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## **An alternative to analysing environmental bioethics**

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**Abstract:** The article presents an alternative to analysing ‘environmental bioethics’, which in a syncretic way, articulates the etymology, the bioethics of dilemmas and creativity and industriousness, in such a way that it allows an innovative stance in the approach to current environmental challenges. Thus, it is recognised at first that the environment is immersed in bioethics, but then it is noticed that the environment contributes, as a positive non-zero sum game, to the concept of ‘environmental bioethics’, in order to strengthen the principles, values, aspects, and approaches of its object of study, taking into account the bioethical imperatives proposed by Fritz Jahr and Hans Jonas to relate rationality to human behaviour and their interactions with nature. Hence, ‘environmental bioethics’ considers that there is a set of ethical aspects and approaches with a bioethical perspective that function as a ‘toolbox’, which emerge as a function of the challenges and circumstances and not as a battery of principles in the sense of the principlism of bioethics.

**Keywords:** environmental bioethics; ethics; moral; moral principles; moral values; bioethical perspectives; etymology of ethics; bioethics; moral duty; sustainability; environmental development; critical natural capital.

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## 1 Introduction

From the etymological analysis of the concepts ‘ethics’, ‘moral’, ‘life’ and ‘environment’ and their relationships: *ethos* (ἔθος) and *ēthos* (ἠθος) and *bios* (βίος) and *zōē* (ζωή) and *ambiens* and *ambientis* a relationship between the environment and the bioethics is presented, and the proposals of Fritz Jahr and Hans Jonas (especially their bioethical imperatives), the article presents an alternative to analyse the ‘environmental bioethics’, which syncretically interrelates the etymological proposals, the bioethics of dilemmas and creativity and industriousness, as a contribution to the analysis of the challenges that arise from techno-scientific developments and the cultural changes that impact the ambient.

For this, in the first instance, the etymological analysis of ethics and its relationship with morality is carried out, then the concepts of life and bioethics and their relationship with the environmental concept are analysed, to continue with an interrelation with the bioethics of the dilemmas and creativity and industriousness, while criticising other positions of bioethics (such as principlism bioethics). As a result, to promote the presentation of the analysis of environmental bioethics as a ‘toolbox’ that advocates for the protection of critical natural capital, the sustainable exploitation of natural resources and responsible behaviours derived from the use of techno-scientific innovations and cultural changes and frameworks for ethical reflection with a bioethical perspective.

## 2 Method

To address the concept ‘environmental bioethics’ the following stages were provided:

- 1 the etymological approach to the concept and its related concepts, among which are ethics, bioethics, life and environment. The etymological approach allows to strengthen the historical imaginaries that have led to their use today with their meanings since their origin
- 2 the philological approach: the derivations, conflicts and hierarchies that can occur in the relationships between concepts, in such a way that their similarities and differences are made evident

- 3 the genealogical approach: the meanings that arise in relation to the contexts in which they are used
- 4 the sociological approach: its evaluation alternatives in the face of practical situations that require them.

All this in order to carry out an alternative analysis of how to understand and demonstrate its *environmental bioethics* scope, as a contribution to solutions of the current environmental challenges.

The syncretic component of the proposed etymological analysis of environmental bioethics with the bioethics of dilemmas and creativity and industriousness, was carried out through hermeneutical analysis and the systematisation of the categories of the discursive analysis of said bioethical approaches, in such a way as to lead to a commensurable conceptual interrelation. In such a way that the constituents and components of environmental bioethics emerged as a ‘toolbox’ in favour of environmental care.

### 3 The concepts ‘ethics’ and ‘bioethics’

#### 3.1 *Ethics*

‘Ethics’ derives, in principle, from the Indo-European *\*s(w)e*, referring to the third-person of the reflexive pronoun, which then becomes Greek by means of the lengthening *\*swēdh-*, giving rise to the Greek concept *êthos* (*ἦθος*), for one side, and on the other, when using *\*swēdh-no-*, *éthos* (*ἔθος*) will be constructed (Robert and Pastor, 1996); therefore, it should be recognised that in the *Greek world*, especially archaic Greek (which is also present in classical Greek), these two concepts are used to refer to ethics [*éthos* (*ἔθος*) and *êthos* (*ἦθος*)], which, as Maliandi (2009, p.20) points out, ‘although mutually linked, they are not equivalent’.

The *êthos* (*ἦθος*), in archaic Greek, was initially understood as a place of refuge and protection where animals reside and are raised; later it was interpreted as the space of protection of human beings, then it was applied to the place of accommodation [Ferrer and Álvarez, (2003), p.23]. From this conceptualisation we can see, in a first approximation, that the environment (a concept that will be addressed later) is integrated into the *ethos* and is associated with “(...) the conditions that arise from there for human beings to build a coherent behaviour with the logic of life, an ethic that favours the virtuous and happy (agathist) cultivation of life in all its manifestation” [Cely, (2007), p.73].

Now, the *êthos* (*ἦθος*), in the modern sense, goes from the place where animals and humans reside to what man carries in himself, it means the character or way of being of a person from the point of view of his moral habits, is a way of life in terms of attitudes, virtues, vices and moral dispositions. In this interpretation moral life has to do with the formation of moral character through responsible choices. In this notion as a way of life, the connection between man and nature is lost, that simultaneity between the environment and the human indicated by Cely (2007, p.75).

On the other hand, the concept *éthos* (*ἔθος*), in classical Greek means ‘habit’, ‘custom’, that is, they are those concrete and particular acts by which people carry out their life projects: in each particular choice, I choose the kind of person I want to be.

However, it is important to clarify that *ēthos* (ἤθος) also refers to habit, custom, use, but, as mentioned, in addition to character, feelings, way of being, thinking or feeling, temperament, morality and the morals, and more closely related to the Indo-European, it refers to nation, people, race, ‘[people of the same nature as one] ethnic’ (Robert and Pastor, 1996). Thus, you can have a habit without rationality or relationship with morality, in which case it would be to have *éthos* (ἔθος).

Related to morality, Aristotle in Book II of the *Nicomachean Ethics*, postulates that both in *éthos* (ἔθος) and in *ēthos* (ἤθος), as virtues, the good that can be funded by *éthos* (ἔθος) can be achieved as origin of the custom, or by *ēthos* (ἤθος), since it originates and increases mostly from teaching, which Aristotle called dianoethics [Aristotle, (2010), p.35 [II-I-15]]. In short, *éthos* (ἔθος) and *ēthos* (ἤθος), are recognised by Aristotle as a virtue (*ἀρετή* [aretē]), which implies virtuous behaviours in practice and learning from mistakes by continuous follow up of our actions. Aristotle (2010, p.3 [I-1094a]) points out that: “Every art and every inquiry, and similarly every action and pursuit, is thought to aim at some good”; thus, the good (*τὸ ἀγαθόν* [to agathón]) it is the aim of all human activities and it cannot be other than the good life. Practical understanding is a way to achieve the good life, understood as the mastery of passions and the achievement of a harmonious and satisfactory relationship with the natural and social world through the exercise of virtues [Cortina and Martinez, (2001), p.60]. The good is the basis of ethics, which in turn is supported by rationality and the efforts of the will, since they have to their credit the application of behaviours, overcoming the confinement of an isolated, closed and selfish self, towards the recognition of the *other*. Thus, ethics makes sense as a capacity for conscious realisation of the human condition [Arendt, (2005), p.35] for life in society, which must also have to become a habit, a way of life, in other words: the habit of consciously seeking and doing good.

At present, different meanings co-exist that are given to ‘ethics’, for example, Spinoza, in accordance with Aristotelian dianoethics, presents ethics as a rational behaviour whose teleology is the good. In this regard, Spinoza (1990, p.150) says: “under the rule of reason, we will seek the better between two goods, and the lesser between two evils”, since good is useful for the individual as well as for his life in society, and ultimately for society itself. This, he postulates on the basis that “what leads men to common society, that is, makes them live in harmony is useful, and bad, on the contrary, what introduces discord in the city” [Spinoza, (1990), p.138 (Proposition XL)], something that is only achieved, according to Spinoza, if one is free, that is, if one acts in accordance with reason. On her part, Cortina (1998, p.41) refers to ethics as “a type of knowledge that guides us to forge a good character, that allows us to face life with human height”. So, talking about dianoethics or ethics would be exactly the same, because that knowledge can come from habit as from teaching; the important thing here is that behaviour allows living in a common society.

As has been shown, the term ‘ethics’ could be classified as polysemantic, or in other words: “Ethics is a generic term that can encompass various ways of understanding and examining the moral life” [Beauchamp and Childress, (1999), p.1]. Situation that has led to systematise ethics in approaches and types<sup>1</sup>, which are not necessarily exclusive, given that depending on the characteristics of the reflection and approach of specific or generic cases of ethical behaviour, fuzzy limits can be found between the approaches, and even between the types.

### 3.2 Moral and ethics

Given the different positions, especially emotivism (Hume, 2005; MacIntyre, 1984) and the *theory of common morality* (Beauchamp and Childress, 1999), which lead to stress the senses of ‘ethics’ and ‘moral’, it is important to keep some considerations in mind that allow us to clarify how ‘ethics’ and ‘morals’ will be understood.

In regard to ‘moral’, an origin can be found from Indo-European in the already mentioned root *\*s(w)e*, and its lengthening *\*swēdh-*, which brings it closer to the concept *ēthos* (ἦθος), giving rise to the concept in customary Latin *consuetudo*, *-inis*, from which our concept ‘custom’ comes. On the other hand, at present, the origin of the concept ‘moral’ is recognised from two Latin words: *mōrālis* and *mōs*. *Mōs* is ‘custom’, ‘character’, ‘way of being’, in such a way that it is synonymous with *ēthos* (ἦθος) and *mōrālis*, although it also corresponds to what is related to customs, some alternative translations are: ‘moral’ and ‘ethical’, something that makes it synonymous with *ēthos* (ἦθος).

San Isidorus of Seville in *Etymologiarum, Libri II, XXIV De definitione Philosophiae*, set forth the division of philosophy that the classical Greeks made into physics (*Physica*), ethics (*Ethica*) and logic (*Logica*), and its characteristics. As inferred from the text of Saint Isidorus, from this division of philosophy, what they called ‘ethics’, is equivalent, in the first instance, in the sense of what the Romans called *moralis*: whose object is knowledge by way of life. This is what we could call *ēthos* (ἦθος). However, according to Isidorus, Socrates raises, say, four virtues for an *ethical life*: prudence, justice (fairness), moral strength and temperance (moderate); situation that brings *moralis* closer to *ēthos* (ἦθος), given its correspondence with *mos*. So, just as we can state that *ēthos* (ἦθος) is implicit in *ēthos* (ἦθος), *mos* is implicit in *moralis*, if *mos* is understood as ‘the way of living honestly’, insofar as it corresponds to the virtues proposed by Socrates, and *moralis* as the knowledge of *mos*.

Made an analogy of ‘ethics’ and ‘moral’ in their corresponding Greek and Roman contexts, leads us to say that:

- 1 *ēthos* (ἦθος) is for the Greeks, what *moralis* is for the Romans
- 2 *ēthos* (ἦθος) is to the Greeks what *mos* is to the Romans.

Now, for practical purposes, to get rid of the synonymy that still exists in these definitions, we will understand ‘moral’ as the translation of acts in a factual way to ‘good’ or ‘bad’, under the rule of common sense, and ‘ethics’ as the philosophical reflection (in the understanding set out with Saint Isidorus) that is made on morality, and for this use is made of the conceptual schemes of philosophy.

“Ethics is primarily concerned with finding out what morality consists of, and for that it has to investigate what traits values, norms, or principles must have in order for us to call them ‘moral’ and not otherwise. But it is also faced with the task of seeking the reasons for the existence of morality, which is what has been called ‘the question of the moral foundation’, and, finally, applying what has been gained from these reflections to daily life.” [Cortina, (1998), p.42]<sup>2</sup>

#### 4 The concepts ‘life’ and ‘bioethics’

In classical Greek, there are two words to designate ‘life’: *bíos* (*βίος*): life, existence, way of life, subsistence, livelihood and resources, and *zōḗ* (*ζωή*): life, time or duration of life; way of life, way of living, existence, subsistence, livelihood; resources, livelihoods and assets.<sup>3</sup>

On the other hand, about ‘bioethics’ it is worth starting by saying that: ‘due to the structure of the word *bioethics*, it allows an intuitive etymological approach: ‘ethics of life’ [Yate Arévalo, (2017), p.39]. If we compare this approach with its etymological sense, ‘bioethics’ is made up of the two words of Greek origin: *bios* (*βίος*) and *ēthikós* (*ἠθικός*)<sup>4</sup>, where *ēthikós* (*ἠθικός*) is everything related to ethics (as has already been seen); hence the ease of its intuitive etymological approach: ‘ethics of life’. However, from the above, we would find two *ethics of life*, namely: *bioēthikós* (*βιοηθικός*) and *zōēthikós* (*ζωηθικός*), that is, ‘bioethics’ and ‘zoe-ethics’. So, from the etymology, ‘bioethics’ it is ‘ethics referring to organic life and ways of life’, and ‘zoe-ethics’ to ‘ways of living life’.<sup>5</sup> These ethics should not be understood from the Cartesian dualism: *res extensa y res cogita*<sup>6</sup>; but as an ontological relationship, proposed by Spinoza, between *natura naturante* and *natura naturada*: it is a monism in which life is only one: organic and a way of being lived at the same time. However, since *bioēthikós* (*βιοηθικός*) has to his credit existence itself (life) both organic and mode, it includes *zōēthikós* (*ζωηθικός*); therefore, *bioēthikós* (*βιοηθικός*) will be the main concept in bioethical discussions and reflections, and only when it is necessarily explicit will the term *zōēthikós* (*ζωηθικός*) be used. In other words, from the etymology, ‘bioethics’ includes ‘zoe-ethics’, and not the other way around.

Regarding the current use of the term ‘bioethics’, two origins can be traced:

- 1 in 1927, Fritz Jahr published an article entitled *bio-ethics: reviewing the ethical relations of humans towards animals and plants* (Jahr, 2012b)<sup>7</sup> in which he highlights, from the principle of responsibility, the negative impact that techno-scientific development has been causing on the environment and therefore on all life, including that of human beings. Jahr (2012a, p.1) says: “From Bio-Psychik it is only a step to bio-ethics, i.e., the assumption of moral obligations not only towards humans, but towards all forms of life”. In this, the existence of subjects of moral consideration is recognised [Singer, (2003), p.109], since it is the responsibility of human beings to protect life (*bios* [*βίος*] and *zōḗ* [*ζωή*]), in consideration of their own interests, especially that of not feeling pain [Singer, (2003), p.114].
- 2 Van Rensselaer Potter published the article ‘bioethics, the science of survival’, which was later printed in 1971 in the book *Bioethics, Bridge to the future*, in which he says: “Bioethics, as I envision it, would attempt to generate wisdom, the knowledge of how to use knowledge for social good, from a realistic knowledge of a man’s biological nature of man and of the biological world” [Potter, (1971), p.152].

Already today, we can find a wide variety of definitions [Saada, (2008), p.xxi; Jacoby and Siminoff, (2008), p.5; Hottois, (2007), p.26; Molina Ramirez, (2011), p.114; Congreso de la República de Colombia, 2010; Pessini et al., (2013), p.20; Kottow, (2009), p.12]; But, for our case, point four of the Buenos Aires Charter on bioethics and human rights, written in 2004, becomes a pillar of attention to vindicate what Fritz Jahr has stated about the relationship of the human being with the environment, and the

consideration of the latter as a subject of moral consideration given its own interests, without dissociating the importance for the survival of human beings.

“That bioethics deals not only with ethical problems originating from scientific and technological development; but also of the conditions that make an ecologically balanced human environment in natural biodiversity; and of all ethical problems related to the attention and care of life and health, being that for this reason it has a basic presupposition in the concept of integral health understood from the biological, psychological, social and environmental perspective, such as the development of the essential human capabilities that make life as long, healthy and successful as possible for all.” [Brussino et al., (2004), p.2]

Therefore, nowadays, bioethics, given all the aforementioned nuances, rather than being a practical ethic, is a reflective form of the development of human beings in their relationship with themselves and with the environment, while presenting its own philosophical approach, tools and methods to strengthen reflections in accordance with practicality, facticity, which is required beyond the theorisation of the impacts of human beings at individual, social and environmental scales in relation to life (*bios* [*βίος*] and *zōē* [*ζωή*]), if the separation considered above is overcome).

In such way, it will be possible, although not without the pertinent doubts, to use the meaning of *ēthos* (*ἔθος*) as: “abode or habitual place, room, habitation, residence, homeland; of animals, barn, stable; lair” [Pabón and de Urbina, (2013), p.282], to address, in principle, the meaning of ‘environmental bioethics’, from the concept of ‘bioethics’. For our case, the concept of ‘lair’ is of interest, which is defined, among other meanings, as: ‘shelter or refuge to get rid of harm or danger.’ So, ‘bioethics’ in itself is a protection that allows to avoid damages and dangers, not only for human beings but also for all nature, since as has been seen, zoe-ethics exist (*ζωηθικός* [*zōēthikós*])<sup>8</sup> within bioethics. Thus, it seems to speak of ‘bioethics’ and ‘environmental bioethics’ is a tautology. But, if it is recognised that there is a current difference between the different fields of knowledge in which bioethics intervenes, it is necessary to overcome the apparent tautology and define ‘environmental bioethics’ from the relationship of the different meanings of *bios* (*βίος*), *zōē* (*ζωή*), *ēthos* (*ἔθος*) and *éthos* (*ἔθος*), and those derived from ‘environmental’.

## 5 The ‘environmental’ concept

‘Environment’ is a synonym of the word ‘Ambient’ which is made up of the Latin root *amb-/am-* which is used to designate ‘on both sides’, and allows the construction of the verb *ambire* which means ‘surround’ or ‘be on both sides’, which is constructed through the use from the Indo-European root *\*H<sub>1</sub>ei-* whose inheritance gives the meaning to go, in Latin *ire*, as a verb, and with use as a conditional suffix means ‘to walk’, ‘to go from one place to another’. Now the present participle of the verb *ambire* is *ambiens*, *ambientis*<sup>9</sup>, in which the agentivity has an active voice, which makes it possible to infer that it is an active actor, from which its meaning ‘that goes on either side’, ‘that surrounds’, ‘surrounding’ in an active sense derives; in other words, it is that which actively acts on that on which it acts. Then, the environment acts actively on what is in it. Thus, from the etymological perspective ‘ambient’ is the set of factors external to an

organism, which surrounds it, and whose characteristics are active in relation to said organism.<sup>10</sup>

However, it should not be understood that the social world and the natural world are separate and are governed by completely different laws [Lie, (2016), p.11], since it is recognised that nature understood as a world not affected by the human action no longer exists; the idea of distinguishing the natural from the social implies a metaphysical dualism that treats human beings as if they were outside the world, instead of recognising us as part of nature [Vogel, (2015), p.66]. Apparently, what has been lost is the connection to nature that we once had or should have, and therefore we are separated from nature in a way that we ignore the impact of our actions on it. The separation between the social and the natural is materialised by positive science<sup>11</sup>, it seeks to control and dominate nature through experimentation<sup>12</sup> and math.<sup>13</sup> Scientific knowledge is limited to natural sciences, basic or applied sciences, including engineering. Positive science aims to improve the efficiency of machines by ignoring the interactions between social and natural phenomena [Díaz Rodríguez, (2019), p.313]. Today, it is aspired that the only valid form of knowledge is positive science, with its axiologically neutral operating power; nature is domesticated as a controllable machine governed by laws and forces. Positive science seeks to interpret reality mechanistically, confusing the search for truth with certainty. This claim to certainty and predictability is rendered unfeasible, especially by the existence of the Heisenberg uncertainty principle.

The positive sciences facilitate the fusion of science and technology and the dominance of the operational power of science. Techno science arises through the integration of knowledge, doing and power; it is interpreted as techno-scientific progress that can substantially modify human nature and the natural environment with uncertain and even irreversible effects [Díaz, (2019), p.33]. Techno science blurs the distinction between the natural and the artificial, that natural reality unchanged by human beings gives way to a human intervention that prevents differentiating it from the artificial [Kottow, (2009), p.15; Marcos, (2001), p.39]. In terms of Vogel (2015, p.66), the remodelling of the natural world into an artificial one by techno science and structured for human purposes, is due to the loss of connection with nature, it makes us see it as something we must master, a deposit of raw materials that must be exploited indefinitely and structured for human purposes.

The technical-scientific intervention creates a socio-natural conglomerate in which the borders between cities and surroundings, territory and human communities have been blurred, a globalised socio-natural world has been formed [Marcos, (2001), p.103]. These new realities allow the transition to the notion of environment as a complex and dynamic system where social and natural aspects are integrated and interact [López et al., (2013), p.27]. This new environmental perspective rethinks the anthropocentric vision that considers the environment as the biophysical environment that influences human activity and is used to satisfy our needs [Guevara, (2007), p.30] and approaches what has been etymologically established as 'environment': the set of external factors, such as system, that acts actively on what it is.

In this new interpretation, the notion of environment reconfigures the natural and social world, moving from separations to interactions.<sup>14</sup> In this context, the environment is the result of the interactions between the ecosystem and the cultural system and manifests itself in several dimensions: symbolic, organisational, cognitive, techno scientific and biophysical; it is a continuity between the subject and the surroundings, it is the expression of the continuity between nature and society. This notion of environment



conceived as complex and dynamic interactions, is opposed to the Cartesian dualism that separates the unity of being with the natural world (Descartes, 2008), it is a particular form of interaction and social construction that conceives nature as a deposit of raw materials of indefinite exploitation.

In the environment conceived as interactions, the human is part of nature, but it differs substantially from the natural world: it has a moral dimension. This orientation distances itself from the trends that:

- 1 seek to 'green' humans, that is, to obviate ethical commitment, where the laws of ecology completely govern human behaviour regardless of social considerations
- 2 'anthropocentrise' nature, understood as a nature at the exclusive service of human needs and outside of moral considerations.

## 6 Towards an alternative analysis of environmental bioethics

As we have seen, from the etymological approach, ethics is a space of protection for animals and humans that varies between national, regional, local, and domicile, the biophysical environment makes sense as a foundation for the protection and survival of animals and humans, obviously that space is referenced to animals and humans. When ethics is transformed into a way of being of people, Aristotle gives meaning to it through virtues, since that way of being becomes virtuous exclusively within a community, that is, on both levels: the individual and the social. Now, the Greek world separates the polis from nature, but from the etymological point of view, when reviewing the evolution of the notion of ethics, it is necessary to integrate the individual, social and natural level. With the etymological review of bioethics, that integration acquires greater conceptual force because it expresses that ontological unity between the organic and the way of being; in humans, this indissolubility between the social and the natural is recognised, but it is enriched and supported by the natural with the moral and spiritual dimensions.

The current notion of 'environment' avoids the separation between the social and the natural and assumes that ontological unity, but with an emphasis on the reciprocal interactions between the social and the natural. Those two-way interactions between the social and the natural derived from techno-scientific intervention and cultural change cause environmental opportunities and risks. In turn, the intervention of techno science and social and natural interactions cause contexts of greater complexity and uncertainty.

The sphere of action of bioethics, which includes *zoe-ethics*, includes the personal and social and natural levels. Techno-scientific change has caused complex and dynamic interactions between the social and the natural that cause environmental impacts, characterised on the one hand, by being cumulative, uncertain and the potential to cause irreversible damage and, on the other hand, by opportunities for protection and conservation of natural capital, as Jahr (2012b) explains. Thus, bioethics extends its radius of influence to the challenges arising from socio-natural interactions, that is, the challenges of the environment. Bioethics must deal with ethical issues derived from the introduction of techno-scientific innovations and cultural change that cause environmental impacts in contexts of complexity and uncertainty, we are talking about environmental bioethics (Jahr, 2012b). This analysis of environmental bioethics emerges from the etymological and is supported by most of the writings of Fritz Jahr, who not

only used the term bioethics for the first time, but his visionary understanding of the problems that he had to address, led him to raise the ethical concerns related to new technologies and cultural change [Sass, (2007), p.280].

The field of action of environmental bioethics is aimed at contributing to the ethical issues that emerge from contemporary environmental problems and opportunities characterised by the presence of cumulative effects, high doses of epistemic and ontological uncertainties and the danger of causing serious and irreversible damage in globalised societies of rapid techno-scientific change and new cultural dynamics. Environmental bioethics recognises the interactions between bioethics and the environment in a two-way relationship because it draws on environmental thinking to enhance its contribution to the socio-natural challenges posed by contemporary societies.

Beyond the empirical sciences, a set of ethical guidelines and responsibilities is required to enable the sustainable exploitation of natural resources and prevent the destruction of the vital functions of natural systems. Environmental problems inevitably lead to a series of fundamental questions: What should we value as human beings? What kind of beings are we and what do we want to be? What lives should we live? How should we, as human beings, behave towards other living organisms? Environmental decisions and policies are ultimately determined by our answers to these and similar questions [Stenmark, (2017), p.12].

Environmental bioethics must be based on values and principles on which ethical judgement must be based and allow a well-argued distinction between the 'lawful' and the 'unlawful'. In this sense, to remain indifferent to any system of reference under the pretext of tolerance is not valid, especially when reflecting on the importance and human and social survival or safeguarding the ecosystem for future generations; consequently, one cannot ignore the moral duty to seek rational and valid guidelines that can be shared or, at least, responsibly discussed [Sgreccia, (1996), p.61]. Bioethical proposals must be based on their capacity to protect and promote natural and human life, and on their capacity to promote the flourishing of life in an open universe.

Environmental bioethics seeks the permanence of humanity in harmony with nature through a sustainable balance between current and future generations, having as a material object environmental problems and opportunities with an ethical dimension. The formal object is associated with ethical issues derived from cultural and techno-scientific change that causes environmental impacts characterised by the presence of accumulation, irreversibility, epistemic and ontological uncertainties, impacts of diverse scope, especially global and international.

Environmental bioethics allows studying the interactions of the human and the natural, recognising that the human is not only nature, it transcends beyond, with its moral and spiritual dimensions.<sup>15</sup> Thus, environmental bioethics distances itself from the currents of thought that seek to 'green' man and from the approaches that reduce the human to a simple social construction that must invent a meaning of life starting from 'zero', regardless of biological and spiritual considerations. We consider the ethical contribution for the solution of environmental problems proposed by environmental ethics is insufficient and should be complemented, given that the schools of thought of environmental ethics have moved into two extremes:

- Ecological approaches (animal ethics, biocentrism, ecocentrism, among others) that defend nature presenting an anti-humanist bias in their desire to distance themselves

from the traditional currents of strong anthropocentrism that relate to nature as a deposit of raw materials without any type of moral commitment.

- Social approaches (ecomarxism, ecofeminism, social ecology, market ecology, among others) fall into the mechanism and naivety that social change derived from the economic sphere, modifications of power relations from a gender perspective, change in property structures, among others, cause changes in the natural world.

These proposals generally embrace the totalitarian, anarchist or utopian solutions that are the product of reflections disconnected from scientific, anthropological, ethical, social and natural reality. Therefore, environmental ethics “(...) can lead to reactionary mirages of returns to wisdoms, metaphysics or spiritualist, traditional or oriental religions, or to the revolutionary lures of a ‘new’ society, of ‘another’ politics, of a ‘new’ science and ‘other techniques’... in complete break (even violent) with the contributions of modernity” [Hottois, (2006), p.60].

We consider that one of the ways to respond to ethical questions derived from techno-scientific and cultural change that causes environmental impacts, is environmental bioethics since it recognises<sup>16</sup>:

- a The principle of totality that includes the axiological gradation: dignity and intrinsic respect for all human beings and the inherent, instrumental and aesthetic values of the natural are recognised.
- b The nature-society relationship occurs in terms of reciprocal interactions.
- c Humanity protects the critical natural capital stock in current generations and between generations and sustainably exploits natural resources.
- d The human is related to nature in symbolic, aesthetic and spiritual terms.

This way of analysing environmental bioethics makes it possible to highlight the need to overcome the predominant current in bioethical thought called ‘bioethics of dilemmas’, which consists of deliberating and choosing the options that are available, and often presented as dilemmas in essential questions that affect life in general and in particular, this leads to consider the future of bioethics in two senses, those in favour of *progress* and those *resistant to change*; however, contemporary bioethical problems can also be posed as challenges to creativity and industriousness that materialise in configuring new courses of action that protect and prioritise life in general and in particular cases (Marcos, 2019).

In the context of contemporary environmental problems, a significant contribution is environmental bioethics, taking into account, the bioethics of dilemmas and the bioethics of creativity and industriousness.

### 6.1 *Environmental bioethics of conflicts*

Bioethics of conflicts assumes that ethos is conflictual, i.e., the norms and values of different individuals tend to conflict with the norms and values of other individuals and even in some cases with one’s own norms and values. Ethos cannot be totally conflictive but neither can it be absolutely harmonious.

**Table 1** Environmental bioethics of dilemmas: main bioethical aspects for the solution of environmental problems

<i>Bioethical aspects bioethical aspects and value and/or central ideas [explanation]</i>	<i>Limitations</i>
<p><i>Bioethical aspects:</i> utility principle<sup>1</sup></p> <ul style="list-style-type: none"> <li>• Productive and allocative efficiency.</li> </ul> <p>The most efficient alternatives are selected. Those affected are considered and decisions are made through cost-benefit analysis that allows increasing happiness or collective well-being. Good is sought for the majority and the benefits and costs are monetised. There is the utilitarianism of the acts in the company, the utilitarianism of the rules and the bureaucratic utilitarianism for public investment projects.</p> <p><i>Bioethical aspects:</i> universal principle of dignity and respect<sup>2</sup></p> <ul style="list-style-type: none"> <li>• Universal moral rights</li> </ul> <p>Universal respect for individual human rights regardless of any consideration. They are legitimate moral rights because they affect the basic interests of human beings. Equal consideration and treatment before the law is guaranteed to all human beings.</p> <p><i>Bioethical aspects:</i> prevention principle<sup>3</sup></p> <ul style="list-style-type: none"> <li>• Epistemic uncertainty</li> </ul> <p>Environmental impacts are anticipated where the magnitude and timing of the impact can be known with a certain degree of probability. It moves between certainty and epistemic uncertainty, in any case, a predictable risk. It is related to the principle 'polluter pays'.</p> <p><i>Bioethical aspects:</i> precautionary principle<sup>4</sup></p> <ul style="list-style-type: none"> <li>• Ontological uncertainty</li> </ul> <p>It anticipates cumulative environmental impacts that can cause serious and irreversible damage due to the use of techno science; It implies a lack of knowledge of the magnitude and time of occurrence of the environmental impact, in any case, there is the presence of unpredictable risks. The burden of proof rests with the producer.</p>	<p>There are no inherently bad acts. Efficiency considerations predominate over equity. Ethical and methodological risks for monetising human life, the use of time, loss of biodiversity, extinction of species, loss of archaeological heritage, among others. The cost-benefit methodology prefers projects that generate immediate benefits as well as generate high environmental costs in the long-term.</p> <p>Compliance with duty ignores the circumstances and consequences of environmental conflicts with a moral dimension. It does not know the good for the majority, with a high risk of falling into inefficiency. They have indirect duties to animals and nature.</p> <p>Poses predictable risk and reversible environmental damage</p> <p>Large-scale projects can be discouraged by precautionary costs and schemes that relate to 'pay to prevent'.</p>

Notes: <sup>1</sup>The main exponents of the principle of utility are Jeremy Bentham, John Stuart Mill, Henry Sidgwick.  
<sup>2</sup>The main exponent of universal principle of dignity and respect is Immanuel Kant.  
<sup>3</sup>The main exponent of prevention principle is Aristotle.  
<sup>4</sup>The main exponent of precautionary principle is Aristotle.  
<sup>5</sup>The main exponents of principle of protection are Miguel Kottow, Emmanuel Levinas and Fermin Schramm.  
<sup>6</sup>The main exponents of justice as equity are John Rawls, Gail Henderson and Joaquin Valdivieso.  
<sup>7</sup>The main exponent of legal justice is Richard Dworkin.  
<sup>8</sup>The main exponent of environmental justice is Ronald Sandler.  
<sup>9</sup>The main exponents of principle of responsibility and will to make sense They are Hans Jonas and Viktor Frankl.  
<sup>10</sup>The main exponent of principle of equal consideration of the interests of those affected it is Peter Singer.

Source: Own elaboration

**Table 1** Environmental bioethics of dilemmas: main bioethical aspects for the solution of environmental problems (continued)

<i>Bioethical aspects: bioethical aspects and value and/or central ideas [explanation]</i>	<i>Limitations</i>
<p><i>Bioethical aspects:</i> protection principle<sup>5</sup></p> <ul style="list-style-type: none"> <li>Ethos protector of recognition of the other</li> </ul> <p>Protection with a bioethical perspective is due to the lack of protection and the damages derived from socio-natural interactions and asymmetric relationships between moral agents and patients. The protective ethos prevents Nietzsche's (1996) lack of political will and ethos of violence. In public policies it is applied when certain environmental objectives are mandatory, they are environmental services that overcome problems of poverty and exclusion and cannot be discarded for secondary reasons. Recognise the cultural contexts of those affected.</p>	<p>Confusing the ethics of protection with paternalism. A social empowerment to overcome the asymmetries of power but instrumentalised politically can end in the paralysis of vital projects for the development of a region or a country.</p>
<p><i>Bioethical aspects:</i> justice as fairness<sup>6</sup></p> <ul style="list-style-type: none"> <li>Maximise the social position of the least advantaged, the principle of fair savings and protection of critical natural capital.</li> </ul> <p>Justice as equity demands the protection of critical natural capital and a sustainable exploitation of natural resources that maximises the expectations of the least advantaged until they exceed social minimums. Fair saving stimulates equity between generations by maintaining the stock of natural capital and equity in the distribution of natural resources.</p>	<p>It is clear that efficiency is a means to achieve just institutions. However, the traditional conflict between efficiency and equity is not solved satisfactorily. Further research is required for the measurement and evaluation of critical natural capital.</p>
<p><i>Bioethical aspects:</i> legal justice<sup>7</sup></p> <ul style="list-style-type: none"> <li>Freedom and fair and equitable treatment of individuals. The moral rights of people have priority over collective goals; the essential axis of this perspective is freedom. People must have equal treatment in their convictions and equal right in access to resources to have a decent life.</li> </ul>	<p>It considers that the existing principles can be applied in all cases, even when there is uncertainty in the decision; this uncertainty is a source of judicial discretion. However, the creation of new judicial referents is not accepted when there is no precedent, it is considered that the existing principles can respond to new challenges.</p>
<p>Notes: <sup>1</sup>The main exponents of the principle of utility are Jeremy Bentham, John Stuart Mill, Henry Sidgwick.  <sup>2</sup>The main exponent of universal principle of dignity and respect is Immanuel Kant.  <sup>3</sup>The main exponent of prevention principle is Aristotle.  <sup>4</sup>The main exponent of precautionary principle is Aristotle.  <sup>5</sup>The main exponents of principle of protection are Miguel Kottow, Emmanuel Levinas and Fermin Schramm.  <sup>6</sup>The main exponents of justice as equity are John Rawls, Gail Henderson and Joaquin Valdivieso.  <sup>7</sup>The main exponent of legal justice is Richard Dworkin.  <sup>8</sup>The main exponent of environmental justice is Ronald Sandler.  <sup>9</sup>The main exponents of principle of responsibility and will to make sense They are Hans Jonas and Viktor Frankl.  <sup>10</sup>The main exponent of principle of equal consideration of the interests of those affected it is Peter Singer.</p> <p>Source: Own elaboration</p>	

**Table 1** Environmental bioethics of dilemmas: main bioethical aspects for the solution of environmental problems (continued)

<i>Bioethical aspects bioethical aspects and value and/or central ideas [explanation]</i>	<i>Limitations</i>
<p><i>Bioethical aspects:</i> environmental justice<sup>8</sup></p> <ul style="list-style-type: none"> <li>• Distribution of benefits and environmental burdens assignment of environmental burdens and benefits between people and communities. Determination of the causes of unequal exposure to environmental impacts on ethnic minorities and low-income communities, Is unequal exposure to environmental hazards unfair? Concentration of polluting activities in a given area, evaluate fair treatment for people regardless of their race, culture or ability to pay.</li> </ul> <p><i>Bioethical aspects:</i> principle of responsibility and will to meaning<sup>9</sup></p> <ul style="list-style-type: none"> <li>• Efficiency in the extraction and use of natural resources, moderation in consumption, responsible consumption</li> </ul> <p>Hans Jonas' (1995) principle of responsibility is based on a future-oriented ethic that is supported by the ethical imperative that there must be humanity in the future. Seeks to limit hedonistic consumption. A responsible consumption policy is put into practice through strategies that integrate the principle of responsibility and Frankl's will to meaning (change of lifestyles), that is, to harmonise the public and the individual.</p> <p><i>Bioethical aspects:</i> principle of equal consideration of the interests of those affected<sup>10</sup></p> <ul style="list-style-type: none"> <li>• Ability to feel</li> </ul> <p>It is a principle of animal welfare that resolves conflict of interest by degrees of self-awareness. The goodness or badness of actions depends on the future expectations of a sentient being. It is a utilitarianism of preferences that seeks to increase the collective well-being of sentient beings. The core of the proposal is to avoid suffering.</p>	<p>Ethical considerations for putting environmental justice expectations into practice are unclear. Cost-benefit analysis to seek environmental justice is an impartial decision-making mechanism that seeks to increase the total well-being of a society. However, this methodology is a cause of uneven exposure to environmental hazards.</p> <p>Disarticulation between responsible consumption policies and the meanings of life of individuals in society. Changes in lifestyle can be very long-term.</p> <p>Due to their utilitarian nature, actions or omissions of an evil nature are equivalent because they interest the results excluding the intentions. Counterintuitive results can be reached such as reducing human rights to simple wishes that are legitimate as long as they do not affect others. The moral conflicts between avoiding suffering and death, the first consideration predominates. Some have called this ethical perspective hedonistic utilitarianism.</p>
<p>Notes: <sup>1</sup>The main exponents of the principle of utility are Jeremy Bentham, John Stuart Mill, Henry Sidgwick.  <sup>2</sup>The main exponent of universal principle of dignity and respect is Immanuel Kant.  <sup>3</sup>The main exponent of prevention principle is Aristotle.  <sup>4</sup>The main exponent of precautionary principle is Aristotle.  <sup>5</sup>The main exponents of principle of protection are Miguel Kottow, Emmanuel Levinas and Fermin Schramm.  <sup>6</sup>The main exponents of justice as equity are John Rawls, Gail Henderson and Joaquin Valdivieso.  <sup>7</sup>The main exponent of legal justice is Richard Dworkin.  <sup>8</sup>The main exponent of environmental justice is Ronald Sandler.  <sup>9</sup>The main exponents of principle of responsibility and will to make sense They are Hans Jonas and Viktor Frankl.  <sup>10</sup>The main exponent of principle of equal consideration of the interests of those affected it is Peter Singer.</p> <p>Source: Own elaboration</p>	

In the bioethics of conflicts, the principle of utility seeks the efficient use of natural resources, favouring decisions that generate immediate benefits and may cause long-term environmental costs, as well as increase the welfare conditions of society; the principles of prevention and precaution seek to protect nature from irreversible damage and are oriented to preserve the good or right of nature, however, very much determined by cost-benefit assessments and historical trends. The principle of dignity, which requires recognition of the uniqueness of individuals and their treatment as ends in themselves over and above collectivist approaches, the criteria and principles of justice, understood as the moral obligation that good or right acts are in the interest of society as a whole, the weighing of environmental benefits and burdens in the context of communities, without losing sight of the ecological basis for survival, social minimums and present and intergenerational economic development. The equal consideration of interests for sentient being subject to the primary recognition of the equal rights of human beings, special protections for vulnerable human beings and recognised by any power that wants to have legitimacy. These special protections must be based on an unrenounceable political will and on certain special benefits to guarantee conditions of gratuity. The principle of responsibility understood as the responsible use of technoscience that allows the good and the right to be realised in any process of change and the articulation of responsible consumption policies with the will of meaning and lifestyles of individuals in society.

In the bioethics of conflicts is the traditional approach in which binary thinking predominates, it is considered that the future can be predicted based on the past and the present, there is a tendency to ignore residual uncertainty or treat it as all or nothing. Binary thinking assumes slow change and there is a possibility of getting it right in mutually exclusive choices or with a limited number of politically viable environmental reforms, usually with two possible yes or no answers. Because experiences and intuitions may predominate in choices, the following beliefs may be held:

- a the belief that things will work out in the future regardless of the data
- b not being sure of anything and the tendency to maintain current conditions
- c what is known does not matter and it is better to imitate what everyone else does; this was considered by Kahneman et al. (2021) when he pointed out that the mental mechanisms that originate noise or variability of judgements and shared errors despite their omnipresence are rarely considered in strategic decisions.

In the bioethics of conflicts there is a tendency to consider that changes imply progress; this can weaken the principle of balance between the permanent and the mutable, i.e., keeping stable what is valid and the necessary change to avoid stagnation; the search for novelty can lead to losing sight of the essence of bioethics, which is the promotion of life. Decisions based on conflict bioethics run the risk of falling into the availability heuristic because of the tendency to give more importance to recent incidents because they are more easily remembered, risk evaluative judgements based on the long-term are replaced by judgements conditioned by simplicity (Kahneman et al., 2021).

Bioethics of conflicts can be appropriate with short-term time horizons, since forecasts, as Kahneman et al. (2021, p.159) points out, can be difficult, but not impossible, and in these cases experts excel over ordinary people. This bioethical approach may be relevant in environments of relatively predictable change and as an initial starting point for envisioning certain futures that help to reduce to some extent

situations of uncertainty or incomplete information, but without making definitive decisions. One drawback of this approach is that, in major bioethical and environmental problems, the actors in the conflict are trapped between two extremes: the ‘enlightened’ or standard-bearers of progress and the ‘reactionaries’ or opponents of change, which is usually defined in favour of those who best capitalise on power relations, leaving aside any scientific and moral considerations. Table 1 shows the bioethical aspects of environmental bioethics dilemmas.

### 6.2 Environmental bioethics of creativity and industriousness

In situations of residual uncertainty arising from the use of technologies that may cause irreversible consequences or decisions that affect the fundamental rights of human beings or cause serious damage to nature, the bioethics of creativity must be taken into account. The exercise of forecasting the future of bioethics is insufficient, this is evidenced by Kahneman et al. (2021) pointing out that detailed long-term predictions about concrete events are simply impossible, experts tend to deny irremediable ignorance and are overconfident in the predictability of future events that are in fact unpredictable and believe they can succeed in these tasks. It may be fruitful to undertake the effort to build a bioethics of the future with creative and laborious solutions.

**Table 2** Bioethics of industriousness and creativity: a perspective to overcome binary thinking

<i>Focus and value and/or central ideas</i>	<i>Overcoming binary thinking</i>
<p>Focus: utilitarianism<sup>1</sup></p> <p><i>Value and/or central ideas:</i> principle of utility and efficiency</p>	<p>The choices that maximise collective well-being are increased when the spectrum is broadened to multi-criteria assessments, which include the social, aesthetic, political, cultural and ecological dimensions. These multi-criteria evaluations, including the scoring method and the hierarchical analytical process, can be complemented with the ecological footprint, the water footprint, the carbon footprint, environmental spaces, among others, typical of the ecological economy. The criteria for the conservation of natural resources must be based on:</p> <ol style="list-style-type: none"> <li>1 ‘Landscape/aesthetic/recreational value</li> <li>2 Biological importance as a source of knowledge</li> <li>3 Instrumental value/natural resources</li> <li>4 Role of natural environments as mitigators of climate change</li> <li>5 Possibility that future generation may know a world that has not been created by human beings’ [Klier et al., (2017), p.70].</li> </ol>

Notes: <sup>1</sup>The main exponents of utilitarianism are Jeremy Bentham, John Stuart Mill, Henry Sidgwick and Peter Singer.

<sup>2</sup>Its main exponent is Immanuel Kant.

<sup>3</sup>The greatest exponent of the ethics of the virtues is Aristotle.

<sup>4</sup>Its greatest exponents are Kahneman, Tversky and Thaler.

<sup>5</sup>The greatest exponent of ecotheology is Christianity.

Source: Own elaboration



**Table 2** Bioethics of industriousness and creativity: a perspective to overcome binary thinking (continued)

<i>Focus and value and/or central ideas</i>	<i>Overcoming binary thinking</i>
Focus: human rights <sup>2</sup> <i>Value and/or central ideas:</i> universal moral rights	There is a direct and inalienable duty to universalise essential rights of the unprotected to guarantee the principle of moral equality of all human beings; efficiency is a means for equity. It has indirect, inalienable duties of protection of nature and animals as the basis of survival and future permanence of humanity. A capable moral subject is self-aware, approves of himself and is capable of evaluating his moral acts in terms of positive or obligatory; It is complemented by a subject of rights who is worthy of respect, is subject in relation to the other, who knows his rights and is empowered as a citizen. When there are human groups that are in conflict over environmental issues, the parties feel that they are treated fairly and there are a multitude of responsible choices that the parties recognise.
Focus: ethics of virtues <sup>3</sup> <i>Value and/or central ideas:</i> virtues	The change in lifestyles invites to industriousness, requires efforts to seek the most convenient at the individual and social level. The solution of environmental problems has focused on consequences and a rights approach, forgetting the types of people and their lifestyles. The intellectual virtue of prudence supports the virtues of self-control such as strength, temperance and modesty, as well as the virtues of social relationships such as kindness, justice, sweetness, good humour, among others. A new relationship with nature requires a change in the attitudes, dispositions and perspectives of people, including those responsible for policies. The environmental virtues of sustainability, respect for nature, environmental protection and communion with nature [Sandler, (2018), pp.222–226]. A central element of change is recognising mistakes and learning from them. Bridges must be built between the individual, the community and the collective in a dialogue and actions in both directions.
Focus: behavioural economics and psychology <sup>4</sup> <i>Value and/or central ideas:</i> cognitive biases and uncertainty	Human decisions present cognitive biases because they are supported by heuristics, emotional or moral motivations and social influences that lead to systematic errors. These biases mean that many decisions do not adjust to the rational behaviour proposed by neoclassical economics (Thaler, 2017; Kahneman, 2012). From this perspective we recognise a decision maker who makes cost-benefit calculations, a decision maker who can be wrong due to cognitive biases, and a decision maker who can be a reciprocal altruist. In solving environmental problems under conditions of uncertainty, cognitive biases are especially relevant, especially retrospective, correspondence, confirmation and false consensus biases (Kahneman and Tversky, 1972; Kahneman, 2012). When you have a prejudice and the imagined data is taken for granted without their respective verification, this causes ethical prejudices that are the source of great injustices and can even lead to biased decisions.

Notes: <sup>1</sup>The main exponents of utilitarianism are Jeremy Bentham, John Stuart Mill, Henry Sidgwick and Peter Singer.

<sup>2</sup>Its main exponent is Immanuel Kant.

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<sup>5</sup>The greatest exponent of ecotheology is Christianity.

*Source:* Own elaboration

**Table 2** Bioethics of industriousness and creativity: a perspective to overcome binary thinking (continued)

<i>Focus and value and/or central ideas</i>	<i>Overcoming binary thinking</i>
Focus: ecotheology <sup>5</sup> <i>Value and/or central ideas:</i> theocentrism	The strength of this approach is in its relational dimension with oneself, with others and with the cosmos. You have to observe and understand the world and nature as a whole as in the song to the creatures of Francis of Assis. It is a path of industriousness and creativity that harmonises the material and the spiritual, more than a doctrine it is an experience [Patiño Morales, (2015), p.566]. The axis of the proposal is in love, in the will to serve that seeks the good of otherness, this goes beyond cost-benefit solutions and reciprocal altruism. You can only be in harmony with nature when you are in communion with God. Human beings make tutelage of nature through divine revelation, expressed in moral laws that are oriented to care and love for creation. Naturocentrism and anthropocentrism are not accepted because they are paths outside the dictates of creation and lead to anti-humanism or the predation of nature. Any of the alternatives mentioned lead man to his destruction.

Notes: <sup>1</sup>The main exponents of utilitarianism are Jeremy Bentham, John Stuart Mill, Henry Sidgwick and Peter Singer.

<sup>2</sup>Its main exponent is Immanuel Kant.

<sup>3</sup>The greatest exponent of the ethics of the virtues is Aristotle.

<sup>4</sup>Its greatest exponents are Kahneman, Tversky and Thaler.

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*Source:* Own elaboration

The bioethics of creativity is based on utilitarian criteria that encourage increases in social welfare, expanding the radius of action from cost-benefit assessments to multi-criteria assessments articulated with the rights approach that is concerned about unprotected human beings and the universalisation of essential services; likewise, it is a bioethics that protects itself from collectivism and individualism and promotes human life, recognising its inherent dignity. The change in behaviours and lifestyles is not guaranteed exclusively with consequentialist and deontological approaches, for this it is necessary to be concerned about the type of people who share our world, that vital space in which we make ourselves and relate to each other; virtuous lives that creatively build community in harmony with nature are required. Bioethicists to address the biases, heuristics and noise pointed out by Kahneman et al. (2021) that cause systematic errors in decisions in environments of risk and uncertainty due to technoscientific change can be supported by:

- a recognising these systematic errors
- b constructing scenarios for changing mindsets, questioning traditional hypotheses of the future
- c generating new strategic visions by constructing causal diagrams that unveil the feedback effect and the time between the execution of an action and the moment its impacts are felt.

Moving towards sustainable human development requires integrated, creative and laborious efforts in the scientific, social and ethical spheres. It is worth noting that

sustainability is an insufficient criterion to evaluate the adequacy and morality of an act, for example, there may be social structures that are not very acceptable from an ethical point of view but sustainable over time, as may be the case of caste structures or dictatorships (Linares, 2009). The same traditional notion of sustainable development is defined in terms of future needs that are very difficult to predict, making it necessary to strengthen and expand the field of research from being to should be, from balance to norm (Valera and Marcos, 2014). It may be pertinent to speak of sustainable human development formulated in terms of capabilities, morally committed to a time scale in our radius of action of reasonable foresight and formulated in terms of capabilities (Valera and Marcos, 2014) allows addressing the ethical perspective in terms of an environmental bioethics, not only of dilemmas but in terms of environmental challenges that are oriented to seek creative directions. Environmental problems can be approached not only as simple conflicts anchored to history and the present that force a choice between the alternatives presented, for example, human needs versus environment, but also as challenges for human creativity that allow the creation of new courses of action that promote human life and life in general (Marcos, 2019). The theological perspective in its various creeds, can be gathered in the following:

“If we approach nature and the environment without this openness to wonder and amazement, if we no longer speak the language of fraternity and beauty in our relationship with the world, our attitudes will be those of the dominator, the consumer or the mere exploiter of resources, incapable of limiting his immediate interests. On the other hand, if we feel intimately united to all that exists, sobriety and care will spontaneously emerge.” [Iglesia Católica. Papa Francisco, (2015), p.11]

Table 2 shows the bioethical criteria that support environmental bioethics of creativity and industriousness.

## **7 Discussion**

The analysis carried out on environmental bioethics, in principle, coincides with Potter (1971, 1988), Jahr (2012b) and Sass (2007), since it considers that environmental effects influence life in a holistic sense, surpassing the traditional conception of reduce it only to human health. However, it differs in its articulation with the recent paradigmatic change in bioethics in that ethical reflection is not only approached from a historical and philosophical perspective, but also encompasses a wide range of knowledge and disciplines [Pace, (2010), p.56], in line with the bioethics of industriousness and creativity proposed by Marcos (2019).

It coincides with the characterisations of environmental bioethics made by various researchers, in aspects such as:

- a the ethical issues of human groups in conflict
- b the dangers and threats that influence the environment, human beings and their body
- c the environmental effects with implications for human survival
- d the recognition of research axes such as biodiversity, biosafety, sustainable development, climate change and the ethics of responsibility with future generations (Hottois, 2007; Potter, 1988; Lacadena, 2012; Cadena, 2010; Buxó, 2003).

Now, as it has been shown, the analysis of environmental bioethics from the etymological perspective allows for a greater radius of scope with respect to medical approaches, since the latter understand the sphere of influence of environmental bioethics as:

- a The relationships between human health and environmental impacts, the potential value of environmental mitigation efforts and the reduction of damages by the provision of health care services.
- b A sustainable health care that according to Pierce (1997), is understood as the combination of the conservationist sensibilities of ecology, the call to stop the rapid development of the global market and the urgent need to reduce the size of the health sector.
- c The interactions between human health and global sustainability and between human health and environmental deterioration derived from the research carried out by *The Canadian Medical Association Journal* and the *Journal of Medical Humanities*.
- d The intersections of world health and environmental policy led by the American Society for Bioethics and Humanities and the axes of research in nutrition, natural disasters and public health developed by David Resnik (Richie, 2014).

Thus, this alternative analysis of environmental bioethics makes it possible to highlight the complementarities or substitutability between the environmental bioethics of dilemmas and the environmental bioethics of creativity and industriousness, unlike Marcos (2019) who considers that these approaches are substitutes, since this alternative analysis presents frameworks for reflection to find novel paths from various disciplines and suggests some bioethical principles and aspects that may support the solution of environmental problems when ethical conflicts arise from a bioethical perspective, based on frameworks for reflection for the protection and conservation of nature, the protection of human life and natural life that above all guarantees Jonas's bioethical imperative: there must be humanity in the future.

Environmental bioethics provides a conceptual and methodological framework that can contribute to the academic and research community, advisory bodies, commissions, councils, communities or other public and private actors committed to the ethical issues arising from techno-scientific changes and cultural changes generated by policies, programs, projects or activities related to the environment, thus:

- a development of critical and argued ethical reflections on aspects of science and technology that have environmental implications
- b enunciation of strategies for the management of existing ethical conflicts that have importance for the preservation of human life, human interactions with the environment or access to advances and progress of techno-scientific knowledge in the environmental field
- c evaluation of the ethical and legal consequences of the application of technologies and ethical sustainability at the level of research and policies related to the environmental
- d review of existing environmental policies and regulations in light of the proposed criteria.

- e conceptual and methodological support for the drafting of environmental laws, regulations and policies related to ethical problems derived from technoscientific changes and their application in the life sciences
- f structuring of guides, documents, booklets, conferences, workshops and debates as a mechanism for educating and informing the public and professionals about ethical problems related to the life sciences.

The proposal is affected by the social preference for technical and economic solutions that involve more rapid changes in the behavior of actors through cost-benefit valuations and legal policy solutions that coercively seek to force a transition to a sustainable society. Changes in ethical values are inherently slow and responses are reactive, as opposed to the pro-active attitude required by the processes of transition to a sustainable society. Over-regulation is an understandable response to the rapid development of conflicts and crises, but this does not mean that the effects of ethics and values, which are more solid and long-lasting, should be disregarded (Harremoës, 2002).

The proposal is conceived as a support and element of legitimacy to the processes of change or permanence, however, an excess of application could contain a risk associated with the paralysis of certain economic and social advances, preventing to follow the trajectory of sustainable human development.

On the other hand, the emerging proposal of environmental bioethics requires new research to consolidate the foundation and justification of the concepts, methodologies and criteria and measurement of the effectiveness of its application by public and private actors.

## 8 Conclusions

On a basic etymological approach of the concepts ‘ethics’, ‘moral’, ‘life’ and ‘environment’, which allows us to study their origin, evolution and meanings, is easy to recognise a relationship between bioethics and the environment from a two-way interaction that complement each other, which emerge from the etymology as the basis of the analysis presented, defining ‘environmental bioethics’ from the relationship of the different meanings of *bios* (*βίος*), *zōē* (*ζωή*), *ēthos* (*ἦθος*) and *éthos* (*ἔθος*), and those that are derive from ‘environmental’. Consequently, the environmental bioethics concept, from its utility, allows the recognition of the values of the environment, even if they are framed in the values of *Anthropocene* utility that are formulated within the framework of the survival of the species; that leads to the formulation of values, principles, aspects ..., although not exclusive, specific for the analysis of the relationships between human beings and the environment, such as, for example, the precautionary and protective principles, cognitive biases and environmental virtues. The *bioethical imperatives* proposed by Fritz Jahr and Hans Jonas are a good reference to relate rationality with the behaviour of human beings and their interactions with nature.

By approaching environmental bioethics in a syncretic way with the different theoretical and methodological proposals that correspond to it, it becomes evident that environmental bioethics considers that there is a set of ethical aspects and approaches with a bioethical perspective that function as a ‘toolbox’ that emerge according to the challenges and circumstances and not as a battery of principles, since environmental

bioethics advocates the protection of critical natural capital, the sustainable exploitation of natural resources and responsible behaviours derived from the use of techno-scientific innovations and cultural changes and frameworks for ethical reflection with a bioethical perspective.

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## Notes

- 1 Among them we can find, as an example, the deontic, descriptive and meta-ethical approaches. Also: for example: Aristotelian ethics (Aristotle, 2010), Kantian ethics (Kant, 2005), the ethics of prima facie duties (Dancy, 1995), consequentialist ethics (Pettit, 1995), utilitarian ethics (Goodin, 1995), environmental ethics (Elliot, 1995), emotivism ethics (Hume, 2005), communitarian ethics (Beauchamp and Childress, 1999), ethics of care (Beauchamp and Childress, 1999), casuistic ethics (Beauchamp and Childress, 1999), ethics of common morality (Beauchamp and Childress, 1999), Anglo-Saxon principlism ethics (Beauchamp and Childress, 1999), applied ethics (Cf. Maliandi, 2009), the ethics of minimums and maximums (Cortina, 1998), ecological ethics (Kottow, 2009) and the ethics of discussion (Habermas, 2000).
- 2 But, it should not be misunderstood that ethics can only be approached by philosophers, since reason is the power (*conatus*) of human beings, and through it, it is possible to access the practical, the useful of ethics, so any person making use of his rationality can make ethical reflections; here the important thing will be that the facticity that characterises morality is in correspondence with the rationality that falls on it.
- 3 An example of the use of the term *zōē* (ζωή) in Greek is: «ζωή κατακτήσασθαι οἱ ποιῆσται» whose translation would be to live, to earn a living.
- 4 It is common to find the Greek words *bios* (βίος) and *ethikós* (ἠθικός) for the conformation of the word bioethics; However, given the meaning that *ἦθος* (*ēthos*) has, developed in the sections on ethics and ethics and morals, the use of the term *ἠθικός* (*ēthikós*) for the conformation of the word bioethics has greater precision.
- 5 Here it is important to mention that currently *zōē* (ζωή) is used as a prefix zoo (e.g., 'zoo', and 'zoopolitical') whose meaning refers to organic life, that is, with the dynamics of language the meaning has been modified from *zōēthikós* (ζωηθικός). Although this does not influence reflection, as we will see later.
- 6 «*quatenus sum tantum res cogitans, non extensum, & ex alia parte distinctam ideam corporis, quatenus est tantum res extensiva, non cogitans, certum est me a corpore neo revera esse distinctum, & absque illo posse existere (...)*» [Descartes, (2008), p.175].
- 7 The article by Fritz Jahr was the first for which there is a record of the use of the term bioethics, however, as Gilbert Hottois says, Fritz Jahr's proposal went unnoticed, and therefore, «it did not influence the history of bioethics that it began in 1970» [Hottois, (2011), p.89 Note 3]. However, the claim made by Hottois refers to the fact that Fritz Jahr's bioethics did not influence the current of biomedical ethics and its relationship with techno science for the use of environmental resources in consideration of the primacy of human interests, a field in which Bioethical exercise has been recognised as hegemonic today. Nonetheless, for this document the proposal of Fritz Jahr is of utmost importance, especially, what he called the bioethical imperative: «*Respect every living being, including animals, as an end in itself, and treat it, if possible, as such!*», Although it is clearly recognised that the use of if possible renders it not an imperative [Jahr, (2012b), p.12].

- 8 It is easy to see the relationship between *zōē* (ζωή) and the zoo is used to refer to the animal world beyond the human being.
- 9 Thus *ambientis* would be the Greek equivalent *peri* (περι): «environing», with which the verb «environ» (περιβάλλω [περιβάλλω]) is constructed, with which the word ‘environment’ is constructed: περιβάλλοντος (περιβάλλοντος).
- 10 In the Anglo-Saxon world, the *ambient* is referred to as environment (= surroundings) to refer to the abiotic and what surrounds a living organism including the human [Duque, (2007), pp.79–80].
- 11 Comte believes that positive science has passed the mythical-theological and abstract-metaphysical stages, reaching the highest and definitive stage, which is positive, which corresponds to the formulation of laws understood as constant relationships between observable phenomena. Positive science is the only one equipped with instruments to scientifically understand and control nature [Artigas, (2003), p.33].
- 12 Bacon opted for the inductive method and experimentation as means for mastering nature. The philosophical notions of the form and the ends are expelled from the new science; it is intended to move from Aristotle’s nature of things to the search for general laws [Artigas, (2003), p.30].
- 13 Descartes contributes to the new science with the mathematical method, which explains reality in a mechanistic way, through displacements and collisions of matter, where the interiority of living beings disappears (except the human spirit), everything is pure exteriority [Artigas, (2003), pp.30–31].
- 14 The word ‘separation’ comes from the Latin *separationem* which is the distance between two or more elements, while the word ‘interaction’ comes from the Latin *interactio* and is associated with the interactions between processes and elements that develop reciprocally.
- 15 We share with Marcos (2010, p.201; 2013, p.157) that reducing human nature to the natural is to enable the way to instrumentalise what is human, and consider that there is no human nature, it would be the task of inventing it through techno science.
- 16 The analysis acquires greater explanatory capacity because it encompasses the environmental bioethics of dilemmas and the environmental bioethics of industriousness and creativity; this is supported by the ideas developed by Marcos (2019).