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# MAKING ENVIRONMENTAL ETHICS MORE PRACTICAL: A MODEL OF PRINCIPLISM

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**Abstract:** Environmental Ethics is a type of applied ethic whose objective is to guide, using principles and rules, the analysis, the deliberation, and the resolution of conflicts that are environmental and social at the same time. Within the different theoretical approaches of Environmental Ethics, there is a tension between normative ethical level and the methodological level that prevents integration between the two of them. The problem of Environmental Ethics to reconcile these two orders is the issue addressed in this paper. Our proposal regarding this subject is to approach it from a theoretical strategy of mid-level principles and this is why it does not aim at suggesting a theoretical foundation of ethics, but a referential framework that makes a pluralistic outline of principles compatible with a well-defined methodology of rules and meta-rules, thus contributing to a more practical Environmental Ethics.

**Keywords:** *environmental ethics, socio-environmental conflicts, mid-level principles, framework principle, derivative principles, strategic principles, environmental citizenship*.

## 1. INTRODUCTION

We start from the premise that Environmental Ethics (EE) is a type of applied ethics whose objective is to guide, using principles and rules, the analysis, the deliberation, and the resolution of conflicts that are environmental and social. With this purpose, two aspects of a different order must be made compatible: the normative ethical level and the methodological level. Within the theoretical approaches of EE there is a tension in these levels that ultimately prevents integration between them.

The normative ethics order refers to the compatibility between the duties of justice toward current and future human beings and the duties of caring for the environment and the non-human living entities. The methodological order aims to make the principles that justify those duties and with the method that allows them to be applied compatible. The difficulty of EE to reconcile these two orders is the problem addressed in this paper.

Our proposal regarding this subject is approaching it from a theoretical strategy of *mid-level principles*. In addition, because of this, it does not aim at suggesting a theoretical foundation of ethics, but a referential framework that makes a pluralistic outline of principles compatible with a well-defined methodology of rules and meta-rules, thus contributing to make a more practical EE.

The socio-environmental conflicts are expressions of the metabolic maladjustment that exists between the social systems and the ecosystems at different levels: global, regional, national and local. This maladjustment impacts on current and future generations of humans and on other species and ecosystems. Within this context, different societies at a global level engage in the usage of natural resources and in the burdens of pollution they produce in an unequal manner, which brings about ecological distribution conflicts (Martínez Alier, 2002).

This kind of conflicts are classified in different categories, depending on the type of environmental impact: (i) *Conflicts in the extraction of materials and energy*: conflicts over oil extraction, use of water, mining, biopiracy and conflicts between traditional and industrial fisheries. (ii) *Conflicts about transportation*: oil spills, conflicts over oil and gas pipelines, tailings, etc. (iii) *Conflicts about waste and pollution*: toxic struggles, export of toxic, solid or liquid wastes, transboundary pollution, equal rights to carbon sinks, amongst others (Martínez Alier, 2006).

The socio-environmental issues have certain characteristics that are relevant for an ethical analysis and that differentiate EE from other applied ethics. (i) They are caused by anonymous collective action or by private actors or state agents. (ii) They demand a technical and scientific knowledge that originates from a number of different disciplines. (iii) There is a constant scientific uncertainty regarding their long-term impact. (iv) They are extremely dynamic. (v) They are inter-connected with other socio-environmental problems; therefore, they need to be addressed in a holistic manner. Furthermore, these problems need to be expressed in different "languages of valuation" (Martínez Alier, 2002). The use of a monetary language ('the internalization of externalities' in the price system, or the 'polluter pays principle', or 'cost–benefit' analysis.) is not enough because there are also environmental, social, cultural, and recreational considerations, whose appropriate names are livelihood, food security, human rights, territorial rights or other.

The questions that arise from this type of problems are: (i) What principles of environmental ethics are necessary to give coherence to a pluralistic ethical framework and, at the same time, feasibility to a problem-solving methodology of socio-environmental conflicts? (ii) Why would those principles be chosen over others? How do you justify that choice? (iii) How to specify the principles in rules, at the time of application, and how to weigh the rules when they conflict in a concrete case? (iv) Finally, one has to ask if a principles strategy is enough to build an EE.

## 2. THEORETICAL FRAMEWORK AND THE METHODOLOGICAL BOUNDARIES OF ENVIRONMENTAL ETHICS

Throughout the EE tradition, which was born around the 1970s, alongside with other applied ethics, a double tension is observed in both of the aspects identified in the problem just stated, normative ethics level and the methodology level, which ends up by revealing the lack of integration between both (Lecaros 2012, 2013a, 2013b).

At the level of normative ethics, EE must reconcile the duties towards human beings with the duties towards the environment. The tension between both duties is expressed, on the one hand, in each of the EE founding approaches (anthropocentrism, biocentrism and ecocentrism) and, on the other hand, between these approaches. This dual tension rests

on a meta-ethical question to which class of entities belongs the intrinsic value that underlies socio-environmental ethical duties (current or future human beings, or sentient animals, all living things, ecosystems, or even the biosphere).

Each approach proposes normative ethic answers that are incompatible to each other and create tension of the foundation of each one. On one side, the ethical anthropocentrism has difficulties for justifying its duties towards nature, when these duties are not or cannot be mediated by current or future human interests. On the other side, biocentrism and ecocentrism have trouble establishing priority criteria when there is conflict between the environmental duties and social justice duties, and current or future human beings.

At a methodological level, EE must reconcile the principles with their methods of application. Both the founding approaches and the socio-environmental ones have failed to build a harmonic proposal that links the principles to the method. The founding approaches, which focus on arguing meta-ethical and normative ethic issues, leave aside the moment of applying the theory. The second one, however, is concerned with answering concrete socio-environmental issues, from their starting point of criticism theory (Anarchism, Marxism or Feminism, amongst others), which leave their theoretical presuppositions devoid of a mediation between the principles and the problem-solving rules.

The double tension here is manifested, on the one side, between the methodological proposals of the founding approaches, which are not compatible with themselves (anthropocentrism and non-anthropocentrism) and, on the other side, between themselves and the socio-environmental approaches (Social Ecology, Eco-Marxism, Environmentalism of the Poor, Environmental Justice, Ecofeminism), which react to the abstract character of the first one. Ultimately, both the founding and the socio-environmental approach, sustain, to more or less extent, a divorce between the moment of justification (why) and the moment of application (how).

Specialized literature has highlighted with different emphasis this diagnosis (Nash, 1989; Norton, 1991, 2003; Shrader-Frechette, 1991, 2002; Riechmann, 2006; Weston, 2009). However, the direct treatment of the problem is still, in our view, unsystematic. As a proof of this, all we have to do is to point out that in the monumental work *Encyclopedia of Environmental Ethics and Philosophy* (Callicot & Frodeman, eds., 2008) there is not entry about the EE methodological issue, and is

still expecting an entry regarding *Environmental Conflict Resolution*, which is more of a technical mechanism and has no relation with a particular ethical theory.

The divorce between the moment of justification and the moment of application of EE follows different types of biases, which we can group in five different categories: (i) the *epistemic bias* is the one related to the gap that exists between the use of risk assessment techniques, environmental analysis techniques and the economic epistemology that underlays the discussions (Sagoff 1988, Shrader-Frechette 1991); (ii) the *meta-ethical bias* that embraces issues such as the difference of position between ethical intuitionism and non-intuitionism, the existence or the absence of an intrinsic value in nature, and whether they exist objectively or they are created by humans, among other topics (Jamieson 2008); (iii) the *normative bias* is mainly related to the differences between the ethical theories regarding the extension of the environment-related duties (only regarding future human beings, or regarding sentient animals, or regarding everything that is alive, or even regarding the ecosystems, biosphere); (iv) the *estimative bias* refers to the tension between the positions that tend towards the axiological dichotomy and those that are open to an axiological pluralism; (v) the *aesthetic and imaginative bias* has to do with the differences that surround the aesthetic value (an extrinsic value) that is bestowed upon nature in its natural state and the heuristic value given to the human ability to imagine socio-environmental scenarios that are different from the ones we currently have.

To overcome this theoretical and methodological weakness, we will take the evolution of another applied ethic, Bioethics, as a point of reference. Bioethics was born around the same period as EE, and it has developed theoretical and methodological integrated frameworks that have successfully solved problems in the biomedicine field, sciences of life and their technological implementations. The extensive bioethical literature shows the profound debate that has surrounded the methodological issues when it comes to solving moral conflicts in specific contexts such as the clinical and the medical research.

To a large extent, this debate was promoted by the success of Beauchamp and Childress' theoretical and methodological proposal in *Principles of Biomedical Ethics* (1979, latest edition 2013). The North American authors proposed a *cluster of moral principles,* which serve as guidelines to determine more specific moral norms to solve problems. Using the concept of "*cluster*" they are trying to show that each princi-

ple is an integrating focal point for other principles and moral considerations. Besides the principles and rules, the authors do not disregard the importance of the rights and virtues in the conflicts that arise in moral life (Beauchamp & Childress 2013, 13-14).

For the purpose of our proposal, what we would like to highlight is that these authors were not trying to substantiate the principles in any particular normative ethics theory (kantian, utilitarian, casuistry, virtue ethics, etc.). Because of this, they have been denominated *mid-level principles* for they prove compatible with "many or perhaps most of ethical theories" (Beauchamp & Childress 2013, 383-384). Justifying that *Principles of Biomedical Ethics* does not form a normative ethical theory, and so it is not the subject of this article. The authors emphasise the way in which they choose to justify their principles and, with such purpose, they resort to a procedural or formal theoretical justification and another one that is substantive, while respectively following the model of "reflective equilibrium" (Rawls, 1971, 1999) and the common morality theory (Gert, 1998; Gert, Culver & Clouser, 2006).

The criticisms this proposal received were not enough to undermine it, on the contrary, they have allowed it to grow. These criticisms come from different perspectives, such as the common morality theory (Clouser & Gert, 1990; Gert, Culver & Clouser, 2006), casuistry (Jonsen, 1995; Strong, 2000), communitarianism (Callahan, 2003), hermeneutic ethics (Ten Have, 1994), amongst others. They have hugely enriched the ideas that have been suggested to determine the methodological extent of bioethics and, at the same time, to specify the content of the principles. This has been reflected in the maturity and success that the discipline has been awarded by society through its institutionalization in different ways, such as ethical committees, national and international commissions, recommendations and reports to international agencies, etc.

In this paper we use the theoretical model of *mid-level principles* proposed by Beauchamp and Childress merely as a guideline to design a strategy to create a scheme of principles in EE. From our perspective, it is a good model to face the problems we identified, because the logic of structure and explanation of the Beauchamp and Childress' theory is conceived in a way that is right to coordinate the level of the principles (the theory) with the level of rules and their application procedure through the use of the deliberative method, specification, weigh and balance.

However, it is important to clarify that we do not use this model either because of the *four clusters of moral principles* structure that the authors

propose (autonomy, beneficence, non-malfeasance and justice), or for the specific content of any of the rules that result from these principles. We use it as a model so that we can follow its architecture and internal logic, which we consider suitable to design a scheme of EE principles that will be able to solve problems and conflicts of a socio-environmental order.

## 3. PROPOSAL OF PRINCIPLES FOR ENVIRONMENTAL ETHICS

The design we propose as a scheme of principles for EE is characterized by a three-level structure that docs not mean a hierarchy of principles in terms of an "ultimate foundation" in a specific EE theory, be it anthropocentric, biocentric or ecocentric. In this sense, our proposal, while following the Principlism' model, would serve to build a *mid-level principles*' theory that is compatible with anthropocentric and non-anthropocentric theories alongside with theories that have a socio-environmental approach.

The first level of the proposal is composed by a framework principle: the principle of responsibility as caring for the vulnerable being, which allows us to combine a weak anthropocentrism with a moderate biocentrism.

The second level is built by three principles derived from the framework principle, which make them compatible with the duties towards current and future human beings, non-human living creatures and the environment: (i) the principle of intragenerational global justice; (ii) the principle of intergenerational justice (future generations); and (iii) the principle of interspecific care or principle of caring for life in the biosphere. These three principles represent a *cluster* of principles of intermediate level that comprehends other principles and norms of a strategic and operational level.

The third level is built over a foundation of four principles of operational order that aim at safeguarding the balance and integrity of the derivational principles through specific norms that need to be weighed and balanced when they conflict. These strategic principles are: (i) the principle of sustainability; (ii) the precautionary principle; (iii) the principle of common but differentiated responsibility; and (iv) the polluter-pays principle.

To justify the election of the principles Beauchamp and Childress follow the Rawls's model of reflective equilibrium (Rawls 1970, 1999) and

the common morality theory (Gert 1998; Gert, Culver and Clouser 2006). For our proposal, the usefulness of the method of reflective equilibrium lies on the fact that it allows that our scheme can be constantly reviewed. This method aims at searching, through an analysis and continuous adjustment, the harmony or coherence between our moral convictions, in which we have placed our upmost trust and we believe to be less influenced by biases and prejudices (*considered moral judgements*), and the moral principles and theoretical tenets they uphold.

The usefulness of the common morality theory in elaborating a scheme of principles for the EE is found in the ability to recognize those general principles (i. e. intergenerational justice, precautionary, solidarity), adopted by the moral judgment that most people support and share in society. However, the conflict of principles is not solved by the common morality theory, since it still works at an abstract and formal level. The conflict of the principles does not work at an abstract level, but, at the moment of its application to a particular case, by means of the specification of a principle in rules. Different approaches in EE can converge in the formal recognition of the same value as the basis of a principle, but they differ in content or meaning when applied to specific cases. Therefore, at the abstract level of the principles there is only an apparent agreement. For this reason, a methodological framework in the EE is necessary to weigh and balance such axiological tensions that underlie the principles.

This proposal recognizes that, when applying principles and rules, a methodology of weighing and balancing the norms that are in conflict is not enough, for there are other referential frameworks to consider when evaluating the interests of the affected parties: the language of rights and the language of the virtuous agent. Because of this, we have added the approach of an environmental citizenship for a sustainable society to this proposal.

Our proposal does not intend to develop a theory of the action of the moral agent in socio-environmental conflicts. We do not doubt the crucial importance of the above, but the objective of the article is to give an account of the need to establish coherence between the plurality of ethical principles at stake in the EE and their application. The proposal of the authors is that the principles cannot be applied directly, without mediating procedures specification, weighting and balance. For this reason, a reflective rational agent in needed when assuming responsibility for the environment.

### 3.1 FRAMEWORK PRINCIPLE

The principle of responsibility as caring for the vulnerable beings comes from Hans Jonas' (1979) ethics; however, this does not mean that we accept his metaphysical foundation. On the contrary, it is arguable that this principle does not need an ultimate justification but a proof of its evidence in the *proto-factuality* of the phenomenon of life, which is, in essence, what is vulnerable.

The principle performs a double meaning within the design of the proposal: (i) an indicative function, for it allows us to outline the basic aspects of EE and to establish, in a coherent manner, an ethics that is concerned with vulnerable people (global ethics), with the vulnerability of future human beings (future generations ethics) and with the vulnerability of life expressed in live entities and the systemic relations (animal and environmental ethics); (ii) a justifying function, for it allows us to uphold derivative and strategic principles when the justification through abstract procedures (reflective equilibrium) is no longer enough, because it ends up in intuitions rooted in the common morality and are inherent in the world of life. This principle has to be considered a framework principle for the principles that follow and not an ultimate foundation for them.

### 3.2. DERIVATIVE PRINCIPLES

Derivative principles are interdependent principles that enable us to integrate the duties of justice towards current and future human beings to the duties towards the environment. The structure of the derivative principles is as follows:

A. *Principle of Intragenerational Justice or economic and environmental global justice*. This principle upholds a global ethic of the fair distributions of natural resources and/or respect for the minimum rights of livelihood (Singer 2002; Shrader-Frechette 2002; Sachs & Santarius 2007), which is linked to sustainable growth (*vid.infra*).
B. *Principle of Intergenerational Justice (future generations)*. This principle upholds the rules of comparable option quality of the environment and of access to the legacy of future human beings

(Brown 1999; Dobson 1999). Under this principle, it is possible to discuss the different positions that the justice theories undertake in relation with the interests of future human beings in the design of the social contract (libertarian, liberal and communitarian theories).

C. *Principle of Interspecific Care or principle of taking care of life in the biosphere*. This principle upholds the duties related to animal care and the duties towards the environment over the basis of recognizing the intrinsic basic value of living entities, which is used as a starting point to build derivative values (species) and projective values (ecosystem, biodiversity, biosphere). Within this context, the key issue is to discuss the extension of the moral community and the theories of interest prioritization in conflictive cases (Goodpaster 1978; Sterba 1998; Attfiled 1995).

### 3.3. STRATEGIC PRINCIPLES

Strategic principles are non-prioritized and intermediate level principles. In this sense, they imply *prima facie* duties, which means that everyone has to be respected unless it conflicts with a duty of the same or of superior level. The roles of these principles is to guarantee the integrity and interdependence of the derivative principles. The structure and content of the strategic principles is as follows:

A. *Principle of sustainability*. This principle is at the basis of the concept of sustainable growth, which has three dimensions. The first one is the dimension of future, which is the better-known one thanks to the Brundtlland Report *Our Common Future* (1985): sustainable growth is that which satisfies "the needs of the current generation without compromising the ability of future generations to satisfy their own needs". This concept of sustainability correlates with the idea of limits to growth (Meadows 1972, 1992). The second dimension is the one present in the idea of metabolic adjustment between society and nature, in whose description and analysis intervenes the environmental economics (Georgescu Roegen 1971; Daly 2004), human ecology, whose most powerful tool is the ecological footprint (Wackernagel & Ress 1992), and other tools of the *Environmental Governance* (Saunier & Meganck 2007;

Bäckstrand et al. 2010; Bäckstrand & Kronsell 2015). The third dimension is the self– sufficiency or austerity in view of the need to go beyond eco-efficiency (Weizsäcker et al. 1997), restricted by the rebound effect or Jevons paradox, and encouraging self-sufficiency policies (Linz et al. 2007).

There are four recurring elements in the definitions of sustainable growth that shape this concept within the International Environmental Law: (i) intergenerational equity: the need to preserve natural resources for the benefit of future generations (Principle 3 of the Rio Declaration). (ii) Sustainable use of resources: exploiting natural resources in a "sustainable", "cautious", "rational" or "appropriate" manner. (iii) Intragenerational fair or equitable use: the state-wide use of resources has to bear in mind the necessity of other states. This element is mainly represented in the recognition of the special needs of the developing countries. (iv) Integration element: the need to assure that the environmental needs will be integrated in economic and development plans, programs and projects, and that developmental needs will be taken into account when applying environmental objectives (Principle 4 of the Rio Declaration).

B. *Precautionary Principle*. This principle commands that when human activities can lead to (i) risk of unacceptable damage (those which threaten life or human health or the environment, which are severe and indeed irreversible, and unfair for current or future generations), (ii) that are scientifically plausible but uncertain (the plausibility judgement has to be based on a scientific analysis and the uncertainty is applied, although not limited to, to causality or the limits of the hypothetical damage), (iii) measures or actions need to be taken that avoid or reduce the risk of damage (actions or measures need to prevent the risk of damage, they need to be proportional to the severity of the damage, the have to assess the consequences of both the action and the inaction, which have to be chosen in an inclusive manner). It is maybe one of the most controversial concepts and tools of the environmental governance and, because of this, in the systematization and clarification of the debate, there needs to be a distinction between the legal argument (Ewald et al. 2008; De Sadeleer 2007) and the ethical one (Raffensperger & Tickner 1999). In the International Environmental Law, the criteria or precautionary principle has different demonstrations

with very different normative contents. First, the risk standard of proof (in other words, the degree of risk that triggers the principle) is not consistent: sometimes you need risk of serious or irreparable damage, while in other cases the risk of environmental damage is enough, without a major qualification. Second, it varies depending on the burden of proof. Third, the expected response varies once the principle has been applied: (i) it can force into action; (ii) it can empower to act; or (iii) just promote more caution.

C. *Principle of common but differentiated responsibility*. This principle was introduced in the Declaration of Rio and has been widely discussed at an international level for the implementation of the Convention on Climate Change and it is present in the specialized literature of *Global Environmental Politics* (Hoffmann, 2011; Dauvergne, 2012). This principle, just as it is stated in the Declaration, assumes that there has been a group of countries who are mainly responsible of the planets' environmental issues, and that, to a large extent, they owe to that exploitation the development they possess today. As a consequence, this principle, even though it recognizes the necessity for commitment by all countries while facing environmental issues, makes a distinction between developed and developing countries, while applying the idea of intergenerational justice or equity.

Even though we are talking about the obligation to cooperate in the development of specific norms, there is a significant normative value in setting parameters according to which there needs to be a distribution of the responsibility amongst the developed and developing countries, and this has to be taken into account in the following treatises or the interpretation of those in effect. The shared but differentiated responsibility, in consequence, can signify the definition of an equitable balance between the developed and developing countries, at least in two ways: (i) it enables different standards for developing countries and (ii) makes supportive assistance demandable from the developing countries to developed ones. Differentiated responsibility means that there has to be more demanding conduct standards for developed countries, for they are the ones who have contributed the most to the current environmental issue (such as exhaustion of the ozone layer and climate change) and are the ones who, in turn, have the greatest capacity to face them.

*Polluter-pays principle*. This principle contends that the costs of pollution have to be assumed by the one responsible for causing it. However, the precise content or signification of this principle, alongside with its application to particular situations, is still to be determined, particularly in relation with nature and the extent of the costs and of the exceptional circumstances in which the principle would not be applicable. The Declaration of Rio acknowledges this principle as follows: "Principle 16. National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment." The practical implications of this principle is shown in the allocation of economic obligations to those activities that damage the environment, particularly through the use of economics tools (insurances and objective liability) and the implementation of the norms that refer to competence and subsidies (for example, to discourage the use of technologies or unsafe practices).

### 3.4 ENVIRONMENTAL CITIZENSHIP AS RESPONSIBLE AGENT IN THE GLOBAL SOCIETY

A proposal of EE principles that does not take into account the agent can hinder the passage from principles to rules, at the moment of applying them to specific conflicts. However, it is important to specify that the purpose of the article is to clarify another aspect of this applied ethics, which speaks about the compatibility between ethical principles and their application from the procedural point of view. The theory of responsible citizenship can account for an adequate agency for the socio-environmental issues. Admittedly, the "Environmental Citizenship" is surfacing as a new paradigm of the citizenship theory (Dobson 2003; Dobson & Bell 2006) in contrast with traditional citizenships (liberal and republican).

This new type of citizenship is characterised by (i) being sustained by duties rather than by rights, for there are non-reciprocal duties of respect and care towards unknown human beings, remote both in time and space, as well as duties of care towards non-human entities, thus distancing itself

from the contractual model of citizenship which is based on reciprocal rights and duties; (ii) the actions of the private sphere (such as ways of consuming, travelling, working) have progressively more consequences in the public sphere; (iii) complementing the public virtue of justice with the private virtues of care and solidarity; (iv) overcoming membership in the territory of the nation-state, because the trend points to a postcosmopolitan citizenship that makes us aware of both local and global membership in planet Earth (Lecaros 2016).

One of the challenges faced by an agency theory, in the context of the global society, is its foundation over a paradigm of rationality different from the dominant, technocratic and economistic rationality. An alternative to this dominant rationality is ecological rationality. When "the value 'long-term integrity of ecosystems and the biosphere' (and the values related to it) are placed ahead of economic, legal, epistemic, military values, etc., and we perform our reasoning and weighings in accordance with this hierarchy, then we will be operating within an ecological rationality" (Riechman, 2009: 50). We consider that the methodological proposal of this article can be addressed in future works following the axiological rationality (Echeverría, 2007) and the operational concept languages of valuation in socio-ecological conflicts (Martínez Alier, 2002).

## 4. MAKING ENVIRONMENTAL ETHICS MORE PRACTICAL

One of the problems that EE faces is the lack of clear methods to apply the ethical principles of deliberation and resolution of environmental conflicts. That is why a methodology appropriate for the scheme of principles proposed has to be able to turn the strategic intermediate principles into rules, with the purpose of defining their content and extent at the moment of applying them.

The methodology also has to be able to determine the derivative principles and justify the lexicographical order between the framework principle, the derivative principles and the strategic intermediate principles. This order obeys to the level of abstraction and generality and the role played in the diagram of the first two levels of principles. The rules that contain the derivative principles are general and have to be specified through the strategic principles that are of an operational order.

Specification, following Beauchamp and Childress (2013), is a process that reduces the indeterminacy of the principles and the general rules,

which allows us to obtain rules with concrete contents that are applicable to specific situations. Specification does not aim at justifying the content of the principles, but at specifying their application scope: it is a continuous process that demands to maintain the relationship of content between the principle and the rules every time new specifications are made.

The rules extracted from the strategic principles are classified as *substantive rules* (sustainability rules, precautionary rules and self-sufficiency or austerity rules), *procedural rules* (precautionary rules and rules of ecological justice) and *distributive rules* (rules of compensation for ecological and social damage and polluter-pays rules). Each one of these rules has to be applied bearing in mind the socio-economic, cultural, political and environmental conditions of the conflict.

Likewise, these rules operate while being directed by *meta-rules* which establish criteria to weigh and balance conflicting rules, guaranteeing the coherence between the intermediate principles when they are applied, thus avoiding the resolution of cases in terms of a dilemma: (i) the meta-rule of systematic assessment of the conflicted entities; (ii) the meta-rule of the temporal consideration of the decisions; (iii) the meta-rule of prioritizing duties over rights.

The weighing and balancing, according to Beauchamp and Childress (2013), is a process that consists in looking for reasons that uphold our convictions regarding the rules that need to prevail when there is conflict with other rules. The key in the process of rule weighing in the environmental conflicts field is the legitimation of the reasons given to make one rule prevail over another. On this point, we have to bear in mind the epistemic biases that were stated in the second section.

Finally, to limit the partiality and arbitrariness in the weighing and balancing process of the rules, our methodological proposal appeals to mechanisms that are used in specific methodologies such as the *Environmental Conflicts Resolutions* (Susskind et al., 1999; Susskind et al., 2002; Dukes et al., 2000; Moore 2003), and in methodological platforms such as E. Ostrom's Institutional Analysis and Development Framework (1990, 2005), and M Callon's Hybrid Forums (2009). Now we will refer briefly to the identification of some tools that can complement the processes of specification and weighing of rules in socio-environmental conflicts.

### 4.1 INSTITUTIONAL ANALYSIS AND DEVELOPMENT FRAMEWORK (E.OSTROM)

E. Ostrom's institutional approach is suitable for self-organization and self-management of commons. The political scientist has developed, in *Governing the Commons* (1990) and *Understanding Institutional Diversity* (2005), the theoretical framework and the applied methods to address environmental issues in which commons are at stake. In very broad terms, Ostrom understands institutions as prescriptions that humans use to organize all forms of repetitive and structured interactions (for example, families, neighborhoods, markets, firms, sports leagues, churches, private associations, and governments at all scales). Within the Institutional Analysis and Development Framework, she distinguishes as an analytic key unit the action arenas (actions situations and participants), which are determined by exogenous variables (biophysical and material conditions; community attributes; rules) and by the self-organized interactions and results (Ostrom, 2005, 13-15).

In *Governing the Commons,* Ostrom proposes design principles that are characteristic institutions where the common resources lasted for a long time. 1) Clearly defined boundaries: Individuals or households who have rights to withdraw resource units from the common-pool resources (CPR) must be clearly defined, as must be the boundaries of the CPR itself. 2) Congruence between appropriation and provision rules and local conditions: appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labor, material, and/or money. 3) Collective-choice arrangements: most individuals affected by the operational rules can participate in modifying those operational rules. 4) Monitoring: the ones in charge of monitoring the compliance of the agreements between the exploiters of the commons have to answer to the organization. 5) Graduated sanctions. 6) Conflict-resolution mechanisms: simplicity of access to the problem-solving mechanisms. 7) Minimal recognition of rights to organize: the ability to organize themselves in front of local and governmental powers. 8) Nested entities: the different activities surrounding the commons are organized in multiple layers of nested enterprises (Ostrom, 1990, 88-102).

## 4.2 HYBRID FORUMS (M. CALLON)

One of the creators of the *Actor-Network Theory,* M.Callon alongside P. Lascoumes and Y. Barthe, proposed in *Acting in an Uncertain World: An Essay on Technical Democracy* (2009) a referential framework to think of the public controversies about techno-scientific issues in society and the challenges they represent for their actors and their processes, namely "*concerned groups*", the traditional "*secluded research*" performed by modern science, "*delegative democracy*" and its representation procedures, including markets as well.

The core concept developed is the hybrid forums, with which they want to express the procedure through which we overcome the dichotomy between official forums composed by the science experts and the informal forums composed by the rest of the citizens. In the traditional model of involvement, the basic distinction is between the objective risks (evaluated, calculated and controlled by scientists) and subjective risks (fears and uncertainties experienced by the affected people). While maintaining this division, people have to circulate from the subjective risk universe (irrational and overwhelmed, and sometimes violent) towards the objective risk (rational and controlled) and then it is considered possible to sit down to have a conversation and discuss, deliberate and make decisions (Callon et al., 2009, 13-36).

The thesis that Callon et al. uphold is that the citizens' participation is a requisite for the construction of legitimacy of science in society. For that purpose, they propose uniting both forums (official and informal) through different participative and deliberative procedures (public debates, consensus conferences, citizen panels and jury) that allow us to transfer the competence from the observers (experts, scientists) to the actors (Callon et al., 2009, 153-189). This way, those procedures contribute to redirect us to an enriched democracy named "dialogic democracy" (Callon et al., 2009, 205).

Through this model, the authors propose a redefinition of the "representatives" and the "represented" in modern democracy, presenting hybrid forums as producers of citizenship and as a path towards the "*democratization of democracy*". For Callon et al., the model of citizen involvement in science is an open dynamic one which, through controversy, customizes the weave of the social, economic, politic, technical, scientific, cultural, performing (without standardization), in constant experimentation, of our world. This type of construction of our society

demands, in the end, some sort of "measured action", which translates in not taking definitive actions and leaving options open, because some new sociopolitical and technical arrangements constantly contribute to a reconfiguration of our common world (Callon et al., 2009, 225-254).

## V. CONCLUSIONS

The principlism in environmental ethics requires an adequate structure that keeps the proportions with nature and the characteristics of socio-environmental conflicts. In this sense, the different aspects at stake (technical, economic, social, scientific, political, and ethical, amongst others) in this kind of conflicts lead to favoring a pluralistic structure of principles. That is why it is crucial to determine the way in which this principles relate to one another, particularly in the cases of collision or when there is a practical impossibility of fulfilling their content. This problem is solved using a methodology that limits and regulates the conditions of application of the principles.

The design we propose as a scheme of principles for EE is characterized by a three-level structure, not meaning a hierarchy of principles in terms of an "ultimate foundation" in a specific EE theory, be it anthropocentric, biocentric or ecocentric. In this sense, our proposal, while following the Principlism' model, would serve to build an mid-level principles' theory that is compatible with anthropocentric and non-anthropocentric theories alongside with theories that have a socio-environmental approach. The methodology appropriate for the scheme of principles proposed has to be able to turn the strategic intermediate principles into rules with the purpose of defining their content and extent at the moment of applying it.

A model of principlism in environmental ethics, following the model of Beauchamp and Childress, certainly needs to be adjusted to the requirements of the EE, particularly in what refers to the agency theory and the theory of values. In this article we have proposed to at least advance in one of the elements of a theory of environmental ethics: the methodological question. This task is necessary to address the discontinuity between the principles commonly accepted in socio-environmental issues and the guidelines or rules of application for specific cases of socio-environmental conflicts.

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