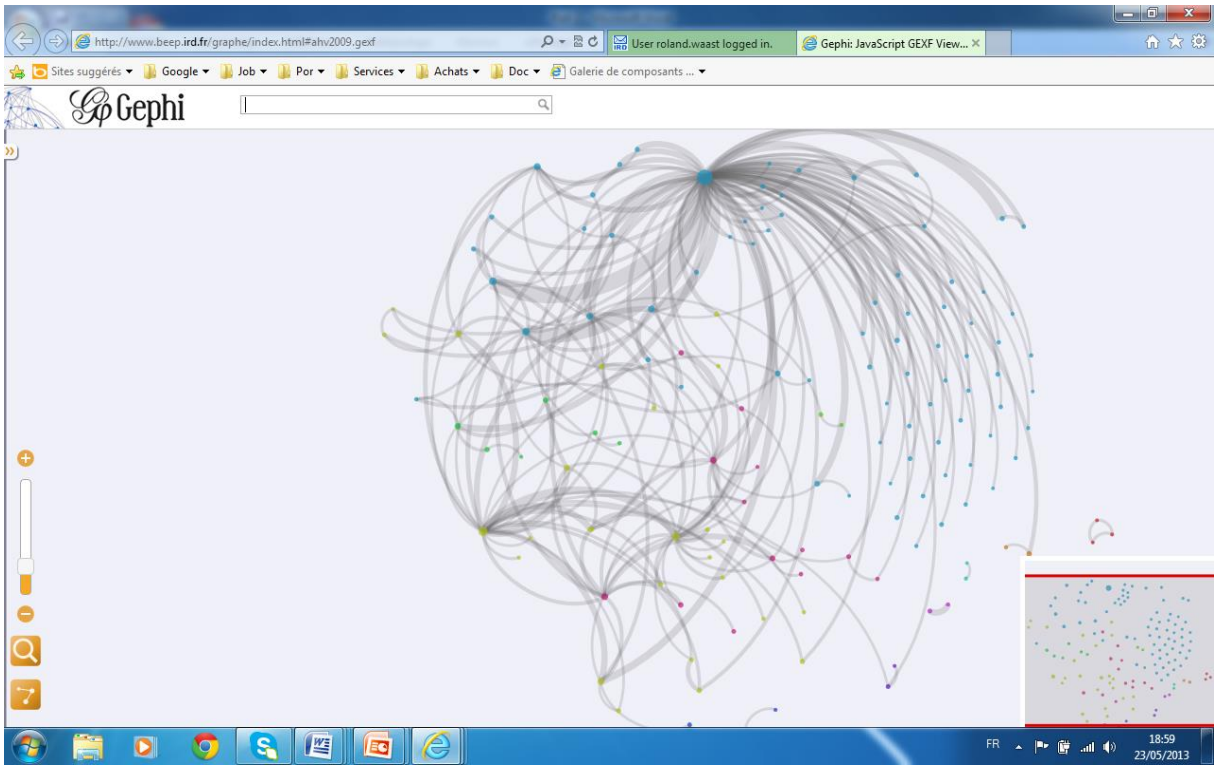
Example: 4 Journals with Natural* in their titles


public_land
environmental_protection
ecosystem_management
federal_courts
power_plants
state_engineer
water_policy
legal_framework
federal_government
water_conflicts
wildlife_refuge
federal_agencies
international_agreements
commerce_clause
international_watercourses
water_use
district_court
water_management
natural_conditions
san_juan~chama
natural_resource
federal_lands
park_service
public_trust
renewable_energy
future_generations
economic_development
case_study
scarce_water_resources
national_wildlife
water_allocation
land_grants
resource_management
water_resource
water_rights
land_trusts
colorado_river_delta
environmental_decision
water_supply
mexican_land
land_trust
land_grant
water_law
impact_assessment
refuge_system_improvement
water_shortages
water_resources
solar_energy
indian_water_rights
federal_land
el_vado
refuge_system
river_basin
environmental_protection_agency
property_rights
water_quality
climate_change
interstate_water
acequia_officials
federal_district
institutional_arrangements
government_agencies
energy_security
private_land
natural_resources
environmental_health
policy_makers
public_interest
usc_department
rio_sonoyta
collective_action
river_delta
water_conservation
land_use
wildlife_service
national_parks
rio_grande
scarce_water
water_right
water_users
public_participation
roadless_rule
colorado_river
environmental_impact_assessment
twentieth_century
improvement_act
natural_gas
agricultural_land
reserved_rights
critical_habitat
supreme_court
middle_rio
animas~la_plata
private_lands
ecological_integrity
power_generation
western_shoshone
forest_service
national_park
corps_of_engineers
biological_integrity
local_ordinances
species_act
public_lands
silvery_minnow
prior_appropriation
conservation_easements

8) The (uni)terms' network

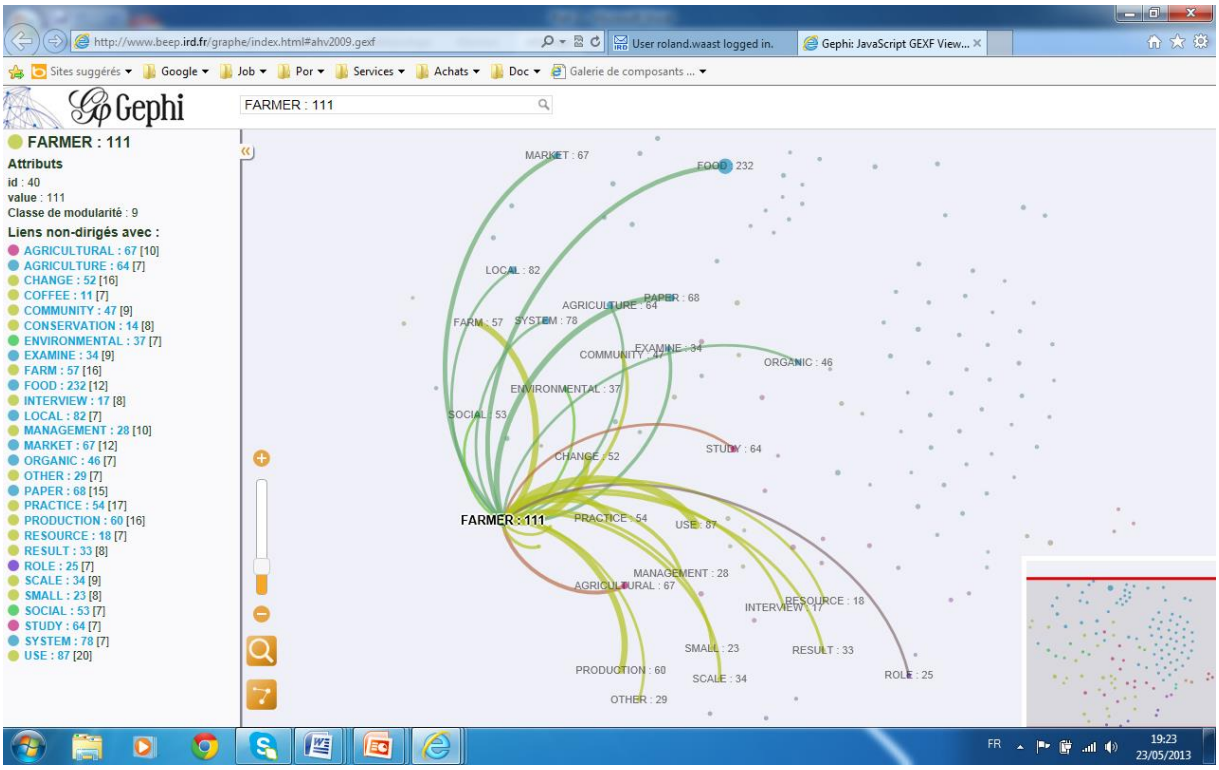
We were able to perfect a powerful tool capable of giving a good idea of a journal's contents. The corresponding graphs are **interactive and available on the Internet.** Here is an example of the 'views' it gave of the journal *Agriculture & Human Values* (2009-2012).





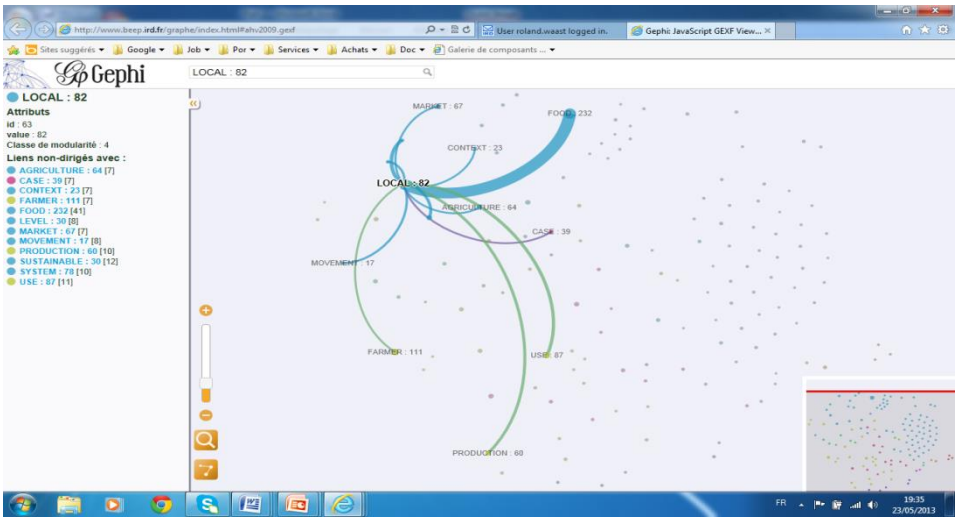
The first graph by itself shows the silent webs of connections between the main key words. This allows us to see that two words make up the central nodes of these webs: the one in the top centre (the most important); and the other, by itself at the bottom left. Clicking on the first of these nodes allows us to view its title (FOOD), the list of words it has connections to (on the left of the screen) and its network of relations (see the following Figure).

We can repeat this for the second important node, which proves to be the word FARMER.



The thickness of each line represents the strength of the connection. Its colour indicates which 'cluster' it belongs to - that is to say the group of meaning to which it is the most closely related. Here, the blue lines belong to the theme of 'Food', and the green lines to 'Farmer'.

Clicking again on the particular point of interest makes its own links appear.



These graphs are freely consultable for detailed use, at a ***dedicated URL for readers to copy*** into a navigator.

We made these graphs for 3 journals from different set periods:

For the journal AGRONOMY_SUSTAINABLE_DEVELOPMENT
http://www.beep.ird.fr/graphe/index.html#agr_sus_dev-2005.gexf
Graphs on a year-by-year basis from 2005 to 2011(simply change the date from 2005 in the URL)

For the journal Agrociencia
http://www.beep.ird.fr/graphe/index.html#agro2003.gexf
http://www.beep.ird.fr/graphe/index.html#agro2006.gexf
http://www.beep.ird.fr/graphe/index.html#agro2009.gexf
Graphs for the 3-year set periods: 2003 calculated from 2003-2005
then 2006 (2006-2008)
and 2009 (2009-2011)

For the journal Agriculture_Human_Values
http://www.beep.ird.fr/graphe/index.html#ahv2003.gexf
http://www.beep.ird.fr/graphe/index.html#ahv2006.gexf
http://www.beep.ird.fr/graphe/index.html#ahv2009.gexf
graphs for the 3-year periods: 2003 calculated for the period 2003-2005
then 2006 (2006-2008)
and 2009 (2009-2011)

9) Conclusion.

- We now have at our disposal reliable tools that can be transposed into different languages.
- Our experience has shown us the importance of first searching through each journal before bringing them together into a wider pertinent corpus.
- Our tests showed that isolating uniterms can reveal a journal's editorial line and its main areas of focus.
- But consideration of bi- or tri-terms provides a significant supplement of comprehension in terms of the meaning to give to the single words.
- It now remains to complete the corpus to search through. Once the fields of interest for the project have been precisely defined, we can propose to search through the most respected journals in the area. Several schools of thought will naturally compete within each area. These schools of thought will need to be named (or their leading authors will) in order to identify the most significant journals that are illustrative of them.
- Equally in the next phase, we will define a genuinely Latin American corpus along the same lines.

Conclusion of part I

We have examined the viewpoint of the 'mainstream' humanities and social sciences on environmental questions over the past fifty years. We used the WoS bibliographic database because it is the oldest, largest and most stable option, despite the inconveniences of its English-language bias.

Our method was firstly to focus on the origins and trajectories of the ENGOV European project's main framing keywords, and on the champions of these keywords (authors, institutions, journals). We also showed the connections between the leading journals' keywords, which connections have created just as many spaces of reflection.

At the completion of this work, we will highlight the following points.

The vocabulary review showed that the keywords have had highly variable weightings, fortunes and conceptual statuses.

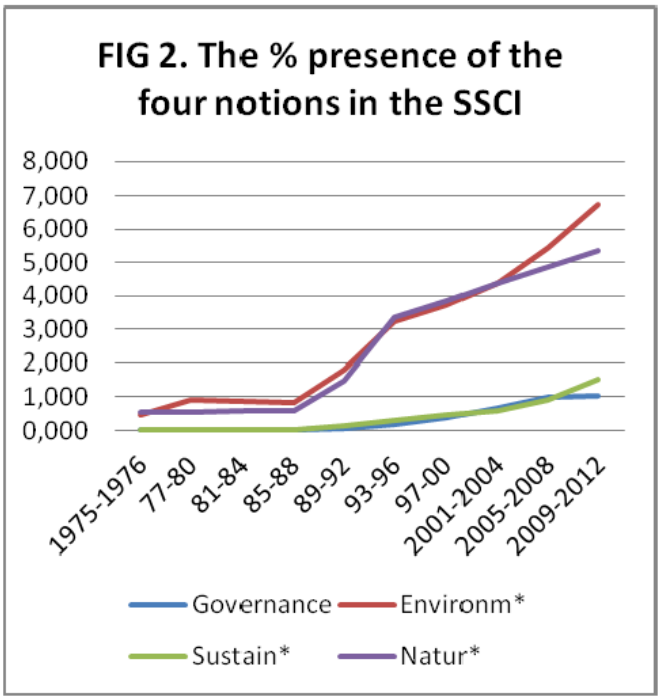
1. The weighting of words

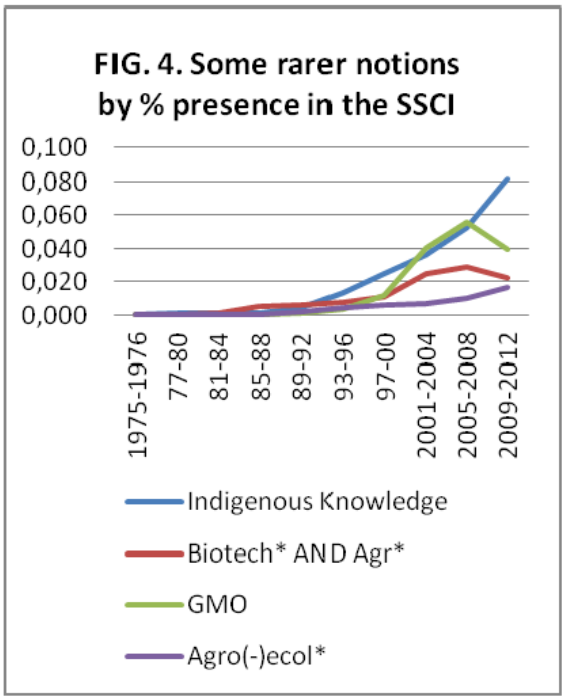
The most common words were also the most polysemic, as is the case with *Nature* and *Environment*. Such words by no means come under one unique area of studies. From 2009-13 for example, 14,000 of the 90,000 articles using the notion of Environment were in 'environmental studies'. But the term also featured in 15,000 medical studies on psychology, and to almost the same extent, neuroscience. In environment studies itself, a variety of issues were addressed. Unlike what one might believe, agriculture (in its broadest sense), bio-conservation and biodiversity are distinctively minority questions today, owing to pressure from issues such as energy, water resources, climate change and, in a different register, urban change. Approaches have also varied across the same field: nowadays, economics and management (business management in particular) have taken a strong lead; other approaches have lagged far behind (geography, sociology, and even ethics and the philosophy of science are still noteworthy; pharmacology and biotechnology, have however published just 1 and 5 articles respectively).

The weighting of the more precise words has been more modest, if still significant. This was the case of the success of *Governance* and *sustainable* [development] in the 1990s, which success only grew in the 2000s. These terms became legitimate in academia thanks to a few maverick authors' influential works, activist movements, influential governments and international conferences.

One could be surprised that words so closely linked to key controversies (GMOs, the clash between agricultural biotechnologies and *agro*-(biology, ecology, forestry...) have only had sporadic coverage. Paradoxically, the notion of '*indigenous knowledge*' fared the best (it was a long-established anthropological term which eventually featured in 1 out of 1000 articles, which was twice as much as for GMOs.) The 'mainstream' science we have studied here has had little taste for 'revolutionary' science, preferring controversies to be over before discussing them.

The following charts sum up this data:





2. The meaning of words

The concepts framing the ENGOV project have had wide-ranging ***conceptual statuses***. Some (Nature, Sustainable...) have been essential concepts for reflection in established disciplines and influential schools of research. Others (Indigenous knowledge...) have served as the tools of war in heuristic disputes. Others have sometimes had a much 'softer' status (Governance, environment...), or were even simple linguistic conveniences.

The term '**Nature**' is a well-established concept that has been particularly central to philosophy and anthropology (through the Nature / Culture opposition). Environmental or ecological issues came later. It played a role in original studies in small areas of anthropology, ethics and the philosophy of science. Elsewhere (in law, economics and business studies, labels and norms) it continued to undergo definition, or was simply supposed to be used.

The term '**Environment**' is even more ambiguous. While it had been a long-established methodological tool in the material and health sciences, for the *social sciences*, it was more about defining a subject or field of studies. Although it became very fashionable, this was more out of pragmatism than intellectual breakthrough. The exception was a small, low-key stream of ecological criticism in the 1960s and 1970s (which was also the case for '*Sustainable*'.) An important further exception was the breakthrough of the term as a *theoretical tool* from 1985 thanks to *ecological economics*. If not quite looking to reconstruct economics as a discipline, this discipline certainly strove to critique and reform neo-liberal economic theory. It looked to redress certain particular weaknesses: the restrictive focus on the 'factors' of labour

and capital, poor awareness of activities outside the market and of factors without a price tag (such as what nature supplies), the struggle to take a long-term approach or to acknowledge changes in preferences. Administration and management aligned, pro parte, to take this into account.

Three further notions merit attention. These are Sustain* (= Sustainable), Indigenous knowledge and Governance. They illustrate three typical trajectories.

The term '**Sustain***' (robustness, the ability to keep going, to **last**) probably has the deepest roots. It goes back to very old schools of thought, which returned in a contemporary form in the 1950s. Non-academics and maverick authors who were concerned about *the future of humanity* promoted them. They were first concerned by considerable demographic growth, for the time, in the impoverished third world, and their responses translated into several schools of thought. The first one highlighted the limits of the plasticity of the planet and the risk of natural resource depletion. This gained the support of natural science specialists from the 1960s, and went on to speak to public opinion. A second school, which took the 1970s critique of consumer society further, highlighted natural resource wastage and called for *slow or zero growth.* It informed the thinking of state leaders who were dealing with economic crisis and the 'oil crises'. The third school voiced scepticism as to the infinite capacity of the sciences to solve every sort of problem. By contrast it critiqued technical alienation (J. Ellul) and the barbarism with which technology was being put into action (A. Nandy).

Campaigners and decision-makers supported these movements. At first the academic social sciences only paid limited attention, contributing commentaries on the hard-hitting works coming off the press (*Silent Spring,* 1962*, Blueprint for Survival*, 1972, *The Limits of Growth*, 1978, and the influential *State of the World,* 1985-1992); and then showing interest through the new field of 'environmental studies', which made its appearance in indexed journals from the early 1980s. It was however '*ecological economics*' which marked a genuine intellectual breakthrough. It used imaginative and constructive models and indicators, and quickly won over many decision-makers, blazing the way for steadily growing numbers of field 'surveys' from 1995. Such momentum continued with the move to focus on concrete issues of management, the market, 'good practices' and environmental engineering.

The notion of '**Indigenous Knowledge**' has nowadays been practically 'appropriated' by 'environmental studies' and the anthropologists collaborating in this area. But committed agronomists working on development projects to re-evaluate peasant know-how were the ones to begin the process in 1980. From the 1990s the concept became more *militant,* highlighting the dependency and marginalisation of 'indigenous' people. This looked to support the fight for indigenous people to share fairly in the profits of development (legal battles), or more radically to achieve their emancipation.

The notion therefore stands out from the more common '*local knowledge*' and '*traditional knowledge'*. The expression '*local knowledge*' has as its primary interest the *dissemination* of knowledge. It can be found in this capacity in works on industry as well as public health, administration and law. Anthropologists studying systems of representations have made space for it. The expression 'traditional knowledge' is more

connected to issues of memory, cognition, and adaptation, as well as innovation and *(technological) learning.*

The term *Indigenous Knowledge* in principle raises a fundamental debate: *is modern science just another ethno-science*? Looking at 'indigenous knowledge' or 'local knowledge' is a challenge to the exclusive legitimacy of conventional scientific knowledge, which was now sometimes critiqued as foreign, forcefully imported and as no more expert than any other science. But it is not certain whether debate on knowledge plurality and its workings was truly on the agenda; or even if the matter was raised. The expression 'indigenous knowledge' was sometimes a backup argument used by agronomists and environmentalists for winning over public opinion or project funders, just as 'scientific knowledge' has been used as an argument by other communities (such as biotechnologists). The notion served as a mobilising impetus and a legal argument, but barely at all as a working tool for development actions. Few projects worked on its basis, except perhaps in *medicine and psychiatry.*

The term '**Governance**' was *almost completely absent* from the SSCI until the start of the 1990s. It stemmed from the concerns of managers in universities, medical services and innovative urban planning departments for bringing about change with a minimum of internal friction. They proposed amicable conflict management on a micro-institutional level, primarily for the public sector. In the late 1980s the word's usage was *imported* to the fields of law and **business** organisation.

This at first concerned solving conflict between shareholders and company managers. The involvement of *Harvard* (and its Business School) was a turning point in the popularisation of the notion. *Transposing and opening up* the notion of 'regime' (as applicable to states) to **all sorts of areas, scales and organisations**, continued with other American universities, and in some other universities from across the world.

Only from 2000, ten years after it took off, did *environmental studies* begin to make significant use of the term. European (and particularly English) universities now took the lead: they managed to persuade ***the European Community*** to give particular attention to this battle horse. The notion of governance, which in 2000 was primarily used in the business, public administration and political science sectors, found prodigious success by moving into environmental studies (the second largest area of usage in 2014). The notion went global. Europe (particularly north Europe) was still the primary site of dissemination, and opinion leaders (the most published and cited authors) were part of this process. It now seemed an obligation for all environmental debate to use the term. The issues continued to widen however; there was concern about planetary change (overexploitation, climate change, water and energy crises...) and the search for a government for the new **'*Anthropocenic*'** age.

Finally it might be a surprise that the heated controversies in the natural sciences and/or between States and civil society only found an erratic, distracted echo in the 'mainstream' social sciences, as for example with the issue of GMOs. The global agri-food system did, of course, receive some attention. We can find as en entry, in the ethics and philosophy section, a small collection of articles on the controversies of agricultural biotechnology, and the differences between Europe and the United States' perceptions and legislation on it. Similarly, their Agro- (biology, ecology, forestry) alternatives were evoked. These

questions were not just approached from an ethical angle, but also increasingly from a 'business' and economic results perspective.

Analysis of leading journals' word associations shows up the compartmentalisation of areas of reflection

We searched the titles and abstracts of all the articles published by seven prestigious journals since 1975 (or their origin) that have been widely cited by the bibliographic database of the WoS, and which represent distinctive approaches in the field of environmental studies.

We broke the period under examination down into sub-periods of 5 years. Journal by journal, we retrieved the keywords that were characteristic of the sub-periods and mapped them out.

We repeated the process to retrieve the 'N-Grams', which are frequent associations of 2 or 3 words that convey a particular issue (more than 3 words gave meaningless outcomes). We cross-tabulated their scores with different sub-periods. We thus worked out which issues have remained constant, declined, emerged or have been short-lived.

We used other methods to draw up, journal by journal, *the connections* established between the different kinds of words. We measured their strength and categorised them (into 'clusters') showing the areas of thought (which show up in terms of closeness or repulsion between words).

The results highlight several methodological paradoxes *(see illustrations in the text):*

1. Despite the understandable temptations, it is *not recommended* to search through a ***cocktail of journals*** if their titles suggest that they tackle a notion that one wishes to map out for evolution and content. For example, a set of 6 respected journals with the term Natur* in their titles gave a confusing variety of perspectives, whose main features were biased by the relative weighting of the journals in question (some had published many articles, and others fewer articles over the same period).

2. It is also important to *beware of the **Title*** of a journal one is about to search. Certain differences will be well known to the articles' authors, but less so to the uninitiated. For example, the 'Journal of Natural *Products*' focuses on the industrialisation of wild harvests and on researching how to achieve this objective. The 'Journal of Natural *Resources*' is meanwhile 'conservationist' and more interested in preserving natural park species than in human action and environmental development.

3. Our tests showed that the retrieval of uniterms can reveal a journal's editorial line and the relative weight of the major issues covered. But looking at bi- or tri-terms improves comprehension of the meanings to give to the single words.

The results highlight a number of points:

1. The journals' editorial lines remained highly consistent, giving them *a strong identity.* They cultivated and maintained their editorial lines over the decades with only exceptional slippages. This came from the need to retain a long-term readership and to attract contributions in line with their chosen approaches.

2. There are as such very few journals where rival approaches clash or meet. Their scope is at best that of a discipline (such as agronomy), without necessarily addressing issues from related disciplines (such as molecular biology or biotechnology): these are voiced in other journals of reference to their community).

3. It's probably best to ask for specialist advice on which journals to search, provided the expert is aware of the range of existing approaches. After review, one can select the journals to combine into a meaningful cocktail.

4. As far as the debates of interest to us are concerned, the important journals are 'meta-journals' (which periodically take stock of the range of subjects and give an overview of the area), and those prioritising values over techniques as their editorial cornerstone. These include *Agriculture & Human Values* and *Science, Technology & Human Values,* to cite two examples.

The results can be read on the graphs presented, in the body of the text.

All of the journals' richest graphs are those showing the connections between words and their categorisation in terms of their proximity to each another. These are freely available in the Internet and interested readers can visit their URLs. A simple method is offered so readers can explore for themselves the relations between words of interest, as the journal in question represents them.

Part II:

ORIGINS AND SHIFTS IN MEANING OF ENGOV'S KEYWORDS: A VIEW FROM LATIN AMERICA

Report Objective

Our first report set out the *area of reflection* which ENGOV comes under. We traced the origins, trajectories and promoters (authors, journals, institutions) of the major key words which frame the project. We measured the weighting of these words across the full range of the social sciences, and mapped out the cloud of terms that regularly co-occur within a set of major Journals.

For this work, we used the most well established database, the SSCI, (which today is part of the World of Science = WoS). Despite its strengths, this database has well known biases: it favours English-speaking material and leaves little room for Journals from "peripheral" countries (such as Latin American ones). It can be said to reflect "mainstream" science well, while innovative and controversial areas tend to be lost in the noise of incremental progress being made within the fashionable paradigms of the day.

This new bibliographic report compares these results with those obtained from a **specifically Latin-American bibliographic database.** Two Latin American databases are both well maintained and wide-ranging: *SCIELO* is mostly in Portuguese and is based in Brazil; *REDALYC* is mostly in Spanish and was developed in Mexico. Both have the same biases, in that they focus more on journals that are published in their country of creation, and lack a great deal of historical perspective (having been created around 2000). We chose to use **REDALYC**, as it covers more of the countries ENGOV looks at, and was willing to work closely with us (REDALYC provided extracts from throughout its whole database, which make this study possible).

2.1. REDALYC: Comparison of a Latin American database with the SSCI

Introduction to the REDALYC database

REDALYC is an open access archive of academic journals published in Latin America. It was created in 2002 with the ongoing logistical support of the National Autonomous University of Mexico. It steadily grew since its creation from scratch, and now offers the full contents of over **900 journals** (across all disciplines) published in 17 countries (including a few from Spain and Portugal), and now has over **324 000 articles** for consultation. It is currently growing at a rate of around 70 new journals and 60,000 articles annually.

As a point of comparison, SciELO is about the same size and age (but has a somewhat different geographical coverage). Since 2012, a gateway of the virtual library **LATINDEX** has also compiled texts from REDALYC, SciELO (partially) and other equivalent national work from 30 countries across the continent. It features 3000 Journals and *1,400,000* articles. These combined portals cannot be searched all at once, but only one at a time.

REDALYC still has a modest scope, even on a Latin American scale. LATINDEX, which began in 1997, has the fully backdated list of every academic Journal in Latin America, and mentions 21,000 (+ 5,000 online) journals. Many of these journals have admittedly discontinued, or have patchy quality or chances of survival. LATINDEX's "catalogue" nonetheless features **6,400 active journals** that do meet basic editorial standards (in terms of publication rate and typography). REDALYC further filters these Journals in order to maintain stricter editorial criteria and scientific standards. This is not the reason why it is able to cover such a limited number of Journals, however. This is due to it being a free access archive. The most "bankable" Journals are the work of professional publishers and accessible on a paid subscription basis, rather than for free and instant online access.

The resultant bias is difficult to measure. **The WoS** does not have this problem, as it simply flags up Journal articles and gives their abstracts. It usually offers a link to the full on article on publishers' websites, where a subscription or single purchase is offered. Journals have nothing to lose by featuring in the WoS, and everything to gain. This is how the WoS has kept a good handle on its catalogue, which started out as a database of references collated by respected scientists, before expanding to cover the most-cited journals out of the existing inclusions. Thus the WoS came to include the "best" Journals worldwide, making it even more appealling to other Journals looking for inclusion.

REDALYC and the WoS (SSCI): 2002-2013

Ultimately, REDALYC still offers a broad cocktail of Latin American Journals, even if it lacks some of the biggest names - which perhaps however makes it less "mainstream". This might all help it to more readily feature livelier debates, more obviously controversial material, and innovative topics.

For the humanities and social sciences alone, REDALYC features 530 journals, and it compiled over 170,000 articles between 2002 and 2013. Most of these articles have Latin American authors, who in turn are almost always affiliated to institutions on the continent.

Over the same period (2002-2013), the SSCI (WoS) featured 51,000 articles with at least one author affiliated to a Latin American institution (2.5% of its total content). The countries represented were, in order, Brazil (31,000 articles), Mexico (10,500), Chilei (5,800), Argentina (5,300), and much further down, Peru (1,200), Venezuela (1,100), Cuba (700), Colombia (500), and a few others further down still. There were many foreign co-signatories among those articles: from the United States (8,000) as well as Europe (2,600 from Spain and 10,650 from across the whole of the EU).

Given below is a table of comparison between the 2 databases: the WoS and REDALYC

	REDALYC	SSCI - at least 1 Latin American co-author	SSCI
1975- 2001: Nb of Art. (Social Sciences and Humanities)	0	19,330	2,561,900
2002-2013: Nb of Art. (Social Sciences and Humanities)	170,000	51,000	2,050,000
2002-2013: Nb of Latin American journals (SSc & H)	530	120	120
2002-2013, SSc & H: Nb of Articles published by at least 1 author affiliated to a Latin American institution	165,000	51,000	s.o
2002-2013, SSc & H: Nb of Articles published in Latin American journals by at least one author affiliated to a Latin American institution	165,000	43,000	s.o

In the SSCI, Latin American writers are cited as *co-authors* in the following Journals and fields:

Nb SSCI Articles 2002-2013	Psychology, Health(care)	NON Psychology or Health(care)	Total	% Total
Latin American journals	36,000	7,000	43,000	85%
International Journals	6,500	1,500	8,000	15%
TOTAL	42,500	8,500	51,000	
% of TOTAL	83%	17%		100%

The table highlights the SSCI's strong leaning towards Latin American journals on Health and Healthcare, as well as Psychology (in its broad sense: Psychiatry, Psychoanalysis and Neuroscience). We can also see that *by far the most Latin-American inclusions in the SSCI are from journals in the region* that have been included in the database.

Few "International" journals include the voices of Latin American authors on a fairly regular basis (other than in Health and Psychology, which are far ahead of other fields). *No more than a dozen international journals* are part of the top 100 to feature the continent's researchers. Some of the journals are specialised in this field (*Latin American Perspectives* = US, *Latin American Research Review* = Latin American Studies, Pittsburg US, *The Journal of Latin American Studies* = Cambridge, England). Others are specialised in

Economics or Archaeology: **Energy Policy** and **Ecological Economics** are on the list, but also noteworthy are World Development [The World Bank], Economics Letters; as well as: *the Journal of Archaeologic Sciences* and ... *Scientometrics* (!)

For the humanities and social sciences, searching *by key word* brings up:

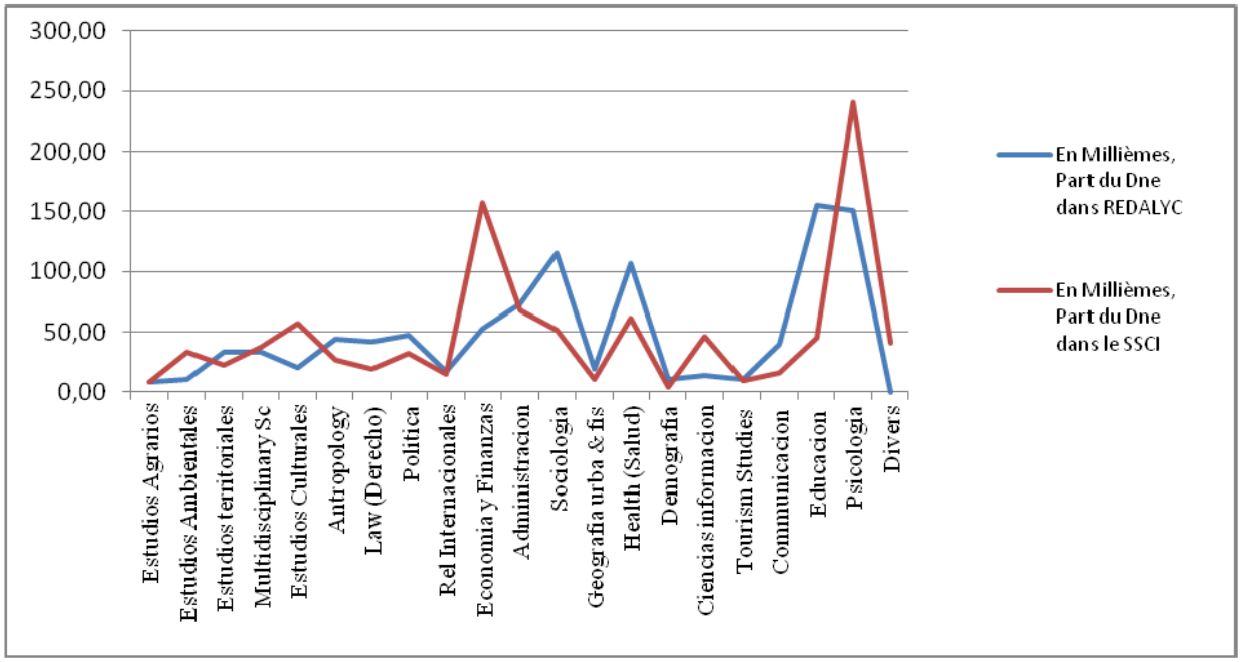
	REDALYC (Nb of Articles)	WoS (Nb of Articles)	REDALYC (% of corpus)	WoS (% of corpus)
Environment*	8160	140,000	5 %	5. 5 %
Govern*	650	22,900	0,4 %	0. 9 %
Sustainab*	1,765	26,700	1 %	1.0 %
Indigenous Knowledge*	17	1,500	0.01 %	0.06 %
Transgen*	123	1,130	0.07 %	0.05 %
Agro-Biotec*, Agrobiotec*, Biotecholog*	240	630	0, 14 %	0.03 %
Agroecology, Agrobiology, Agroforest*	284	600	0.16 %	0.02 %

For comparison purposes with the WoS, from here on we will use **2002-2012 as our period of reference**, as we did in our *previous Report* on the SSCI.

If we compare the 2 databases, we can see **somewhat differing areas of focus,** as the following graph shows:

Graph: Main fields in the two databases

[Share of each field by thousandths, in Redalyc and in the SSCI]



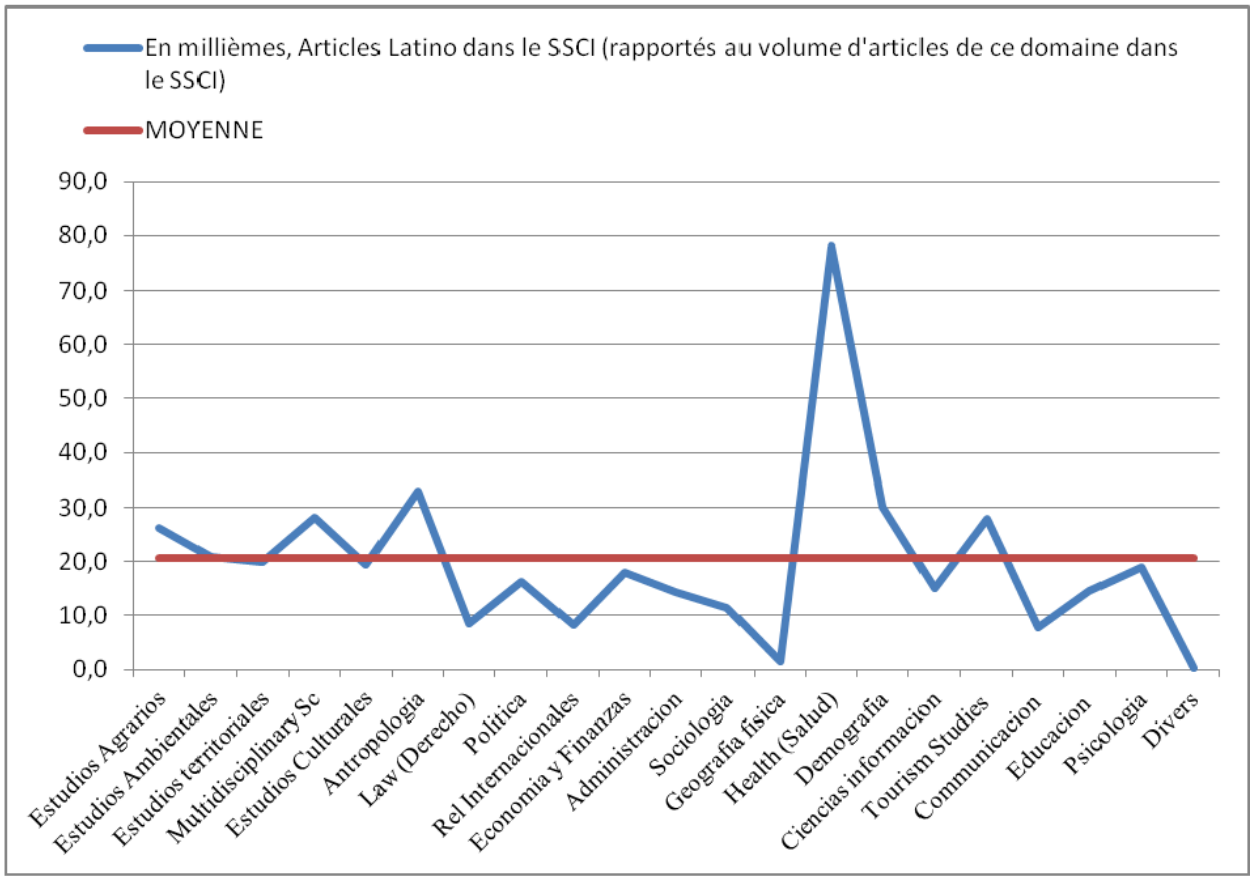
REDALYC contains more work in anthropology and sociology, as well as *law, politics, communication and education.*

The SSCI has a greater focus on *Psychology* (although this also features widely in REDALYC) and on *Economics* (Economic theory in particular). It gives more room to IT research, but also to "*cultural studies*" (particularly in the arts and humanities). For other areas (and notably in terms of our particular interests: Agricultural and Environmental studies), they both show roughly the same levels of interest.

It is interesting to look at the ***areas where the SSCI most calls on*** Latin American authors. There is a low average across all areas, with Latin Americans accounting for little over 2% of the total authors from "all countries". The following graph shows which questions give Latin Americans a greater voice with respect to this average:

Graph. Reference to Latinamerican authors in the SSCI : average and specific fields

[By thousandths of the total of references in each field]



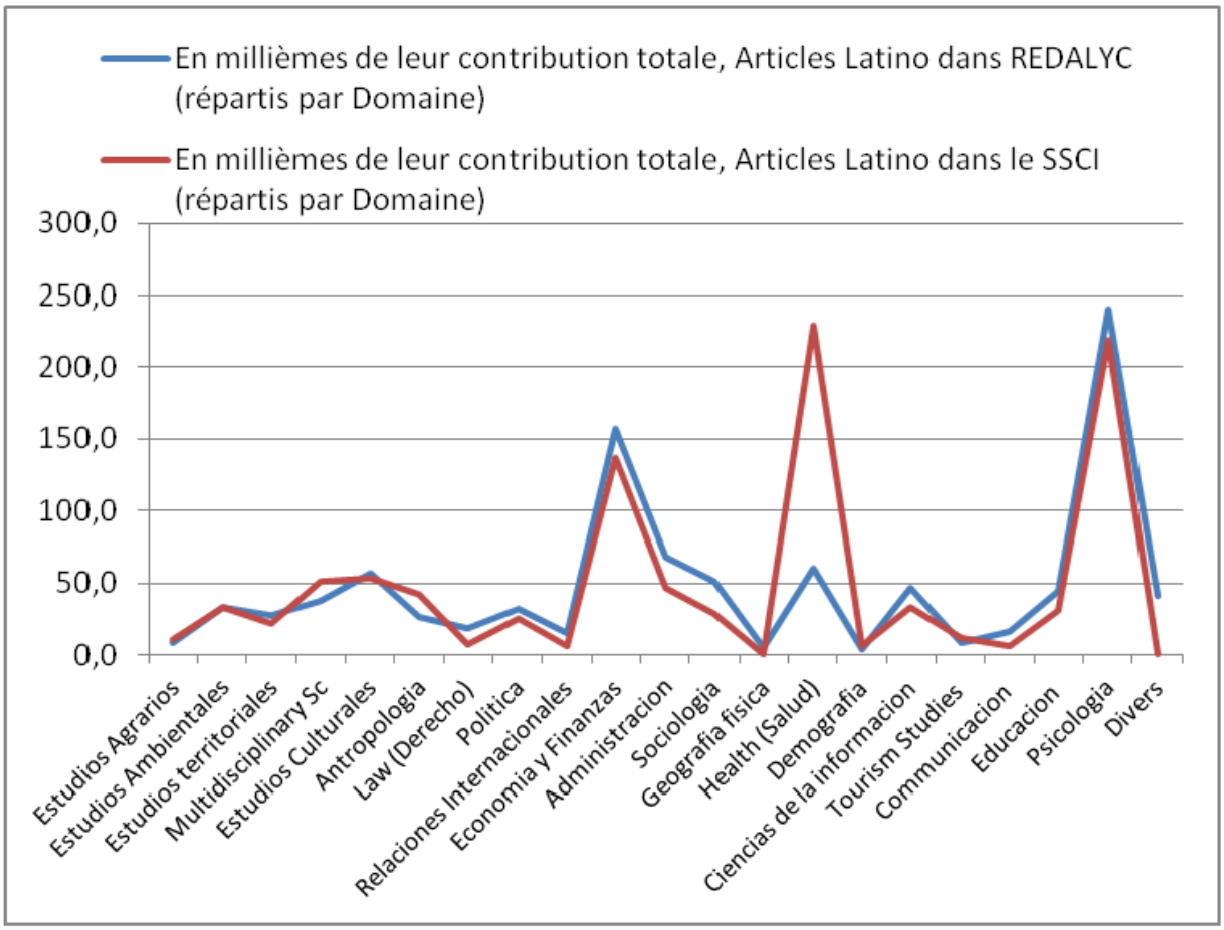
Public health as a field calls on Latin American perspectives the most, along with *anthropology* and *multidisciplinary studies*. But Latin Americans are less consulted on questions of law, sociology, geography, and even communication and education. It is unlikely that their skills are in question, but in these fields their ***areas of focus are more "local" and thus less important in the "mainstream".*** By contrast, as far as

public health is concerned, their region is seen as a *laboratory for testing out* problems and innovative schemes; and as an original ***field*** in anthropology. In 'leading' disciplines (economics and theoretical psychology) or in those where experts are available from across the globe (politics, international relations) their contributions are less valued.

The same findings can be shown in terms of the academic areas REDALYC takes into account, as compared to the SSCI. The following graph shows this. We can find the same focus as the SSCI on public health studies in Latin America, and to a lesser extent on anthropological and multidisciplinary approaches. For other areas, **the two databases also remain quite similar.**

Graph. Distribution of Latinamerican articles by field in the two databases [Redalyc and SSCI]

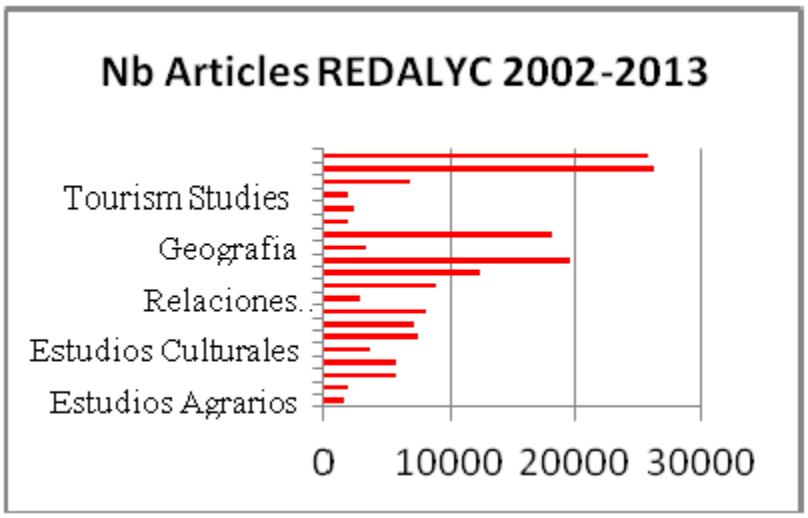
[By thousandths of total Latinamerican articles in the database: Redalyc or SSCI]



In conclusion:

REDALYC now has 3 times more Latin American contributions than the SSCI. Like the SSCI, it wants to have an "academic" profile. REDALYC probably better *reflects the volume of expertise* currently in existence[15]. The SSCI denotes *the global attention* such expertise is given by the "mainstream": it is patchy on theoretical material and stronger on fieldwork (in anthropology and public health; and there is a faraway care for those "social sciences" looking to apply usual theories and methodologies to Latin-American problems (in sociology, politics, economics, communication and education).

In our key fields of *agricultural, territorial and* ***environmental*** *studies*, by contrast, the two databases show striking *similarities*: *their* ***relatively modest weighting*** of these research concerns (see for example the following graph); and the "modest" attention paid to their findings by the global "mainstream".



2.2. A comparison of selected notions in REDALYC and the SSCI

We will now undertake a term-by-term comparison of REDALYC (the social science components of this 2002-created Latin American database) **and the SSCI** (an internationally

[15] This, moreover, is certainly related to how many students enrol in a given discipline, and by extension to how many university teachers there are in that discipline (expected to undertake research).

recognised "mainstream" social sciences database).**The study focuses on a set period (2002-2012).**

The search was carried out with key words from the Titles and Abstracts of articles

The selected key words were those of particular interest to us, and which were already used in our previous Report on the SSCI

These were:

In French	In Spanish	In English
Gouvernance	**GOBERNA***	**GOVERNANCE**
Environnement	**AMBIENT***	**ENVIRONMENT***
Durable	**SOSTEN***	**SUSTAINAB***
Savoirs Indigènes	**CONOCIMIENTO INDIGENA**	**INDIGENOUS KNOWLEDGE**
Biotechnologie (agricole)	**(BIOTEC*) AND (AGRICULT*)**	**(BIOTECHNO) AND (AGRIC)**
Agro- (Ecologie, Foresterie)	**AGROECOLOGIA, AGROFOREST***	**AGROECOLOGY, AGROFOREST***
OGM	**TRANSGEN***	**TRANSGEN***

Let's recall what this research was based on. It involved searching through vast corpuses of articles in order to **frame** the changing usage (across time and, here, space) of our chosen concepts. We do not claim to analyze all the ideas held in such a large number of articles, but we look at the words through which they are set forth: we have already established how central this is to how situations are evaluated and how actions are decided. Campaigners or decision-makers are often the ones who initiate key words; but to gain *legitimacy* the scientific community must take them up at some point. Our research is thus centred on well-documented academic literature. It is also limited to the social sciences and the humanities, which our central terms of governance and sustainable development first and foremost come from.

The words under study are *polysemic.* We will thus take into account the wide variety of fields of research which make use of them. Perhaps surprisingly, the terms that ENGOV is concerned with have neither a monopoly nor even the most important share. By looking at the disciplines involved, we can come to understand how environmental questions have typically been addressed, and what, if anything, has been specific to Latin America. We will mention also some articles that are typical of the Latin America literature.

a) The notion of environment (REDALYC / SSCI: 2002-2012)

Only 1,650 articles on the **REDALYC** database (out of the 170,000 articles in its Social Science collection) are categorised under "Estudios Environmentales". They all come from 6 specialised Journals[16].

[16] This is REDALYC's categorisation policy. The 6 journals represent Brazil (*Ambiente e Sociedade*), Peru (*Ecologia Applicada*), Mexico (*Gazeta Ecologica*), Spain (*Ecosistemas*) and Columbia (*Gestion y Ambiente*, *Revista Luna Azul*). The Spanish and Brazilian journals are in the SSCI.

There are however far more frequent references to the notion of "***environment****" across Redalyc's full corpus. The term features in the titles or abstracts of 16,264 articles, which is around 10% of the articles in the database[17]. Only half of those articles are from the humanities and social sciences, making for a total of 8,160 out of the 165,000 articles in its humanities and social science collection. This is clearly considerable (***5% of the total***), given the breadth of the subjects that pertain to the social sciences as a whole. By way of comparison, the SSCI also shows up the notion in 5.5% of its corpus over the same period. We have already highlighted this as impressive for a term which only made its appearance twenty-five years earlier, and which became widely established in the 1990s and, above all, the 2000s. References to "**environment**" are thus about as common in the Latin American literature as they are in the global "mainstream": no more and no less... To show this in more detail, let's look at the research areas involved.

We can see that the notion of the environment is ***highly polysemic*** in both REDALYC and the WoS**.** Many different approaches and concerns underlie references to it.

The term is used widely throughout the "hard" sciences, which conceptualised it and then made methodological use of it. In the humanities and social sciences, it refers more to a subject or field of study. It became highly fashionable, but more out of pragmatism than intellectual breakthrough (with the exception of "*ecological economics*")

A few noteworthy differences distinguish Redalyc's and the SSCI's approaches:

- Agrarian studies are much more established in Latin America, while the opposite is the case for ecological studies[18].
- Economics ("Business Economics" in particular) takes up a lot of space in the SSCI, while *public administration* prevails in Redalyc. Moreover, Redalyc's "economics" coverage includes a lot of *ecological economics* (the speciality through which Latin Americans contribute the most to the SSCI).
- Education and its approaches are much more widely covered in Redalyc.
- Social and sociological approaches are also much more established in Latin America.
- Political science engages much less with the subject of the environment than it has throughout the rest of the world (particularly in international relations)

For the rest, the relative weighting of fields concerned with the environment is noticeably the same in Redalyc and the SSCI (anthropology, cultural studies, law, public health, etc.)

The following table shows this.

Table. Range of research fields using the notion of environment in the social sciences:

	REDALYC			SSCI		
Fields	Nb of articles referring to Environment* (=X)	‰ of the articles with Environ* within REDALYC (= X / 8 160)	The weighting of each field in REDALYC (by ‰)	Nb of articles referring to Environ* (=Y)	Nb of SSCI articles with Latin American authors	The weighting of each field in the WoS (by ‰)

[17] If we look at the full texts (and not only abstracts), the term ENVIRONMENT* looses all meaning: it features in 132,489 articles out of the 324,496 on the whole database.

[18] It is true that ecological and environmental studies in Redalyc should be inflated due to territorial studies and human geography. But even so environmental studies do not reach SSCI's score in this field.

Agrarian studies	132	16.2	8	654	43	3
Ecology + environ studies	517	63.4	10	20,676	701	154
Human geography	495	60.7	19	5,852	146	44
Territorial studies*	200*	33.0	17	2,105		16
Anthropology	226	27.7	44	3,062	182	23
Cultural (Area studies)	71	8.7	21	1,070	20	8
MultidiscIplin	798	97.8	33	3,968	129	30
Sociology + Social issues	567	69.5	115	N	69	33
Politics	161	19.7	47	3,606	54	27
Internat Relations	31	3.8	16	1,679	12	12,5
Law	117	14.3	42	2,081	19	15
Public administration	1,099	134.7	73	5,144	129	38
Economics	355	43.5	53	22,623	480	167
Public health	742	90.9	106	13,230	927	98
Psychology	739	90.6	142	25,266	565	187
Languages, Art and Literature	80	9.8	7	640	18	0,1
Education	1,041	127.6	137	7,916	171	60
Architecture-Urbanism	200	20	16	2,732	87	21
Information & Communication	209	25.6	53	5,071	147	39
Demography	46	5,6	7	524	24	4
Tourism	253	31,0	11	12	0	0,1
Philosophy	81	9,9	13	1,412	36	11
History	115	14,1	10	1,126	9	9
TOTAL	8,160	1,000	1,000	131,615	3,810 (3 %)	1,000

Legend: Green highlighting is for the foremost contribution in the column; Blue is for 2nd rank; Yellow for 3rd rank

* N.B. 1. Redalyc's territorial studies have been split into 2 parts: urban studies and territorial studies proper (with a strong ecological and environmental focus).

* N.B. 2. We added a column to tally Latin-American appearances in the SSCI (around 3% of worldwide contributions referring to the "environment"). It shows the areas where Latin American authors are the least in sync with the global mainstream (that is to say, the areas where their material has lower levels of reception or there is lower demand): this is the case with their environmental studies proper. In contrast, they get particular attention for their work on public health and in anthropology.

Let's finally note that **the environmental *subjects*** that Redalyc processes **are almost the same as those found in the SSCI; the *concepts used* are noticeably the same, all of them being present in Latin America, *with various weights but*** *without any particular originality*. ***[See Annex]***

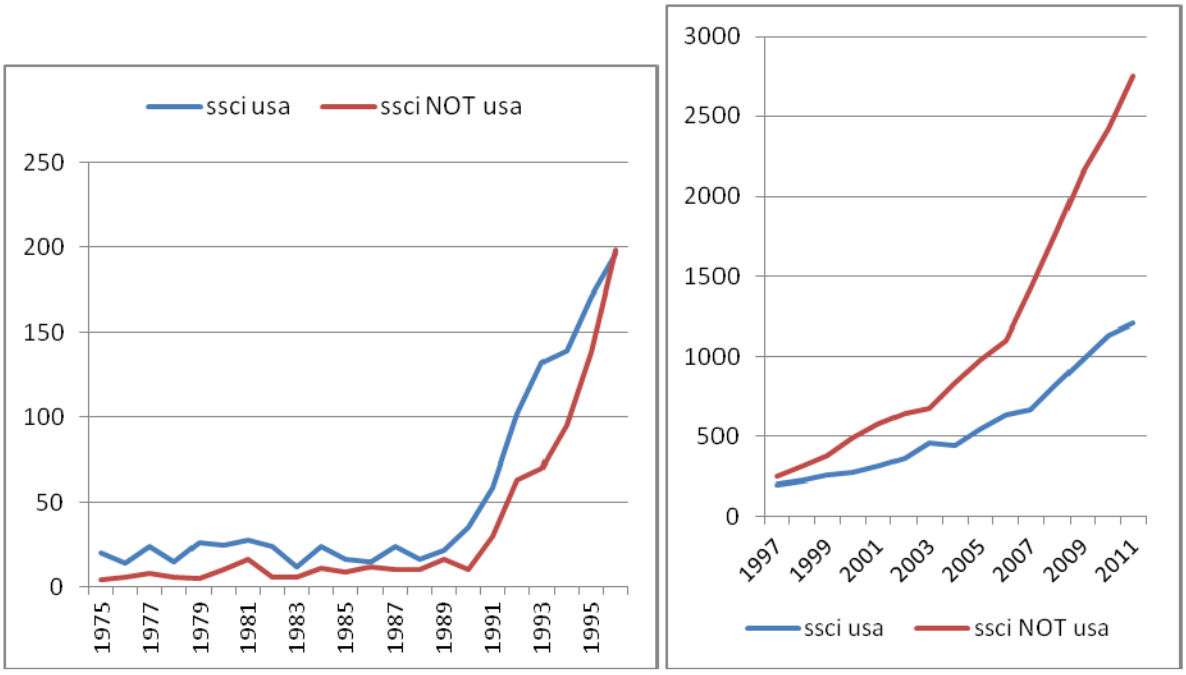
b) The notion of governance (REDALYC / SSCI: 2002-2012)

Our first Report noted the prodigious development of the notion of governance *from the 1990s*, starting with the United States. Its areas of usage diversified, broadening from a term used in change management or conflict reduction in businesses, into innovative fields in public administration, sectorial problems (urban planning, dam's building etc.), or the true government of regions or even nations.

by % in the SSCI	1975-1976	77-80	81-84	85-88	89-92	93-96	97-00	2001-2004	2005-2008	2009-2012
Governance	0.020	0.024	0.026	0.023	0.068	0.187	0.364	0.662	1.005	1.016

% of "GOVERNANCE" across the SSCI (the number of articles to feature the notion divided by the total number of articles searched by the database over the whole period).

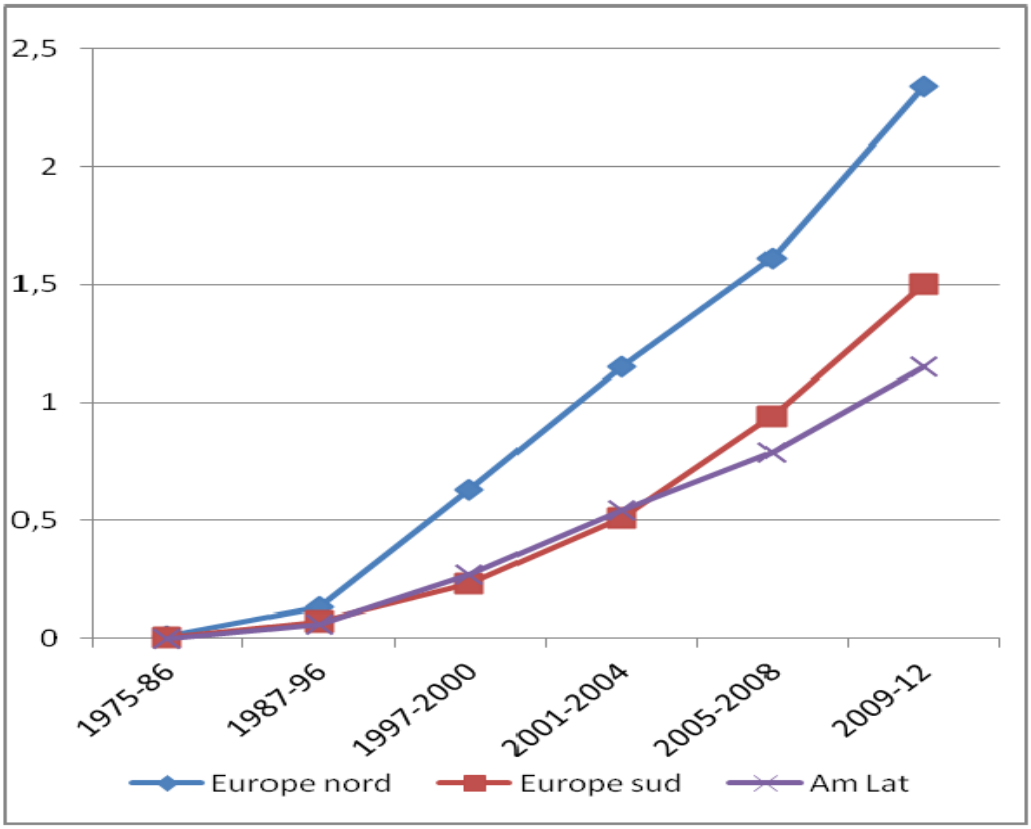
Europe initially lagged behind, but then the concept took off dramatically, at least in *Northern Europe* (Southern and Eastern Europe were more reticent). The enthusiasm continued in the United States (but started to decline from 2010) while it exploded in Europe (which has been the biggest user of the term since 2000). It also spread out to varying extents across the world.



Presence of "GOVERNANCE" in the SSCI: from 1998 it was used less in the US than outside the US (particularly in Northern Europe).

This retrospective was made through an analysis of the SSCI. The REDALYC database *only started in 2002*. It is not therefore possible to refute, confirm or further clarify these trains of events for Latin America. But the SSCI data on this area are interesting. Since 2002, the database has considerably widened its coverage of Spanish language content, and authors from the "rest of the world" (i.e. from formerly

underrepresented parts of the world = outside the USA and English-speaking Europe). This gives a relatively meaningful perspective on the differential progress of key words by "cultural area". We can see from this that the notion of "*Governance*" had a lot of success in Northern Europe, but less in Southern Europe, and even less so in Latin America, which it initially reached through the United States, and where it continues to spread to this day, albeit with a certain reserve.



The key to this is probably to be found in ***the map created by Luigi Rossi*** (in the following illustration), which uses articles from REDALYC with the expression "Goberna*" in their titles. It shows that the notion is used in deliberate contrast to government. The major questions raised in this space are over the role of the *state*, the exercise of *democracy,* and the underlying, original question as to what is governable ("**gobernadilidad**"). The notion of governance is therefore always put into *political* question, which is a key difference to the SSCI's area of reflection, where it emerges as a management tool and an apolitical instrument, or even as a means of depoliticisation[19].

As in the SSCI, the term is used across a range of disciplines. Our first report on the SSCI highlighted how polysemic it is, which has been the key to its success. From 2009-2013, it was used across at least fifty

[19] Questions over the legitimacy or appropriateness of governance or government as concepts can also be found in the SSCI. But it makes much less impact as it is drowned out by the sheer number of articles from supporters of the notion of "Governance".

fields, the most active of which were, in order: economic studies (far in the lead), political, and environmental studies. Quite far behind come questions of public administration, law, and sector management (urbanisation, health, education... the latter seemed to be starting to distance themselves from the notion). We have put these data alongside the corresponding data from REDALYC (see the following table).

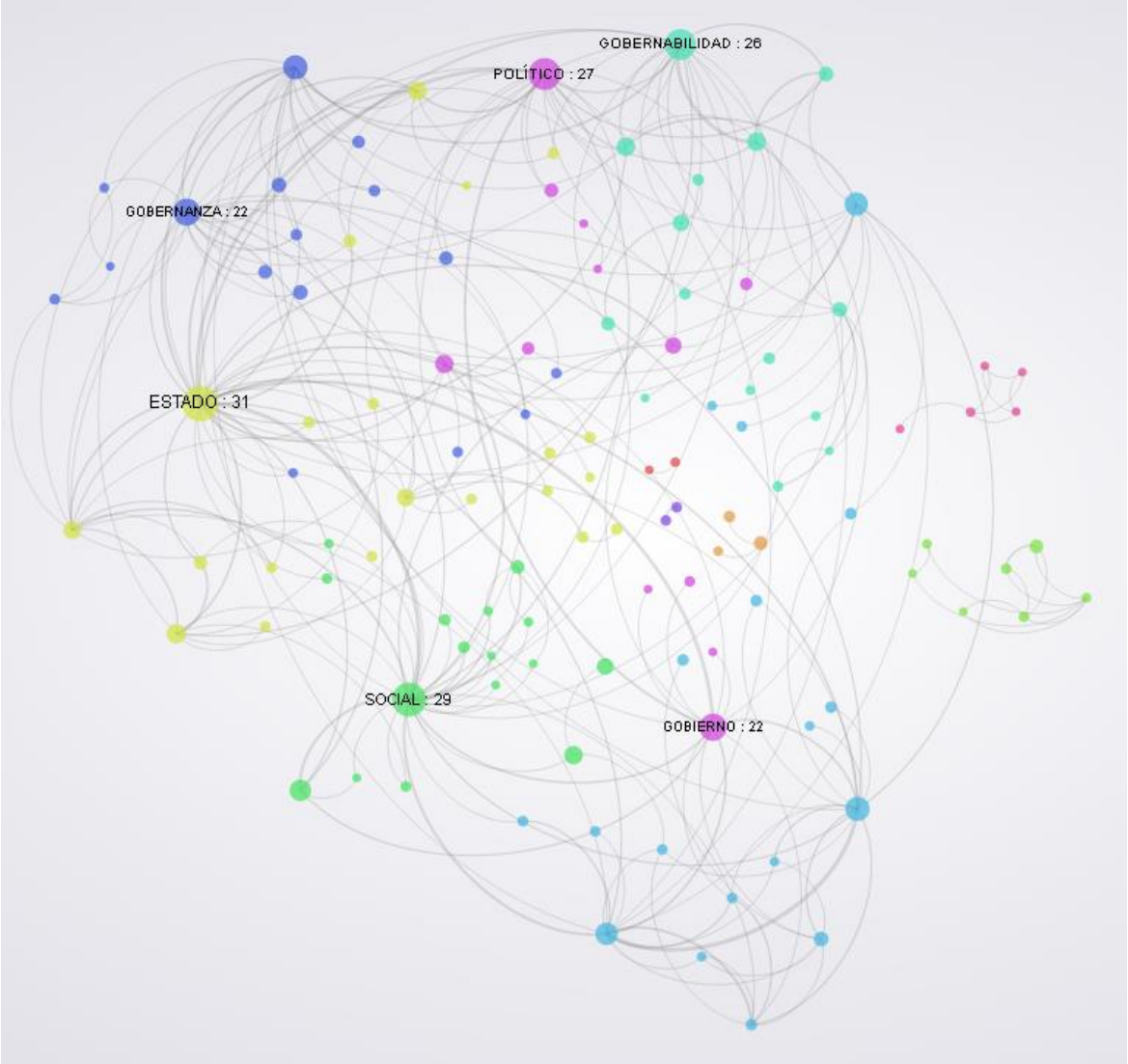


Table:

The usage of Govern(ance). 11 The most important recent fields: REDALYC / SSCI

	Politics	Socio	Territorial Studies	Economics	History	Admin	Law	Edu	Anthro	Multi-discp	Environment	Others
REDALYC	24 %	20 %	8 %	7 %	5 %	5 %	4 %	4 %	4 %	3 %	ε	16 %
SSCI	17 %	5 %	10 %	27 %	E	6 %	6 %	2 %	5 %	3 %	16 %	3 %

We can see the different approaches reflected in the two databases. In Latin America, for REDALYC, governance is primarily and most widely a **political** and **social** matter. This is followed by "**Territorial** studies" (which is a unique category to REDALYC that can be reconstituted in the SSCI): here it is a question of decentralisation, and of regional government and management. Curiously, there is little evidence of environmental studies. This is the opposite to what can be seen for the global *mainstream*, which strongly favours the notion of governance in environmental studies, and favours economics over sociology (as well as over politics - not to mention historical studies, which is absent).

Beyond these figures, it is worth looking at the content of these Latin American studies.

The first major focal point is the question of ***areas beyond the reaches of authority*** ***("ungovernable"*** *areas?).* These are commonplace, as with the territories of international criminal organisations, guerrilla zones, Latifundio fiefdoms, and zones where populations adhere to traditional laws, or anywhere when there are (historical) outbreaks of anarchy. The necessary conditions for government, and what the correct definition of governance is, are queried within this framework.
Here are some references on this topic (others to be found in the ***Annex***):

2005 *Polis, Revista de la Universidad Bolivariana(Chile).* François Graña (Universidad de la República – Uruguay). **Globalización, gobernanza y "Estado mínimo": pocas luces y muchas ombras**

2005. Reflexión Política(Colombia). Luis Caraballo Vivas (Universidad de los Andes - Venezuela);José Antonio Rivas Leone (Universidad de los Andes - Venezuela). **(In) gobernabilidad y partidos políticos en Venezuela**

The second, collateral, focal point, concerns establishing the **rule of law,** setting up or consolidating **democracy,** discussing its appropriate forms, looking at how it emerges, alongside the role of "**civil society**" and its teething problems.
Here are some references on this topic (others to be found in the ***Annex***):

2003. *Revista Latina de Comunicación Social(España).* José Guadalupe Vargas Hernández (University of California Berkeley - Estados Unidos). **Teoría de la acción colectiva, sociedad civil y los nuevos movimientos sociales en las nuevas formas de gobernabilidad en Latinoamérica**

2006*. Revista Mexicana de Ciencias Políticas y Sociales.* Marycela Córdova Solís (Universidad del País Vasco - España).
Democracia, gobernabilidad y malestar social en América Latina.Una reflexión.

2006*. Contribuciones desde Coatepec (México).* José Guadalupe Vargas Hernéndez (Instituto Tecnológico de Ciudad Guzmán - México). **El desarrollo emergente de la sociedad civil como forma de gobernabilidad**

2011. *Reflexiones* 90 (2). Ma. Concepcion Delgado Para. **Estado de excepción y gobernabilidad en México**

A third, recurring focal point is that of the **decentralisation** of power (big city management, regional management, municipal management...).
Here are some references on this topic (others to be found in the ***Annex***):

2005, *Estudios Demográficos y Urbanos(México),* Pedro Pírez (Universidad Nacional de San Martín - Argentina); **Buenos Aires: ciudad metropolitana y gobernabilidad**

2005, *Revista de Artes y Humanidades (Venezuela),* Fárido Caldera (Universidad Católica Cecilio Acosta - Venezuela);Juan Romero & Luis González (Universidad del Zulia - Venezuela). **Gestión pública, gobernabilidad y municipalización. Caso Maracaibo Oeste (2002-2004)**

We of course also encounter the **more classic focal points** of business governance, the implementation of innovative (and notably educational) projects, administrative modernisation...

2012. *Gestión y Ambiente(Colombia).*Carmen Zamudio Rodríguez (Universidad Distrital Francisco José de Caldas. **Gobernabilidad sobre el recurso hídrico en Colombia: entre avances y retos**

2005. *Iconos. Revista de Ciencias Sociales(Ecuador).*Guillaume Fontaine (Facultad Latinoamericana de Ciencias Sociales - Ecuador). **Microconflictos ambientales y crisis de gobernabilidad en la Amazonía ecuatoriana**

2012. *Estudios y Perspectivas en Turismo (Argentina).*Leonardo Furtado da Silva et al. (Universidade Regional de Blumenau - Brasil). Gobernanza y Territorialidad en el desaroll **turistico** regional. **El caso del Oktoberfest en Blumenau - Brasil**

NB. 1. Note that 2007 was the transitional year where "Governanza" began to overtake "Gobernabilidad", starting to move closer to the global mainstream.

NB. 2. Complementary references are given in the *Annex*.

c) The notion of sustainable (REDALYC / SSCI: 2002-2012)

Searching Redalyc for "Sosten*" brought up **1764 articles** *from 2002 to 2012.* The notion primarily came up under the humanities and social sciences, which accounted for 1254 articles (as opposed to 520 in life and material sciences), making for 70% of the total contribution. Here too, the notion is polysemic. The following Table shows the range of research fields using the term.

Table. Range of research fields using the notion of "sustainable" in the social sciences:

	REDALYC					SSCI	
Fields	Nb of articles referring to Sosten*	‰ of articles with Sosten*	Nb of articles referring to Ambient* (=X)	‰ of articles with Ambient* (=X / 8 160)	Weighting of the field in REDALYC (by ‰)	Nb of articles referring to Sustain* (=Y)	‰ of articles with Sosten* in the SSCI =Y / 25 950
Agrarian studies	22	18	132	16	8	1006	39
Ecology + environ studies	79	63	517	63	26	6290	242
Human geography	82	65	495	61	19	1607	62
Territorial studies	98	78	400	34	Split	1985	76
Anthropology	19	15	226	28	44	547	21
Cultural (and area) studies	7	6	71	9	21	37	2
Multi-discipl'ry	116	93	798	98	18	1403	54
Sociology + Social issues	87	69	567	70	115	988	38
Politics	38	30	161	20	47	573	22
International Relations	5	4	31	4	16	505	19
Law	21	17	117	14	42	788	30
Administration	138	110	1099	135	73	444	17
Economics	159	127	355	44	53	5200	200
Public health	64	51	742	91	106	1326	51

Psychology	28	22	739	91	152	562	22
Languages, Art and Literature	5	4	80	10	6	79	3
Education	103	82	1041	128	155	862	33
Architecture-Urban planning	33	26	36 +	19	16	1037	40
Information & Communication	34	27	209	26	53	131	5
Demography	9	7	46	6	10	70	3
Tourism	83	50	253	31	11	?	E
Philosophy	18	14	81	10	5	433	17
History	7	6	115	14	4	70	2
TOTAL	1254	1000	8160	1000	1000	25950	1000

Legend: Fields most involved are higlighted in green, 2nd rank is in blue, 3rd rank is in yellow

The most involved field here is economics, followed by administration and planning. Then come educational concerns, followed by "multidisciplinary" studies, geographic, sociological and regional studies.

At first glance, the various research fields are involved in very similar proportions to what was seen for "environment". There are just some differences in the weight economic and political discussion gives to "sustainability", and conversely, the greater attention that is given to environment in education and public health.

It would however be wrong to think that the two approaches go hand in hand. If we look at the articles on "Sustainability", less than 1/3 of their abstracts contain the term "environment" and barely 10% of their titles do[20]. Conversely, articles mentioning "Environment" only refer to "Sustainability" in 5% of their abstracts, and in less than 2% of their titles!

An excellent article from Redalyc sheds light on this paradox[21]. It presents the findings of an in depth survey of almost all Aguascalientes' agricultural researchers (those in university posts or working in research centres). The survey looked to understand how they choose their research topics. The study ultimately identified ***three quite separate communities*** which focused on *productivity, sustainability or the environment*. We should probably add a fourth category, which went almost unnoticed in the sample, namely genetic engineering specialists, whom the other groups vilify. Curiously, a few factors which one might have thought to play a role prove to have little impact: age, sex, whether one works in a laboratory

[20] These figures are for the humanities and social sciences. They are almost identical to the database's figures on life and human sciences (8% of the titles) although 2/3 of its contributions are from agricultural science (+ 20% for engineering and 14% for medicine)

[21] Reference: "ENFOQUES DE INVESTIGACIÓN SOSTENIBLE, ECOLOGISTA Y PRODUCTIVISTA: INFLUENCIAS EN LOS CIENTÍFICOS" *Rev Mex de Ciencias agricolas*, 2011, by: Luis Reyes-Muro (Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias - México); Miguel Ángel Damián Huato (Benemérita Universidad Autónoma de Puebla - México); Jesús Axayacatl Cuevas Sánchez (Universidad Autónoma Chapingo - México); Fernando Manzo-Ramos (Colegio de Postgraduados – México).

or on the field, research independence (which is generally sought after) or working as a collegiate when choosing a topic, (dis)taste for basic research (unanimous), the qualities expected of a researcher, their associated values... It is true that there is no information on social origin, professional background or personal values. But the most influential factors remain *agronomic specialty,* pressure from funding sources, and above all the *home institution and its method of evaluating its researchers.*

While topics dealt with by environmental studies do not seem very different in Latin-America and in the global "mainstream" (SSCI), the *approaches to "sustainability"* deserve some further detail. **The Gephy graph** given in the Annex helps to situate them.

d) Some rarer notions: Searches for transgenes (REDALYC / SSCI: 2002-2012)

As a whole, the REDALYC database shows up a significant level of activity on transgenesis in Latin America. This is first and foremost in Brazil, but also Mexico, Argentina, Chilli and Columbia. There is also some activity in other countries (Venezuela, Peru, Uruguay, Costa Rica). This work is often carried out in National Research Centres or elite Institutes of higher education, rather than in lower tiered universities (Brazil and Chilli are exceptions). There is a variety of collaborative work, particularly with China, India, South Korea, Pakistan (Lahore University) or even Malaysia, rather than European universities or even the United States. The following table sets out this data, which is based on 123 articles (0.3% of the database) and the work of 474 authors.

Latin America	Brazil	Mexico	Argentina	Chlei	Colombia	Venezuela.	Peru	Uruguay	Costa Rica	Collaborative
Nb of Articles	41	36	13	13	12	5	2	1	1	-
Nb of Authors	98	83	34	29	26	12	7	3	3	180
In research centres	8	50	22	6	2	8	3	3	0	90
In universities	90	32	12	23	24	4	4	0	3	78
In international centres	-	1	-	-	-	-	-	-	-	12

Collaborative work with	China	India	South Korea	United States	Pakistan	Malaysia	Taiwan	Various Asia	Various Europe	Others
Nb Authors	30	21	17	14	13	7	6	4	12	8
Coming from research centres	15	5	8	0	0	0	0		8	6
from universities	15	4	9	14	13	7	6		4	2
from international research centres	-	12	-	-	-	-	-	-	-	-

The most notable sources include the *Revista Electronica de Biotecnologia* (published in Chile, but with a continental or even international scope), the *Anais da Academia Brasileira de Ciências* (Brazil) and to a lesser extent the *Acta Scientiae Veterinariae* (Brazil). The biggest research fields quickly included veterinary science (with high success for cloning in goat production, then bovine transgenesis in Brazil in 2007), horticulture (with a wave of research and essays on apples, bananas, pepper, jackfruit, mango... which started in 2010 from Venezuela to the Southern Cone), oils, fodder and more problematically, with rice (from 1998 in Costa Rica), wheat and corn.

International seed-producing firms had the last word on these last three cultures (as they did with soya and cotton). They started putting their products on the market in 1996, which were quickly taken up in Argentina (saving time for large-scale agricultural businesses), Brazil (through a network of farmers from Rio Grande do Sul), and then in other places, including Mexico with a form of corn which is threatening local varieties (*maiz*) with possible extinction (despite it being the historical source for the global distribution of this crop). Latin American research was in a position just to search transgenes for *plants of local interest*, without a global market, and that were therefore *"abandoned"* by the seed-producing multinationals.

The database shows the ***increasing importance*** of the activity, which went from 4 articles annually in 2000 to a dozen from 2006, and then around twenty from 2010 onwards.

If we look just at the **"humanities and social sciences"** section of REDALYC, the number of articles goes down to 37 (which is 0.2 ‰ of the humanities and social science database). But 15 of these articles are due to "interference" in our search, which also brings up articles on "transgender" people. Only 22 relevant articles remain to look at, which is clearly the same proportion as can be found in the SSCI.

With such small numbers, it would be pointless to claim to carry out a statistical analysis. Let's instead just focus on a few *significant papers:*

Several articles take strong issue with the unfettered marketing of genetically engineered seeds, and the risks posed to *biodiversity with all its symbolic impact*. There was intense debate in Mexico on corn (*maiz*: a local crop). A few articles were less adamant. One painstakingly measured the environmental impact of "conventional" crops (with high levels of input) and transgenic crops (thought to limit the need for herbicides): wheat, and cotton in Columbia[22].

Others by contrast call for university research in this field, and are concerned with the respect of academic intellectual property rights (Costa Rica). Finally, one of the most original articles looks at the role of ***stakeholder networks,*** *one of* which stole genetically modified soya seeds from Argentina and propagated them in Rio Grande do Sul while they were still unauthorised. This case study highlights the interests and power relations that are converging into two rival networks among farmers themselves (one of them including the powerful group of mass-scale farmers).

[22] The results are mitigated: less herbicides on transgenic wheat, but as much on transgenic cotton.

e) Some rarer notions: Searches for biotechnology (REDALYC / SSCI: 2002-2012)

As a whole, the debate on transgenes largely appears to have been left to the specialists of biology. But this impression changes a great deal if one searches the database for "**BIOTECHNOLOGY**". The result brings up no fewer than 556 articles, including 240 *from the humanities and social sciences*[23].

Almost all of REDALYC's 22 humanity and social science categories mention biotechnology in at least 1 or 2 articles. Some fields are of course more involved than others. For illustrative purposes, the 12 main fields are listed here:

Fields	Philosophy	Multidis	Sociology	Admin	Health	Law	Eco	Education	Agriculture	Psycho	Others
Nb of articles	45	42	35	18	17	13	10	10	9	9	32

The dates are also of interest. The term began its rise in 2004 (but the database was relatively underdeveloped at this point), and it reached a steady level of 50 to 60 articles annually from 2005. Remarkably, the humanities and social sciences immediately made up an important share in this total: from a third to half.

Years	1997-99	2000-02	2003-04	2005-06	2007-08	2009-10	2011-12	2013
Humanities and Social Sc	2	19	26	48	48	35	42	n.a
Hard Sc	0	12	26	55	54	83	77	n.a
Σ Redalyc	3	31	52	103	102	118	119	n.a.

Beyond this ranking by field, it is important to look at what was the most important focus of each field.

Philosophy, as the biggest field, focused particularly on progress in *human biology* and the questions it raised about the body, the self and the future of humanity. *Ethics* took up a major share and many doctors took part in the debate. Other papers look into *social representations of (human) genome research* and the acceptability of its applications. There was less interest in agricultural biotechnology (but there was a lot of controversy on the commercialisation of the knowledge and relations which had hitherto not been based on the logic of the market.)

Sociology took the opposite stance. Agricultural biotechnology was its major focus of discussion, including GMOs, and the promised outcomes of various types of farming for *small-scale farmers, indigenous people, and excluded people and minorities*... It also discusses researchers' positioning and choices of subject[24]. For this purpose, it increasingly analyses socio-technical networks and the nature of communication between researchers and businesses.

[23] Other critical texts on the human significance of biotechnology have been published in Journals labelled "Hard Sciences" (around twenty articles). x

[24] We have already given the example of the interesting survey carried out in Aguascalientes by Reyes-Muro et al.

There are more articles classified as *multidisciplinary,* and they are highly varied. They are comparable to articles in journals that are classified as "hard science", but which ask very similar questions: on ethics, professional practices, justice, regulation, prospects, or even the limits that should be placed on research.

In general, there are few doubts expressed as to the feats of medical biotechnology. But many questions are raised concerning its informed introduction into everyday medical practice, its introduction into the market, and guarantees over equality of access. There are discussions on its later impact on the future of humanity, the temptations of eugenics, changes in consciousness and the radical changes the development of "bio-economics" would bring.

By contrast, some doubts are raised over the promises of agricultural biotechnology: the idea of a new green revolution based on GMOs, or of manufacturing substitute plant food for meat or animal proteins which could provide a new form of global food aid. This is generally countered by another, more local and pragmatic approach, which rejects this planetary view and the neo-liberal "grand narrative", aiming to preserve "indigenous and peasant-based" agriculture to ensure food security for the least well-off, marginal people.

Many articles look at *representations* of biotechnology in the media and the public arena. They search what the consumers are hoping and waiting for. They pay attention to the resistance of some, to the social movements taking up the cause and their effects on public *regulation* (as in Europe for agricultural transgenes). We must also mention a few articles looking at nanotechnology in terms of mitigating and managing risk, raising public awareness, the transfer of technology, sustainable development, as well as ethical and political issues.

Selected references that are illustrative of these concerns are given in the **Annex**.

f) Rarer notions: Searches for indigenous knowledge (REDALYC / SSCI: 2002-2012)

We focused our search on the "rallying call" notion of "indigenous knowledge" (rather than "traditional" or "local" knowledge). Curiously, although this notion started out in Latin America and was widely promoted by social movements (and also by academics: agronomists, archaeologists, anthropologists...) few articles come up in REDALYC: twenty at most. This is probably because the war ended with the "victory" of the 1998 Rio Conference and the recognition of the *intellectual property rights* of indigenous people where their traditional knowledge is put to commercial use.

We of course find a number of articles going back over "biopiracy" (which is denounced by its detractors but portrayed by its supporters as a development opportunity that respects local communities, including one by a respected anthropologist in strong support of the ICBG-MAYA project in 2000: but these papers are dated, or memorials. One could expect there to have been new articles on the implementation of the Rio agreements, *but it seems to have been the time of entrepreneurs,* local community leaders, legal experts and politicians. There is little by way of observation on how firms avoid complex negotiations with local communities, for example by obtaining medicinal plants from hawkers or at markets; or by recruiting, training and paying the collectors and cultivators of plants used in the production of "natural" cosmetics.

A few articles continued to give updates on particular kinds of knowledge (medicinal plants, farming practices, *women's knowledge*[25]) or even on "indigenous ways of knowing", the integration of knowledge into a world vision and into social status. The ***Annex*** *gives references* on these subjects.

Education has now however pushed ahead. Most of the studies look at *pedagogical problems* (how to reconcile and bring together traditional and modern knowledge); as well as training teachers, agricultural extension practitioners, traditional doctors. Another concern is about teaching in local languages; and supporting indigenous people through basic schooling, or even through access to higher education.

But we know little about the current conservation, renewal or decline of traditional knowledge and its transmission (social frameworks, specialists). On this matter, *in-depth research by* ***ENGOV*** (notably on nutritional and culinary knowledge and practices...), which is forthcoming for publication, will contribute *welcome data and analysis* to this neglected field. Two original articles are however noteworthy: one on the institution of traditional doctors in the public health system in Chile and its effects (*professionalization* of knowledge, the training of *experts* and the bureaucratisation of the exercise of knowledge). The other is on the perception (or lack thereof) of climate change by indigenous people in the Columbian Amazon.

The ***Annex*** gives the relevant references.

[25] Related to the division of labour, and little acknowledged.

g) Rarer notions: Searches for agroecology. (REDALYC / SSCI : 2002-2012)

Searching for agroecology (or/and agroforestry) leads to a surprise. The search brings up 284 articles, which is certainly a modest score, but relatively *far much more than in the SSCI*. This is the only notion related to the environment which surpasses the relative interest shown in the WoS.

These articles belong *primarilyton environmental and agrarian studies*[26]. A significant share (1/4) however is multidisciplinary research. Public health and sociology are less prevalent, but still make interesting contributions. Other fields of research are largely absent[27].

While this term tends to feature in environmental journals, the term itself only appears in 16 titles (and 93 abstracts). Concern for sustainability only figures in 11 titles (and 23 abstracts). Governance and development are not mentioned.

Beyond this survey, we would like to highlight a few **key focuses** and offer references for these.

Many of the contributions, it has to be said, most resemble *manifestoes.* They give repeated reprimands or rely on well-worn concepts such as the social economy, the opposition of market value to social utility, the co-evolution of natural and social milieu... They all rely on flimsy surveys which are often carried out with (and with the support of) very small groups of supportive stakeholders.

This for example is the case of "public health" where, in the absence of any serious epidemiological investigation, arguments that pesticide poisoning is harming workers' health slides into anathemas against agro-business, or even the call for participative management across the board. This is also the case for sociology, where agro-ecology is touted as the direct opposite of agro-industrial exploitation of the land, and idealised as a mode of "traditional agrarian practice" (used by indigenous people and small farmers in need of "cultural, economic and social" protection). Here too, little field data is offered, except for a few fruits with miraculous uses, some local product exchange networks (for sidestepping the market) or some small biological produce cooperatives.

There are of course some more nuanced articles, but these tend towards didacticism. We find a ***state of the art*** offering an overview of ***schools of "ecological" thought*** in the social sciences: sustainable development (reformist), and (more radical) environmental economics (and its refinement through ecological economics), political ecology (focusing on the power relations between actors) and agro-ecology looking to rehabilitate the "positive" agricultural practices of the traditional peasantry. We also find an essay looking to set out a science to bring these various scientific approaches together around the concept of the *socio-ecological resilience* of observable systems.

[26] Just as 90% of the hard scientific research which discusses agro-ecology comes from soil science and agricultural science.

[27] This includes economics as an approach: Four articles mention it in their title, and 15 mention it in their abstract.

Those works classified as "multidisciplinary studies" are more interesting. Here we find *surveys*, notably of poor farmers on their survival strategies, their maxims for action, crop choices (cash or subsistence crops); as well as confirming, measuring and explaining the greater biodiversity of "agro-ecological" farms.

Other articles explain the traditional practices and knowledge on soil conservation and water-saving. There are briefs on how such knowledge has come up against and become integrated into "technical" knowledge, while being tested out in projects for new cropping practices (or new forms of crops).

A few others try to measure and analyse current environmental and agro-ecological damage. They look at the perceptions of farmers themselves in regard to this. *Agro-forestry* is given particular attention, with essays on the agro-ecological zoning of agro-forestry systems. Interesting work has been done on traditional knowledge about the insecticidal properties of plants, and it speculates about using these as an organic form of parasite control.

Finally, many of the articles engage with *methodological* issues (suitable survey practices, participative research) while taking a less clear stance on *theory*. Besides certain fundamental, trustworthy texts (which are often from Spanish authors and backed up with great erudition), many tout a holistic approach which is not without its contradictions. Is agro-ecology a theory or a toolbox, a simple collection of empirical practices? Is it a question of knowledge, or should it be based in a *social movement*? Is it only meant for poor farming? Or should it look for ways to transition into all kinds of farming[28]?

It is however understandable, given other research describing the scientific communities and schools of thought that structure the agronomy profession (apart from genetic engineers), that this holistic approach could appeal to researchers united in a hatred of basic science, who see themselves as practitioners who look to defend applied work that is very close to the ground and to users; but who are also looking for academic recognition, and the posts and funding that come with it, and who need well established theoretical armature to do so[29].

But we cannot narrow down the interest agro-ecology has raised to corporatism. It has arisen from a true social sensibility, from the awareness that peasant and indigenous societies are threatened with extinction in Latin America, and from high regard for democratic proceedings.. Many articles take a stand for *social movements,* calling for an osmosis whereby these movements are the ones to steer research. Without claiming that agro-ecology is a sort of modern avatar of Marxism, it certainly takes on the attraction and power of a ***praxis***. And it clearly responds to a humanistic concern for protecting the planet in the "Anthropocenic" age.

[28] The question is raised in a single, very interesting article. The diagnosis is clear and the indicators are ready; but the path is quite difficult to set out.

[29] For a portrait of agronomists who are productivist, environmentalist or in favour of sustainable development, see Reyes-Muro's article, op.cit. For the genetic engineers' socio-technical networks, see the ***Annex*** of references under Biotechnology. On the need for academic recognition, see the ***Annex***.

Conclusion of part II

We have compared the Social Science Citation Index (SSCI is a bibliographic database reflecting current global science) and a Latin American database: REDALYC. This database is not on the same scale but, being focused on Latin America, it searches through a thousand-odd journals which are almost entirely absent from the SSCI, and gives a voice to many more authors from the continent. The objective was to measure whether the key notions in the ENGOV project were used to the same extent in both databases, and to see what differences in approach might emerge.

The overall finding is that the problematics and concepts used on a global scale are all present in Latin America to a *comparable extent.* This is notably the case with the most general notions: environment and sustainable development. It is also the case with the most cutting-edge concepts (transgenes, biotechnology, indigenous knowledge), albeit with some distinctive features.

The most notable differences pertain to the following points:

- The notion of *governance* is *much less accepted* in Latin America; it is used in various ways and its appropriateness has been subject to debate. The depoliticisation of debates and peaceful conflict management have not deemed appropriate for many situations. The literature highlights the importance of addressing lawless zones, and zones which (owing to the mafia or guerrilla forces) are outside state control, the temptation of authoritarianism for the state as well as the teething problems of civil society. In general, questions on the environment have been approached through a more *political* angle, with more *social* concerns than throughout the rest of the world, and a strong call for *democracy*. Economic approaches are less overwhelmingly predominant, while ecological economics is more well-established.

- In contrast, *agroecology* is much more prevalent in REDALYC than the SSCI. Interest in this approach comes down to the large scale of the indigenous and peasant societies that are threatened by food insecurity, to the resulting openness to *social movements* and the concern of many agronomists to implement a *praxis* in poor, marginal zones: this is a concern shared by many social scientific practitioners who are sensitive to what is at stake economically, politically and socially, as well as ethically and culturally. Developing transgenic crops to solve the problem of "living well" from the land has many sceptics, even if they can understand the "fascination" of biological researchers for genetic manipulation, while closely studying the socio-technical networks these researchers weave with a variety of stakeholders. The advocates of agro-ecology also have their networks (which are different and well characterised). Bio-engineering is a shared foil for the whole scientific community of agronomists. Is there a division of labour (large-scale farming for some, poor farming for the others?) Or is there a different vision of the world and future: do you have to (can you) envisage the whole of farming in transition to agro-ecology (or conversely to transgenic food)?

-Curiously, both transgenes and indigenous knowledge now attract few articles: they are old wars (but it is surprising that there has only been empirical follow-up in a few - excellent - articles). By contrast, *biotechnology* has been the focus of a great deal of literature, which has been more passionate when backed by concerns for *health* than for farming. There is no doubt as to the scale of progress made. But many questions have been raised about the promised transformations for the body, the self, human beings, and for current medical practice, as well as about how to ensure access for all to suitable healthcare.

In substance, Latin American seems to be well in sync with science worldwide, but without blind adherence. It has its own focuses, favoured approaches, interpretative nuances, and innovative practices.

ANNEX: BIBLIOGRAPHY

This Annex offers a choice of references drawn from the latin-american database REDALYC.

They have been selected, among a great number of articles, in order to illustrate the main themes and approaches authors from this region adopt when using our reference keywords, namely:

Governance, Environment, Sustainable; and also: Indigenous knowledge, Transgenes, Biotechnology, Agro-(ecology, -forestry).

Most of the titles (and abstracts when we show them) are naturally **in SPANISH** (their publication language).

The references are arranged here in the same order as the reader meets comments in our Report.

The Annex Plan is then as follows:

1° About Governance [our query: "Gobern*"]

- Scope and relevance of the concept: possibility of exercise power (in outlaw zones and turmoil periods; "government" and "governance"; fetishism of "governance"; asymmetry of "powers" for decisions to be taken; social and political aspects.
- The Sate of Law; Democracy; Civil society (in its beginnings)
- Decentralisation
- More classical fields for the concept: business governance, governance in innovative projects (especially educational ones); administrative modernization…

2° Environment and Sustainability (which are portmanteau words) are dealt with here only when they are combined with "Governance".

3° Transgenes [our query: "Transgen*"]

- Threats and unacceptability (especially agricultural GMOs); Threats on biodiversity, assault on symbolic representations and values; Threats to small farmers
- Measure of effects of transgenes on the environment
- Research at University and Intellectual proprerty questions
- Sociology: Socio-tecnique communities; Networks of stakeholders (especially those of large-scale farmers)

4°) Biotechnology [our query: "Biotec*"]

- Numerous papers issued from different viewpoints: especially Philosophy (more about biomedical biotech), Sociology (more about agricultural biotec) and Multidisciplinary
- Other concerns: representations of biotechnologies and biotech products in several social milieus

5°) Indigenous knowledge [our query: “conocimiento indigeno”]

- Biopiracy
- Specific “good” traditional practices and knowledge to be tapped; Women’s knowledge
- Field enquiries: tradi-praticians in the health system (Chile); perception of climate change by indigenous tribes in Peru.

6°) Agro-ecology, Agro-forestry [our query: “Agroecolo*, OR Agroforest*”]

- Manifestoes, advocacy and stance against global agribusiness; case studies of alternative (small & local) projects. Agro-ecology against Capitalism.
- Some good traditional practices (agro, soil) and how they have been integrated in small scale development projects. Measurements of damage on environment by “conventional” farming (with large input of chemicals) . Agro-forestry and biological control against pests.
- Scholarly and empirical demonstrations of the merits of agro-ecologoical approaches. A review of the schools of thought. A survey of the (various) practices. An attempt to establish a “science” unified around the concept of resilience. Methodological debates and theoretical qualm.
- A portrait of the profession of agronomists
- Agro-ecology as a new Marxism ? (Holistic approach, praxis and adjacency to social (peasant) movements).
- Full Transition of the global agro-food system to GMOs or to Agroecology ?

GOBERNABILIDAD

A. Scope and Relevance of the Concept

1) 1997 Sociología *Perfiles Latinoamericanos(México)* México
Antonio Camou (Sin Institución - No se conoce);

Gobernabilidad y transición democrática en México
Este trabajo revisa algunos de los "sesgos" presentes en el debate sobre la transición democrática. Se recuperan asimismo los elementos básicos del"mode1o" de transición utilizado para evaluar el caso mexicano y se muestran las consecuencias de descuidar en el análisis académico los problemas de la gobernabilidad. Este recorrido permite descubrir la naturaleza "bifronte" dela transición mexicana, que obliga a considerar *no sólo el eje que va del autoritarismo a la democracia* sino también las condiciones para *un ejercicio eficaz del poder político.*

2) 2005 Polis, Revista de la Universidad Bolivariana(Chile)
François Graña (Universidad de la República - Uruguay);

TITLE
Globalización, gobernanza y "Estado mínimo": pocas luces y muchas sombras
ABSTRACT
El término "gobernanza" en boga, alude a modalidades *participativas* de gestión del *poder*, opuestas al tradicional Estado centralizador. Esto ocurre en contextos de intensificación de la globalización e interconexión mundial, "crisis de la deuda" y agudización de la pobreza extrema en el Hemisferio Sur, ascenso de las mafias, desequilibrios medioambientales, inseguridad planetaria y desastres humanitarios sin precedentes. Junto a ello, prospera la arremetida liberal contra el "Estado social" sospechoso de ineficiencia, proteccionismo, despilfarro y corrupción. La good governance reclamada por el Banco Mundial a los países deudores, legitima una intervención directa en sus políticas económicas y sociales. Pero el preconizado "Estado mínimo" parece agudizar los males preexistentes: desintegración y exclusión social, desocupación endémica, desprotección e inseguridad ciudadana crecientes.

3) 2005. Reflexión Política(Colombia)
Luis Caraballo Vivas (Universidad de los Andes - Venezuela);José Antonio Rivas Leone (Universidad de los Andes - Venezuela);

TITRE
(In) gobernabilidad y partidos políticos en Venezuela
RESUME
Nos proponemos esbozar los escenarios de gobernabilidad e ingobernabilidad de la democracia en Venezuela a partir del rol cumplido positiva o negativamente por los partidos políticos. Abordamos la

TITRE
cuestión de la crisis de gobernabilidad como un fenómeno complejo. La ingobernabilidad se presenta como una crisis básicamente como *crisis de legitimidad, crisis de conducción política y crisis del Estado*, es decir no se logra conformar un ambiente y escenario definido por la legitimidad y eficiencia que conlleva a un deterioro del sistema político a causa de *la disfunción de los partidos como productores de representación y gobernabilidad en la sociedad* venezolana a finales de los años ochenta. Finalmente analizamos el agotamiento del bipartidismo y la llegada del fenómeno Chávez y naturalmente la persistencia antes y ahora de indicadores de ingobernabilidad democrática.

4) 2005. Espacio Abierto(Venezuela)

François Graña (Universidad de la República - Uruguay);

TITRE
Todos contra el Estado: Usos y abusosde la "gobernanza"
RESUME
El término “gobernanza” en boga, alude a ***modalidades participativas de gestión del poder***, *opuestas al tradicional Estado centralizador*. Esto ocurre *en contextos de intensificación de la globalización e interconexión mundial, “crisis de la deuda” y agudización de la pobreza extrema* en el Hemisferio Sur, ***ascenso de las mafias****, desequilibrios medioambientales, inseguridad planetaria y desastreshumanitarios sin precedentes*. Junto a ello, prospera la *arremetida liberal contra el “Estado social” sospechoso de ineficiencia, proteccionismo, despilfarro y corrupción*. La ***good governance*** reclamada por el Banco Mundial a los países deudores, *legitima una intervención directa en sus políticas económicas y sociales.* ***Pero el preconizado “Estado mínimo” parece agudizar los males preexistentes: desintegración y exclusión social, desocupación endémica, desprotección e inseguridad ciudadana crecientes*****.**

2007. Revista Iberoamericana de Ciencia, Tecnología y Sociedad - CTS(Argentina)

Emilio Muñoz (Consejo Superior de Investigaciones Científicas - España);

Espacios de conocimientos y su gestión: procesos de Gobernanza

En este artículo se desarrolla una reflexión, desde el punto de vista español, sobre la conveniencia de aplicar conceptos como el de sociedad del conocimiento -junto con otros de nueva data, como los de “espacios” y “gobernanza”- para dar cuenta de la dinámica y las diferentes problemáticas presentes en la política y la gestión de la ciencia y la tecnología.

Source
Revista de Economía Mundial(España) 2008

Adresse Auteur
Manuela A. de Paz Báñez (Universidad de Huelva - España);

TITRE
Globalización y gobernanza. Algo más que la tradicional dicotomía estado-mercado
RESUMEN

Source
Este artículo trata de poner el acento en los aspectos de la globalización y su gobernanza que no tienen aún carta de ciudadanía. Es el caso de las otras formas de gobernanza que no son las estatales y las intergubernamentales. Aun reconociendo la importancia decisiva de éstas, el artículo señala otras organizadas en muy diversas redes no jerarquizadas, la llamada sociedad civil global. Ésta ha logrado negociar estándares sociales y ambientales con las empresas líderes de las cadenas globales de valor agregado, a través de mecanismos que son más flexibles y eficaces que las negociaciones interminables en los organismos intergubernamentales

B. The State of Law

2010. Lecturas de Economía(Colombia)
Jorge Polanco (Universidad de Antioquia - Colombia);

TITLE
Dificultades de la gobernanza del desarrollo económico en el entorno regional de Medellín

2010. En-claves del Pensamiento(México)
Alfonso Durazo (Instituto Tecnológico y de Estudios Superiores de Monterrey - México);

Innovación y gobernabilidad en un Estado obsoleto
El presente trabajo analiza la necesidad de innovar el trazo institucional del Estado mexicano como vía imprescindible para incidir en *la eficacia del aparato público* en su conjunto y afianzar la gobernabilidad en *un marco de legalidad y principios democráticos*. Se parte de la *hipótesis de que las deficiencias del Estado mexicano se deben más a* ***la obsolescencia de su estructura jurídica -diseñada bajo una visión semi-autoritaria****- que a una deficiente gestión de gobierno*. Se asume igualmente que la baja calidad de la democracia es también consecuencia directa de la existencia de un Estado obsoleto que afecta la implementación de políticas públicas e influye de manera decisiva en los bajos niveles de gobernabilidad conocidos hoy por nuestro país. Se propone un programa de ajuste y creación institucional que trascienda la mera actualización de procesos para llegar a ***la matriz del problema: la estructura jurídica*** *del Estado mexicano*.

Estado de excepción y gobernabilidad en México
La soberanía de un Estado se manifiesta en el derecho constitucional que le asiste para suspender las garantías individuales de sus ciudadanos bajo la retórica de salvaguardar sus derechos, suspendiéndolos. México no escapa a esta lógica estatal. Sin embargo, en este mismo espacio de anulación jurídica emergen otros modos de estar-juntos puestos en práctica por ciudadanos "desnacionalizados", en el sentido de la pérdida de sus derechos en su propio país de origen, que indican nuevas modalidades de acción política surgidas de la desagregación de los derechos de la ciudadanía moderna. Para ello, propongo rastrear las huellas del Estado de excepción en la experiencia mexicana para identificar los rasgos que se repiten en el tiempo y sobreviven, aún, poniendo en peligro el equilibrio entre el respeto a los derechos ciudadanos y una legislación de

emergencia. A continuación, se exploran algunos elementos de la democracia representativa moderna que permiten explicar la escenificación ficticia de la gobernabilidad puesta en marcha por el Estado de excepción. Para concluir con la enunciación de algunos ejemplos de lo que hoy podríamos identificar con la emergencia de prácticas de participación ciudadana surgidas en un contexto de excepción.

C. Democracy, Governance and the Civil society (in its beginnings)

Source
2003. Revista Latina de Comunicación Social(España)
Author's Address
José Guadalupe Vargas Hernández(University of California Berkeley - Estados Unidos);
TITLE
Teoría de la acción colectiva, sociedad civil y los nuevos movimientos sociales en las nuevas formas de gobernabilidad en Latinoamérica
Abstract
Este trabajo tiene como objetivo analizar las relaciones existentes entre la sociedad civil y la emergencia de nuevas formas de gobernabilidad en Latinoamérica en unambiente de globalización económica. Bajo el marco teórico de la *teoría de la acción colectiva* se analiza la acción de los nuevos *movimientos sociales* y sus relaciones con la *estructura de red de la sociedad civil*.

2004. Geoenseñanza(Venezuela), Xiomara Araujo (Universidad de los Andes - Venezuela);

Una revisión básica sobre conceptos y teorías de gobernabilidad

Gobernabilidad es un concepto que ha sido usado extensivamente no sólo para explicar procesos de gobierno, particularmente los cambios experimentados por los estados nacionales como una *respuesta a sus ambientes externos*, o bien al papel del Estado en la *coordinación de la interacción de los ámbitos público y privado*. Este es también un concepto que ha sido ***asociado a los debates sobre desarrollo y democracia***. Así como existen varios conceptos de gobernabilidad, también existen varias teorías y nociones sobre gobernabilidad. En este artículo, se discuten las corrientes más importantes que sehan desarrollado sobre este tema para explicar los procesos de cambio que están conduciendo a nuevas formas de gobernabilidad y se vincula con algunos conceptos importantes tales como: ***interacciones, redes y asociaciones***. Este trabajo además señala, en relación con las tendencias observadas en las *nuevas formas de gobierno*, *la relevancia de la creación de asociaciones* o alianzas socio-políticas para el manejo de los asuntos públicos. Junto con esto, se analizan los *cambios institucionales* y el incremento de la ***participación*** de la sociedad que son reconocidos, también, como un resultado de la *transición experimentada en los gobiernos.*

2006. Revista Mexicana de Ciencias Políticas y Sociales (México)

Marycela Córdova Solís (Universidad del País Vasco/Euskal Herriko Unibertsitatea - España);

TITRE
Democracia, gobernabilidad y malestar social en América Latina.Una reflexión
RESUME
En este artículo, la autora examina la *dicotomía de la liberalización económica y política* que se presenta en América Latina a partir de las décadas de los 70y 80. Se analiza la *ambigüedad entre la apertura de los mercados nacionales y los procesos democráticos que* se gestan en la mayor parte en los países de la región que, al *no responder a las expectativas de sus sociedades*, han coadyuvado a polarizar internamente a las mismas y en algunos casos a crear ***un ambiente de ingobernabilidad y de malestar social*** por las ***promesas incumplidas*** de la democracia, *dañando la imagen de la política y de la propia democracia.*

2006. Contribuciones desde Coatepec (México)
José Guadalupe Vargas Hernéndez (Instituto Tecnológico de Ciudad Guzmán - México);

El desarrollo emergente de la sociedad civil como forma de gobernabilidad
Este trabajo tiene por objetivo analizar el desarrollo emergente de la sociedad civil como una forma de gobernancia, el carácter evolutivo de su conceptualización, su orientación como forma de gobernancia y gobernabilidad y la delimitación de las características propias de la comunidad, mercado, Estado y sociedad civil como tipos ideales de orden social. El análisis de las funciones de la sociedad civil permite determinar la tendencia de su emergencia como un nuevo orden social en Latinoamérica. Finalmente, se analizan los retos que enfrenta la sociedad civil.

2007. Ciencia y Sociedad (República Dominicana)
Francisco Cueto Villamán (Instituto Tecnológico de Santo Domingo - República Dominicana);

Desconfianza política, instituciones y gobernabilidad democrática en la república dominicana
Las sociedades latinoamericanas y caribeñas iniciaron, en la década de los ochenta, su proceso de democratización en un contexto de debacle económica, manifestada a través de la crisis fiscal y el aumento de la deuda externa. Como respuesta a tal situación se inició un proceso de privatización de las empresas públicas, el cual buscaba, fundamentalmente, reducir la participación del Estado en la economía. Sin embargo, este proceso de corte privatizador no se acompañó de reformas que convirtieran a estos Estados en entes eficientes y eficaces en la consecución de sus responsabilidades sociales. Es decir, no supuso reformas viables en los poderes públicos y en las administraciones públicas. De igual modo, los principales actores de representación política (los partidos políticos) siguieron funcionando en base a una lógica que importantiza el paternalismo y el clientelismo como dispositivos de relación entre los ciudadanos y el Estado. El resultado ha sido la existencia de Estados más disminuidos y sin capacidad para asegurar crecimientos económicos sostenidos, instaurar el imperio de la ley, e implementar políticas públicas que promuevan un desarrollo humano sostenible. En cuanto a esto, la República Dominicana no es una excepción. Este artículo trata de investigar el grado de confianza de los ciudadanos dominicanos hacia las principales organizaciones de representación e instituciones gubernamentales claves. En suma, se busca analizar los peligros que puede presentar para la gobernabilidad democrática del país la débil confianza ciudadana hacia dichas organizaciones e instituciones.

D. Decentralisation

2005 *Revista de Artes y Humanidades UNICA (Venezuela),* Fárido Caldera (Universidad Católica Cecilio Acosta - Venezuela);Juan Romero (Universidad del Zulia - Venezuela);Luis González (Universidad del Zulia - Venezuela);

Gestión pública, gobernabilidad y municipalización. Caso Maracaibo Oeste (2002-2004)

El presente artículo indaga las condiciones que impactan *las posibilidades de gobernabilidad municipal* en el proceso de municipalización político-territorial de Maracaibo, concretizada en la creación del municipio Maracaibo-Oeste. La estrategia metodológica deductiva siguió básicamente tres pasos: a) *Identificar los actores sociales* y tipos de interacción que se han dado durante el proceso de municipalización considerado; b) definir las estrategias políticas que ellos han desarrollado; c) precisar los *aspectos técnico-legales-financieros asociados* que pueden constituir amenazas u oportunidades para el proceso y la gobernabilidad municipal

2005, Estudios Demográficos y Urbanos (México), Pedro Pírez (Universidad Nacional de San Martín - Argentina);

Buenos Aires: ciudad metropolitana y gobernabilidad

El presente artículo se refiere a la ausencia de respuesta institucional en Argentina, como consecuencia de la falta de reconocimiento de la ciudad como objeto real de gobierno. Se entiende que lo metropolitano es el resultado de la intersección de una dimensión urbano territorial (crecimiento y expansión de la ciudad) y otra político territorial (la organización territorial del estado).La configuración metropolitana, desde que se iniciaron los procesos de expansión propios de la industrialización sustitutiva de importaciones hasta que se resintió *el impacto de la reestructuración y la globalización*, ha transformado el territorio acentuandolas diferencias y las desigualdades, las fragmentaciones y las zonas excluyentes que pese a todo se complementan. Esas desigualdades se concretan en *tres contradicciones fundamentales; la primera entre el ámbito territorial de los problemas y el relativo al gobierno y a la gestión local; la segunda entre el ámbito territorial de las necesidades y el de la representación política y la última entre el ámbito territorial de las necesidades y el de los recursos.* Tales contradicciones en tanto no son resueltas tienden a configurar desigualdades que se polarizan territorialmente. La cuestión metropolitana se convierte en un asunto de gobernabilidad como falta de orientación o conducción gubernamental, que deriva en problemas metropolitanos como la "ilimitada" expansión urbana, las desiguales condiciones de la calidad de vida urbana y de la seguridad ciudadana, la distribución no equitativa de los recursos financieros, la mala gestión de los servicios, las dificultades para la gestión ambiental, y la falta de un ejercicio democrático que legitime las decisiones que afectan el ámbito metropolitano. Frente a esos problemas existen alternativas institucionales que, desde la fragmentación hasta la consolidación, intentan una gobernabilidad metropolitana. No todas esas formas tienen conexión con las condiciones reales del Área Metropolitana de Buenos Aires. Su complejidad político institucional y su peso (demográfico, económico y político) en el contexto nacional, relativizan una posible solución hacia la consolidación. Frente a esas dificultades, *procesos de centralización estatal y de transferencia*

de decisiones al mercado caracterizan la gestión urbana en esa Área Metropolitana, *fortaleciendo sus contradicciones y dificultando la gobernabilidad.*

E. Classical uses

2011. Revista Mexicana de Investigación Educativa (México)

MIGUEL ÁNGEL OLIVO PÉREZ (Universidad Pedagógica Nacional - México);LUIS REYES GARCÍA (Universidad Pedagógica Nacional - México);CLAUDIA ALANÍZ HERNÁNDEZ (Universidad Pedagógica Nacional - México);

CRÍTICA A LOS CONCEPTOS DE GOBERNABILIDAD Y GOBERNANZA Una discusión con referencia a los consejos escolares de participación social en México

El presente artículo sostiene que los supuestos en que se basan los consejos escolares de participación social, provenientes de los enfoques de la gobernabilidad y la gobernanza, no son suficientes para conocer con profundidad "lo que sucede" con su implementación en las escuelas, especialmente si tienden o no a *empoderar a los actores* escolares. En consecuencia, el trabajo argumenta sobre la necesidad de dotar a dichos enfoques de una mayor profundidad teórica, a través de la recuperación de *las peculiaridades históricas y culturales de los contextos en que son aplicados*, con el propósito de que puedan servir, no tanto como recursos heurísticos generales al servicio de la acción política, sino como herramientas teóricas con las cuales se pueda diagnosticar e intervenir de mejor manera en la realidad educativa de nuestro país.

F. Governance and environment

2010. Revista Mexicana de Sociología(México)
Ludger Brenner (Universidad Autónoma Metropolitana - México);

TITRE
Gobernanza ambiental, actores sociales y conflictos en las Áreas Naturales Protegidas mexicanas
RESUME
Este artículo analiza los retos que enfrenta la gobernanza ambiental de la Reserva de la Biosfera Sian Ka'an, una de las Áreas Naturales Protegidas más importantes en México. El estudio identifica los actores sociales involucrados, sus intereses, estrategias, poder relativo y acciones. La información pone en claro que el mayor problema que enfrenta la gobernanza ambiental *resulta de los intereses y acciones contradictorias que llevan a cabo los diferentes actores sociales.*

AMBIENT (& Gobern)

2005 Iconos. Revista de Ciencias Sociales(Ecuador)
Guillaume Fontaine (Facultad Latinoamericana de Ciencias Sociales - Ecuador);

TITRE
Microconflictos ambientales y crisis de gobernabilidad en la Amazonía ecuatoriana

RESUME
Este artículo analiza la relación entre contaminación y conflictos ambientales en el norte de la Amazonía ecuatoriana. La idea central que se defiende es que el manejo de conflictos por la empresa petrolera del Ecuador, Petroecuador, puede llevar a negociaciones "eficientes" a corto plazo, a costa de la institucionalización de los arreglos y de un tratamiento de las causas estructurales de los conflictos. Este entorno, condicionado por una gestión ambiental inadecuada en el norte de la Amazonía, constituye el telón de fondo de los conflictos radicales en el centro y el sur de la región y seguirá siendo un marco referencial contra la política petrolera del Estado. En particular, el clima de tensión social que resulta de esta situación es agravado aún más por la mediatización del juicio contra Chevrón-Texaco. Sin una redefinición de las políticas públicas–en particular políticas ambiental y social responsables y equitativas–este clima amenaza conde sembocar en una crisis de gobernabilidad democrática.

[Ambient : Gestion de l'eau] [Gobernabilidad c/ équivalent de participation]

2012. Gestión y Ambiente(Colombia)
Carmen Zamudio Rodríguez (Universidad Distrital Francisco José de Caldas - No se conoce);

Gobernabilidad sobre el recurso hídrico en Colombia: entre avances y retos

Este trabajo corresponde a una revisión general sobre la gestión del agua en Colombia, en la cual se enfatiza *la gobernabilidad como un elemento fundamental* en este tipo de procesos. Por lo tanto, a partir de la recopilación y análisis de información secundaria, se identifica la evolución de la gestión del agua en el país y, en esa medida, los aspectos que permiten evidenciar *una crisis de gobernabilidad* en esta materia. En tal sentido, inicialmente se plantean algunos aspectos relevantes para abordar el análisis de la *gestión integrada* del recurso hídrico y la gobernabilidad del agua. Más adelante, se abordan factores que reflejan que pese a importantes avances en la gestión del agua en el país, todavía es incipiente un enfoque integral que considere múltiples criterios para facilitar la gobernabilidad sobre el recurso hídrico. Así, se plantea que existe una crisis de gobernabilidad sobre el agua, que se expresa en términos del *desconocimiento de la experiencia y contexto internacional*, la *descoordinación y dispersión de la política* del agua, el *desconocimiento de las* ***diversas formas locales de gobierno***, la percepción errónea sobre la abundancia y riqueza hídrica del país y *el disimulo o desinterés con que se ignoran* ***las múltiples presiones*** *que se ciernen sobre el agua.*

[Tourisme]

2012. Estudios y Perspectivas en Turismo (Argentina)

Leonardo Furtado da Silva (Universidade Regional de Blumenau - Brasil);Carlos Alberto Cioce Sampaio (Universidade Regional de Blumenau - Brasil);Oklinger Mantovaneli Jr (Universidade Regional de Blumenau - Brasil);

GOBERNANZA Y TERRITORIALIDAD EN EL **DESARROLLO TURÍSTICO REGIONAL. El caso del Oktoberfest en Blumenau - Brasil**

Este trabajo presenta como objetivo principal caracterizar la gobernación y la territorialización en el producto turístico Oktoberfest desde su inicio, en 1984, hasta 2008 como elementos de influencia en el desarrollo turístico regional. Es un estudio cualitativo analítico-descriptivo amparado mayoritariamente en fuentes primarias por medio de entrevistas semiestructuradas (con gestores estratégicos del evento) y por fuentes secundarias originadas en el relevamiento realizado en el archivo de la Fundación Cultural de Blumenau, Brasil. Los datos fueron correlacionados por medio del análisis de contenido. Sintéticamente, los resultados del estudio demuestran que el evento pasó por un conjunto de distintas fases bastante expresivas caracterizadas como territorialidades y propiciadas respectivamente por instancias de gobernación. O sea, modelos de acuerdos para la consecución de los objetivos que apoyan al evento y lo caracterizan. El estudio permitió comprender que la actual coyuntura de las instancias de gobernación presentes en el producto turístico Oktoberfest en Blumenau remite a un momento de rescate de los valores endógenos del evento donde el elemento comunitario e histórico-cultural necesarios para su identidad y sustento se mostraban en deterioro con elación a momentos anteriores. Se planteó la hipótesis de que, por la representatividad que ocupa, el Oktoberfest está influenciando todo el conjunto de eventos regionales del calendario del mes de octubre en el Estado brasileño de Santa Catarina.

2010. Estudios y Perspectivas en Turismo (Argentina)

Javier Martín Ordoqui (Universidad Nacional de Mar del Plata - Argentina);

Gobernabilidad ambiental y turismo en el litoral marítimo. El caso de Mar de las Pampas, Provincia Buenos Aires - Argentina

El impacto del turismo de sol y playa en el litoral marítimo de la Provincia de Buenos Aires; Argentina, necesita una caracterización, descripción y análisis en relación con la construcción del territorio y las modificaciones paisajísticas y ambientales realizadas en la costa y las playas. En

esta investigación se realizará un estudio particular sobre Mar de las Pampas, villa balnearia ubicada en el sur del Partido de Villa Gesell. El objetivo principal será establecer su evolución histórica, las causas de la creciente urbanización, el estado de sus playas, el riesgo de erosión marina por causas antrópicas, el avance del medio construido en el frente costero y las políticas de gestión turística y territorial en el ambiente costero. Este estudio permitirá establecer la relación que tiene *el desenvolvimiento del turismo con la gobernabilidad ambiental* y las capacidades de generar ***herramientas participativas para la resolución de conflictos.***

2009. Reflexiones(Costa Rica)
Oscar Fernández González (Universidad de Costa Rica - Costa Rica);

PAPAGAYO, SARDINAL Y LA GOBERNANZA EN COSTA RICA: DOS INTERVENCIONES DEL ESTADO Y SUS DISTINTAS CONSECUENCIAS

El artículo plantea un breve análisis sociológico comparativo de dos procesos acontecidos recientemente en Costa Rica, que podían ser estudiados desde el prisma teórico de la gobernanza a escala local. El primero de ellos se refirió al cierre temporal y parcial del Hotel Allegro Papagayo, ubicado en Guanacaste, ordenado por el Ministerio de Salud como respuesta a *peticiones de los vecinos por la contaminación* que el hotel provocaba en el estero y en el lugar. La medida política tomaba *en consideración intereses de conjunto* y ni si quiera fue objetada por los restantes hoteleros. El segundo proceso se refirió más bien a la ampliación del *acueducto de Sardinal*, también en Guanacaste, que comenzó a desarrollar un *consorcio privado para asegurar el su ministro del agua en forma prioritaria para algunos empresarios hoteleros, arriesgando así el abastecimiento futuro del agua para los vecinos* de la zona. La *conjugación de agentes privados y de agentes públicos, ejemplificaba un claro proceso de gobernanza parcial y parcializada que fue legalmente objetada*, gracias a la movilización de *organizaciones vecinales*, lo que condujo a la paralización -al menos temporal- de la obra.

TRANSGENES

Transgenes [our query: “Transgen*”]

- Threats and unacceptability (especially agricultural GMOs); Threats on biodiversity, assault on symbolic representations and values; Threats to small farmers
- Measure of effects of transgenes on the environment
- Research at University and Intellectual proprerty questions
- Sociology: Socio-tecnique communities; Networks of stakeholders (especially those of large-scale farmers)

Références : TRANSGENES

1) **Polemics** against the free trade of transgenic seeds and about risks for biodiversity. Emotional and symbolic load. Here are some titles :

Revista Fitotecnia Mexicana(México), 2009, Liberacion comercial de Maiz transgenico y acumulacion de transgenes en razas de Mais Mexicano.

El Cotidiano(México), 2012, La defensa internacional del maíz contra la contaminación transgénica en su centro de origen.

Abstract. Como ha podido documentarse, el gobierno mexicano ha mantenido una política de promoción del libre comercio y de las importaciones de maíz, y ha alentado el avance de los cultivos transgénicos. En el tlcan aceptó principios y condiciones que apoyan los intereses de Estados Unidos y Canadá [...]. No dio ninguna respuesta al hallazgo de maíz nativo contaminado con transgenes a pesar de ser el país centro de origen y diversidad del cereal [...]. Desoyó las demandas de científicos y de amplios sectores de la sociedad civil de México y muchos países, y favoreció en todo momento los intereses transnacionales [...] la sociedad civil promueve actualmente una audiencia de Maíz, soberanía alimentaria y autonomía frente al Tribunal Permanente de los Pueblos, capítulo México.

Title 2011 Rev Mex Ciencias agricolas
FLUJO GÉNICO ENTRE MAÍCES COMERCIALIZADOS POR DICONSA Y POBLACIONES NATIVAS EN LA MIXTECA POBLANA

2009,LIBERACIÓN COMERCIAL DE MAÍZ TRANSGÉNICO Y ACUMULACIÓN DE TRANSGENES EN RAZAS DE MAÍZ MEXICANO (*Revista Fitotecnia Mexicana*, Mexique)

Abstract 2009 Rev fitotecnia mexicano
Se analizan aspectos del mejoramiento genético autóctono de maíz (MGAM), la biología reproductiva de la especie, la tecnología actual del ADN recombinante (TADNR) y la Ley de Bioseguridad de Organismos Genéticamente Modificados (LBOGM), para inferir sobre la posible acumulación de transgenes en más de 50 razas nativas de maíz (RNM), a consecuencia de una eventual liberación comercial del maíz genéticamente modificado (MGM) en México. Se destacan las diferencias entre la primera oleada de MGM, importada de E.E. U.U. como grano y una segunda "oleada" de MGM adaptada a México. Los hábitos reproductivos del maíz lo hacen proclive a la difusión de alelos entre sus poblaciones, mientras que las prácticas del MGAM propician el cruzamiento por la ruta ¿semilla-polen¿. En la etapa comercial actual de la TADNR no sería posible controlar el locus de inserción, por lo que los 50 eventos transgénicos independientes (ETI) del mercado mundial de semillas de MGM estarían dispersos en el espacio cromosómico. Tal dispersión haría posible que los ETI sean concentrables, por cruzamiento, en un solo genotipo. También es posible que con la liberación comercial de MGM, los ETI fluyan y se acumulen en el genoma residente de las más de 50 RNM. Se ignora si hay umbral(es) deletéreo(s) de acumulación de transgenes, más allá del cual se dañe la diversidad del maíz nativo; por tanto, el Principio Precautorio habría de prevalecer sobre cualquier otra consideración. La investigación pertinente habría de ser llevada a cabo bajo estrictas normas de bioseguridad, y sus resultados e implicaciones entendidas, antes de proceder a la liberación comercial de MGM al campo mexicano.

2) Effects of transgenes on environment : measures

Title: Environmental effect of conventional and GM crops of cotton (Gossypium hirsutum L.) and corn (Zea mays L.) 2011, ***Agronomía Colombiana***(Colombia),

Résumé In the corn belt of Valle de San Juan and in the cotton zone of El Espinal, municipalities in the department of Tolima (Colombia), 10 conventional corn producers, 10 producers of genetically modified corn, five producers of conventional cotton and 15 producers of transgenic cotton were surveyed in the first half of 2009 to contrast the differences in the environmental impact associated with use of insecticides and herbicides, which were evaluated by estimating the environmental index quotient-EIQ. In the case of maize, an EIQ of 42 was found in the conventional type, while transgenic technology had an EIQ of 3.03. In the cultivation of cotton, an EIQ of 263.59 was found for the conventional type while for transgenic technology this value varied between 335.75 (Nuopal BG/RR) and 324.79 (DP 455 BG/RR). These data showed a lower environmental impact using GM technology in the cultivation of maize when compared

to the conventional counterpart, in connection with the use of insecticides and herbicides, in the context of time, space and genotypic analysis. This effect was not observed in the case of cotton, where environmental impacts were similar.

PROPUESTA DE COTEJO DE IMPACTO DE LA ACUMULACIÓN DE TRANSGENES EN EL MAÍZ (Zea mays L.) NATIVO MEXICANO 2009 ***Agrociencia*** (Mexico)

Résumé La liberación del cultivo de maíz genéticamente modificado (MGM) a escala comercial en México, involucra potencialmente la interacción genética entre más de 30 eventos transgénicos independientes (probablemente más de 30 loci transgénicos diferentes) y más de 50 razas nativas de maíz (RNM) en el campo mexicano. Aunque la Ley de Bioseguridad de Organismos Genéticamente Modificados (**LBOGM**) y su reglamento establecen el supuesto de que el control del polen permite minimizar la interacción genética entre ambos maíces, es posible que la vía alterna "*semilla-polen*", no prevista en esa ley, contravenga el realismo del supuesto. El status actual de la tecnología del ADN recombinante no permite predeterminar el locus transgénico de cada transformación, por lo que los más de 30 loci transgénicos independientes del mercado de semillas estarían dispersos en el espacio cromosómico. Esto es causa central de la acumulación de transgenes en las RNM, cuando los MGM y las RNM interaccionan genéticamente, con efectos que se desconocen. En este ensayo se propone el cotejo de la hipótesis de un umbral deletéreo de acumulación de transgenes en cada RNM. Se discute el impacto de 10 ciclos de cruzamientos entre las RNM y 32 o más híbridos transgénicos, para obtener poblaciones con individuos que acumulen cargas transgénicas desde cero hasta 32 o más. Además se discute la evaluación biológica, agronómica y molecular de los genotipos estudiados.

3) **Research at university and intellectual property**

Interciencia, 2003, Developing transgenic rice at the university of Costa Rica: perspectives and considerations for managing intellectual property rights par A.M. Espinoza; S.Salazar & A. Sittenfeld

4) Social representations

Revista Electronica de Biotecnologia (Chile), 2005, Attitudes towards genomic: Research in four Latin American countries.

Résumé: The present reflection refers to data obtained about the social representations of genomic research and its applications through interviews with legislators and lawyers, biomedical researchers and civilians and the review of scientific and legal literature in four Latin American countries: Argentine, Chile, Mexico and Peru. Several issues are addressed: little access to prevention and therapeutic methods, lack of equity in health benefits, commercialization of gene sequences through patents which leads to commercial exploitation of underdeveloped countries, the possibility of physical or psychological damage or genetic discrimination, the possibility of genetic modifications or abortion for eugenic reasons, the necessity of safeguarding confidentiality, risks and benefits of the use of transgenics and cloning, the necessity of legal regulation to prevent the pathway towards genetic enhancement or reproductive human cloning and of regulating access to genetic information. Using the method of content analysis of verbal behaviour to evaluate the degree of anxiety and hostility of subjects in relation to the Human Genome Project (HGP) developed by Gottschalk and Gleser, an inverse relation between levels of anxiety and level of knowledge was

observed which highlights the importance of educating the population. Differences in the level of hostility towards the HGP were also found among the groups.

5) Social Networks

Journal of Technology Management & Innovation(Chile) , 2009, The Influence of the Actor Network on the Innovative Process of Transgenic Soybean in Rio Grande Do Sul, Brazil, par: Doriana Daroi & Luis Felipe Nascimento

Résumé Rio Grande do Sul was the first Brazilian state to plant genetically modified soybean. The sowing occurred in 1998 with Roundup Ready soybean seeds from Monsanto smuggled from Argentina. The aim of this study is to investigate how this innovative process of planting transgenic soybean came about in Rio Grande do Sul based on the actor network involved in the period 1998 to 2003. Although the innovative process has been discussed in the literature on innovation management since the work of Schumpeter, there is still no clear understanding of the issues of interests and power that involve the innovative process. Given this, from within the literature we have sought a perspective that would understand the innovative process as being political. We adopted Actor Network Theory as a base for the discussion of the primary and secondary data obtained regarding the controversy surrounding transgenic soybean in RS. The results point to the existence of two translation chains that contribute towards the formation of actor networks.

6) Realisations (non-SHS literature)

Development of transgenic lines from a male-sterile *potato* variety, with potential resistance to Tecia solanivora Povolny 2012 ***Agronomía Colombiana*** (Colombia)

Résumé. **Male sterility** is *a very important characteristic for environmental safety in genetically modified (GM) plants*, particularly in the release of transgenic plants *in the centers of origin or high biodiversity areas*. In order to contribute to the development of environmentally safe agricultural technologies that allow the proper use of transgenic potato crops in Colombia, this project developed transgenic potato cry1Ac of Bacillus thuringiensis (Bt), lines that are potentially resistant to T. solanivora, from the male-sterile variety Pastusa Suprema (PS) (Solanum tuberosum ssp. andigena). Modifications were made to the Agrobacterium tumefaciens mediated-transformation protocol which allowed the genetic transformation of leaves of in vitro plants, with transformation efficiencies of 22 and 37%. Cry1Ac protein levels in transgenic leaves ranged from 88 to 639 ng mg-1 of fresh leaf tissue, suggesting a better potential plant resistance. This is the first report on transgenic lines with potential resistance to T. solanivora from a male-sterile variety of S. tuberosum ssp. andigena.

Numerous other Titles (non-SHS):

Titre:Production of transgenic goat (Capra hircus) with human Granulocyte Colony Stimulating Factor (hG-CSF) gene in Brazil 2007 ***Anais da Academia Brasileira de Ciências***(Brasil)

CARACTERIZACIÓN DE POBLACIONES DE Phytophthora infestans (MONT, DE BARY) OBTENIDAS DE Solanum TRANSGÉNICAS Y DE HÍBRIDOS SOMÁTICOS RESISTENTES 2010 ***Interciencia***

INSERTION OF Agrobacterium rhizogenes rolB GENE IN MANGO [au Vénézuéla] 2010 ***Interciencia***

Efficient RNAi-induced Protein Knockdown in Somatic Cells Using Diced or Chemically Produced Small Interfering RNAs (siRNA) 2012 ***Acta Scientiae Veterinariae(Brasil***)

In Vitro Development and Cell Allocation After Aggregation of Syngeneic Wild Type and Fluorescence-Expressing Bovine Cloned Embryos 2012 ***Acta Scientiae Veterinariae(Brasil***)

References : BIOTECHNOLOGIES

4°) Biotechnology [our query: "Biotec*"]

- Numerous papers issued from different viewpoints: especially Philosophy (more about biomedical biotech), Sociology (more about agricultural biotec) and Multidisciplinary
- Other concerns: representations of biotechnologies and biotech products in several social milieus

1) Philosophy

- *Biomedical technologies, Bio-Ethics.*

2011. *Acta Bioethica*(Chile) par José Roque Junges (Universidade do Vale do Rio dos Sinos - Brasil);
Titre: O nascimento da bioética e a constituição do biopoder [Pouvoir biologique et naissance d'une bio-éthique]

2011. *Persona y Bioética*(Colombia) par María Luisa Pfeiffer (Univ de Buenos Aires - Argentina);
Titre: "Progreso" biotecnológico y pobreza. Una reflexión ética

2003. Dimensiones éticas de la crítica agroecológica a la biotecnología agrícola

2) Anthropology

2001. *Alteridades* (México) par Federico Besserer (Universidad Autónoma Metropolitana - México);

Title : **Luchas culturales en la agricultura del capitalismo tardío**. [las formas de **resistencia cultural** de los trabajadores del jitomate son translocales y resultan de la contienda con las *formas culturales hegemónicas* de la agroindustria para la que trabajan]

3) Sociology

2001. *El Cotidiano* (México), **Biopiratería** y resistencia en México

2012. *Estudios Sociales* (México), Construcción de redes de transferencia **ciencia-industria** en el sector de biotecnología en México. Estudio de caso sobre las vinculaciones tecnológicas entre investigadores de CINVESTAV Irapuato y LANGEBIO y empresas del sector agro-biotecnológico.

2011. *Redes* (Argentina) Dinámicas de **innovación** en biotecnología vegetal. Estudios de caso en empresas de **Argentina y Francia** par P. Pellegrini U.N. Quilmes Argentine

2008. *Sociologias* (Brésil), **O fascínio dos cientistas** colombianos pela engenharia genética de plantas [recherches prometteuse sous dépendance sciento-économique des pays du Nord).

4) Multidisciplinary

-*Medicine and health*

2006, *Universitas Médical*, « Crisis global, salud y enfermedad: dimensiones comtemporáneas en la agenda de la salud pública » par L.C.Domínguez Torres (Pontificia Universidad Javeriana - Colombia

2008, « El conocimiento del genoma humano y la sociedad: Un conflicto inevitable »
Col 2008 in *El Hombre y la Máquina (Colombia)* [genome kowledge is concentrationg within large consortia in rich countries, making i toit of reach for most of the developing world]

2005, « La ética y la técnica contemporánea: Implicaciones en el Área de la Salud » *2005 Peru*
Una reflexión y discusión en los profesionales de la salud sobre las ***implicaciones en la práctica cotidiana*** de los avances de la técnica, así como sobre ***el papel de la ética*** *como ente regulador de estos avances.* También se propone analizar los cambios quese han generado en las relaciones entre los profesionales y las personas/clientes delos servicios de salud, a partir de la biotecnología

Revista Iberoamericano de Ciencia, Tecnolgia y Sociedad, 2012, « Ciencia, neoliberalismo y **bioeconomía »**

-*Public Perception*

2009, « Percepción pública de la biotecnología agrícola en la ciudad de Mérida », 2009 Venezuela

2004*, Revista Iberoamericano de Ciencia, Tecnolgia y Sociedad*, 2004, « Encuestas a consumidores sobre biotecnología »

2012, « La comprensión pública de la biotecnología. El caso de los alimentos transgénicos en cursos de posgrado »

2005, Chile. Rev Electronica de Biotecnologia; Attitudes towards genomic: Research in four Latin American countries.

-*Nanotechnologies*

[...la relevancia de **una investigación social de las nanobiotecnologías…** una serie de cuestiones… *análisis y gestión de riesgos; diseminación y comprensión pública; transferencia tecnológica; bioética y biopolítica; y sostenibilidad*.]

- *Social Movements, Regulation*

2004, « Manejar la incertidumbre: la *controversia sobre la ingeniería genética en Europa* y su influencia sobre la regulación »

KNOWLEDGE

[Knowledge Society]

2007. Revista Iberoamericana de Ciencia, Tecnología y Sociedad – CTS (Argentina)
Emilio Muñoz (Consejo Superior de Investigaciones Científicas - España);

Espacios de conocimientos y su gestión: procesos de Gobernanza
En este artículo se desarrolla una reflexión, desde el punto de vista español, sobre la conveniencia de aplicar conceptos como el de sociedad del conocimiento -junto con otros de nueva data, como los de "espacios" y "gobernanza"- para dar cuenta de la dinámica y las diferentes problemáticas presentes en la política y la gestión de la ciencia y la tecnología.

[The Knowledge of Agronomists]

2011 MEX. ENFOQUES DE INVESTIGACIÓN SOSTENIBLE, ECOLOGISTA Y PRODUCTIVISTA: INFLUENCIAS EN LOS CIENTÍFICOS(AS) Luis Reyes-Muro (Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias - México); Miguel Ángel Damián Huato (Benemérita Universidad Autónoma de Puebla - México);Jesús Axayacatl Cuevas Sánchez (Universidad Autónoma Chapingo - México);Fernando Manzo-Ramos (Colegio de Postgraduados - México);

Rev Mex de Ciencias agricolas, 2011

Los científicos(as) agropecuarios(as) están influenciados(as) por diversos factores para definir su enfoque de investigación. El objetivo de este trabajo fue identificar aspectos demográficos y profesionales, institucionales e influencias internas-externas asociados al enfoque sostenible, ecologista o productivista de los científicos(as) en Aguascalientes, México en 2008. Los enfoques fueron sometidos a un análisis de correlación con 44 factores de influencia. El enfoque **sostenible** correlacionó positivamente con la especialidad, la solución de problemas de interés institucional, investigación en terrenos de productores e investigación en sistemas de producción y negativamente con investigación básica y biotecnología. El enfoque **ecologista** correlacionó positivamente con la opinión del grupo interdisciplinario en la definición del problema a investigar. El enfoque **productivista** correlacionó positivamente con la especialidad, opinión del usuario y colegas en la definición del problema, estudios en terrenos de productores y en la estación experimental, trabajos por componente tecnológico y con la objetividad del investigador(a), y negativamente con la disciplina ecología. El modelo de regresión logística para la investigación con enfoque sostenible se explica por el origen de los investigadores(as), estancias de investigación, tipo de institución, fuente de financiamiento, investigación por demanda del usuario y prioridad institucional, trabajo interdisciplinario, estudios tanto en sistemas de producción como por componente tecnológico. El modelo ecologista se explica por las estancias de investigación, aprobación del proyecto por un comité técnico, investigación en terrenos de productores, trabajo interdisciplinario y estudios en sistemas de producción. El modelo productivista tuvo las variables explicatorias tipo de institución y trabajo en sistemas de producción.

Indigenous Knowledge

5°) Indigenous knowledge [our query: “conocimiento indigeno”]

- Biopiracy
- Specific “good” traditional practices and knowledge to be tapped; Women’s knowledge
- Field enquiries: tradi-praticians in the health system (Chile); perception of climate change by indigenous tribes in Peru.

-Biopiracy

2010. *Revista Pueblos y Fronteras (*Digital*,* México) La biopirateria de los recursos de la medicina indigena tradicional en el estado Chiapas. [Back to the case of ICBG-Maya]

2001. *El Cotidiano* (Mexico). Biopiratería y resistencia en México.

- Some Specific indigenous knowledges

2001. *Agrociencia*. **Title** : Conocimiento indígena del efecto de plantas medicinales locales sobre las plagas agrícolas de Los Altos de Chiapas, México [with a proposal to use them for a biological control of pests]

2005. *Revista Austral de Ciencias Sociales.* **Title** : **Mujeres indígenas**, conocimientos y derechos intelectuales [Due to the sexual division of work there are specific knowledges of the Women, and they are hardly acknowledged]

-Pedagogy, Indigenous Teachers’ training

2006. *Cuadernos Interculturales.* **Titre** : Conocimiento de *relación de parentesco* como contenido educativo para escuelas situadas en comunidades Mapuches de Chile.
2010. *Comunicar.* **Titre** : Conocimiento indígena sobre el medio ambiente y *diseño de materiales educativos*
2011. *Perfiles Educativos.* **Titre** : *Educación superior intercultural* en México

-Mitigation of modern and traditional knowledge in practice.

2004. *Interciencia.* **Title** : Conocimiento indígena vs científico: **el conflicto** por *el uso del fuego* en el ParqueNacional Canaima, Venezuela.
Es importante analizar y comparar el conocimiento ecológico sobre el fuego entre los indígenas Pemón en el ParqueNacional Canaima, Venezuela, con elde los técnicos y científicos, para esclarecer las causas del largo conflictoentre las dos partes por el uso del fuego en esta área protegida. Durante décadasse ha tratado de restringir laquema de sabana en el Parque Nacionalpor parte de los Pemón, debido ala creencia que el fuego causa la desapariciónde los bosques. Los datospresentados exponen argumentos culturalesy ambientales, hasta la fecha ignoradaspor científicos y técnicos, sobrelos cuales se basa la lógica Pemóndel uso del fuego. De modo similar aotros casos documentados en Australiay Africa Occidental, se demuestra quelos Pemón utilizan la quema de sabanacomo herramienta de manejo de la tierrapara prevenir grandes incendios forestales.Esta información es de importanciapara integrar la realidad culturaly ecológica del área al programa de control de incendios existente en elparque desde

1981. También se analizany se comparan las percepciones sobrecambio ambiental entre los técnicos,científicos y Pemón, considerandoespecialmente el papel del fuego eneste proceso. Existen coincidencias ydiscordancias importantes entre el conocimiento ecológico del fuego, que debenser consideradas en el diseño deun sistema de manejo del fuego que integreambas formas de conocimiento.

2012. *Chungara Revista de Antropología Chilena.*
Title : Neoliberalismo Multicultural en el Chile post-dictatura : La Politica indigena en Salud y sus efectos en comunidades Mapuches y Atacamenas. [A case study about the insertion of tradi-praticians within the health (public) sector = the outcome is a *professionnalisation* of traditional knowledge, forging *experts*, and some bureaucratisation of the knowledge practice.]
[N.B. Remmeber that Indigenous knowledge normally links speculation with a cosmogony and a territorial approach.]

Also:
« Contribuições das plantas medicinais para o cuidado e a promoção da saúde na atenção primária »
[About a programme of certified tradipraticians in Brazil]

2009. *Bulletin de l'Institut français d'études andines*
Title : Pueblos indígenas y *cambio climático*: el caso de la Amazonía colombiana (a survey)

AGRO ECOLOGY, AGRO FORESTRY

6°) Agro-ecology, Agro-forestry [our query: "Agroecolo*, OR Agroforest*"]

- Manifestoes, advocacy and stance against global agribusiness; case studies of alternative (small & local) projects. Agro-ecology against Capitalism.
- Some good traditional practices (agro, soil) and how they have been integrated in small scale development projects. Measurements of damage on environment by "conventional" farming (with large input of chemicals) . Agro-forestry and biological control against pests.
- Scholarly and empirical demonstrations of the merits of agro-ecological approaches. A review of the schools of thought. A survey of the (various) practices. An attempt to establish a "science" unified around the concept of resilience. Methodological debates and theoretical qualm.
- A portrait of the profession of agronomists
- Agro-ecology as a new Marxism ? (Holistic approach, praxis and adjacency to social (peasant) movements).
- Full Transition of the global agro-food system to GMOs or to Agroecology ?

1° Manifestoes

- *Conventional agriculture and biotechnologies against Health and Humanity.*

"Gestão ambiental e democracia: análise crítica, cenários e desafios"

O artigo discute limites, alternativas e desafios da gestão ambiental nas sociedades contemporâneas inseridas no capitalismo globalizado a partir de uma análise crítica **apoiada em autores das ciências sociais, da ecologia política e da saúde coletiva**.

Para isso, sistematizamos o significado da gestão ambiental hegemônica em sua vertente da ecoeficiência e seus limites para o enfrentamento dos riscos ambientais e para a construção de processos e sociedades mais democráticos. Construímos quatro tipos ideais de cenários envolvendo possíveis combinações entre gestão ambiental e democracia. Este modelo serviu de base, juntamente com trabalhos acadêmicos e a experiência teórica e militante dos autores, para uma reflexão sobre as características atuais e as tendências futuras de gestão ambiental e democracia, com ênfase na realidade latino-americana, mais especificamente na brasileira. Por fim, discutimos possibilidades de transformação social a partir das contradições e alternativas emancipatórias decorrentes das confrontações entre tendências hegemônicas do mercado e contra-hegemônicas provenientes de utopias e movimentos sociais, estas assumindo princípios da justiça ambiental, da economia solidária, da agroecologia e da sustentabilidade, bem como da construção de novas epistemologias.

Dialogo entre Agroecologia e promoçao da Saude

Objetivo: Identificar aspectos que relacionam a **agricultura familiar ecológica** e a promoção da saúde de agricultores membros da Associação para o Desenvolvimento da Agroecologia do Paraná - AOPA. Métodos: Pesquisa qualitativa, de caráter exploratório. Entrevistas semiestruturadas foram realizadas, no período de outubro a novembro de 2007, com 6 agricultores da AOPA, tendo como base um roteiro com questões a respeito dos fatores que motivaram a transição para a agroecologia; e a percepção dos atores sobre possíveis mudanças na alimentação e na saúde das famílias relacionadas à inserção neste sistema produtivo. Resultados: Observou-se que o principal motivo de transição para a agroecologia foram as questões relacionadas à saúde, sobretudo a ocorrência de intoxicações por agrotóxicos. Sobre a saúde das famílias destacou-se o autocuidado e o uso de práticas naturais de saúde, e em relação à alimentação da família foi registrado o aumento da produção de alimentos para o consumo. Conclusão: A partir da percepção dos agricultores foram identificados aspectos relevantes e em sintonia com alguns dos campos da Promoção da Saúde, em especial vinculados à criação de ambientes favoráveis ao desenvolvimento de habilidades pessoais e ao reforço da ação comunitária, os quais indicam que a prática da agricultura familiar ecológica pode ser considerada uma ação promotora da saúde dos agricultores e de suas famílias.

2008. *Tabula Rasa*(Colombia) par EDGARDO LANDER (Universidad Central de Venezuela);
Title : La ciencia neoliberal […tendencia creciente a la mercantilización de la ciencia, en particular (pero no sólo) las disciplinas asociadas a la biotecnología y la biomedicina… múltiples **formas de resistencia** y **búsquedas de alternativas** a este orden global]

- *The Scientific base*

La diversidad de los agroecosistemas (***F. Sans, Barcelona***), 2007
El artículo analiza el efecto de la intensificación de las actividades agrícolas sobre el funcionamiento delos agroecosistemas y destaca la necesidad de incorporar las bases científicas y los modelos de gestión de la agroecología que *permitan armonizar la producción agraria, la conservación de los recursos naturales y el desarrollo rural*. Se discute la importancia de la diversidad en elfuncionamiento de los agroecosistemas y la necesidad de identificar el tipo de diversidad que se quiere mantener o favorecer con el objetivo del legar a un equilibrio ecológico y, en consecuencia, proponer las prácticas agrícolas más adecuadas para favorecer la diversidad. Además elartículo muestra que la agricultura ecológica favorece la diversidad de las comunidades arvenses en los cultivos cerealistas mediterráneos y la presencia de especies propias de los sembrados. La agricultura ecológica –principalmente la ausencia de herbicidas- conlleva un aumento de la abundancia de las especies arvenses y cambios en la composición florística al favorecer las especies de hojas anchas y polinizadas por insectos, y las leguminosas. El artículo señala la importancia de estudiar estas ***interacciones*** desde un punto de vista ecológico con objeto de valorar su papel en la estructura trófica de los agroecosistemas e identificar potenciales especies perjudiciales o benéficas desde un punto de vistaagronómico.

- *Success stories* [small cooperatives, networks of direct marketing, miracle cultures: *arroz ecológico, algodão*, and fruits: *Coyul* …]
- *… and small studies*

NARRATIVAS ÉTICAS, SIMBÓLICAS Y POLÍTICAS ASOCIADAS AL CONSUMO DE ALIMENTOS AGROECOLÓGICOS. UN ESTUDIO DE CASO

Este artículo tiene como fin precisar y analizar algunas de las cuestiones éticas, simbólicas y políticas asociadas al consumo de alimentos agroecológicos, implícita y explícitamente manifiestas por los consumidores al optar por este tipo de alimentos. Los hallazgos dan cuenta de las narrativas mediante las cuales los consumidores justifican para sí y para los demás dicha elección preferencial. **Empíricamente**, lo expuesto se sustenta en el análisis de los razonamientos y prácticas de algunos frecuentadores permanentes y ocasionales del Mercado Agroecológico de Manizales, espacio de encuentro e interacción auspiciado por el Jardín Botánico de la Universidad de Caldas. Los resultados se organizan en torno a cinco ejes relacionales: a) consumo agroecológico y responsabilidad socioambiental, b) consumo agroecológico y práctica ciudadana, c) consumo agroecológico y diferenciación identitaria, d) consumo agroecológico, afectividad y cuidado, e) consumo agroecológico y expectativas alimentarias, y f) consumo agroecológico y evocación sensorial. El artículo concluye reforzando el acto de preferir alimentos agroecológicos como un proceso de apropiación de los significados y valores contenidos en cada producto, a la luz de las representaciones construidas por los consumidores.

- *Several empirical studies*

2006. *Interciencia* : Agrobiodiversity and technology in resource-poor farms

[A survey : there is more biodiversity in agroecological farms]

Farms managed by peasants are traditionally considered as containing a high level of agrobiodiversity. However, the internal heterogeneity of their farming systems and the links between agrobiodiversity, technology and peasant livelihood strategies have been **much less explored**. In order to explore these relationships,a comparison was carried out between two groups of resource-poor farmers in Northeastern Argentina: agroecological farmers and tobacco growers. The results suggest that the high agrobiodiversity observed in these farms rests on four main diversification strategies: genetic, spatial, temporal, and management diversification. Agrobiodiversity is also the result of the type of technologies used within these farms and the conditions in which the productive processes take place. Despite the fact that both groups of farmers have a very similar farm structure, a shared technological matrix and the same fine-grain logic underlying their approach to farming, their farms showed markedly different levels of agrobiodiversity. Agroecological farmers managed more than three times as many species as did tobacco growers. They also devoted significantly more species to self-consumption and self-input. The findings described here have implications for rural development and policymaking, since the embracement of different approaches to farming can produce largely different impacts on both peasant livelihoods and the environment.

- *Some « key-ideas »*

Agroecología y sustentabilidad 2008
Este artículo enfatiza la importancia de la agroecología en la búsqueda de lasustentabilidad en el manejo de recursos naturales en **zonas rurales**. Se inicia discutiendo la relevancia de lograr el equilibrio en tre los sistemas natural y social para la sustentabilidad. Sepropone la interpretación integral de los sistemas naturales y humanos a través del concepto de **coevolución**, así como la incorporación de elementos socioculturales y económicos en el análisis de ecosistemas, enfatizando el reto de la *transición desde el valor del mercado hacia el valor ecológico y el bienestar humano*. En la segunda parte del trabajo se presenta el carácter multidisciplinario del manejo del sistema agroecológico, como requisito primordial para su sustentabilidad, resaltando la importancia de la agroecología en los esfuerzos para lograr el desarrollo, la productividad y **la utilidad social** a largo plazo. El trabajo finaliza discutiendo el reto de la investigación agrícola hacia el estudio de las interacciones complejas y la transdiciplina, enfatizando la importancia de las instituciones en la investigación y promoción de la prácticaagroecológica, para concluir analizando las *aplicaciones, limitaciones, potencialidades y perspectivas de la agroecología como disciplina emergente*.

« Economia social »

Em função dos seus princípios fundadores, os empreendimentos de Economia Social apresentariam um conjunto de ações ambientalmente mais sustentáveis do que seus equivalentes capitalistas? Ou a crescente importância política, social e legal da temática de sustentabilidade socioambiental teria impresso um marco positivo no meio empresarial? Essas perguntas guiaram o estudo de caso no qual foram comparadas as formas de uso de bens naturais, notadamente a água e os solos, contrastando dois empreendimentos de economia social -uma cooperativa de arroz ecológico em Tapes (RS) e uma rede de produção de algodão em consórcios agroecológicos em Tauá (CE) - com empreendimentos capitalistas dos mesmos ramos de produção agrícola e nos mesmos locais. A pesquisa, realizada por meio de entrevistas, observações de campo, levantamentos bibliográficos e documentais, demonstrou que as ações virtuosas ambientalmente divergem por tipo de empreendimento e não por tipo de produto cultivado, sendo os empreendimentos de economia social, naqueles casos estudados, efetivamente mais virtuosos do que os empreendimentos capitalistas.

- *A « review » of the schools of thought*

Escuelas de pensamiento ecológico en las Ciencias Sociales 2008, *Estudios Sociales* (México)

En este trabajo se esbozan cinco escuelas de pensamiento ecológico dentro de las ciencias sociales: (1) elmodelo dominante de **desarrollo sustentable**, que corresponde a lapropuesta reformista esbozada en ellnforme Brundtland y la Agenda 21;(2) la **economía ambiental**, que representa un esfuerzo por incorporar consideraciones ecológicas a la teoría neoclásica de economía; (3) la **economía ecológica**, que incluye unanálisis de flujos de energía, apuntando hacia las limitaciones de la economía ambiental; (4) la **ecología política**, que constituye un esfuerzo por analizar la compleja dinámica socioeconómica detrás de los problemas ambientales, enfocándose en las *relaciones de poder* entre diferentes actores y grupos sociales; y (5) la **agroecología**, que pretende rescatar y desarrollar los aspectos positivos de la producción campesina tradicional. El objetivo es construir un mapa para ayudar a orientar a todo aquel que tenga interés en explorar los temas ambientales desde el óptico de las ciencias sociales.

- *Methodological matters*

« La *investigación participativa* en agroecología: una herramienta para el desarrollo sustentable »

- *Agroecology : Theory or Praxis ?*

LA AGROECOLOGÍA: UN MARCO DE REFERENCIA PARA ENTENDER SUS PROCESOS EN LA INVESTIGACIÓN Y LA **PRAXIS**
La Agroecología es **un referente teórico**, que ***sirve de orientación general*** para las experiencias de agriculturas ecológicas, desde el ámbito local, para el fortalecimiento de los sistemas de producción, con un respeto por las estructuras ecológicas y sociales. Desde este fundamento, se generó la necesidad de ganar espacios en la academia y las instituciones de investigación, para enriquecer las bases epistemológicas de la Agroecología a través de la investigación científica, buscando hacer un cambio del paradigma científico. ***Se plantea la Agroecología como un movimiento social***, sin desconocer que los resultados cimientan los soportes para las investigaciones científicas de la academia. Entonces, la interacción entre la investigación en Agroecología y los movimientos agroecológicos son un desafío para ésta, que hasta ahora no ha planteado estudios sin que haga una división entre *el modelo* ***reduccionista*** *del paradigma científico convencional, y los enfoques* ***sistémicos y holísticos*** *de la Agroecología*, buscando considerar estudios integrados que circulen en la complejidad de los sistemas naturales y sociales. Para entender los enfoques de la Agroecología y el planteamiento de la investigación, se hace necesario conocer las bases conceptuales. Así la ***Agroecología como planteamiento investigativo*** tiene la premisa de tener *una formulación social, que se sustente en movimientos participativos* para la construcción de conocimientos *a partir de experiencias ancestrales* o *principios de* ***coevolución*** *social y ecológica.*

- *Agroecology as a « Science » ?*

« La ciencia emergente de la sustentabilidad: de la práctica científica hacia la constitución de una ciencia »
El término "ciencia de la sustentabilidad" se ha utilizado para referirse más a la actividad científica orientada a promover el paso de las sociedades hacia trayectorias sustentables, que para hacer alusión a un conjunto de principios bajo los cuales una comunidad científica pueda construir ***conocimiento de forma sistemática alrededor de un objeto de estudio***, que es lo que caracteriza a una ciencia. Este ensayo sostiene la tesis que en el seno de esta actividad científica está emergiendo una ciencia de la sustentabilidad en el sentido moderno y ***no meramente una práctica*** científica. Esta afirmación tiene fundamento en el hecho de que es posible definir **la resiliencia socioecológica de los sistemas** como

objeto de estudio de la ciencia de la sustentabilidad, que es *el soporte de transdisciplinas como la economía ecológica, ecología política, ética ambiental, ecología industrial, ecología cultural y la agroecología*; y además, este objeto de estudio está ontológica y epistemológicamente sustentado.

- *Agroecology and its publics*

2013, *Interciencia* , Agroecologia e sua epistemologia.

As Representações Sociais da Agroecologia para a Agricultura Familiar a Visão de Pesquisadores, Extensionistas e Produtores Rurais Este artigo tem por objetivo compreender as representações sociais da agroecologia para pesquisadores do Instituto Agronômico do Paraná (Iapar), extensionistas do Instituto Paranaense de Assistência Técnica e Extensão Rural (Emater) e produtores rurais da agricultura familiar. Para tanto usa como base a Teoria das Representações Sociais, e adota um percurso metodológico qualitativo e descritivo. A análise realizada ilustrou as representações sociais da agroecologia para os três atores envolvidos com trabalhos agroecológicos. Notou-se que há grande preocupação com o meio ambiente, com a saúde dos envolvidos e com a complexidade inerente do trabalho agroecológico. Para os agricultores, a principal preocupação é com o retorno financeiro. Encontraram-se representações que retratam preconceitos e descasos que a agroecologia ainda sofre em suas áreas para os três atores implicados. Foi possível concluir que o objeto da representação social ainda possui obstáculos, pelo fato de ir contra a corrente de pensamento vigente.

- *A general conversion af agriculture to Agroecology ?*

Title: « Conversión agroecológica de sistemas convencionales de producción: teoría, estrategias y evaluación »

Abstract. La conversion de sistemasconvencionales de produccion, caracterizados por monocultivos manejados con altos insumos a sistemas diversificados de bajos insumos, se basaen dos pilares agroecologicos: la diversificacion del habitat y el manejo organico del suelo. El funcionamiento optimo del agroecosistemadepende de disenos espaciales y temporales que promueven sinergias entre los componentes de la biodiversidad arriba y abajo del suelo, lascuales condicionan procesos ecologicos claves como la regulacion biotica, el reciclaje de nutrientes y la productividad. La evolucion de latransicion agroecologica puede ser monitoreada por *un conjunto de* ***indicadores de sustentabilidad*** *que estiman la calidad del suelo y la salud delcultivo*.

- *Inclusive innovation*

« Fundamentos culturales, sociales y económicos de la agroecología », 2004

[There is a contradiction between two agricultural « modes » : "el modo agrario tradicional (indígena, campesino) y el modo **agroindustrial** (convencional)"]

La agroecología, como enfoque ecológico del proceso agrícola, no solo abarca laproducción de alimentos; sino, que toma en cuenta los aspectos culturales, sociales yeconómicos, que se relacionan e influyen en la producción. Así, situados como dosmodos radicalmente diferentes de apropiación del ecosistema, el modo agrariotradicional (indígena, campesino) y el modo agroindustria (convencional) conformanlas dos maneras de concebir, manejar y utilizar los agroecosistemas.

2013 MEX Chapingo. Miguel Angel Sámano Rentería (Universidad Autónoma Chapingo - México);

La agroecología como una alternativa de seguridad alimentaria para las comunidades indígenas

[… se resisten a desaparecer y buscan **alternativas junto con algunos intelectuales** que apuestan por la **vía campesina e indígena de producción, basados en los conocimientos sistematizados por la ciencia de la agroecología]**

- *Agroecology and Social Movements*

EL NEOLIBERALISMO Y LA “CONSTRUCCIÓN DE TERRITORIOS POPULARES” EN EL AGRO ARGENTINO CONTEMPORÁNEO: EL "DEBATE AMBIENTAL CAMPESINO" Y EL MNCI (1976-2010)

El trabajo pretende ver cómo el ascenso del modelo económico neoliberal reconfigura las relaciones políticas y organizativas en el agro argentino. En ese sentido, intentaremos analizar el contexto socio-político en que nace el MNCI (Movimiento Nacional Campesino Indígena), las relaciones posibles entre el ascenso neoliberal y el nacimiento del Movimiento; sus formas organizativas y los cuestionamientos que el MNCI hace al modelo económico imperante, y la lógica productiva propugnada por éste (**agronegocio, monocultivos, transgénico, etc**.). Siendo así, pretendemos hacer un análisis del aumento productivo impulsado con el neoliberalismo y los cambios en los "modos" de producción en el "campo" realizados en las últimas décadas, paralelo al surgimiento del MNCI contestando este modelo desde una mirada "contrahegemónica". Por consiguiente, analizaremos las distintas formas de intervención y construcción de territorios trazadas, por un lado, de forma hegemónica desde el ascenso neoliberal y el advenimiento de los productos transgénicos y, por el otro, frente a las proposiciones planteadas por el MNCI y su propuesta agroecológica y "campesina". En este sentido, la "cuestión ambiental" toma centralidad en los análisis de los cambios productivos y de política económica realizados con el avance neoliberal y sus efectos sociales en el "agro" (éxodo rural, desposesión, etc.), que incrementan el avance del "modelo neocolonial extractivo" y generan impactos significativos hacia los ecosistemas naturales y sus ciclos reproductivos. Las distintas formas/propuestas de apropiación de estos ecosistemas, y los distintos impactos producidos por cada una, van a ser problematizados en el presente trabajo.

« La ausencia campesina en la Argentina como producción científica y enfoque de intervención »

En el presente artículo los autores plantean que es imprescindible recuperar un concepto con vasta trayectoria en los estudios rurales. Para ello se problematizan las formas en que dicho concepto fue caracterizado tanto desde la academia como desde los programas de intervención estatal. A la par, se propone un cambio epistémico que permita reconocer **al sujeto campesino en sus discursos y prácticas**: *Soberanía Alimentaria, Reforma Agraria Integral, Agroecología y Justicia Ambiental* dan cuenta tanto de la historicidad del sujeto como de la capacidad del mismo de insertarse en debates actuales que convocan a toda la sociedad.

La *gestión pública ambiental* rural, un tema abierto al debate

El presente ensayo indaga, con el empleo del método socio- jurídico, por la gestión pública ambiental rural desde el derecho ambiental y agrario y las ciencias ambientales. Para proponer alternativas de gestión pública en este campo, hace referencia a diferentes figuras jurídicas vigentes en Colombia, entre las que se destaca las zonas de reserva campesina de la ley de reforma agraria. Para concretar las propuestas de solución, toma como ejemplo paradigmático el caso del agroecosistema intervenido por los silleteros de Santa Elena en el Departamento de Antioquia, ubicados en un borde de la ciudad metropolitana, desde la visión de la nueva ruralidad y con aportes desde la ecología política y la agroecología.

- *Technology and social movements*

Separación o integración para la conservación de biodiversidad: la ideología detrás del debate "land-sharing" frente a "land-sparing" 2012 Ecosistemas Espana)
La mayoría de los bosques en el neotrópico están fragmentados. Frecuentemente los fragmentos de bosques se encuentran en una matriz agrícola que consiste en diferentes tipos de agroecosistemas. En este artículo discutimos la falacia del argumento "land-sparing" que promueve la intensificación de la agricultura como mecanismo de protección de bosques y por ende de la biodiversidad. También discutimos el contenido ideológico del debate de separación (land sparing) frente a integración (land sharing). Posteriormente argumentamos que es en la matriz agrícola donde se deben enfocar los esfuerzos de conservación de biodiversidad. Nuestro argumento usa evidencia empírica y la teoría de metapoblaciones para proponer que la mejor estrategia para evitar la pérdida de biodiversidad en paisajes fragmentados es desarrollar sistemas agrícolas diversos y ecológicos que promuevan la migración de organismos entre fragmentos de bosques. La calidad de la matriz con respecto a los procesos metapoblacionales incrementa con la diversificación de los agroecosistems, la incorporación de árboles y otros elementos que aumentan la diversidad estructural de los agroecosistemas y la eliminación de agroquímicos tóxicos. *Las iniciativas agroecológicas del movimiento* ***Campesino a Campesino*** *y de movimientos sociales de pequeños*

agricultores como ***la Vía Campesina*** *representan los mejores aliados de la conservación* de los bosques y la biodiversidad en el neotrópico.

N.B. SUSTAINABLE

No specific references : see above «Environment & Governance" and "Agroecology"

Remember also the following paper by Reyes-Muro et al.:

2011 *Rev Mex de Ciencias agricolas,* Luis Reyes-Muro (Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias - México);Miguel Ángel Damián Huato (Benemérita Universidad Autónoma de Puebla - México);Jesús Axayacatl Cuevas Sánchez (Universidad Autónoma Chapingo - México);Fernando Manzo-Ramos (Colegio de Postgraduados - México);

Title : ENFOQUES DE INVESTIGACIÓN SOSTENIBLE, ECOLOGISTA Y PRODUCTIVISTA: **INFLUENCIAS EN LOS CIENTÍFICOS**(AS)

Abstract : Los científicos(as) agropecuarios(as) están influenciados(as) por diversos factores para definir su enfoque de investigación. El objetivo de este trabajo fue identificar aspectos demográficos y profesionales, institucionales e influencias internas-externas asociados al enfoque sostenible, ecologista o productivista de los científicos(as) en Aguascalientes, México en 2008. Los enfoques fueron sometidos a un análisis de correlación con 44 factores de influencia. El enfoque **sostenible** correlacionó positivamente con la especialidad, la solución de problemas de interés institucional, investigación en terrenos de productores e investigación en sistemas de producción y negativamente con investigación básica y biotecnología. El enfoque **ecologista** correlacionó positivamente con la opinión del grupo interdisciplinario en la definición del problema a investigar. El enfoque **productivista** correlacionó positivamente con la especialidad, opinión del usuario y colegas en la definición del problema, estudios en terrenos de productores y en la estación experimental, trabajos por componente tecnológico y con la objetividad del investigador(a), y negativamente con la disciplina ecología. El modelo de regresión logística para la investigación con enfoque sostenible se explica por el origen de los investigadores(as), estancias de investigación, tipo de institución, fuente de financiamiento, investigación por demanda del usuario y prioridad institucional, trabajo interdisciplinario, estudios tanto en sistemas de producción como por componente tecnológico. El modelo ecologista se explica por las estancias de investigación, aprobación del proyecto por un comité técnico, investigación en terrenos de productores, trabajo interdisciplinario y estudios en sistemas de producción. El modelo productivista tuvo las variables explicatorias tipo de institución y trabajo en sistemas de producción.