

THE ENVIRONMENTAL PROBLEMS FROM AN ECONOMIC PERSPECTIVE

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Abstract: *The environmental problems or risks are complex and multifaceted, leading to a multitude of visions and approaches, even conflicting to each other, for identifying strategies to cope with and eventually solve these problems. Typically, different entities (individuals, economic entities, states or other supra-state institutions, etc.), use different methods or models to identify, predict or assess environmental risks and, as a result, they design sometimes dissimilar preventive strategies. In such a context, becomes increasingly clear the need for a common understanding of the environmental problems or at least some clarifications in this vast variety of opinions.*

Keywords: *environmental risks, ecosystem, diversity, ecological impact of economic activities.*

Introduction

The environmental problems, although not new in human history, enlarged their scope and exceeded the geographic and generational frontiers simultaneously with the development of the economic activity. The question here is how actors, for example states, could become aware of these possible risks, given the fact that most, if not all of these global environmental dilemmas can have different effects on different countries: while some countries might be entirely inundated by the increase of the sea level forecasted by some climate change models, and countries confronted with aridity might see their small agricultural lands succumb to desertification, others might experience an increase in their agricultural production as warmer climates in traditionally temperate regions support longer growing seasons.¹ Moreover, countries unilaterally taking measures to reduce their environmental perils might face the risk of making their economy more vulnerable in front of competition from countries that do not take such measures.

General approaches of environmental risks

The main question here seems to be “whether or not societies are on a self-destructive path”,² mainly given the fact that scholars advance two opposing

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¹ T. Tietenberg, L. Lewis, *Environmental & Natural Resource Economics*, 9th Edition, Pearson Education, 2009, p. 5.

² *Ibidem*, p. 9.

visions of the future, which not only suggest different policy options to address the environmental issues, but also imply that acting according to any of the two, when no one could be correct, might be an inefficient and dramatic way of action.

The first group of such scholars, among which the most notable and very controversial figure is Bjørn Lomborg, former Director of Denmark's Environmental Assessment Institute, assert that all societies have also been coping with environmental problems in the past and they have been successfully able to solve them. As such, the exaggerated concern with environmental problems is wasteful and, as "this civilization over the last 400 years has brought us fantastic and continued progress", it will continue to progress and be prosperous, because "we have no reason to expect that this progress will not continue".³

On the other side, there is the Worldwatch research institute – harshly criticized by Bjørn Lomborg –, centred on the analysis of the environmental problems, with their annual publication "State of the World", which considers that the current evolution of the society is unsustainable and, as such, decision makers should take measures for fighting against the "21st-century challenges of climate change, resource degradation, population growth, and poverty".⁴

These two conflicting interpretations of the facts entail very different modes of action, very diverse policies and strategies. Clarifications and, eventually, a common understanding of the problems are equally essential, as societies will respond to these challenges based on their own perception.

Usually, different entities (be they individuals, groups, states or other supra-state instances), use different methods or models to identify or predict risks, although most of these models militate for a preventive way of action: the decrease of the most likely causes of the risk would produce a decrease of that risk. Nevertheless, any measure for decreasing the risk implies a cost, either a direct monetary cost, or an opportunity cost, or a cost in the form of a loss of authority or influence. As a result, most often stakeholders, either at international, regional or local level, are not willing to assume the eventual costs entailed by measures taken to reduce environmental risks.⁵

An even bigger problem is the assessment of the risk, given the fact that different entities assess and perceive environmental risks differently, based on a wide range of factors, from their knowledge, culture, education to ideology.

This situation has led experts to talk about four different interpretations of eco-system stability – the so-called "myths of nature" –, according to which

³ B. Lomborg, *The Skeptical Environmentalist. Measuring the Real State of the World*, Cambridge: Cambridge University Press, 2001. After a serious criticism following the release of the book in 2001, Bjørn Lomborg revised his position regarding the global warming, stating that it is "undoubtedly one of the chief concerns facing the world today"; details on Juliette Jowit, "Bjørn Lomborg: \$100bn a year needed to fight climate change", in *The Guardian*, 30 August 2010, accessed on line on 15 November 2011,

<http://www.guardian.co.uk/environment/2010/aug/30/bjorn-lomborg-climate-change-u-turn>.

⁴ The *Mission* of the Worldwatch Institute, the official site of the Worldwatch Institute, www.worldwatch.org, accessed on 15 November, 2011.

⁵ C. de Franco, C. O. Meyer (eds.), *Forecasting, Warning and Responding to Transnational Risks*, Basingstoke: Palgrave Macmillan, 2011, p. 66.

various environment control institutions take decisions, assuming that nature evolves in a certain way:⁶

1. *Nature benign*: this interpretation predicts the “global equilibrium”, as the nature is predictable, lasting and forgiving. Nature can take care of itself, always returns to its durable equilibrium and can never be damaged. For such a vision, the most suitable management style is a non-interventionist one or, in other words, a *laissez-faire* style.

In the context of the environmental degradation, this would indicate the belief that the self-regulation system of the nature would eventually lead to equilibrium even if human behaviour unbalance it.

2. *Nature ephemeral*: this interpretation predicts exactly the opposite, as the nature is frail and unforgiving. As such, human behaviour can easily leads to the catastrophic breakdown of the world and the proper management style for this “myth” is the precautionary, attentive one.

In the context of environmental change, there is the menace of an increased and continuous degradation, which would eventually lead to destruction of the world.

3. *Nature perverse/tolerant*: this interpretation, although seems like a junction between the first two, predicts that nature is forgiving only to a certain extent. It is relatively stable and is not affected by small impacts, yet becomes unstable and vulnerable when an upper limit is passed. The effective management style is the interventionist one, and requires to take measures for preventing major excesses, as in case of minor disturbances the nature will take care of itself.

4. *Nature capricious*: this interpretation assumes that nature is unpredictable and any measure is useless. As a result, the institutions do not actually manage the risks, but rather cope with unpredictable events.

According to this typology of “myths of nature”, another typology has been developed, dealing with the human nature and rationality, namely: individualist, hierarchic, egalitarian and fatalist.⁷ While this typology is too simplistic to include all the factors that influence the human perception of the world, it might however show how the same information about uncertainties can determine very different environmental policies, depending on the decision maker.

Another important problem is that of the strategy – at the general level – designed and adopted for dealing with environmental risks. Here, again, there is no single way of thinking, although the most three important strategy models could be identified:

1. Risk minimisation: it is focused on the reduction of causes of potential risks, for example the causes of environment degradation and the irresponsible behaviour.

2. Cost-effective risk minimisation, which could mean either allocating a definite budget, or identifying a solution that decreases the cost-benefit ratio without a given budget in advance.

⁶ M. Schwarz, M. Thompson, *Divided We Stand: Redefining Politics, Technology and Social Choice*, Philadelphia, PA: University of Pennsylvania Press, 1990, pp. 4-5.

⁷ *Ibidem*, p. 6 ff.

3. Prevention of extreme losses, such as accidents with huge impacts on and irreparable effects over the environment.⁸

All these three strategies could have their advantages for the environment protection. Nevertheless, they suggest that there is no single way of action when dealing with environmental problems or risks, and they are rather a matter of choice, depending on the individual factors or ideologies of the decision maker.

The Environmental Responsibility from an Economic Perspective

At a general level of the analysis, it could be noticed that in the field of economics, two disciplinary approaches have been developed in the last years to address the environmental challenges: ecological economics and environmental economics. Although different, they are complementary.⁹ The ecological economics makes use of a wide range of methodologies (including the neoclassical one), depending on the goal of their examination, while environmental economics is based solely on the paradigm of neoclassical economics, which lay emphasis on maximizing human welfare and using economic incentives to modify the destructive human behaviour. Moreover, in this field the “evolutionary economy” should be introduced. The evolutionary principles are used for the study of economy in an attempt to offer an alternative analytical framework to the neoclassical principles of economic analysis that gained primary importance in the twentieth century, as economists in all schools of thought have tried to think of the economic system as the product of an evolutionary process.¹⁰

While none of these three relatively new disciplines seems to offer a generally accepted system of thinking for coping with environmental problems, they might offer a hint about how to look at this complex challenges. Although they have common characteristics, the ecological economics is more close to evolutionary economics than the conventional and limited environmental economics, as shown in the schematic comparison between them.

Main differences between evolutionary, ecological and environmental economics

Evolutionary Economics	Ecological Economics	Environmental Economics
Evolutionary capabilities Diversity of agent, technique, and product Innovation-recombination/mutation Fitness Evolutionary stability Limits of adaptation	Optimal level Biodiversity Divergent views on innovation Equity (intra/intergenerational)	Optimal allocation Representative agents Optimal research and development Efficiency, cost-effectiveness Sustainable macro

⁸ C. de Franco, C. O. Meyer (eds.), *op. cit.*, pp. 72-73.

⁹ T. Tietenberg, L. Lewis, *op. cit.*, p. 7.

¹⁰ K. Dopfer, J. Potts, *The General Theory of Economic Evolution*, London and New York: Routledge Taylor & Francis Group, 2008, p. 1.

Path-dependence Various time scales Population/distribution indicators Bounded rationality and selection Functional morality Adaptive individuals and systems	Resilience Limits of growth Ecological irreversibility Medium and long time scale Physical and biological indicators Narrow-minded, myopic behaviour Environmental ethics Causal processes	growth Growth of limits Economic irreversibility Short and medium time scale Monetary indicators Rational behaviour Utilitarianism Equilibrium, comparative statics/dynamics
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Source: Adapted from Jeroen C. J. M. van den Bergh, “Evolutionary thinking in environmental economics”, *Journal of Evolutionary Economics*, Springer, vol. 17(5), October 2007, pp. 521-549.

Both environmental and ecological economics are concerned with the relation between the ecosystem and resource management, trying to identify the causes and the characteristics of environmental problems and their solutions. Nevertheless, the environmental economics focuses its analysis on the neoclassical principles of rational choice in the context of scarcity of resources, while ecological economics combines elements of economics, ecology, geography, political science, thermodynamics, ethics, and various other natural and social sciences.

From the economic point of view, the environment is an asset. On the one side, this special asset supplies the economy with raw materials – which are transformed, through the production activity, into goods and services –, and energy – which feeds the transformation process. After the production and consumption activities, these raw materials and energy go back to the environment as waste products, in a continuous cycle. On the other side, this asset provides direct basic services to consumers, such as air, water, food, shelter etc.

Logically, as in the case of any other assets, no entity, either economic or individual, would have any interest in letting this essential assets – the environment – be depleted. Nevertheless, this happens, and a possible explanation advanced by experts might consist in the type of property rights – defined in economics as entitlements establishing the right, privileges and limitations of the owner on the use of the resources – which allows producers and consumers to use environmental resources.¹¹ An effective structure of property rights, which would result in an efficient and responsible utilisation of the environment, would have three main characteristics:

1. *Exclusivity* – all the benefits and costs resulting from the ownership and use of the resource are granted to the owner alone, either directly or indirectly by sale to others.
2. *Transferability* – all property rights can be transferred from one owner to another in a non-restrictive way.

¹¹ T. Tietenberg, L. Lewis, *op. cit.*, p. 22 ff.

3. *Enforceability* – property rights could not be subject of any confiscation or violation by others.

Accordingly, it could be asserted that an owner of a resource, whose property rights possess all these three characteristics, would have a very strong motivation to use that resource not wastefully, given the fact that any decrease of the value of that resource represents a personal loss. Usually, this situation is typical for private property right. Nevertheless, an immense part of the environment resources are under other types of property regimes, such as state property, where government has the right of ownership and control over the property; common property, where the property is collectively owned and controlled by a well defined group of co-owners; and open-access regimes, where no individual or group owns or controls the resources.¹² All these property regimes involve various motivations for resource use and imply different problems regarding the efficiency of that use: in state-property regimes, problems can derive from the lack or ineffectiveness of the rules of protection; in common-property regimes, where resources are protected either formally, through specific legal rules, or informally, by tradition or custom, problems might arise from conflicting interests of the collective decision making; in case of open access regimes, problems are linked with the fact that no individual or group could restrict or even decree rules of access, giving birth to the so-called “tragedy of the commons”.¹³ In this latter case, unrestricted access to resources might annihilate any motivation to preserve.

Nonetheless, every of the existing property regimes could be faced with the risks of overexploitation of resources, although in open access regimes the careless exploitation is more likely to occur. The matter of environment protection is more complicated by the fact that it includes a very wide range of problems, from pollution (of soil, water, air) to climate change or decline of biodiversity.

From an economic perspective, calculating the impact on the environment of any economic decision would necessitate a method to determine the relative value of the various impacts. Moreover, when calculating the ecological impact of any product, one should take into account the human behaviour which goes together with its production and consumption.¹⁴ For example, a company creates value by transforming the material inputs and energy, through labour and technology, into products or services that satisfy the necessities of customers. Yet, this economic value bears a price, in a way that any economic activity alters the natural environment by making use of available natural resources, creating new materials and producing waste. Moreover, these environmental impacts disturb not only the entities involved in the economic exchange (for example, the producers and the consumers), but also a range of other parties, such as those living in the proximity of the production facility or, on a long run, even people living in other parts of the world.

Having in mind that there are many potential ecological effects of every economic activity and, even more important, that there is no “best way” of

¹² *Ibidem*, p. 23.

¹³ *Ibidem*, p. 29.

¹⁴ F. Boons, *Creating Ecological Value. An Evolutionary Approach to Business Strategies and the Natural Environment*, Cheltenham, UK; Northampton, MA, USA: Edward Elgar, 2009, p. 1.

evaluating those effects, it is asserted that the environmental strategy of any economic entity is based on either an implicit or an explicit estimation of the ecological effects that are to be considered.¹⁵ Economic entities could create ecological value in two different ways: by reducing their environmental impact through their activities, and also by bringing their contribution to defining such environmental impacts. One major difficulty here is that the different economic entities, even those operating within the same industry, use different technologies of production and therefore their ecological impact might be different, which in turn would lead to a diversity of methods for approaching the impact. Neither the producers, nor the consumers, seem willing to pay the cost for impact reduction and, as a result, the environmental strategies of the economic entities will vary from no measures at all, considering the ecological impact as an unavoidable consequence of the economic activity, to sound strategies that would generate a competitive advantage from reducing such effects.

This diversity of entities' responses to their ecological impact has been the subject of many classifications over time, and one of these first classifications, based on the study of the environmental protection in the USA, includes three different categories of economic entities depending on their level of compliance with governmental regulations:¹⁶

1. The "crisis-oriented environmental management", specific for economic entities that do not have either specially assigned staff or departments for dealing with environmental problems or a definite policy that would guide the compliance with laws and regulations. In case of divergence with regulations or control institutions, such entities would deny their impact on the environment or would try to find an *ad hoc* solution.

2. The "cost-oriented environmental management", adopted by economic entities that comply with environmental regulations, which are considered essentially as a necessary cost of activating in the business field. Such entities have both a specific policy and designated personnel to verify the observance of regulations, negotiate with governmental institutions and create investment plans for impact control through technologies or other measures.

3. The "enlightened environmental management", characteristic for economic entities that do not simply comply with regulations, but are also trying to decrease their ecological impact by undertaking different practical measures and promoting an internalisation of ecological values among all its employees.

Another, more recent, classification is based on the relation between the investments made for reducing the ecological impact and their potential of becoming sources of competitive advantage.¹⁷ Depending on the entity's competitive focus (on processes or products/services) and its potential source of competitive advantage (cost or differentiation) four types of competitive environmental strategies can be identified:

¹⁵ *Ibidem*, p. 2.

¹⁶ J. M. Petulla, *Environmental Protection in the United States: Industry, Agencies, Environmentalists*, San Francisco: San Francisco Study Center, 1987, p. 72 ff.

¹⁷ R. J. Orsato, "Competitive Environmental Strategies: When Does it Pay to Be Green?", *California Management Review* Vol. 48, No. 2, Winter 2006, pp. 127-143.

1. The “Eco-efficiency” strategy is adopted by economic entities which are oriented on processes and focused on cost reduction, concomitantly trying to reduce both the cost and the environmental impact of organizational processes.

2. The “Beyond compliance leadership” implies the compliance not only with government regulations, but also with demands of other stakeholders, such as customers and the general public. Such economic entities are willing to spend money for increasing their ecological efficiency, as well as for informing the general public about their efforts, in an endeavour to gain competitive advantage.

3. The “Eco-branding” strategy is adopted by economic entities that are able to market differentiation based on the environmental qualities of products or services, especially for a niche market. Three preconditions are essential for this strategy to generate competitive advantage: consumers must be disposed to pay for the eventual costs of ecological differentiation; the consumer has access to credible information about product’s “green” characteristics; and the differentiation should be difficult to be duplicated by competitors.

4. The “Environmental cost leadership” supposes that economic entities are able to market ecologically innovative products, which comply with environmental regulations at a low cost.

Such classifications, alongside many others, beside their importance for understanding the complexity of the relation between economic activity and environmental problems, show us again that there is not and, perhaps, there could not be, any possibility for designing a generally valid strategy of action when it comes to protecting the environment.

Conclusions

Any entity, be it individual, economic organization, or nation, in an attempt to get informed in order to become responsible in relation to the environment would have to cope, at the simplest search, with at least two opposing visions of the future, four different interpretations of the ecosystem stability, three general strategies for dealing with environmental risks, two disciplinary approaches developed to address environmental challenges and two classifications, one including three, the other including four types of different strategies to reduce the ecological impact of the economic activity. In such a context, anyone would be overwhelmed by the multitude of information, diversity of opinions, and variety of approaches or range of solutions.

It is, indeed, true that this diversity includes a wide array of issues and different ways of looking at quite different problems. Each of these approaches mediates the insight into only a part of the picture. Moreover, as mentioned before, environmental problems range from pollution, climate change, to decrease of biodiversity, and although these problems are interrelated, they usually are treated separately.

The goals of all the entities should be similar and focused on the elimination of their negative impacts upon the environment. However, generally speaking, they have different objectives: societies seek economic growth, economic entities pursue profit, and individuals struggle for their personal well-being. Although these different objectives may be integrated into a wider concept of “general

welfare”, eventually their reckless productive and consumptive activities determine the use of natural resources and, as the result, the transformation of nature.

The majority of authors speak about the rapid exhaustion of the stock of natural resources once with the industrialization and even more in the post-industrial phase of human society’s evolution. The exploitation of resources beyond a certain level may cause a severe disequilibrium of the ecosystem, with unquantifiable consequences for humanity. Species and resources have disappeared before, with no possible way of returning to the *status quo ante*. While the technological advance has led humankind to a continuous adaptation, also through the creation of new resources that are not found naturally in nature, the increasing number of inhabitants of the world might generate a bigger pressure on the ecosystem, with yet unknown effects.

Going back to the main issue, it could be asserted that there is no single and simple way for understanding and assessing the impact of the human behaviour and economic activities upon the environment, and no certain path for designing a strategy to reduce that impact. Clarity is, nevertheless, crucial if we are to discern in this daze of theories, disciplines, opinions, strategies, problems or solutions. And perhaps more studies from an evolutionary perspective are necessary if we aim to comprehend how humankind coped with scarcity of resources and increasing needs in its history in order to identify a future way of action.

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