

## TEMA PARA DEBATE

### ON THE USEFULNESS OF ECOSYSTEM SERVICES EVALUATIONS

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*SUMMARY.- A ground breaking paper by COSTANZA et al. published in Nature this year has led to an intense debate about the potential, and convenience of making economical valuations of the services provided by ecosystems. This debate has been encouraged by the journal, by giving Internet free access to the paper, as well as by the International Society for Ecological Economics (ISEE) and the Communications for a Sustainable Future (CSF) who had co-exponsored an Online Forum offering the possibility to submit opinions to their web site. In the present work, we resume and analyse these opinions. In spite of potentially enormous technical difficulties, and strong ethic arguments against it, many consider worth the effort to deep into the economical value of the services provided by ecosystems. It is considered that this kind of valuations can become important ingredients of the conservationist debate, since monetary value is a measure that can be understood by the society as a whole.*

*RESUMEN.- Un artículo polémico escrito por COSTANZA et al., publicado en Nature el pasado año, ha provocado un intenso debate sobre el potencial y la conveniencia de realizar valoraciones económicas de las funciones o beneficios proporcionados por los ecosistemas. Este debate ha sido estimulado por la revista, dando libre acceso al artículo en Internet, y también por la International Society for Ecological Economics (ISEE) y Communications for a Sustainable Future (CSF), quienes han ofrecido la posibilidad de remitir opiniones a su página de la World Wide Web. En este trabajo se resumen y analizan estas opiniones. A pesar de las enormes dificultades técnicas y de sus importantes problemas éticos, muchos consideran que merece la pena el esfuerzo de realizar valoraciones de los servicios proporcionados por los ecosistemas. Se considera que estas valoraciones pueden ser elementos importantes para el debate conservacionista, ya que el valor monetario es una medida que puede ser entendida por toda la sociedad.*

**Key-words:** Ecological Economics; conservation Ecology; conservationist debate.

## 1. Introduction

The increasing human pressure on natural systems and associated environmental degradation are important sources of social concern. To date, a great deal of the conservationist debate has been based on ethic questions (e.g., do we have the right to lead species to extinction?), as well as on the consequences that an excessive natural degradation may have for humanity subsistence. Since the publication of their paper entitled "The value of the world's ecosystem services and natural capital", COSTANZA *et al.* (1997) have put the monetary costs associated to natural depauperation into the first line of the conservationist debate. COSTANZA *et al.* (1997) considered that ecosystems provide, through their functions and components, benefits for human populations (services). These services are, precisely, what they have valued, as ecosystems are irreplaceable and their total value infinite. Thus, they grouped ecosystem services into categories, and calculated their value per unit area using valuation techniques mostly based on 'willingness-to-pay'. The resulting values were then multiplied by the surface area occupied by each ecosystem to arrive at global totals, giving an average of US \$ 33 trillion per year (with minimum and maximum estimates being US \$ 16 and US \$ 54 trillion per year, respectively); i. e. much higher than the estimated global gross national product (GNP) which is US \$ 16 trillion per year.

A 6-week Online Forum around this paper has been co-exponsored by the International Society for Ecological Economics (ISEE) and the Communications for a Sustainable Future (CSF). The electronic mailing list hosting the debate has been closely moderated, so that only a selected fraction of the contributions submitted to it have been finally posted. The messages can be seen at: <http://csf.colorado.edu/ISEE/ecovalue/proceedings/>. In the present work, these opinions have been collected, categorised, and collectively examined to provide a joint picture of the impact of the paper, and on the potential advantages and flaws of making such kinds of valuations.

## 2. Overall analysis of the debate

The number of participants in the debate was 53 (see Table 1 for a list of participants and the codes used to identify them through the text), and the number of contributions 83. All participants were in occidental countries (Figure 1), with USA being the country contributing most (35 participants). Only 7 participants belonged to private companies, whereas the rest were in universities, institutions and governmental entities (Figure 2).

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Table 1. List of Participants.

*Lista de participantes.*

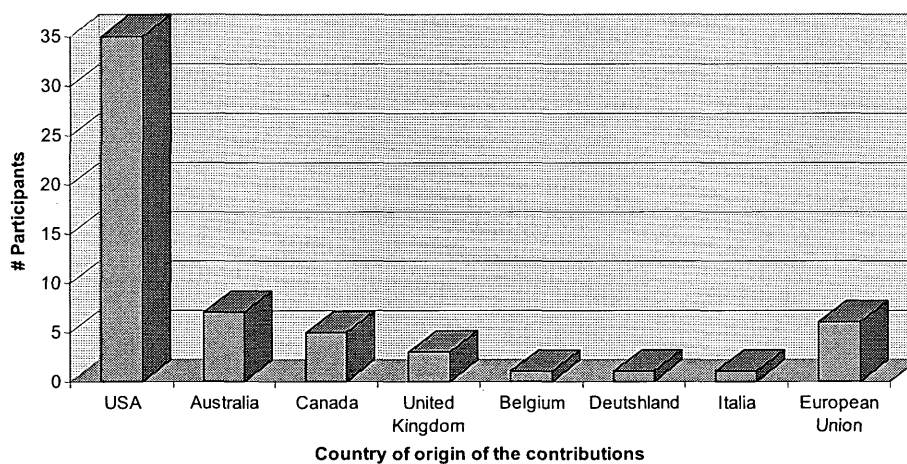


Figure 1. Number of participants per country.  
*Número de participantes por país.*

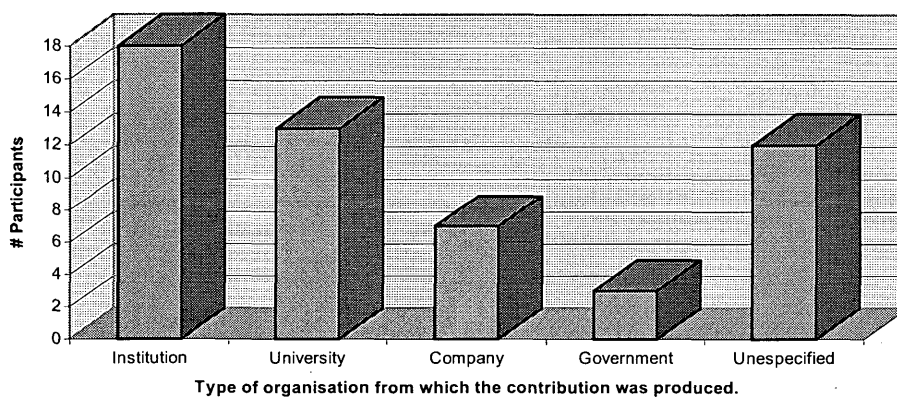


Figure 2. Number of participants per type of organisation.  
*Número de participantes por tipo de organización.*

### 3. Main arguments supporting the interest of making ecosystem services valuations

Overall, 38% of the contributors to the debate have supported the interest of making ecosystem services valuations (Figure 3), many of them even after having recognised that these valuations will always be far from perfect. A central idea to defend these kind of valuations has been that economy can

provide one set of systematic, consistent information, evaluating ecosystem services on the same basis as the marketed goods and services are evaluated (see participants codes 26 and 42 in Table 1). Monetary valuation is an accounting methodology for estimating relative prices. In this way, economical valuations of ecosystem services are interesting because they allow to *compare "incomparables"*, thus facilitating the process of making choices, which is an important element of policy-making and, in general, of most human action (4, 5, 11, 26, 44, 45, 46, 50, 51). Because our natural, historical and cultural capital/services/stock currently have no explicit monetary value, there is a danger that far from being seen as invaluable (i. e., of infinite value) they are seen free (i. e., worth for nothing) (8, 26, 33, 46). Without the help of some kind of standard valuation criteria to natural systems, many may easily reach the conclusion that there is an unlimited supply of natural capital (26). A very different conclusion may emerge if people can compare the costs of living with products that keep Nature in acceptable conditions with those that lead to natural degradation (6, 7, 16, 17, 21, 22, 35, 42).

Directly linked with the preceding arguments, another important idea supporting the valuation of ecosystem services has been that they may serve as potent *caution calls* against environmental degradation. In particular, because these valuations are formulated in terms that most people can understand (i.e., natural capital has a value and it plays an integral part of economy) (4, 5, 8, 12, 13, 15, 20, 22, 26, 29, 31, 39). In this way, the paper by COSTANZA *et al.* (1997) has been considered as a first step into a promising line of work.

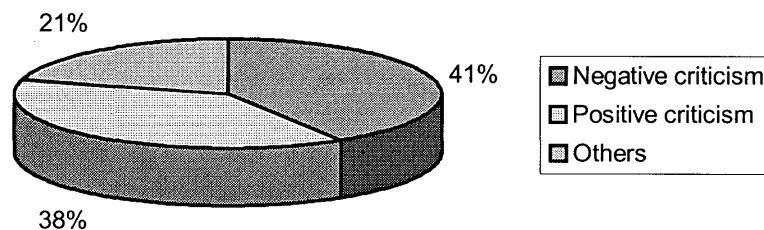


Figure 3. Percentage of supporters and detractors to the COSTANZA *et al.* (1997) paper.  
Porcentaje de partidarios y detractores al artículo de COSTANZA *et al.* (1997).

#### 4. Main criticisms and caveats

Many criticisms (41%) to the work of COSTANZA *et al.* (1997) have to do with methodological issues (5, 10, 13, 14, 30, 36, 38, 41, 45, 46, 53), particularly with the difficulty of doing a valuation of ecosystem services for real (Figure 3); i. e., to perform it not as an intellectually interesting exercise focused to

increase public awareness, but as a working tool aimed at being used in policy-making. For example, it is unclear how researchers would get the prices right, having into account how an actual market works, with budgetary constraints and consumers' willingness to pay limiting the amounts of money at which goods and services change hands. Prices represent bargains struck between willing buyers and sellers. But, if human welfare is measured in any other way than market exchange, prices cannot measure the contribution that a good or service makes to it (5, 11, 18, 27, 30, 34, 36, 39, 40, 46).

Another difficulty has to do with the fact that time scales of economic planning and large-scale biological evolution are not commensurate (28, 30, 32, 34, 36). If we try to measure bio-geochemical events with the same ruler we use for business cycles, we will set ourselves up for catastrophic awakening (36). All these difficulties faced have led some to think that valuations of ecosystem services may rapidly become useless as tools of generating debate, and may even damage the credibility of ecology (20, 46, 52). According to this view, it is unclear that the economical system that have put Nature at risk, will be capable of contributing to the amelioration of such situation (20, 23, 25).

Finally, a number of criticisms can be classified as having ethic roots. Briefly, these contend that ecosystem services cannot be meaningfully expressed in dollars because they are immeasurable as the basis of life support (5, 13). Such views consider that most ecological attributes have an intrinsic absolute value (i. e., they should never be compromised), for which it is essentially wrong to try to give relative values to them (5, 52).

## 5. Alternatives

Many contributors to the debate accept the convenience of making some kind of valuation of ecosystem services, although they criticise the way COSTANZA *et al.* (1997) did it. Some of them propose alternative methods of valuation, based on: household decision models considering "willingness-to-compensate" rather than "willingness-to-pay" (50); the universal value of natural production capacity (43); critical thresholds related with the amount of ecosystem services each human requires (2); and life support units (20). Interesting as they may be, these proposals seem no more than suggestions and ideas that, to be correctly judged, need to be clarified and expressed in a more tangible way. This is not surprising though, particularly since the debate has just began, and the media in which it has taken place so far (i.e.

Internet) is not as well suited for receiving formalised alternatives as, for example, scientific journals.

## 6. Discussion and conclusion

Despite the incipient stage of the exercises of valuation of ecosystem services, there is an extended opinion that they may have important didactic effects, for they are formulated in terms (i. e., monetary value) that are understandable for everyone. Having any idea as to what can be the monetary value of an ecosystem service may prevent actions against it which are made under the assumption that natural capital is for free.

It is clear, on the other hand, that future valuation exercises similar to that developed by COSTANZA *et al.* (1997) will have to confront important technical and ethic problems. There is a strong susceptibility against establishing links between ecology and economics, most of which has to do with the (supposed) danger that a strong involvement of economics into conservation will lead to an increased depauperation of Nature. From this view, it is unclear that monetary valuations of ecosystems services will be used just as a complement, not as a substitute, to the other kinds of arguments and tools that are commonly involved in ecosystem conservation.

Virtually, all the contributions to the debate have come from highly developed occidental countries; which may explain why issues related to nature conservation in the third world have not been addressed. However, poor countries possess a large part of the world's natural capital, for which they can benefit the most from accurate large-scale economical valuations of the services provided by their ecosystems. For instance, third world countries could claim and receive economical compensations according to the monetary value of the services their ecosystems provide, as long as they are committed to conserve them.

In general, there have been interesting arguments both for and against economical valuations of ecosystem services. However, there have been not many ideas on how to improve current valuation methods, or proposals about different ways of doing them, suggesting that an open Internet forum is not probably the best place to find such kind of elaborated work.

Economical valuations of aspects related to the utilisation or existence of particular resources or ecosystems are frequent, particularly those that have to do with protected or tourist areas (see for example AZQUETA, 1994 and CAMPOS, 1996). The work by COSTANZA *et al.* (1997) has the originality of making such valuations at a global scale, thus highlighting the importance of

the services that the large biomes provide to humanity. In light of these global valuations, countries taking care of ecosystem services which occur in their territory, but are beneficial for everyone, could demand economical compensations to the rest of the world. At the same time, such demands made provoke debates on what should be the duties of the countries being paid for maintaining ecosystem services within their territories.

On the other hand, in spite of the potential interest of making economical valuations of ecosystems services, they are not the only kind of valuations we can make. There are other kinds of valuations that have been examined by one of us elsewhere (GÓMEZ SAL, 1995, 1998) for which we shall not discuss them further. In addition, this author has developed a three-dimensional scheme in which he summarises the main characteristics of the evaluative arguments (including ecological, productive, economical, social and cultural aspects) that may be taken into account when performing comprehensive valuations of some systems of human exploitation of natural resources. Multicriteria approaches like the one previously mentioned may be particularly useful when evaluating ecosystems whose current high natural value is directly linked with particular land use forms. For instance, this could be the case of many "cultural" landscapes that have been developed over the centuries in mountains and some Mediterranean areas, and that are currently at risk due to increasing tourism pressures and/or abandonment.

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