

## Economics and Conservation in the Tropics: A Strategic Dialogue

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# Conveying Conservation Outcomes as Biophysical Results (*hectares protected*), Ecosystem Services Provided (*cubic meters of irrigation water*), or Monetary Measures

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In my experience as an economist for a quarter of century, since my student days, one of the most consistent perceptions I developed is that the gap between what interests the “academy” and the issues that are really relevant for society has increased consistently over time. I am sure that, if this is true, there are different explanations for it. To me, the reason has a lot to do with the irrelevance of most “theoretical” work from the last three decades, especially the search for mathematical modeling that disguises very rough (and many times wrong) ideas in complicated formulas. In current days, if there are no complex mathematics and “sound” (i.e., neoclassical based) theory, most academics consider it “non scientific.”

I suffered from this “disease” in the examination of my PhD thesis: it was only approved after I added a mathematical model in an appendix, just to prove that I was able to deal with dynamic optimization and “Hamiltonians” (a tool for optimal control models). This request was made by one of the examiners, a relatively well-known young “professor,” with the argument that the thesis needed “theory.” The theoretical basis I used, Keynesian theory, was not considered “serious enough” by him, and it was made clear that without a sound neoclassical model, the thesis would not be accepted. To accommodate the situation and get the diploma, I produced a mathematical model that added absolutely nothing to the thesis other than supplying a mathematical model and an extra 10-page appendix. Not a single comma was changed in the main text—the theoretical model I developed in the chapter was kept intact, despite not being considered “theory” by the examiner, because of the simple math used. The trick for the appendix was to adapt an already existing model from a textbook that dealt with capital accumulation to another context (tropical deforestation).<sup>1</sup>

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<sup>1</sup> I am very grateful on this particular subject to my supervisor, Prof. David Pearce, who always encouraged me to explore alternative theoretical approaches and supported me on that. By the way, the “rejected” thesis was granted an award as from the Brazilian Economists Council in an annual competition for the best Ph.D. thesis or book on economics. However, I got so upset with the situation that only now, 10 years later, have I decided to send the model to an academic journal.

My personal story is similar to many others, showing that what interests the mainstream economics world is irrelevant most of the time, at least to my understanding. Usually I have no idea who are the recent Nobel Prize winners in economics, and whenever I read their names in the newspapers, I always ask the same questions: what was the true relevance of this person's work to economics and, more importantly, to mankind?; and how do other Nobel Prize winners, who *have* made effective changes in our understanding of the world, feel about these guys?

The problem is getting worse because the traditional diversity in economic thought has been significantly reduced, and in the universities of the developed world, it is almost zero. We usually assume that science walks on a one-way road, and there is no going back: tomorrow, we will know at least as much as we know today, and today's knowledge is always better than yesterday's. Unfortunately, there is no reason to assume *a priori* that this is true. History shows how science has been set back almost to ground zero on many occasions. In my opinion, this has happened in many social sciences, especially economics, with the "single-thought" world of the "Washington consensus." In the past, a good economics course would have exposed its students to different schools of thought: Keynesian, Marxism, and the "classic" authors (Adam Smith, David Ricardo, Thomas Malthus, etc.) in their original form, rather than the distorted versions of current textbooks. Nowadays, the only theory that is taught is neoclassical and its derivations. Anything different is not even mentioned.

The problem is particularly serious in environmental economics because many of the scholars who did not have undergraduate economics training (who come from other sciences), simply do not know that other theoretical visions exist. Even though transdisciplinary approaches are a positive advance, the problem is that the students are only exposed to mainstream neoclassical economics. It is as if someone is introduced to physics, but they are taught that only Newtonian (or quantum or relativistic) physics exists. So, even though there is a strong feeling that "something is wrong" with the traditional analysis, they try to "deconstruct" mainstream economics, using the same tools they are criticizing, because this is the only theory they know. It is no surprise that no true advance comes from this, apart from saying that there is something wrong with the mainstream. Go to an ecological economics conference and you will see what I am talking about.

For example, I have never heard anyone dealing with uncertainty problems in ecological and environmental economics address the (extensive) post-Keynesian literature. The same happens for system dynamics analysis: Schumpeterian and even Marxian authors have already dealt with many of problems that are now being "discovered," but there is no bridging these sides.

This has tremendous practical consequences. Development agencies today only follow the mainstream, and therefore “one-way” thought becomes essential to get access to development funds. The same is valid, although to a lesser extent, to independent foundations and non-governmental organizations (NGOs): in spite of being much more critical of the Washington consensus, their own staffs only understand that same language. Myself, when browsing the “conventional” literature (for example, World Bank technical papers), I only look at papers with applied subjects and simply ignore the “theoretical” advances.

One of the most obvious consequences of this neoclassical bias is the obsession with “putting the prices right” and the concern about “valuation” of natural resources. The neoclassical–cost-benefit analysis has put a lot of effort on the price issue, while there is almost no effort in the literature (especially in the U.S. and U.K. traditions) on the effective demand problem. The main issue is to find the efficient price system, and production factors are assumed to be used at their boundary, because the focus is on scarcity. But, these maximum efficiency solutions do not answer one of the most common problems in development—unemployment and income generation—because the research focus is on resource scarcity, not lack of demand for production factors.

Classical economists dealt with the “value” problem. Value was understood as a social convention that was different from prices. In fact, they did not pay much attention to the question of price changes. They were much more concerned with the evolution of the capitalist system, either defending it (Smith, Ricardo, Mill) or criticizing it (Malthus, Marx). Since they were concerned with the evolution of the systems, particularly the future of capitalism, there was not much attention paid to the determination of prices and quantities separately. In fact, one of the most important problems in Marxian theory is the impossibility of converting the theoretical system based on (labor) value into market prices.

It was the marginalist revolution (mid-19th century) that established separate analysis of prices and quantities. The emphasis moved to individual transactions (“micro” economics), and the critical analysis of capitalism was lost. Since it was assumed that free markets would always allow the best allocation possible of resources, the problem of unemployment is theoretically eliminated, unless there is an imperfection that impedes the maximum efficiency of the system.

Environmental economics is relatively recent, having been developed at a time when there was almost no opposition to the neoclassical perception. Therefore, it has the same bias of putting a lot of emphasis on neoclassical issues (“fair” pricing, efficiency, welfare), with one additional complication: not only are “goods” considered, but also “bads” (externalities). The

point is to “get the prices right,” and pricing became the main concern of mainstream environmental economic analysis. This is the typical analysis carried out, for example, by the World Bank or OECD, the former being particularly instrumental in concentrating research on “pricing” (mistakenly referred to as “valuation”). “Quantities” were less of a problem, and conventional environmental economics simply ignore the issue: as long as the “right” price is found for “externality,” the system would adjust automatically to its most efficient (Pareto) solution; in a similar way, if wages are set up “right” in a “perfect” labor market, unemployment automatically disappears. So, it is not surprising that environmental economists get confused when dealing with values (i.e., combination of prices and quantities).

However, economic growth is a consequence of “real” decisions (more precisely, capital accumulation that defines the future conditions of production). Keynes and Schumpeter tried to return the discussion to how the capitalist system operates with different approaches, but they remain ousted from the environmental debate. This requires that the price system is considered a given, and that the research focus has to move from “finding the right prices” for the environment to moving toward consistent measurements of quantities and considering externalities. For example, instead of asking how much value a rainforest has (and there is already a lot of effort on that), the question that has not yet been answered is “how output or employment are affected by deforestation (or forest conservation).”

Carbon policies are already doing this. Instead of discussing how much is the “true” value of carbon emissions, quantities are considered for policy targets: calculations are made in physical units, and only after that are they associated with prices (usually, very preliminary estimates). The indetermination problem remains: if carbon prices change, changes in emissions quantities will occur, and therefore the “value” result (price times quantity) will remain a proxy (such as a Laspeyre index). But, this proxy is more practical and meaningful than “theoretically-based” academic estimates and allows real-world deals.

On the other hand, there is almost no advance in biodiversity trading schemes. Even though thousands of papers have been written on the value of biodiversity, the lack of a physical aggregate that is widely accepted (such as the IPCC conversion table between different greenhouse gases emissions) has impeded policy advances. In the real world, decisions remain based on very raw indicators, such as reserve area, but a lot of resistance remains against weighted systems (“prices”), which would compare different “quantities” of biodiversity. In other words, while brains and dollars are being diverted to countless PhD theses on valuing one specific site or species, policy makers remain in the dark without a proper system to establish priorities between conservation areas because it is not “elegant”! The advantage of

acknowledging the indetermination of prices and quantities is that there is no perfect valuation system—any one will be imperfect. More research on comparing quantities and less on pricing would be a step forward on this debate.

But, without a “perfect” pricing system for biodiversity (or any other natural issues), how can we establish a weighting system? A combination between scientific criteria and ad hoc choices can be established, as has already been done in the determination of environmental parameters.

The Human Development Index (HDI) is an example of how a very imperfect measurement, with very little (or none at all) “theoretical elegance” but a lot of appeal, has improved policy making on development issues. Note that there is no “explicit pricing” in the HDI, since it assumes ad hoc weights for every issue. But, since its creation, policy makers have become more aware of social targets in the development process. This is a good example of how an exogenously determined system of “prices” (weights) can work with very different types of “quantities” (illiteracy, life expectancy, income, etc.).

The same neoclassical bias has been applied to the environmental accounting debate. Instead of looking for the original objective of national accounts—to measure “real” activity according to the Keynesian problem of measuring “employment” or “output” without any reference to “equilibrium” of any kind—the neoclassical tradition has mistakenly argued that the objective of gross domestic product (GDP) is to measure “welfare” using equilibrium models. This is exactly the opposite of the intention of national accounts: if “output” is always at its full employment (efficient) boundary, there is no need to measure it!

However, even academics intending to be critical of neoclassical economics follow the same approach and a profusion of “welfare-based” GDP-like measures have been produced, none of them with any real impact. Confusion becomes the rule, and very complex mathematical models can be produced with very simple ideas and sometimes huge misunderstandings. I will always remember a paper on “national accounts and tropical deforestation,” written by a famous professor, which spends many pages building a mathematical (and thus, “scientific”) model to explain deforestation in Latin American countries. After many equations, only in the very last paragraph did he mention that he was assuming well-defined property rights in his model (even though it was clear that it was an implicit hypothesis). Any researcher who works with tropical deforestation in Latin America knows that the lack of well-defined property rights is one of the biggest issues to be addressed! I wonder if he has ever realized how useless is his paper, given

the way that he stated that he was absolutely unaware of the subject he was trying to address with his “mathematical science.”

On the other hand, policy makers, journalists, and the public in general are hungry for economic analysis that makes sense to them. In my own academic production, the study that has received by far the most attention from the public, including policy makers, tested whether there was any correlation between changes in rural employment and deforestation in the south and southeast Brazilian Atlantic Forest (“Mata Atlantica”) between 1985 and 1995. The result had a good impact because of the message—there is no positive connection between them, but just the opposite: the more deforestation, the higher does the probability of rural unemployment increase. I included no discussion at all on pricing, only analysis on “quantities” (employment and deforestation), in a (Keynesian) effective demand perspective (I mean, not treating production factors as fully employed). Indeed, it is so “out” of the traditional economic analysis that I have not yet submitted a paper on this work to an international journal because I am sure that I will receive a “reviewer comment” saying that the paper lacks “theoretical foundations.”

So, what can we do?

1. Put less effort on pricing and encourage more research on how to combine environmental variables in physical units with economic (value) variables.
2. This is also the message I got from the environmental accounting literature. The original intention was to reformulate the whole national accounting system, with a lot of emphasis on pricing the environmental variables. However, because of the issues discussed above, environmental values can only be determined on an *ex-ante* (expectational) basis, in contrast to the *ex-post* nature of the national accounts. Because national accounts were designed to measure effective demand with given prices, following its Keynesian roots, they present a fundamental divergence with the neoclassical pricing (“valuation”), which aims at a maximum efficiency solution given the level of output.<sup>2</sup> Therefore, there was no true advance in establishing practical systems, even in terms of satellite accounts (as proposed by the United Nations Statistical Office).

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<sup>2</sup> The opposition between Keynes’ definition of income, as presented in the general theory, and Hicks’ definition of income, as stated in value and capital, was clearly understood by the latter. However, other scholars have not paid attention to these and tried to create a hybrid interpretation—the most obvious example was El Serafy’s attempt to combine these very opposite definitions in his user-cost concept. In very simple terms, Keynes’ definition of income is an *ex-post* concept of effective demand (linked with the issue of how much economic activity has been determined by the entrepreneur’s production decisions), while Hicks’ famous “true income” definition is an *ex-ante* concept that does not consider how the receipt has been obtained, but only how much can be spent without becoming “worse off.”

3. Much better results were obtained when researchers gave up complex solutions involving environmental prices and quantities and looked for more simple but robust systems combining environmental indicators, in physical units, and economic accounts matrices. Again, I quote the environmental accounting debate. The European experience with the national accounts matrix with environmental indicators (NAMEA) seems a much more promising way to first establish a strong connection between economics and natural sciences. Even though a single result is not produced (different from GDP or cost-benefit analysis), the basis for future advances is established. And more importantly, policy makers can begin to understand the real connections between the environment and economic activity.

4. People are interested in “real” issues. For example, will reducing deforestation in the Amazon reduce employment creation in Brazil? They are very open to new ideas and not necessarily to imposed “tradeoffs.” The “environmental Kuznets” curve was a creation of academics (which, by the way, has never been proved right), but common people understand that are “goods” and “bads” from both options. Instead of inventing a single “numerary” (price) to tell whether reducing deforestation is generally “good” or “bad” in general terms (as a standard cost-benefit analysis), and pretending that it was obtained “scientifically,” a much better approach is to announce the most important consequences and let them draw their own conclusions: more pastures or cultivation may result in more dollars from soy or cattle exports or cheaper domestic barbeques, but they will not create many jobs. At the same time, they will induce the displacement of traditional subsistence producers and, of course, there will be fewer forests left (with the ramifications of that).

5. We need good theory, and there is much more in the long life of political economy than the narrow part that is being used today. For the same reason, literature surveys must be much more extensive than the “conventional” vehicles (“prestigious” academic journals and discussion papers). I do not know if I am a good academic or not, but the papers I produced, that I think are the most important, were never published in these vehicles. (Actually, a couple of them were not even translated from Portuguese—another barrier for a non-English native speaker). Alternative journals, edited books, and non-English literature have much more value than usually thought. I know there is a practical problem on how to access these materials (or read them!), but there will be no breakthrough in the “prestigious” journals because the referee system works to eliminate the “heresies” that could represent true innovation.