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Two questions for the Economic-Environmental Auditor are: why should one or another topic be audited? We cannot audit everything. Second, is the topic auditable? I shall remain within this framework.

Not so long ago wetlands and mangroves were described as “malarial swamps” that should be drained (*bonifica* in Italy). Now we have the Ramsar convention, and many conflicts around the world on the preservation of mangroves against the shrimp industry, and the preservation of wetlands against public works, housing for tourists, or agriculture (as in Catalonia in the Llobregat Delta, the Ebro Delta, the Empordà (Costa Brava)).

Not so long ago deforestation in order to put fields into cultivation or pastures was seen as progress in European history. It is still subsidized in Brazil in the form of road building in the Amazon. Now we have REDD, discussed in Copenhagen in December 2009. This means payments for avoided deforestation. Better REDD than dead, or suffocated by increased temperatures.

Economic accounting rests on really existing costs and prices. It does not take into account positive or negative externalities. This is true in business firms, public companies and administration, and in macro-economic accounting.

Human population and loss of biodiversity

Not so long ago environmentalists were alarmed by the prospects of population increase. However, the world human population might peak at 8.5 billion before 2050, earlier than it was thought. It might then decline to 6 billion. Depopulation might have negative economic and environmental consequences locally (as we see in some regions of central and east Europe) but at world level it goes together with a decrease in the HANPP, the human appropriation of net primary production.

A lower HANPP means less pressure on biodiversity, because more food is available for other species. The European Union had once the goal of “halting the loss of biodiversity” by

2010. A decrease in the HANPP would be favoured by a decrease in the human population. So, depopulation is good and bad, and we cannot reduce its effects to a single dimension.

What is the role of the Economic-Environmental Auditor when politicians at international, national or regional levels push for public policies against wetlands, or they increase the HANPP by subsidizing biofuels, or give prizes for higher birth-rates (with the spurious argument that a larger population will make the payment of pensions easier)?

Integrated assessments at the macro level

Why is GDP growth still “good” (in economies with income per capita of 20,000 euros per year)? Auditors in Europe should ask the politicians and public administrators why GDP growth is the main objective of public policies.¹

When a region in Europe in 2009 experiences a decrease in GDP because of the economic crisis, and also increased unemployment (bad), decreased emissions of greenhouse gases (good), less soil sealing (good), are we worse off or better off?

In the debates on the relations between the economy and the environment the two main positions are identified as “weak sustainability” and “strong sustainability”. The split arose in 1977 when economists Solow and Stiglitz (weak sustainability) debated against Daly and Georgescu Roegen (strong sustainability).

Strong sustainability means that so-called “natural capital” (e.g. the decreased availability of fishes) is not substitutable (in the long run) by increases in manufactured capitals (kw of power in the fishing fleet). The notion of *weak sustainability* allows instead for an increase in manufactured capital or ecological restoration to compensate always for a decrease in natural resources. A third view allows for some substitutability without drawing down “critical natural capital”.

At the academic level, there is a new debate in Europe on Economic Degrowth. This follows, 30 years later, from Nicholas Georgescu-Roegen’s book (edited by Jacques Grinevald and Ivo Rens in 1979): *Demain la Décroissance*. Now it is *aujourd’hui la décroissance*.

GDP should be supplemented by social and environmental indicators that become more visible politically. The public administrators should report on social and environmental indicators (as they do already), and also try to assess them all together with the economic indicators (within a macro-multi-criteria assessment).

¹ <http://www.clubofrome.at/2009/degrowth/proceedings.html>

This is a debate that President Sarkozy is now pushing in Europe, and also Environment Commissioner Stavros Dimas. When invited to one of Dimas' meetings in Brussels recently, I wrote back that I was disgusted by the lack of historical memory (no mention of Georgescu-Roegen 1971, Roefie Hueting, 1980, Herman Daly, 1973, René Passet, 1979). Even more disgraceful was not to quote Sicco Mansholt, a president of the European Commission who already in 1972 wanted to debate on GDP growth.

Acknowledging the critiques against GDP from the 1960s and 1970s is a matter of intellectual honesty. It also reinforces today's arguments by Sarkozy et al, because one cannot attribute the critique of GDP only to sour grapes in the current economic crisis. In Spain there was a high level commission on environmental statistics and national income accounting before 1982. Its secretary was the ecological economist J.M. Naredo. The commission was dismissed when the Socialists came to the government in 1982.

Eco-feminist economists (cf. Marilyn Waring, *Counting for nothing*, 1988) insist on the fact that unpaid work (domestic and voluntary work) comprising a large number of hours is not included in the GDP. As Julie Nelson writes in *Ecological Economics* (69, 2009): "One would search in vain in the most paradigmatic models of economics for any inkling of where the materials used in production came from, or where the detritus from the production process goes. Similarly, one would search in vain ... for a discussion of where economic agents come from, or where they go (and who takes care of them) when they are broken or used up".

Jeroen van den Bergh (Free Univ. of Amsterdam, and a research professor at ICTA-UAB) recently authored an article (the initial title was "Abolishing GDP") trying to explain why despite "all theoretically and empirically motivated criticism of GDP as a social welfare and progress indicator, its role in economics, public policy, politics and society continues to be influential".²

The Sarkozy-Dimas initiatives are not new but they are politically useful for the Economic-Environmental Auditor promoting the multi-dimensional assessment of socio-economic-environmental sustainability at the level of firms, municipalities, regions, states. The Auditor should examine the proposals for *changes in reporting macro-economic accounting* (also at the firm level) that better reflect (not only in money terms) the existence of environmental liabilities.

² J. van den Bergh, The GDP Paradox, *Journal of Economic Psychology*, 30(2), 117-135, 2009. Sobre

Because of the economic crisis, some economic indicators are deteriorating, some environmental indicators improve, some social indicators improve and some are deteriorating. We should not add them all up into a single index.³ The Human Development Index takes into account social factors apart from GDP but it does not take into account environmental damages. It correlates too closely with GDP. The Auditor should not simplify too much (e.g. the "ecological footprint"), and not follow slogans (the "triple bottom line").

A socio-ecological transition⁴

Until 2007 all forms of energy were growing in the world economy. Coal extraction increased six times in the 20th century, oil and gas much more than this. When the economy grows, increased efficiency in energy conversion leads in part to Jevons Paradox or the rebound effect, i.e. more energy instead of less energy is used because energy becomes relatively cheaper because of the increased efficiency.

Oil extraction will soon reach the Hubbert peak, perhaps already reached it at 87 mbd in 2007. But this might lead to increased coal extraction, with terrible effects on the greenhouse effect, and many local negative externalities. So, one cannot be optimistic although world carbon dioxide emissions peaked in 2007, they are down at least 3 % in 2008-09. This strong, early reduction had not been foreseen by the IPCC or by Lord Stern (a problem of mental censorship). Is this a peak in a cordillera of peaks?

On the other hand, what is the effect of the economic crisis on biodiversity? Probably good, there will be less deforestation because of less demand for meat and paper. One topic for an audit would be to determine whether there is consistency between the Overseas Development Assistance given by the regional government and the environmental goals of reducing GHS emissions and halting biodiversity loss around the world.

An audit could look into *biofuels* programmes meant to reduce GHG emissions, whether they really do so in an effective and cost-effective manner, researching also the consistency between biofuels programmes and the goal of halting biodiversity loss, taking into account

³ Cf. S. Shmelev and B. Rodríguez-Labajos, Dynamic multidimensional assessment of sustainability at the macro level: the case of Austria, *Ecological Economics*, 68, 2560-73, 2009.

⁴ M. Fischer-Kowalski, H. Haberl eds, *Socioecological Transitions and Global Change: Trajectories of Social Metabolism and Land Use*. Edward Elgar, Cheltenham, 2007,

the low EROI in biofuel production, the increased HANPP, and also the “virtual” water spent in cultivation. International impacts should also be considered.⁵

Are externalities market failures or rather they are successes in cost-shifting?

The Stern report (2006) said that climate change is the largest market failure ever. In fact, biodiversity loss, the 6th great extinction, is perhaps a “bigger” market failure. We have no idea how to count it in money terms. Rather than an “externality” to be internalized into the price system, we have cases of “successful cost shifting” to future generations and other species, and to poor people today.

Externalities are damages not measured either by market prices or by private or public accounting rules. Other great market failures are the introduction of new risky chemical compounds and radioactive elements (like plutonium), or the disappearance of 6000 human languages in the 21st century (including Basque, Quechua, Catalan?)... The competition is open.

There are social reactions against systematic cost-shifting in resource extraction conflicts (mining, quarries, oil and gas fields), transport conflicts (Val di Susa?), waste disposal conflicts (incinerators, or waste dumps as in Campania?). Such movements proclaim, “we are not NIMBY but NIABY”, not in anyone’s backyard.

In Catalonia as in Toscana and elsewhere, there are cases of local resistance to wind energy. One audit could assess whether regional subsidies for wind power are achieving their goal of reducing GHG compared to fossil fuel electricity, taking also into account landscape and cultural patrimony losses.

Consider also positive externalities. In a FP7 project, Civil Society Engagement with Ecological Economics, www.ceecec.net, we consider investments in “water harvesting” in India. If done with voluntary work, they would not appear in GDP economic accounting, if done with paid labour (under NREGA, rural employment guarantee act), they appear at factor cost.

The environment is not a luxury good

It is often argued that only the wealthy have the luxury to be concerned about the environment. This is the so-called “post-materialist” thesis of Inglehart (1990), Krutilla (1967) and others. There are two flaws in this thesis. First, continued economic growth implies

⁵ M. Giampietro and K. Mayumi, *The Biofuel Delusion*, Earthscan, London, 2009. EROI means the energy return on energy input.

environmental degradation at home or abroad, and secondly, the world's poorest receive a large percentage of their livelihoods directly from ecosystems (firewood, fish and game, medicinal plants), and therefore they often fight for the environment. The "GDP of the poor" (TEEB 2008) is undervalued since so much of it depends on un-priced inputs from nature.

This is important for economic-environmental auditing in the South. It is also important for assessing the environmental liabilities of foreign companies in poor countries, and when looking at flows of international trade (ecologically unequal trade). All humans depend on the environmental services from nature – the sun energy and photosynthesis, the rainfall. Poor people depend from such services more directly. If the water becomes polluted by mining (e.g. Vendanta from London in the Niyamgiri hill in Orissa, a territory of the adivasi Dongria Kondh), people living with one dollar per day in cash, cannot afford to buy "plastic" water.

Where to place a waste dump in the presence of incommensurable values?

Auditing of public investments should take into account the value of their benefits, and also the destroyed landscapes, the damages to biodiversity, the cultural damages, and the damage to poor people's livelihood. In which units of account?

Let us consider a European example. Where to build a waste dump near a city? Public decisions must be not only legal but sufficiently justified. The question is, which location, A, B, C, D, would you sacrifice to make a waste dump?

Values / Locations	Biodiversity (species richness, endemism)	Cultural, historical value	Economic value
Location A	first	second	third
Location B	second	third	first
Location C	third	first	second
Location D (not ranked still)			

Each alternative location "dominates" the other two on two criteria. Shall we add more criteria? Shall we give weights to the criteria? Shall we reduce all values to economic value, in order to have a single ranking?

Location A, a most valuable site on the biodiversity scale, does not do very well in economic valuation. Then, (in order to spare its sacrifice) we could resort to extra-market economic valuation, how many people travel to visit it and see the birds or the frogs or the butterflies,

how much money they spend (travel cost method), or a survey is run on the willingness to pay to conserve the site (contingent valuation, stated preferences in money terms).

Notice that Location C could also increase its economic value. How many visitors that historical site gets, which travel costs do they pay? Is this perhaps a sacred place, the "priceless" site of famous (lost) battle?

Who has the power to decide the method for decision-making? Which valuation languages are allowed or forbidden? We have to take decisions taking into account the money values but also other relevant values. Cosmetic Environmental Impact Assessments do not solve such issues. The Environmental Auditor should recommend the use of participatory multi-criteria evaluation.

Green Keynesianism in the crisis of 2008-09 and investment in infrastructures

Relentless, large public investments in so-called infrastructures (e.g. the airport and the new harbour in Barcelona) are financed with European, state and regional funds. The rationale for such investments (underused for the time being) is a projection of trends in passenger number and in materials trade, inconsistent with policies meant to internalize the environmental costs into prices (e.g. carbon dioxide emission costs into the price of air travel). They are also inconsistent with the goal of "dematerializing" the economy increasing resource productivity.

True, increased public investment compensates for the decrease in private investment in the economic crisis. This keeps up demand for cement and bulldozers. One sees the benefits of this, but sometimes there are controversial public works (in Catalonia: the 4th beltway in Barcelona, the motorway from Palamos to Girona...). The controversy itself is a sign that some of the externalities are not taken into consideration.

There is a common perception that *land use planning* in Spain (the regulation of which is devolved to regional and/or municipal authorities) has favoured the realization of economic rents (by changing rural areas into areas where urban building is allowed) even beyond what could be explained from a purely financial point of view, resulting in an excessive supply of housing. The European Parliament had debates on this issue.

The audit would investigate, a) whether, as sometimes alleged, there is an element of corruption involved in such land planning decisions in the form of payments to political parties, b) whether the costs in terms of loss of biodiversity, outdoor recreation areas, carbon dioxide emissions, cultural landscapes, have been taken sufficiently into account into

actual decisions, c) state-of-the-art methods of evaluating socio-environmental costs will be used, and beyond money accounting, multi-criteria methods will be applied.

Other examples of audits

Evaluate, with life cycle analysis methodology, the decisions to spend public money into *RENOVE programmes of car trading*, taking into account whether net savings of energy and materials are achieved, and the safety improvements.

One Catalan topic for environmental-economic auditing could be the regional policy on *transgenic agriculture*, contested by environmental and some peasant organizations. The EU guarantees the coexistence of transgenic and organic agriculture by allowing 0.9 admixture of GMOs into the products of organic agriculture (which by convention should be totally free of GMOs). Is this policy successful (in Catalonia and Aragon, with over 40,000 hectares of transgenic maize), or is transgenic agriculture displacing organic agriculture? Can coexistence be applied without prohibitive costs?⁶

Another topic for auditing, inspired by research on the Zebra mussel invasion in the Ebro river, is whether the water quality goals that regional (or river basin) authorities establish have taken into account "*biological pollution*" (*invasive species*) and not only physical-chemical quality. Moreover, assess whether the costs in preventing or eliminating invasive species are proportionate to the damage avoided, and whether a cost-effective approach should be used to comply with a desired quality norm at a reasonable cost.⁷

Cost-benefit analysis and the discount rate.

Consider an audit on whether a road programme takes duly into account non-economic costs such as the loss of landscape quality and the effects of fragmentation on biodiversity – are such non-economic costs evaluated by the authorities through extended CBA?. Discuss then the role of different discount rates in the results of CBA, and *recommend an appropriate discount rate*. A high discount rate lowers the present value of (distant) benefits and costs.

The Economic-Environmental Auditor cannot just accept any discount rate as a fact of life. Indeed the very existence of a positive discount rate (in real terms) could be questioned.

⁶ Rosa Binimelis, [Coexistence of Plants and Coexistence of Farmers: Is an Individual Choice Possible?](#), *J. of Agr and Env Ethics*, 21, 5 Oct 2008

⁷ B.Rodriguez-Labajos, J. Spangenberg et al, eds, *Assessing biological risks with socio-economic methods. The ALARM experience*. Pensoft. Sofia-Moscow, 2009.

When the discount rate is based as in Ramsey (1928) on the assumption of economic growth, it is taken for granted that today's investments lead to growth. The assumption of growth implies future declining marginal utility as consumption is supposed to increase. Our descendents will be better off. This justifies using now more resources and polluting more. Therefore a degraded environment and a lower quality of life are left to future generations, undermining the initial assumption of growth. This is the "optimist's paradox".

Other issues

Take now *environmental liabilities left by private companies* (chemical companies like Flix in Catalonia, or storage of nuclear waste left by electricity companies). Could an audit examine whether the use of public funds in order to pay for such liabilities, while being legal, is or is not in agreement with the polluter pays principle that aims at internalizing externalities into the price system?

The Economic-Environmental Auditor, a "watch-dog" of sound accounting practices, taking into account that the results of private firms (the "bottom line") provide the main inputs for macroeconomic accounting, could sponsor research on the un-paid liabilities of private companies not only inside the regional or national territories but also abroad.

Such liabilities will most likely come into the open (as with Rio Tinto, Shell and Chevron) only when dramatic court cases are brought against such companies under the ATCA legislation in the United States or other legislations elsewhere. What should such legislation establish?

Another topic for auditing could be to determine whether at state and regional levels the European GHG cap and trade scheme has been properly established – were allowances too generous to some sectors and too strict with other sectors, changing the competitiveness position among regions? Were they in general too generous?

Could the Economic-Environmental Auditor go beyond this and examine the reasons advanced for the claims for an *ecological debt* (carbon debt or climate debt) coming from civil society organizations and some governments of the South (Bolivia for instance), that try to operationalize the notion of "historical responsibility" acknowledged in Rio de Janeiro (1992) and Kyoto(1997).

Are Northern countries really liable for such debt? Could repayment of such debt help the common cause of limiting greenhouse gas emissions? Would a regional government or municipality in Europe be entitled to spend public funds in paying back a part of this so-

called ecological debt, perhaps conditioned to biodiversity preservation and investments in renewable energy? (e.g. supporting the Yasuni ITT initiative of the government of Ecuador).