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Ethics, Prices and Biodiversity

The purpose of this paper is to show that the methods of determining monetary values of biodiversity depend on one's ethical point of departure. After a short summary of the ethical principles of anthropocentrism and biocentrism, the paper discusses the problem whether we should extend the market system and let the price mechanism encompass biological diversity, i.e. put prices on biodiversity. Basically, the anthropocentric approach leads to an ethics of freedom, where the individual has the right to decide what is good and to implement it. Then the individual's willingness to pay for biodiversity is a relevant criterion for its price. But the biocentric approach rather implies that an ethic of law is more important, valuing the real needs of Nature higher than the preferences of the individual consumers. Then the costs for protection or replacement are relevant, because they reflect what Nature needs.

One further question concerns who is to decide the process of biodiversity. If the willingness to pay is the criterion, then obviously the market should decide, using well-developed methods. If on the other hand the costs of protection or replacement are relevant, technical and economic experts have to calculate them - given the politically decided level of biodiversity to be restored.

The basic question, whether the market and the price mechanism should be considered acceptable instruments to protect biodiversity, is not discussed in the paper. However, some environmentalists find the wish to maximize one's utility incompatible with environmental ethics. Also, the price mechanism may take various roles. Thus, prices may convey different information about the value of biodiversity, depending on which role we assign to them.

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Nowadays the price of biological diversity is much discussed. One issue is whether it is at all meaningful to attach one-dimensional economic values to multi-faceted biological phenomena. Some people, in particular a number of environmentalists and biologists, claim that it is a scientifically unsound practice. Others, often economists, on the contrary argue that such valuations are the most efficient - or maybe even the only efficient - means to save biodiversity. Both positions have ethical aspects.

The purpose of this paper is to discuss to what extent the problem how to determine monetary values of biodiversity (the valuation problem) depends on one's ethical points of departure. As will be seen, the relation of "dependence" is not one of strict implication, but instead indicates that the various solutions to the valuation problem may be connected with or rely on some ethical view on environmental policies. One might loosely say that the ethical points of departure are part of the implicit paradigms of the methods of pricing. However, it will also be clear that one's view about how the market system works is

important when it comes to determining the role of prices in environmental policy. This means that well-known political disagreements play a role in this connection too.

The structure of the paper is as follows. First I give a short systematic presentation of different ethical positions. Then I try to connect them with the main methods of pricing: attempts to use market prices such as willing-ness-to-pay approaches; so-called defensive approaches relying on replacement costs or protection costs; and instrumental (pragmatic) approaches to prices. A final possibility is to oppose prices on biodiversity altogether as being unethical.

1. Various ethical positions

Environmental ethics is of course much debated today. The number of books, articles and journals dealing with various aspects of this matter is rapidly increasing. I shall not attempt an overview of the debates, but limit myself to a few topics that seem relevant to the problem of valuation as regards biodiversity. Thus, one should distinguish between two interconnected ethical problems: the problem of the moral object (what has an ethical value) and the problem of the moral agent (who makes ethical decisions and is morally responsible for them). I deal with these two problems in turn in this section.

1.1 The moral subject

The problem of the moral subject is at the center of environmental ethics. It is expressed in the perennial disagreement between anthropocentrism (human life is ethically more valuable than all other forms of life, or maybe even the only ethically valuable form of life) and biocentrism (human life has no more ethical value than - some or all - other forms of life). Both views can be defined and defended in different ways, which have implications for the valuation problem. At least for value objectivists, such views define the scope of the concept of value. I shall summarily present the ethical positions that have a bearing on this problem, beginning with anthropocentrism.

A. Anthropocentric positions

Generally speaking, those who advocate the ethical supremacy of human beings among other forms of life defend their position by pointing to some ethically relevant quality that only human beings possess. I wish to highlight three such qualities.

- a) The first quality is biological: human beings are said to be the biologically most developed and complex form of life, in particular regarding the brain and the neural system. Indeed, human beings are seen as the end and highest point of a long biological evolution and therefore - ethically more valuable than other life forms. This view has been advocated by some evolutionists. But it has also been questioned as arbitrarily identifying the neural system as the ethically most important among many other biological properties.
- b) The second quality is psychological: only human beings possess consciousness and the power of abstract and logical reasoning. Only human beings can have intentions and make long-term plans. Therefore they are the only ones who can make conscious

choices between alternatives, considering their long term consequences. This also implies that human beings are the only ones with a moral responsibility. In other words, human beings are the only moral agents, thanks to their superior power of logical thinking. This Kantian line of thought is in particular consistent with the important tradition within economics that devotes itself to the analysis of human preferences and rational choices.

- c) The third quality is social and philosophical: the personality and identity of individual human beings are largely formed by their relations to other individuals. Our way of life depends essentially on how we ourselves, and others, judge us. Humans create humans, not only biologically but also psychologically and socially. Our personalities are in other words social constructions. Philosophically speaking, the ego is formed in the meeting with the Other. This is taken to mean that the social relations between human beings carry a fundamental moral significance. Such views are characteristic of several continental humanistic philosophical traditions, such as critical philosophy and philosophical hermeneutics.

Obviously, the three qualities are connected. Our developed brain makes our consciousness and power of logical thinking possible, which in their turn are the basis for our social relationships. But it is still a matter of ethical dispute which one of these qualities is morally decisive.

B. Biocentric positions

Basically, those who defend the biocentric position that other life forms can have the same ethical value as human beings argue along one of two possible lines. First, they may say that animals or maybe even plants have some quality that gives them an ethical value. Second, they may hold that ecosystems or Nature as a whole have some emergent quality (i.e. a quality that pertains to a system but not to its parts) which gives them an ethical value, for instance health or integrity. In the second case, it is not an individual or a species that carries ethical value, but the ecological system of which it is a part. This view is often referred to as ecocentrism. Qualities that are not emergent are sometimes called simple: having a consciousness or being able to feel pain are examples of simple qualities.

In the first case, at least three simple qualities have been advocated as being ethically decisive.

- d) The first quality is analogous to the second anthropocentric quality: only human beings and some higher animals like primates (apes and monkeys), dogs and swine have consciousness and therefore an intrinsic ethical value. Thus, consciousness is considered the basic ethical quality. Forms of life without this quality possess only an instrumental value for the higher animals. This view has been defended by e.g. the Australian Peter Singer.
- e) The second quality is more extended: the ability to feel pain is considered the ethically relevant criterion. Thus, birds, frogs, lizards and mammals can feel pain and should therefore be treated with no less respect than humans. But plants, insects and bacteria are not sentient, and can therefore only have an instrumental value. This quality can be considered analogous to the third anthropocentric quality, extending the concept

of the Other to all sentient creatures. This view has been advocated by Eastern philosophers, but also in the West, e.g. by Bentham.

- f) The third and most extensive quality is to possess life. This means that all living things - animals, plants, bacteria - have an intrinsic ethical value. There is no ethical distinction between human beings and amoebae: both have the same moral status. Environmentalists such as advocates of deep ecology have defended this position. Albert Schweitzer is its best known representative.

In the second, ecocentric case the health (or integrity, or resilience) of Nature as a whole is often considered the ethically relevant objective. Depending on one's views about how ecosystems work, ecocentrism can imply either of two environmental policy stances.

- g) The first policy stance is that ecosystems are best protected if keystone functions are preserved. Species having such a function (keystone species) contribute more than others to the health or resilience of their ecosystem. Thus, bees may be considered more valuable than bears, because bees are indispensable for pollination but bears have the same function in the ecosystems as other predators, such as wolves or wolverines. Keystone species are then ethically more valuable than other species because they are instrumental to the health of their ecosystem.
- h) The second policy stance is that all species should be protected, being part of the encompassing network of an ecosystem. In contradistinction to the keystone theory, this means that all forms of life of an ecosystem are considered important for the health of the system. Therefore, all animals, plants and so on have the same ethical value. There is no ethical difference between bees and bears. The practical conclusion is that all endangered species are equally worth saving. This position is close to the idea that all forms of life have the same value (the third simple biocentric quality). It should be mentioned that biologists and ecologists still disagree about whether the keystone theory or the network theory is more adequate. Also, it should be pointed out that the various anthropocentric and biocentric positions lead to different conclusions about whether primarily individuals or species carry an ethical value. Those who hold that some simple quality is ethically relevant, be it anthropocentric or biocentric, in most cases feel that individuals are to be respected and protected. Thus, individuals have a consciousness, enter into social relationships, feel pain and possess life. But those who attach more importance to the health of Nature tend to put more emphasis on species as a means to protect the health of ecosystems. For them, single individuals carry less ethical value, since they are basically unimportant to the survival of ecosystems.

1.2 The moral agent

So far I have discussed the subject matter of ethical rules, i.e. which forms of life are most important from an ethical point of view and therefore should be protected. But the delimitation of moral agents, i.e. those who are morally obliged to protect biodiversity, is also ethically important. We may safely assume that only human beings can be moral agents and therefore morally responsible for their actions. Gorillas and lions sometimes kill their

own kin, but whatever we think about this practice we can hardly blame them morally for it. The ethical problem concerning the moral agents is rather which human beings should decide about the conservation of biodiversity.

To discuss this, I use the distinction between the ethics of freedom and the ethics of law, which I believe represents a fundamental moral and ideological dilemma. Western democratic societies basically rely on an ethical principle of individual rights and preferences: the ethics of freedom. But the environmental problems have led to the rebirth of a radically different moral stance. Environmentalists often advocate the ethical obligation to conform to Nature and obey its laws: the ethics of law. Both types of ethics have their roots in antiquity, but there are also more recent sources.

Thus, the idea behind the first type stems from Enlightenment. It says that every individual is free to decide what actions are good or useful for himself or herself, and (ii) has the moral right (or even duty) to perform these actions. This idea is nowadays often considered self-evident in Western societies, particularly in mainstream economics with its emphasis on the maximization of the individual preferences. Representative democracy is of course a way of “adding up” individual preferences to get an expression of the general will of the people. As we shall see, the advocates of this ethics sometimes disagree on whether the market or the democratic election system is the best road to freedom.

The idea behind the second type of ethics is rather that it is essential to every human being to be an organic part of an all-embracing whole (however defined, sometimes in religious terms), which is an important thesis of Romanticism. Human actions which are contrary to or damage the whole are immoral, irrespective of how useful they may be to individuals. This means that individuals normally cannot themselves decide what is morally right, but have to rely on knowledgeable persons to find out how to behave: prophets, professors or other experts. Sometimes it is held that real freedom means conformity to the laws of the whole. Such ideas do not seem to be generally accepted in the West today, but are apparently important in the East. They are basic to several Eastern philosophies such as Confucianism, I Ching and various schools of Buddhism. It is beyond this paper to discuss which line of thought is to be preferred. But let me emphasize that the choice between the ethics of freedom and of law is not easy. Each type of ethics may seem intuitively appealing, but both also have serious deficiencies. The main problem of the ethics of freedom is to accommodate altruism and respect for others, without essentially giving up the individual freedom to act in one's own interests. In straightforward terms: why should a free individual care for others and for the future environment? So far no solution to this problem has been generally accepted.

The ethics of law runs into its own difficulties. The most notorious problem is of course how to define the System, and the place of various species in it. In this connection, a much debated question is whether the global ecosystem has a climax state with optimal energy use, which is to be preferred to all other states of nature. It also remains a problem how such a state should be defined, and how we know when it really occurs.

A full analysis of these problems should also include a discussion of whether institutions such as representative democracy and the market system are compatible with environmentalism. The respective roles of parliament, local groups and ecology professors would have to be considered - and probably reconsidered. These important problems obviously

deserve a discussion of their own. In this paper, I only deal with various aspects of pricing.

To sum up this section on various ethical positions, there is no necessary connection between the two ethical problems of the moral subject and the moral agent. True, it may seem natural for an anthropocentrist to adhere to the ethics of freedom and the privilege of individuals to decide their own good. This is particularly clear in position b) above, namely that human beings are the only ones capable of rational thinking and conscious choice between alternatives. And a biocentrist may often prefer the ethics of law, especially if the important system to which we should conform is the global ecosystem or Gaia (although the important system could also be defined in an anthropocentric spirit as one or another utopian social system). The prime goal of environmental policy is then basically to avoid damage to Nature, not in the first place to satisfy human needs or interests.

But these simple connections do not always hold true. An anthropocentrist may for instance also claim that the moral place and role of humans in nature is objectively given, although privileged. Then it is not necessarily the case that every individual is free to decide what actions are good, and condition (i) of the ethics of freedom does not hold. Again, a biocentrist may well hold e.g. that the democratic system is the best way to implement an ecological society and protect biodiversity. Indeed, most environmentalists seem to accept representative democracy! In that case it is the will of the people that decides how the laws of Nature should best be obeyed.

A simple figure may summarize the relationships between the various views on the moral subject and the moral agent:

MORAL SUBJECT ----- MORAL AGENT	ANTHROPO-CENTRISM	BIOCENTRISM
THE ETHICS OF FREEDOM	The people decides its own goals and how to reach them	The people decides how to reach given environmental goals
THE ETHICS OF LAW	The place of humans in nature is given and privileged	The place of humans in nature is given but not privileged

Figure 1 Connections between the ethical positions

2. The price of biodiversity

The point of assigning monetary prices to biodiversity is of course to give environmental policy an instrument for protecting it or conserving the health or resilience of Nature. But there are divergent views on how these prices should work and who should determine them.

One position is that prices on biodiversity should reflect how much we are prepared to pay for it. In this way the demand for biodiversity can be compared with our demand for other goods and services, and with the costs of supplying it. The task is then to determine the market demand for biodiversity, either directly or indirectly, via investigations of various kinds.

According to another possible view, prices on biodiversity should reflect its objective “real” value, not our demand for it. The prices may e.g. correspond to the costs for

protecting or preserving biodiversity. It is then reasonable that the prices are determined by experts or by the political system. One may finally also hold that prices and economics are irrelevant to biodiversity and environmental policies, and that one should avoid introducing prices at all. I shall now discuss various views on pricing.

- (i) The first view is that the market demand is the relevant measure of value. This idea is consistent with the traditional view that market prices reflect the equilibrium point between demand and supply of goods and services. Thus, biodiversity should be protected or replaced to the extent that people want to pay for it, at actual market costs for measures such as emission reductions or the restoration of ecosystems. This is the point where demand and supply meet.

The most usual argument for extending the market system to cover ecosystems and their parts is that this is the most efficient method. Today there is generally no obligation to pay for the damaged caused by polluting ecosystems. One result of this is too much pollution. If people instead have to pay for emissions and pollutions which damage the health of Nature, they will decrease these activities in their own interests, to save money.

Also, if the prices are right, the health of Nature will be protected exactly to the extent households and enterprises want. This means that the market will find the optimal trade-off between the protection of ecosystems and other goods and services. Sometimes economists add that this is also the most democratic method, as it avoids the “paternalism” of politicians who want to decide for others.

The most ardent defenders of extending the market system to cover ecosystems also claim that harming most kinds of biodiversity on the brink of disappearance will be so expensive, thanks to the law of supply and demand, that this very fact will save them. The more rare a natural resource gets, the more people are willing to pay for it. For instance, the prices of resources such as oil or clean fishing water increase the rarer the resources get. The price mechanism is therefore the most, or even the only, effective way to protect biodiversity, since prices change automatically as new parts of biodiversity are threatened and become rarer.

A further way of using the market prices on natural resources is to measure “green GDP” by indicating the environmental losses or gains connected with the economic and industrial activities included in the “ordinary” GDP. Thus “green GDP” can be used to compare total welfare, including environmental services, at different points of time and between different countries. Such comparisons may serve as an argument for increasing (or decreasing!) the level of ambition of environmental policies.

There are of course several well-known methods to find out how much people want to pay for biodiversity. In some cases, market prices are immediately available. The value of fish in the sea or a lake is simply the price of the fish in the market. In other cases, it is possible to deduce the market value indirectly. Thus, the value of a clean lake may be deduced from what people are willing to pay to travel to this lake, or from the prices of real estates around the lake in comparison to other land prices. Finally, one may rely on questionnaires or interviews to find out what people are willing to pay: the willingness-to-pay approach. All three methods are extensively discussed and applied by environmental economists. Another important problem is how the new market prices should be designed, e.g. as Pigouvian taxes or as marketable bubbles. I shall not dwell on these rather technical

analyses, but - for the sake of the discussion - presume that it is actually possible to assign a market price to most kinds of biodiversity.

These methods have obvious ethical implications, for both the question of the moral subject and that of the moral agent. As regards the first question, that of the moral subject, market investigations are essentially all that is needed to determine the value of the moral subject - biodiversity - if one accepts an anthropocentric ethics. The preferences of human beings are considered given and determine the demand for biodiversity. The supply of biodiversity is indicated by the costs of protecting or conserving it. The demand and the supply together define the market price and to what extent one should save biodiversity. If, for instance, the market demand for a park or a lake exceeds the costs of protecting it, then one should protect it. But if the protection costs exceed what people are willing to pay (including all possible goods and services one can get out of the park or the lake), then there is no reason to save these ecosystems.

However, for a biocentric ethics, the preferences of human beings can not be considered decisive for how much biodiversity to conserve. Instead, the lives of endangered sentient beings or the health of the ecosystems measured in some biological way, e.g. as their resilience - constitute the criterion for what is ethically correct. It may then be unethical to waste the park or the lake, even if the costs for conserving them exceed what people are willing to pay. This does not necessarily mean that the market value is uninteresting: in practical policies it may be one useful piece of background information, among all other data. After all, human interests should not be totally ignored, even if they are not decisive! But from a biocentric point of view, the market values certainly lose much of their importance as they constitute a fundamentally incomplete decision criterion.

Turning to the question of the moral agent, to allow the individual preferences and the market forces to decide the value of biodiversity is well in line with the ethics of freedom. The preferences of the people are either reflected in explicit or implicit market prices, or in the willingness to pay as shown by a sample of consumers. In all these cases, it is the people (or more exactly, the market behaviour of the people) who decides what biodiversity is worth, in comparison to other goods or services. On the other hand, such a position is not acceptable to the ethics of law, according to which our main moral duty to conform to the laws of Nature, not to decide them. The market place cannot then be the judge of these laws.

- (ii) The alternative to extending the market system is to continue the present practice of letting (mainly) the political system decide the level of ambition in environmental policies. Politically elected bodies like governments, parliaments or communes decide how much money or effort one should put in to protect biodiversity. The defenders of the political method sometimes claim that it is more democratic, because it avoids the uneven distribution of money and power that is characteristic of the market system. Thus, environmental considerations do not risk being run over by powerful economic interests like they do in the market place. Nowadays the political parties normally run their election campaigns on important environmental programmes, among other issues. (True, the political parties are not always explicit about how much money they plan to spend on this or that environmental purpose. But then again, neither are the consumers interrogated in the willingness to pay investigations mentioned above!)

In the political system, there is no longer a question of directly comparing the preferences of the people with the costs or sacrifices connected with keeping biodiversity unharmed, in order to decide the optimal course of action. Instead, the actual defensive costs, such as those of conserving or replacing biodiversity, naturally serve as a basis for political decisions about the level of ambition in environmental policies. These costs may be compared to the costs connected with other options reflected in government or communal budgets, such as welfare payments, measures against unemployment or against crime, or better roads. How much of the taxpayers' money should be allocated to each one of all these purposes has to be decided in the usual political process. In this way, prices are used to reflect the supply of biodiversity in the sense that they show how much we actually have to pay for it. The demand for biodiversity is then of course shown at the election boxes.

Also, the value of biodiversity in this sense may serve as a measure of the so-called environmental debt, i.e. what it would cost us to restore ecosystems and biodiversity to their original status. Obviously, it is a matter of ambition how far we should go to restore natural conditions, and it is an ethical or political question what original status we should strive for. The role of the environmental debt is to serve as a measure of how much that status may cost.

The ethical questions of the moral subject and the moral agent are relevant to the political method of determining the prices of biodiversity. As regards the moral subject, this method is not tied to any particular ethical criterion. Politicians are clearly free to accept any one of the different ethical positions mentioned above. Green parties often adhere to biocentrism or ecocentrism, while conservatives and social democrats tend to prefer anthropocentrism. These positions have different implications for the question of how much biodiversity to conserve. Thus, one might emphasize the interests of human beings, possibly including higher animals with a consciousness, or of all sentient beings, or else one might want to preserve only keystone functions or the whole network of the ecosystems. Obviously, the task of keeping all sentient beings alive, or conserving the whole network of the ecosystems, is much more difficult than just protecting human interests as such.

This indeterminate ethical character of the political method also means that both advocates of a "real" objective value of biodiversity and defenders of an anthropocentric subjectivism may accept the political system as the arbiter of prices. Whatever criterion the politicians choose - be it a subjective anthropocentric or an objective biocentric one - it determines the level of ambition of environmental policy. And the resulting defensive costs (i.e. prices) show how much we have to pay for conserving or replacing biodiversity. The voters then show what they prefer at the elections.

On the other hand, those who prefer the market approach and find the willingness to pay decisive, the conservation or replacement costs are questionable, since they do not necessarily reflect the preferences of the market. Also, they question the concept of environmental debt - or for that matter "green GDP" - measured in terms of such defensive costs, for the reason that it does not indicate how much people are willing to pay to conserve or restore biodiversity, or the optimal level of restoration. As already mentioned, the defensive costs reflect the supply side, not the demand side, of biodiversity and therefore, according to this view, cannot alone serve as a basis for economic decisions - at least in the market sense.

As regards the issue of the moral agent, the political method of determining prices is closer to the ethics of freedom than to the ethics of law. To let the political system decide

the extent to which biodiversity should be saved is clearly consistent with the ethics of freedom. How much biodiversity to preserve, in comparison to other goods and services, is then determined through the usual democratic election process. Whether the central or the local government should be the competent body is a further issue to be settled. Many people feel today that the local level is the important one, as biodiversity is enjoyed by those living close to the ecosystems. Others prefer the central government, or maybe even international bodies, as biodiversity is in the interest of all humankind.

If on the other hand the ethics of law takes precedence when applying the political method of determining prices, representative democracy may be run over. According to one possible version of the ethics of law, the prices of biodiversity should be determined by ecological experts on the basis of some biocentric criterion. For instance, the experts could calculate the costs of preserving the keystone species as the relevant criterion. Then, according to this view, the political system would have to pay this price, irrespective of budget constraints or the general economic situation. In effect, this means that the political system is subordinated to ecological considerations. Democracy has to step aside and ecology takes over, in the spirit of a consistent ethics of law. Some environmentalists more or less implicitly argue along these lines, but so far democracy has generally prevailed. But there are several counterexamples. One is the threat of certain militant environmentalists to sabotage the construction of a bridge between Denmark and Sweden, which was democratically decided by both governments but is considered by some to damage the ecology of the Sound.

- (iii) A third way to decide the price of biodiversity is a pragmatic compromise between relying on the market demand and the political system, but still letting human beings decide the value of biodiversity. Prices then no longer reflect either the demand or the supply of biodiversity. Instead, the government simply determines the prices of various aspects of biodiversity at such levels that they prevent people from harming it. This means that prices are just considered an expedient means to reach the desired level of environmental protection. For instance, the government may decide that licences for hunting elk or bear should be so expensive that only a limited number of those animals are killed. Emission taxes on sulphur and nitrogen may be fixed at such a level that emissions are reduced to reasonable levels. Or entrance fees to national parks could be so high that the parks are not swamped by too many people. This pragmatic standpoint is in fact often accepted by politicians. It has for instance played a large role in the Swedish environmental policy. In order to find the expedient price levels, the government may experiment or simply rely on general insights about how households and enterprises react, based on experiences from the market or the tax system. Also, investigations about the willingness to pay or about replacement costs might give some information, although they are not necessarily decisive. Instead, they get a role similar to Gallup polls.

In this way political and economical methods are combined, while at the same time ethical neutrality is preserved. As regards the moral subject, both anthropocentrists and biocentrist may accept prices as one tool among others to achieve their respective goals. Note that prices no longer express any willingness to pay, but only serve to influence the market

behaviour as much as deemed necessary. These prices may in other words be used for both anthropocentric and biocentric purposes.

Neither does the pragmatic compromise imply any definite positions as regards the moral agent. True, the market is used to implement the environmental goals. But market preferences are not decisive, only used as a means to a political end. And although the political system decides the price level, it is not necessarily tied to any particular ethics (as already mentioned). The politicians may refer either to the ethics of freedom or the ethics of law in deciding the price of biodiversity, and thereby the level of ambition in environmental policy.

The ethical issue aside, there are practical reasons in favour of the pragmatic approach. Thus, it is supported by two factual arguments intended to show that prices can not be determined by the market demand and generally trusted to save biodiversity. First, the way the market works in general has been criticized. Some critics question the claim that the market system and the price mechanism provide adequate information about the preferences of households and enterprises. It is obvious that the market economy works poorly, with inefficiencies and disequilibria such as unemployment, inflation and economic waste. The reason is, according to the critics, that all sorts of social and psychological factors disturb the price signals. Different economic actors have different possibilities of making their voices heard and manipulating prices. Monopolies, cartels and politicians have large possibilities of influencing more or less ignorant consumers, to take only one example. These reasons, which of course are well known from the general political discussions, make it a dubious matter to use the price system as an instrument to protect the biodiversity.

A second objection to using market demand to decide prices in environmental policies is that it is difficult or even impossible to find the right prices of environmental goods. Ecological and social systems are so complex and have so many dimensions that the one-dimensional price mechanism cannot possibly reflect them all. The long-term consequences of biodiversity losses are very hard to map, even for scientists. The much discussed chaos theory gives convincing evidence for this. In particular, the development of emergent qualities may be hard or impossible to predict and therefore to value (the holistic argument). The willingness of individual, often uneducated consumers, to pay for biodiversity then does not seem relevant. Also, ecological services such as the production of oxygen by plants and the power of reproduction can hardly be assigned a monetary value. Further examples of the difficulties to use prices as measures are the esthetic and cultural values of biodiversity.

Furthermore, in the cases where it is possible to rely on methods such as the willingness-to-pay approach, it requires long time and hard work to quantify this willingness. Sometimes it even takes doctoral dissertations to do it. This makes it practically impossible to find out the prices of biodiversity, in particular during periods when relative prices change. One would have to repeat the investigations at least once a year to be sure to catch the relative price movements. All this gives further weight to the pragmatic approach to fix prices at what seems to be the most effective level needed to conserve the biodiversity we want.

- (iv) A fourth possible way to look at prices on biodiversity is to discard prices altogether as an instrument in environmental policies. Considerations about both the moral subject and the moral agent may lead to the view that the price mechanism should not be used. Thus, those who combine biocentrism and an ethics of law are particularly inclined to accept this position.

First, as regards the moral subject, many biocentrically or ecocentrically committed environmentalists claim that the one-dimensionality of economic factors such as prices make them ill adapted to express the multi-faceted and subtle aspects of biodiversity. As was pointed out above, it is not market conditions but the lives of endangered sentient beings or the health of the ecosystems that constitute the only relevant criterion for what is ethical correct. Prices are insufficient and irrelevant, according to this view. Also, if the moral agent should basically obey an ecologically grounded ethics of law, it may be argued that the rules of the market and/or the political system are unsatisfactory.

This ethical position implies that “economising” Nature is a bad way to protect biodiversity. The real cause for the present environmental problems is considered to be an unfettered economic thinking and the struggle to satisfy one’s own individual preferences - factors which constitute the foundation of the market system. Greed is the root of the evil. Industrialism is the child of the cultural habit to put one’s own selfish interests ahead of the needs of Nature. Pricing biodiversity is therefore a misguided proposal and in effect only a way of keeping this ill-fated habit alive. For one thing, it means that one can buy the right to pollute to further one’s selfish interests.

This view is supported by the argument that prices express human preferences, whereas environmental goals such as an unharmed biodiversity should stand above such ephemeral matters. We should pursue these goals and conserve biodiversity because of our overriding moral obligation to conform to Nature. This obligation risks being overtaken by economic considerations if we introduce prices on biodiversity, considering the undeniable power of various vested economic interests.

True, the monetary prices of biodiversity may be set at such a high level that harming ecosystems becomes forbiddingly expensive. Then biodiversity may seem well protected. But in practice economic selfishness is very strong and aggressive, and those enterprises making harmful emissions have in reality substantial possibilities to influence politicians to lower prices. Arguments about unemployment and the balance of payments have proved efficient. Then the socially and environmentally motivated considerations risk losing importance, in particular when economic problems abound - which they always do!

Furthermore, the critics of the market system may also rely on the same factual arguments against the market pricing as the pragmatists. This means that the market works to poorly to serve as an instrument in environmental policy. (I refer to the end of point (iii) above.)

3. Conclusions

The role of ethics as regards the pricing of biodiversity is obviously not clearcut. True, one conclusion of this paper is that the idea of assigning prices to biological diversity holds important ethical aspects. This conclusion can be summarized by extending the figure above:

MORAL SUBJECT MORAL AGENT	ANTHROPO-CENTRISM	BIO- OR ECO-CENTRISM
THE ETHICS OF FREEDOM	The market system or the political system or the pragmatic compromise	The pragmatic compromise (or possibly the market system or the political system)
THE ETHICS OF LAW	The political system relying on experts or the pragmatic compromise	The pragmatic compromise or discarding prices completely

Figure 2 Ethical positions on how to determine prices

It is seen that one's ethical beliefs do not uniquely decide one's views on how to determine prices. If human beings have the moral right to decide the value of biodiversity according to their own interests (anthropocentrism plus the ethics of freedom), they may rely on either the market or the political system to introduce prices as an instrument in environmental policies, or else make a pragmatic compromise using both.

In the first case, prices serve as an information system to show the optimal level of ambition to preserve biodiversity. In the second case, prices express the costs of defending biodiversity, and these costs are used as information in the normal election process. In the third case prices may simply be used as one instrument among several others in environmental policy.

If on the other hand human beings are morally obliged to preserve biodiversity, irrespective of their economic or political preferences (biocentrism or ecocentrism), the political system can be used to convey any one of the different ideas about the meaning of this moral obligation. Some militant environmentalists may even hold that the obligation is more important than democracy, as witnessed by a number of spectacular actions against democratically decided constructions of bridges or roads. Popular preferences, be they expressed in prices or at the election boxes, are then not considered decisive. But for biocentrists, the pragmatic compromise is also possible, providing an expedient means to pursue environmental policy.

A radical position is that "economising Nature" is considered immoral and inadequate, and that prices on biodiversity should be avoided altogether. This is particularly palatable for those who adhere to both biocentrism and the ethics of law.

It should be obvious that the various ethical principles, either about the moral subject or the moral agent, do not give any definite guidelines about pricing. Environmental ethics itself does not say whether the market system or representative democracy is best suited to determine prices on biodiversity. Or, for that matter, whether the market system or a new life style is to be preferred. To decide these questions you have to rely on information about how the social reality functions, in particular how the market works. As is well known, there is much disagreement about that. Thus, the ideological issues of the contemporary political scene reappear in environmental policies!

Also, the choice between competing ethical principles is in my opinion very difficult. In this paper I do not defend any particular theory about environmental ethics. My ambition has been more limited, namely to indicate the complicated ethical aspects of economic

instruments in environmental policies. I am satisfied if my remarks have helped to disperse the illusion that pricing biodiversity is a purely technical question, to be discussed and decided exclusively by economists.

However, to help stimulating the discussion I shall conclude the paper by briefly stating my own position as regards the valuation problem.

- * First, it seems obvious that the political system must remain the basic method to decide the level of ambition in environmental politics. This also means that the (central or local) government shall determine the prices of biodiversity, where such are considered expedient in environmental policies. For practical - and theoretical - reasons, it is impossible to quantify the demand for all aspects of biological diversity. Instead, this demand should be expressed at the election boxes after the political parties have argued their cases for this or that level of biodiversity to be conserved, considering the costs for doing so.
- * However, this does not exclude that investigations into the demand of the market for natural resources may provide useful information when prices have to be fixed. But it is probably an illusion to believe that there are “true” prices of biodiversity, reflecting the demand of the market.
- * In most cases more pragmatic methods of pricing seem more reasonable. The prices should be determined at such a level that they fulfill their purpose to conserve biodiversity. This also means that one should be prepared to use prices (environmental taxes or fees), in particular to curb diffuse sources of emissions such as car exhausts and tourism. As already mentioned, emergent qualities like the resilience of an ecosystem can not be given a monetary value.
- * Finally, I do not see any convincing ethical argument against all uses of economic instruments in environmental policies. Economic thinking may well include an element of unsound selfishness. But I do not think this prevents solidarity and empathy with other causes, such as respect for Nature. On the contrary, economic instruments are no doubt often efficient in environmental policies. And after all, results are more important than abstract principles.