

Available online at www.sciencedirect.com



Ecological Economics 56 (2006) 524-533



www.elsevier.com/locate/ecolecon

ANALYSIS

Ethics, economics and environmental management

Diego Azqueta*, Gonzalo Delacámara

Department of Economic Analysis, University of Alcalá, Plaza de la Victoria s/n, 28802, Alcalá de Henares, Madrid, Spain

Received 10 May 2004; received in revised form 1 March 2005; accepted 3 March 2005 Available online 10 May 2005

Abstract

Individuals derive utility from their access to resources provided by the biosphere, through the satisfaction of a number of needs and necessities. These needs, however, cannot often be met simultaneously since they compete with each other. This conflict is not just relevant at an individual or even intragenerational level. Indeed, it implies a number of uncertainties and irreversibilities into the future, which should not be left to oblivion. From an extended anthropocentric ethical position, in which only human beings have immanent value and are, therefore, subjects of moral consideration, the identification of economic values can be of great use to allocate resources and make decisions on the environment. Economic analysis provides a number of decision tools than can be used to optimise efficiency and equity. The purpose of this paper is to reflect on some of the ethical constraints to the ability of conventional economic valuation techniques to inform decision-making processes affecting the environment. It will be argued that, depending on the stage of development, some environmental and natural assets might well be seen as a common heritage, either from a natural or a cultural viewpoint, rather than just a pool of economic resources that could be used to satisfy basic needs, and depleted or transformed accordingly, whether directly or indirectly. Furthermore, this boundary is not static: the same environmental asset will be demanded as a resource at lower stages of development (both individual and socially), and as a part of the common heritage, at a later stage (again, individual and socially). In the former, the use of conventional methods to value environmental goods and services will be warranted, whereas this would not be the case in the latter. We will also stress upon the fact that this is something quite different from the approach taken in Social Project Appraisal, where the introduction of efficiency prices and distributive factors also provides a move from individual to social welfare maximization, but without breaking away from the market logic.

© 2005 Elsevier B.V. All rights reserved.

Keywords: Economic analysis; Ethics; Environmental management; Superior goods; Preferences; Needs

^{*} Corresponding author. Departamento de Fundamentos de Economía e Historia Económica, Facultad de Ciencias Económicas y Empresariales, Universidad de Alcalá, Plaza de la Victoria s/n, 28802, Alcalá de Henares, Madrid, Spain. Tel.: +34 918854247/5227; fax: +34 918854239.

E-mail addresses: diego.azqueta@uah.es (D. Azqueta), gonzalo.delacamara@uah.es (G. Delacámara).

^{0921-8009/\$ -} see front matter \odot 2005 Elsevier B.V. All rights reserved. doi:10.1016/j.ecolecon.2005.03.003

1. Introduction

Human beings have organised their existence relying, to a greater or lesser extent, on resources provided by the biosphere. Thanks to this access, mankind is able to satisfy a whole array of needs and necessities, from the most basic ones (food, heat, shelter) to, at the other end, some that could be seen as "luxurious goods" (recreation, aesthetic values, etc.).¹ Yet, the fact is that in too many occasions the satisfaction of these needs cannot be accomplished simultaneously, or not even sequentially: they do compete with each other. If a dam is built to produce energy, the flooded land will not be cultivated, and the agricultural products, together with the aesthetic or historical values that the valley could have had, will be lost forever. Even if some time into the future electricity output is no longer necessary, and the dam is to be dismantled, things will not be as they were. A part of the loss will be then irreversible. The problem of managing the access to the biosphere's services from a social point of view is, therefore, crucial, because it has to do with deciding whose, and what needs and necessities are given (a higher) priority.

The purpose of this paper is to reflect on some ethical issues that limit the ability of conventional economic valuation techniques when applied to help in discovering the social value associated to each use.

2. The biosphere: a common good

Human beings share with other species this common ground that, simplifying things, we call biosphere. This coexistence is in too many occasions competitive, something also frequent among other species as well (Barbier, 2001). It thus happens that the process by which humans decide on the best uses of their surrounding natural endowment implies, at least in its final outcome, a clear position about the kind of relationship that humans want to establish with the rest of species on this planet. The discussion about this whole framework of rights and duties, between humans and other living and non-living creatures, has given birth to a fascinating body of literature within the field of Environmental Ethics (see, e.g., Elliot, 1995). As the reader may well be aware, there are several different positions regarding what is ethically acceptable in this mutual relationship, ranging from the widely held anthropocentric positions, to the also popular but less widespread Animal Rights (see, e.g., Singer, 1975), or Land Ethics (from Aldo Leopold and his advocates; Leopold, 1949). Taking into account the complexities of the issue at hand, and the limitations of the authors of this paper, we will simply state our position regarding this question in a clear fashion, and proceed with some further ethical debates. Let's say then that, despite everything, we adhere to what has been called as an extended anthropocentric ethical position, in which only human beings have immanent value and are, therefore, subjects of moral considerability. Of course, the rest of the biosphere also has value, either intrinsic (weak intrinsic) or instrumental, but it is not endowed with the right to moral consideration. It should be remembered, nevertheless, that, as Haywood (1997) points out, being anthropocentric can include ecocentrism to the extent that a self-interested species is capable of maintaining due respect for other natural beings and things.

This starting point thus implies that, regardless of any particular characteristic (be it gender, religious beliefs, race, or the moment in time in which she happens to come to live on this planet), every person should be entitled with the same right to enjoy the services and resources of the biosphere. This means, of course, that future generations have to be considered on an equal footing as the present one, when it comes to the issue of deciding what the best use of the natural endowment at large would be.

The problem is thus one of identifying the set of competing uses that maximises the present value that society as a whole assigns to the needs that its members would satisfy with it. It is therefore the kind of need which is satisfied, the value that the person involved gives to this satisfaction, and the value that society as a whole gives, in turn, to this particular person satisfying this specific need, what is of relevance. All that, of course, without loosing sight of the necessity to respect any ecological sus-

¹ For an insightful reflection on the differences between needs, necessities and desires please see Illich (1993, pp. 88–101).

tainability requirement that might be binding: otherwise the rights of future generations would be at stake.²

3. Natural resources and social welfare

This satisfaction of human needs, which the use of the biosphere's services allows, is both direct and indirect:

- In the former, because it provides the means to directly satisfy some of those needs: food, land to cultivate, wood, coal, etc.
- In the latter, because it provides jobs, and induced income, which permits these needs to be satisfied. This would be the case when, for instance, a piece of coastal strip is developed to supply tourist services and local population is hired to fill new employments.

The social problem, therefore, is to allocate the right to use the services of the biosphere so as to maximise the present social value of welfare arising from this use.

When this use is reflected upon the production of market goods, commodities, their price will be a first indication of its social value, subject to serious qualifications. Market prices are a good indicator of the value of the asset to the person entitled to its use: i.e., of the *financial value* to its owner. This is something quite different from its *economic* and *social* value: i.e., its impact on social welfare. Surely these prices would need to be qualified to take into account market imperfections. *Efficiency accounting prices*, popularised several years ago in the framework of Social Project Appraisal, will help to do so.³ Externalities, on the other hand, will be dealt with the valuation methods that are of interest in this paper.

There is an implicit assumption here, however, that should not be overlooked, and will be dealt with in some more detail later on. Neo-classical economics assumes that people have one overreaching goal: the satisfaction of their wants. Traditionally these wants have been depicted as materialistic (utility functions, for instance, are subsequently built on the assumption that individuals derive utility from the consumption of goods and services), although not necessarily egoistic (Faber et al., 2002). Yet, we all know that satisfaction is also derived from co-operating with worse-off people, or because of our daughter being in love, or the 'unpaid service' of admiring a particular scenery. Indeed, economic theory goes well beyond that assumption: microeconomics further assumes that an individual's various tastes can be neatly ordered into one unitary pattern of desire, with a common nummeraire to trade off different items. In contrast, different authors have argued that people have several wants, including the commitment to live up to their moral values, and these values cannot be precisely ordered or regulated by market prices (Etzioni, 1991). Indeed, *utilitarianism* has been subject to serious criticism (a very good description of which can be found in Welch, 1991). The very concept of rationality in economics, as a result, appears to be too simplistic, derived from a formal structure constructed to understand the universe (thus technological and mathematical), and focused on consequences. This leaves outside the realm of economics another, different

² The authors are well aware that the concept of sustainability, in this case, from an ecological viewpoint, is far from being clear and is the central focus of a crucial debate that may be related to the conflicting paradigms of weak and strong capital substitutability (see, e.g., Neumayer, 2003). Yet, as this is not a relevant issue for the arguments to be developed in this article, we just assume that sustainability, however defined, is guaranteed. In this sense we deviate from Faber et al. (2002) assert that Environmental Economics is not concerned with sustainable development, but only with achieving welfare optima: in our opinion, and from this ethical standpoint, welfare optima cannot be achieved without a simultaneous guarantee of sustainability.

³ In a developed country, efficiency prices will reflect consumer willingness to pay for the good or service produced. In an underdeveloped country, facing a balance of payments constraint, as it is usually the case, these prices would take into account the net impact on foreign exchange flows, of producing or consuming the good or service in question, times the consumer willingness to pay for what could be purchased with an extra dollar (directly or indirectly): the shadow price of foreign exchange, or the so-called Standard Conversion Factor. A crucial accounting price, somewhere in between efficiency prices and distributive factors, is the Social Rate of Discount, a function of the expected rate of growth of the economy, and the slope of the marginal utility of social consumption patterns. See, e.g., Squire and van der Tak (1975) for the World Bank, for a classical reference.

kind of rationality, based on *values* (deontological and/or axiological), whose importance nobody would deny. Some authors (e.g., Habermas), stressing the reductionism involved in this approach, even argue that economic analysis has upgraded its own interpretation of rationality to the category of ideology, thus displacing moral reasons (Azqueta, 2002, p. 56). This is surely a fascinating field for discussion and research, but somewhat beyond the main argument of this article.

Returning then to the main point: within this utilitarian framework, market imperfections are dealt with the help of *efficiency prices* and, when there is no price, some of the methods that have been developed to value intangible goods would be of use: hedonic prices, travel cost, contingent valuation and production function approaches at large.

Therefore, when trying to solve the problem of allocating rights to biosphere functions within an intertemporal framework, the analyst relies on a valuation process of these services, in terms of human needs being satisfied, which is based on the logic of the market. Directly, as when these functions give rise to goods and services that have a market price and, indirectly, when this is not the case, and the analyst applies methods provided by conventional economic analysis to value intangibles. In both cases, markets, whether real or hypothetical, have been refined from any kind of imperfection.⁴

Yet, it seems only natural that society should attach higher priority to the satisfaction, whether direct or indirect, of those needs considered to be more basic: food, shelter, heat, etc. Market values do not reflect this fact, nor do *efficiency prices*, but when applying the instruments of conventional economic analysis, this is accomplished through the use of *distributive factors* (Londero, 1997). These distributive factors (d_i) reflect the fact that the change in social welfare arising from the improvement of the situation of a particular person (i), or household, depends on her position in terms of relative income: i.e., on the set of needs she is already able to satisfy (assuming consumer sovereignty), i.e.:

$$d_i = \frac{\bar{C}}{C_i}$$

where C_i is the level of consumption of person *i*, and \overline{C} is the average level of consumption. The introduction of these distributive factors is only a reflection of the fact that, as it was mentioned right from the outset, occasionally, it is not only the value that the person affected gives to her change in welfare what matters, but also the social opinion about what this change in person i' welfare represents for society as a whole. This is the case when the particular situation of a person or group is considered to be of social relevance, but also when society considers that the individual concerned is herself in a difficult position, objectively, to value her welfare change. Taking into account the social opinion about individual welfare changes, be it through the introduction of distributive factors, or any other way, reflects the difference between economic and social appraisal, and represents just an extension of the distinction pointed out by Sagoff (1988, p. 8), between consumer and citizen preferences (Nyborg, 2000).

Be it as it may, the problem, therefore, seems to have been solved. The analyst, acting as an *homo politicus* (Faber et al., 2002), will take into account not only the economic value of those needs being covered by the access to the services of the biosphere, but also the weight that the individual welfare of the person involved has for society as a whole, in terms of her relative position, and the kind of needs she is able to satisfy.

4. The natural endowment as a common heritage

The above methodological procedure is valid, when the natural endowment is producing, or helping to produce, goods and services that can be considered as *commodities*, and hence valued as commodities (Vatn, 2000). This would be probably the situation in backward economies, where basic needs are not satisfied for the most part of the population, and the local endowment of natural resources is perceived, and managed, as a source of natural resources to be

⁴ In this sense, the caveat pointed out by Nelson (2001), in the line that introducing prices will only extend market relationships to the problem of allocating natural resources and services, would be partially misplaced: modified market prices are only a way to discover social values.

economically exploited. However, when societies advance, and basic needs are covered, in general terms, for the majority of their population, the individual and, therefore, the social demand with regard to nature tends to shift in a very significant way.⁵

Rather than as a pool of natural resources that could be used to satisfy basic needs, and depleted or transformed accordingly, whether directly or indirectly, the natural endowment is seen as a common heritage, either from a natural or a cultural point of view. The same "asset" (a forest) is perceived differently: conservation, and even preservation, dominates now in social preference over economic exploitation.

This change in social demand towards the natural endowment has very serious consequences in terms of the most convenient analytical tools to account for it.

One could still argue that the theoretical framework used to help decide on the best set of uses of the biosphere–efficiency prices, valuation methods and distributive factors–would also apply here. Indeed some of the methods to value intangible goods and services have been widely used to discover both use, *non-use* and *existence* values: values that should actually lie behind this new social demand. Most notably contingent valuation, but also travel cost and hedonic prices have been used to value, both, natural amenities and historic places.⁶

Yet, in all probability, this will not be the case.

Let's take, for instance, the case of hedonic prices. If you travel to Iguazu Falls and ask for a room in one of the hotels placed in the campground nearby, you will be gently informed that if you wish one with a view to the falls, the price will be 100% more expensive than if your choice is a room facing the jungle. The only difference is, of course, the scenery: in all other aspects, the two rooms look the same. No one would argue, of course, that this price differential is the value of the falls for the person involved. Indeed, if you have settled for the cheaper room, you will still be able to go to the hotel lounge, sit down there, and enjoy the same view that your neighbour next door. It is not, therefore, the value you give to the view what is being reflected in this hedonic price differential, but the value people assign to the fact that she may enjoy the view from her own room, without the inconveniencies of having to move to any other place. In this case, the use of hedonic prices is appropriate if one is careful enough to make clear what is being valued: it is not what the person experiences from the view of the falls (joy, awe, respect), something that many people would-rightly-consider invaluable, but the accessibility conditions to the site. The same happens, by the way, when one person goes to the cinema or reads a book: certainly the price of the ticket or the book cannot be said to reflect the value of the film or the novel, maybe a work of art). Neither hedonic prices, nor travel cost measures, can then be used to ascertain the social value of nature as a common heritage: they are directed towards finding the value people gives to the conditions under which this common heritage is accessible.

What about contingent valuation exercises? Indeed, contingent valuation has been used to elicit not only this kind of active use values, but also nonuse, existence values, which are very likely to be the kind of values involved here. In our opinion, the answer is still negative. It is worth discussing this issue in a broader context.

5. Superior values and the market logic of valuation

In our opinion, if contingent valuation, or any other method, was to be used to discover the demand curve for natural endowments as part of social heritage,

⁵ Not only this demand: the perception of inequality, poverty and deprivation also changes. Sen (1982) quoted Rein's view on one of the three broad concepts of poverty: subsistence or frugality, inequality or deprivation and externality. Regarding the latter, Rein said: "people must not be allowed to become so poor that they offend or are hurtful to society. It is not so much the misery and plight of the poor but the discomfort and cost to the community which is crucial to this view of poverty. We have a problem of poverty to the extent that low income creates problems for those who are not poor". Sen (op. cit., p.9) added, "to live in poverty may be sad, but to 'offend or [be] hurtful to society', creating 'problems for those who are not poor' is, it would appear, the real tragedy. It isn't easy to push much further the reduction of human beings into 'means'.

⁶ Application of these methods to historical places and monuments can be seen in Navrud and Ready (2002). With respect to what could be considered as a part of the natural heritage, see, e.g., Arigoni et al. (2000) for the Iguazu National Park and Wearing and Neil (1999) for national parks, in general, in underdeveloped countries.

results should be subject to a variety of serious caveats.

5.1. Evolving preferences

Although economic theory has developed a great deal in recent decades, it has retained at least one enduring feature: the tastes and preference structures of economic agents are normally taken as given, that is, individual desires are taken for granted. This assumption has its philosophical roots in the Cartesian division of the world into two spheres (mind and matter), and the conceptual separation of individuals from their natural environment (Hodgson, 1992, p. 40). The implications are somewhat obvious: this assumption denies the idea that the individual interacts with the environment, and therefore the possibility of changes within the individual herself.

Yet, as it has been pointed out in relation to cultural goods (see, e.g., Thorsby, 1994) the demand for these goods shows what is called "rational addiction" (Becker and Murphy, 1988): i.e., the taste (and demand) for it depend on past consumption. Therefore, the long-run demand curve for good *j* for person *i* ($X_{i,j}$) will shift to the right continuously:

$$X_{i,i}(t) = f(P_i, P, Y_i, X_i)$$

being P_i the price of accessing to the good (including the opportunity cost of leisure time), P the price of substitute goods, Y_j personal income, and X_i the previous consumption of good *i*:⁷

$$X_i = \sum_{t=0}^{t-1} X_t.$$

A somewhat similar outcome is reflected in the notion of "co-evolving preferences": when certain pleasures come only to those who are skilled enough to obtain them, because a previous investment effort has been made in acquiring these skills (Mainwaring, 2001).

Economic theory has thus tried to deal with this complex issue within the context of the perfect knowledge assumption. As a result of that, some economists have placed their emphasis on situations of risk and uncertainty as well as on the relevant concept of irreversibility (Berkes and Folke, 2000). Be it as it may, if this is the case, then, when applying any of the above-mentioned methods to estimate the demand curve for nature services as cultural goods (nature as a common cultural heritage), the analyst should be careful enough to take account of this phenomenon.

5.2. Lexicographic preference orderings

Within the context of any valuation exercise (i.e., through a contingent valuation survey), responses may include the so-called 'protest bids', which are often omitted from the mean willingness-to-pay (WTP) or willingness-to-accept (WTA) calculation, without any adequate reason. Protest bids are zero bids given for reasons other than a zero value being placed on the resource in question (or on one of the attributes of the resource, to be more precise) (see, e.g., Carson, 2004). For example, given the irreversibility of certain environmental changes, a respondent may refuse any amount of compensation for loss of an environmental asset, which she regard as unique, or a species that she feels should be protected at all costs. Respondents may thus decline to state a WTP or WTA amount because they reject the survey as an institutional approach to the problem, or just because they have an ethical objection to the trade-off being requested. This would probably result in a lexicographic preference structure (Spash and Hanley, 1995): "when someone bases her responses to a valuation exercise from a hierarchy of values, then she may express her preferences lexicographically" (Rosenberg et al., 2003).⁸

In all probability this refusal to accept the trade-off being offered is, simply, the reflection of a third and crucial problem, which appears when applying the conventional valuation methods to nature as a common heritage.

⁷ The function that relates current consumption to past consumption is likely to be more than just additive, but rather to give a lower weight to consumption more distant in the past.

⁸ This was the case of Pehuenche women in the high Bio-Bio River in Chile, when Endesa, the largest private company in the country (responsible for electricity generation, transportation and distribution) decided to build six hydroelectric dams on the river, thus displacing around 700 Pehuenche Indians. Is there any (economic) irrational behaviour in not accepting any deal, as some of them did?

5.3. Commodities and superior values

As it was mentioned above, the logic beneath the market process of valuation which has been used to discover nature values (not the market process itself, but its logic) is appropriate when it comes to the problem of valuing commodities. Commodities are goods and services that satisfy human needs because they have an instrumental, use value (Anderson, 1995). The logic that the market system applies to defining their value (and, thus, their price) is based on the information individuals provide about their willingness to pay for it: directly (a reflection of the importance they attach to the particular need being satisfied), and indirectly (since its cost reflects the opportunity cost of production factors, their marginal productivity, and, therefore, the value attached to the needs that would have been covered, had these factors not been used in producing this commodity). This logic is then individualistic and rival (even if she is going to give the good as a present, the consumer informs about what the access to it means to her, not to other people also consuming similar goods), and based on willingness to pay, as stated by the individual. It also sees nothing ethically wrong in the fact that the access to the good being valued is exchanged for a given amount of money. Yet, when it comes to the case of historical, cultural or natural heritage, this logic of valuation is no longer valid, simply because they are not commodities: they have superior values. The relationship between goods having such a value and citizens (not just consumers) is not based on instrumental, use values, but on something quite different: cultural identification, appreciation, the willingness to base reciprocal relations on self respect, weak intrinsic values (Stenmark, 2002, quoted in Söderholm and Sundqvist, 2003), etc. The consumption of these goods tends to be non-rival, a citizens affair, and thus the logic driving its provision and distribution should be based on collective reasoning, not simply on individual willingness to pay. Furthermore, any proposal to exchange it for a given amount of money, would be immediately considered as morally unacceptable. In some cases, not only the good itself, but the surrounding of the public access to its services, in exchange for a given amount of money, would also be rejected.

Contingent valuation is thus an appropriate way to elicit non-use values only when they are related to inter- or intra-generational altruism (the welfare of a third person enters the individual utility function), and, this third party assigns an instrumental value upon the access to the natural asset services (accessibility that may be treated as a commodity). But when faced with superior values, this is not the case, and the use of contingent valuation to elicit non-use values would be seriously misplaced: nature seen as a part of our common heritage can no longer be considered as a commodity producing rival use values, able to satisfy private needs. In this case, the market logic of valuation ceases to apply. Thus, when social demand upgrades the status of an increasing part of the natural endowment, so as to include it within the category of our common heritage, the analyst can no longer count on conventional economic valuation methods to discover the set of uses (and the corresponding set of rights) that maximises social welfare.

The above argument can be made somewhat more clear with the help of a simple illustration: the economic use of a tropical forest.

In a typical underdeveloped country, the value of the forest, as an economic resource, is so low as to be transformed into agricultural or range land by impoverished peasants trying to cover, even if only for a few years, their most basic needs. Both, the average yields obtained in cultivating the land, and the short period of time during which this can be done before having to move to another plot, are a good reflection of this low financial value.

When putting aside this individual perspective, and adopting a more social approach, the value of the ecosystem changes: the forest is now seen not only as a source of privately appropriable commodities (fish, game, wood, medicines), but also as providing some common and/or public goods which also have an economic value: erosion protection, biodiversity, carbon sequestration, etc. Accounting efficiency prices, the shadow price of foreign exchange, together with adequate distributive factors, will help finding out the optimal set of forest uses when the aim is to maximise social welfare. In this case, the already mentioned standard methods to value environmental assets will be required. It is worth noting, however, that even if the valuation methodology is the same, the final result will be different if undertaken by the underdeveloped country authorities, or when performed at an international institution that also takes into account the social objectives of developed societies. Altruism will obviously change both, the family of distributive parameters, and the social rate of discount.⁹ Considering the difference between the individual and the social perspective, between the financial and the economic and social value of the forest, steps should be taken to prevent this process of deforestation while, at the same time, trying to solve the problem of the settler population: part of the benefits of the new forest management should be directed towards this end.

Yet, once this wide social approach has been accepted, it is difficult to stop here.

Let's suppose now that a more acute conflict arises: oil (or any other highly priced ore) has been found in a tropical forest where some menaced indigenous people live. Considerations like those developed in the previous paragraph will make it necessary to compare the social benefits linked to the foreign exchange inflow that its exploitation would provide, with the value of ecosystem services that will be lost as a consequence. The result would probably be a more thoughtful approach to the whole operation: care will be taken not only to reduce spills and unnecessary damage, but also to avoid opening too many roads (to prevent the inflow of settlers). Nevertheless, if oil extraction is allowed to proceed, even under a very careful management, it will have a lasting impact not only on the territory itself, but also upon the indigenous peoples living there. The speeding up of the velocity of aculturization, together with a serious transformation of the forest morphology, is to be expected. In short, the loss of both, a natural and a cultural endowment tightly intertwined.

At this point, the standar approach to value ecosystem services ceases to be entirely valid. The reason is that some people in developed societies no longer emphasise the economic services that the forest may provide (services that, as commodities, have substitutes). They now value most the natural and cultural heritage that this particular ecosystem helps to maintain and, therefore, prioritise conservation rather than exploitation. The value of these "services", not being commodities, cannot, and should not be materialised through the market logic, as conventional methods do.

Economic valuation techniques are still very useful. They may contribute to calculate the opportunity costs of conservation: the economic value of social welfare foregone because of the conservation strategy, and probably would shed some light on the amount of economic compensation due to the people concerned. However, they are essentially not suited for the task of discovering the value of something that society considers no longer as a commodity.

6. A short conclusion

The coexistence of different species (including human beings) in the biosphere is often competitive and conflictive (Barbier, 2001). This means that the process by which humans decide on the best uses of their surrounding natural endowment implies, at least in its final result, a neat position about the kind of relationship humans want to establish with the rest of species on this planet. The discussion about this whole framework of rights and duties, between humans and other living and non-living creatures, has given birth to the so-called Environmental Ethics.

From an economic viewpoint, the problem of deciding amongst the different and often competing uses of the biosphere, is one of identifying the set that maximises the present value that society as a whole, assigns to the needs that its members would so satisfy. The value that the person involved gives to this satisfaction and the value that society as a whole gives, in turn, to this person satisfying this particular need. This decision process, of course, will take place with due respect to any ecological sustainability requirement and threshold, since, otherwise, the rights of future generations would be at stake because of irreversible effects.

⁹ The lowering of the social rate of discount as a result of the larger time horizon applied, and the lower value of the elasticity of the marginal utility of consumption curve, appears even more clearly when taking into account, for instance, the interesting proposal put forward by Sumaila and Walters (2005), where both individual and social rates are combined to obtain the final social rate.

When attempting to solve the problem of allocating rights to use natural assets within an intertemporal framework, economic analysis relies on the market valuation process of the services provided, in terms of human needs being satisfied. Directly, as when these functions give rise to goods and services that have a market price. Indirectly, when this is not the case, and the analyst must then apply methods provided by conventional economic analysis to value intangibles. To take into account both, market imperfections and externalities, and intra and intergeneration equity, the use of accounting prices, and distributive factors, is warranted. Therefore, the analyst, acting as an homo politicus (Faber et al., 2002), will take into account not only the market value of needs being covered by the access to the services of the biosphere, but also the weight that the individual welfare of the person involved has for the social group as a whole.

Economic analysis has travelled a long way in helping society decide on the best set of uses of the biosphere: i.e., the one that will maximise social welfare. By assigning an economic (monetary) value on the necessities satisfied, it does provide a very important input to the social decision-making process that should, ideally, allocate the right to use nature assets and services, at large.

The problem is, nevertheless, that the market logic of valuation only applies if those services can be considered as commodities. However, as societies advance (that is, when basic needs are largely covered for the majority of their population), the social demand with respect to the environment tends to change. Rather than as a pool of natural resources that could be used to satisfy basic needs, the natural endowment is beginning to be approached as something belonging to a common heritage. This change in social perception towards the natural endowment has critical consequences on the usefulness of economic valuation methods to inform decision-making processes. Thus, when social demand upgrades the status of an increasing part of the natural endowment to the category of a common heritage, the analyst can no longer rely on conventional economic methods of valuation. After all, as Scanlon argues "the [concept of] quality of life suffers from an embarrassing richness of possibilities. [...] What kinds of circumstances provide good conditions under which to

live? What makes a life a good one for the person who lives it? What makes a life a valuable one?" (Scanlon, 1993, p. 185).

Acknowledgement

We would like to thank valuable comments from two anonymous referees.

References

- Anderson, E., 1995. Value in Ethics and Economics. Harvard University Press, Cambridge, MA. reprint, 264 pp.
- Arigoni, R., Seroa da Motta, R., Ferraz, C., 2000. A estimação do valor ambiental do Parque Nacional do Iguaçu a través do método de custo de viagem. Pesquisa e Planejamento Economico 30 (3), 355–382.
- Azqueta, D., 2002. Introducción a la Economía Ambiental. McGraw-Hill, Madrid. 420 pp.
- Barbier, E.B., 2001. A note on the economics of biological invasions. Ecological Economics 39 (2), 197–202.
- Becker, G.S., Murphy, K.M., 1988. A theory of rational addiction. Journal of Political Economy 96 (4), 675–700.
- Berkes, F., Folke, C. (Eds.), 2000. Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience. Cambridge University Press, Cambridge. reprint, 476 pp.
- Carson, R.T., 2004. Contingent Valuation: A Comprehensive Bibliography and History. Edward Elgar, Cheltenham, UK. 450 pp.
- Elliot, R. (Ed.), 1995. Environmental Ethics. Oxford University Press, Oxford. 262 pp.
- Etzioni, A., 1991. The Moral Dimension: Toward a New Economics. Simon and Schuster, New York. 314 pp.
- Faber, M., Petersen, T., Schiller, J., 2002. Homo oeconomicus and homo politicus in Ecological Economics. Ecological Economics 40, 323–333.
- Haywood, T., 1997. Anthropocentrism, a misunderstood problem. Environmental Values 6, 49–63.
- Hodgson, G., 1992. Rationality and the influence of institutions. In: Ekins, P., Max-Neef, M. (Eds.), Real-Life Economics: Understanding Wealth Creation. Routledge, London.
- Illich, I., 1993. Needs. In: Sachs, W. (Ed.), The Development Dictionary: A Guide to Knowledge as Power. Witwatersrand University Press, South Africa, pp. 88–101. 306 pp.
- Leopold, A., 1949. A Sand County Almanac. Oxford University Press, New York.
- Londero, E. (Ed.), 1997. Benefits and Beneficiaries: An Introduction to Estimating Distributional Effects in Cost–Benefit Analysis, 2nd edition. Inter-American Development Bank, Washington. 304 pp.
- Mainwaring, L., 2001. Environmental values and the frame of reference. Ecological Economics 38, 391–402.

- Navrud, S., Ready, R.C. (Eds.), 2002. Valuing Cultural Heritage: Applying Environmental Valuation Techniques to Historic Buildings, Monuments and Artifacts. Edward Elgar, Cheltenham. 280 pp.
- Nelson, A., 2001. The poverty of money: marxian insights for ecological economics. Ecological Economics 36, 499–511.
- Neumayer, E., 2003. Weak Versus Strong Sustainability, 2nd edition Edward Elgar, Cheltenham. 256 pp.
- Nyborg, K., 2000. Homo occonomicus and homo politicus: interpretation and aggregation of environmental values. Journal of Economic Behavior & Organization 42, 305–322.
- Rosenberg, R.S., Peterson, G.L., Clarke, A., Brown, T.C., 2003. Measuring disposition for lexicographic preferences of environmental goods: integrating economics, psychology and ethics. Ecological Economics 44, 63–76.
- Sagoff, M., 1988. The economy of the earth. Philosophy, Law and the Environment. Cambridge University Press, Cambridge, UK. 281 pp.
- Scanlon, T., 1993. Value, desire and quality of life, In: Nussbaum, M.C. and Sen, A. (Eds.), 1993. The Quality of Life, Oxford University Press.
- Sen, A., 1982. Poverty and Famines: An Essay on Entitlement and Deprivation. Oxford University Press, Oxford. 257 pp.
- Singer, P., 1975. Animal Liberation. Basic Books, New York. 352 pp.

- Söderholm, P., Sundqvist, T., 2003. Pricing environmental externalities in the power sector: ethical limits and implications for social choice. Ecological Economics 46, 333–350.
- Spash, C.L., Hanley, N., 1995. Preferences information and biodiversity preservation. Ecological Economics 12, 191–208.
- Squire, L., van der Tak, H.G., 1975. Economic Analysis of Projects. John Hopkins, Baltimore.
- Sumaila, U.R., Walters, C., 2005. Intergenerational discounting: a new intuitive approach. Ecological Economics 52, 135–142.
- Stenmark, M., 2002. Environmental ethics and policy-making. Ashgate Translations in Philosophy, Theology and Religion. Ashgate Publishing, 161 pp.
- Thorsby, D., 1994. The production and consumption of the arts: a view of cultural economics. Journal of Economic Literature 32, 1-29.
- Vatn, A., 2000. The environment as a commodity. Environmental Values 9, 493–509.
- Wearing, S., Neil, J., 1999. Ecotourism: Impacts, Potentials and Possibilities. Butterworth-Heinemann, Oxford. 163 pp.
- Welch, C., 1991. Utilitarianism. In: Eatwell, J., Milgate, M., Newman, P. (Eds.), The New Palgrave: A Dictionary of Economics. MacMillan, London.