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## **Beyond Science and Technology: The need to incorporate Environmental Ethics to solve Environmental Problems**

FESSEHA MULU and YOHANNES ESHETU

### **Abstract**

The emergence and development of science and technology has been critical in improving the lives of mankind. It helps mankind to cope with a number of manmade and natural challenges and disasters. Science cannot totally diminish the level of human dependency on nature; but, with the existing availability of natural resources, science has increased our productivity. However, science and technology can also have its own negative impacts on the natural environment. For the purpose of increasing productivity and satisfying human needs, humans have been egoistically exploiting nature but disregarding the effects of their activities on nature. Science has also been trying its level best to mitigate the negative effects that results from mankind's exploitation of nature. However, science alone is incapable of solving all environmental problems. This desk research employs secondary sources of data, and argues that environmental ethics should come to the fore in order to address the gap left by science with regard to resolving environmental problems that mankind faces today.

**Keywords:** environmental ethics, human needs, natural environment, natural resources, science and technology.



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## Introduction

Philosophers like Oruka (1997) and Kelbessa (2003) noted the dominant western conception of ethics results in negative impacts on the environment. They argued that the hierarchical conception of nature, which is central to mainstream western ethics, is the root cause of the current ecological crisis. The dominant western worldviews and social paradigm, Kelbessa (2003) says, has maintained human isolation from nature. This conception of ethics treats the environment only as a means to fulfill the needs and interests of human beings, without paying attention to the effects of human activities, in satisfying their needs, on the natural environment.

Because of this reason, the aforementioned philosophers, and others, who oppose this “traditional” conception of ethics, argue that the present ecological crisis is mainly the result of anthropocentrism in western moral thoughts. Traditionally, ethics centers on Homo sapiens (the human species) only.

*It judges what is good or bad to be what is good or had for man, and is incapable of extending this sort of judgment to the rest of nature (Oruka, 1997).*

Because of the current environmental crisis, many philosophers and environmental activists/ethicists argue that it is a timely endeavor to reconsider our thoughts regarding the values of nature and its inhabitants. Unlike human-centered ethics, which deals with the systematic and critical study of moral judgments and attitudes which (consciously or subconsciously) guide human beings, environmental ethics is concerned not with how human beings ought to behave towards non-human beings, but how human beings ought to behave with regard to nature (Stenmark, 2002). Kelbessa (2003) clearly says that environmental ethics emerged, as a new sub-discipline of philosophy, in the 1970's, and it did so by posing a challenge to traditional anthropocentrism (p. 65).

Callicott (1994) also argues that the subject matter of environmental ethics, as a new sub-field of applied ethics, came into being in the early 1970's in response to the sudden recognition in the 1960's that mainly industrial civilization had endangered the natural environment and its inhabitants. But, it does not mean, says Callicott (1994), that vernacular environmental ethics have not existed implicitly in many indigenous and traditional cultures throughout the world prior to the development of environmental ethics.

Accordingly, environmental ethics can be defined as a new sub-field of applied ethics, and is the systematic and critical study of the moral judgments and attitudes which (consciously or subconsciously) guide human beings in the way they behave towards nature (Stenmark, 2002). Environmental ethics tries to extend the dominant western notion of human-centered ethics to animals, plants, soils, and other sentient beings and the ecosystem as a whole. As Stenmark (2002), argues,

*A theory of environmental ethics thus ought to explain in what sense, if any, human beings have or ought to have moral obligations towards other living beings.*

The subject matter of environmental ethics deals with what ought to be the relationship between human beings and nature. A theory of environmental ethics identifies and justifies certain ethical norms and principles that should guide us in our relations with other living beings or nature as a whole. Singer (1993), also states that:

*At its most fundamental level, such an ethic fosters consideration for the interests of all sentient creatures, including subsequent generations stretching into the far future.*

Although environmental ethics wants to enlarge the moral community to other non-sentient beings, there have been several approaches to formal environmental ethics articulated over the past fifty years (Kelbessa, 2003). Ethicists identify three basic approaches to environmental ethics (Callicott, 1994). The first approach is called anthropocentrism which, simply applied, is standard western philosophies –for example, utilitarianism– which holds that only humans are worthy of moral consideration for their own sake and that we should preserve the environment solely for the sake of the humans who inhabit it.

The second approach is called biocentrism (literally life-centered), and is built on the simultaneously developing works of animal welfare ethicists and attempts to extend familiar human to human ethics beyond sentient animals to all living things. Biocentrism is the view that living creatures and only they have intrinsic value or have moral standing (that is, they can be treated in a morally right or wrong way and are beings to which humans have obligations). For example, one of the advocates of this approach is that; “We must instead recognize that we stand in a relationship to the sum total of living things. Our behavior and attitudes are morally acceptable only when life as such is sacred for us” (Hughes, 2000).

Unlike both anthropocentrism and biocentrism, there is another approach to formal environmental ethics which wishes to extend the moral community beyond human beings to the ecology as a whole. This approach is called eco-centrism-(also known as Cosmo centrism). Callicott (1994), argues that:

*Our environmental problems –the very problems that provoked a search for a new environmental ethic– having little to do with the welfare of individual shrubs, bugs, and grubs. They have a more holistic cast.*

Eco-centrism is thus characterized by an “ethical holism,” the view that ecological entities as a whole and not simply parts (or individuals) have moral standing (Stenmark, 2002). This approach goes beyond living things to the species, ecosystems, land or the biotic community in general. This ethic was built and popularized by Leopold (1949), in his land ethic, “extends the boundaries of the community to include soils, waters, plants, and animals or collectively: the land.” He asserted that ethics originated as a means to social organization and that we human beings have duties and obligations to the several communities to which we belong, as well as to individual fellow members (Callicott, 1994). He rejected the conqueror conception of the dominant western notion of ethics. Rather he argued that:

*A land ethic changes the role of Homo Sapiens from conqueror of the land community to plain members and citizens of it. (Kelbessa, 2003).*

His holistic approach to the biotic community is captured by the following sentence: “A thing is right or good when it tends to preserve the integrity, stability and beauty of the biotic community, it is wrong when it tends otherwise” (Callicott, p. 46).

In general, Leopold’s land ethic has contributed a lot to the development of environmental ethics. Subsequent ethicists and other thinkers developed in their way the normative assessment of the relationship between human beings and nature. Among these,

philosopher Arne Naess distinguished between the “deep” and “shallow” conception of ecology. There are also others such as Holmes and also Singer who were highly influenced by Leopold and were attracted to take part in the environmental debate.

It is worth noting that various terms have been employed by different ethicists and philosophers in their articulation of nature-centered ethics. Because of the range of non-human entities held to be morally considerable, ethicists, says Hughes(2000), most fiercely debated over the distinction between anthropocentric perspectives, ascribing moral considerability only to human beings on the one hand, and non-anthropocentrism on the other. Biocentrism and eco-centrism can be grouped under a non-anthropocentric approach.

These two distinctions (anthropocentrism and non-anthropocentrism) came into being because of a disagreement on whether or not nature has intrinsic value. This point is one of the debatable issues in the emergence and development of environmental ethics. Anthropocentrism confirms that non-sentient beings have no intrinsic value in themselves, irrespective of the human interest. On the other hand, non-anthropocentric ethicists tend to extend intrinsic value to non-sentient beings. They argue that nature has intrinsic value, regardless of human welfare and interest. To put it differently, their disagreement revolves around such questions as whether ecosystems and their components should be preserved for the benefit of humans or other sentient beings who enjoy or depend upon them, but for their own sake. According to Wild (1996), some anthropocentrists put the anthropocentric perspective in these two lines:

*That humans are ‘the source of all values’ and,*

*That the environment has only instrumental value in relation to humans. On the other hand, non-anthropocentric perspective recognizes the intrinsic value of environmental objects and their right to exist in order to fulfill their own ‘evolutionary destinies.’* Many environmental philosophers are part of a long protracted debate on the intrinsic value of nature. Among others, Singer is one who argues in favor of the intrinsic value of sentient beings (Kelbessa, 2003). By intrinsic value, Singer says, we mean for a value that is good or desirable in itself; the contrast is with “instrumental value,” that is, value as a means to some other end or purpose (Singer, 1993). He argues that “we have already seen that it is arbitrary to hold that only human beings are of intrinsic value”. He further says that:

*If we find value in human conscious experiences, we cannot deny that there is value in at least some experiences of non-human beings.*

However, Singer’s non-anthropocentric conception does not extend to beings other than sentient to the ecosystem as a whole. Similarly, Hughes (2000) holds a non-anthropocentric (intrinsic value) perspective based on Aristotelian approach. According to the Aristotelian approach, we can make sense of what it is for non-sentient entities to flourish, and we can therefore identify states and conditions that are good for them independently of human interests. Thus it is sound to say, for example, that:

*A plant does well in certain conditions, or that those conditions are; ‘good for it’ without apparently making any assumption about whether we want it to flourish. Thus anything that can be said to flourish can be said to have its own intrinsic good or intrinsic values, independent of human evaluation (Hughes, 2000).*

On the other hand, there is an important argument of environmental ethics which denies this assertion. For instance, Grundmann's argument is one case for an anthropocentric approach. He argues that;

*A non-anthropocentric approach must distinguish what is normal for non-sentient creatures that should be preserved; and what is 'pathological' which should be avoided.* (Grundmannas cited in Hughes. 2000).

Grundmann's objection for a non-anthropocentric approach is that "It is difficult to know what is 'normal' and what is 'pathological' that should be avoided irrespective of the human interest" (Hughes, 2000, p. xx). As a response to anthropocentrism (or intrinsic value) he says, "We cannot make sense of what it is for a system to flourish except in terms of the human interest served by that system".

#### *Science and technology vis-à-vis the environment: An overview*

Since the industrial revolution, science (and technology) has been a vital actor in changing human lives, albeit primarily in the west. Science has helped people to cope with (human and natural) challenges in order to lead a better life than before. To this end, science strongly relies on natural resources, as well as human intellectual capabilities to extract and wisely utilize (natural) resources to meet the desired end; i.e. satisfying human needs. In such, science can positively or negatively affect nature. The following section briefly assesses how science can result in positive and negative impacts on the natural environment.

#### *Science and the environment: Can science protect the environment?*

No one can deny that science plays a significant role in helping humans to lead an easier life. Science helps humans solve various problems on a daily basis, reducing the level of dependency on the natural environment in various ways. This in turn helps to reduce the level of poverty, deforestation and land grabbing so that it contributes to protecting the environment. For instance, renewable energy sources as alternatives to fossil fuels; from the sun, wind and water can be produced with the help of science and technology, and is of vital importance in terms of human innovation protecting and sustaining the natural order of the ecosystem (UNEP, n.d.).

Besides, science is capable of protecting the environment in such a way that it increases agricultural productivity in a limited land. This results in reducing competition among people for additional land (U.S. Congress, Office of Technology Assessment, 1994). Mechanized agriculture and irrigation are vital for helping citizens to realize their food security, and minimize their level of dependency on rainfall. Through this development, life can be sustainable on the one hand, and at the same time significantly reduce the number of poor people (Pearce, 2002). In other words, without science and technology, it is very hard to feed the increasing human population. It is unthinkable and impossible to satisfy the growing food demands (or needs) of a world population in excess of (7) seven billion in a traditional subsistent way through foraging for fruits from the forest, hunting wild animals and farming rain dependent agriculture ploughed by oxen. Above all, without technology no development would be sustainable (Pearce, 2002, p. 15). Through rain, for instance, agricultural productivity could increase for a year, but if the next season brings a drought, it is hard for the population to realize/secure adequate sources of food. Thus, science is in the role of rescuer in hard times, and helpful in good times.

For millennia resources have been dormant and unproductive. However, with the emergence of the industrial era, the existing resources –manmade and natural– have become far more productive. Increasing in resource productivity has two implications: quantitatively, growth ensures sustenance; and, qualitatively, development is sustained (Pearce, 2002).

#### *Limitations of science in protecting the natural environment*

For centuries, the expansion of high-tech manufacturing industries in the west and recently countries like china depending on coal as the source of the power to function these industries have been releasing tons of CO<sub>2</sub> per annum in to the atmosphere. As a result of which the world has been affected with a global warming, wild fire, desertification, poverty and diseases such as cancer. Up to the late 1960's and early 1970's, the main global agenda was the issue of poverty eradication (Ausubel, Frosch, & Herman, 1989). Thus, the world was ignorant about the environment what it a matter was how the world can reduce the level of poverty at global level. The world gave little attention about the need for protecting the environment.

However, recent developments have shown increases in GDP and per capita income are not the real indicators of development, and do not help the world reduce the number of deprived people at the global level. This brings forth the agenda of environmental protection, which is an interdisciplinary question connoting ethical issues at the global scale (Allaby, 2000). This shows science cannot only help people to lead a good live, but also that science can result in hazardous and environmentally unfriendly applications of technology. For instance science has been used in order to produce plastics, chemicals, and gases that threaten nature and its inhabitants.

It is a fact that science helps people to increase their productivity. However, science also pollutes the environment. For instance, in agriculture, to increase productivity, people use various chemicals such as insecticides, pesticides, fertilizers. But, all of these chemicals have their own side effects. They pollute water, kill insects and small creatures, and reduce the productivity and fertility of the land etc. If a given plot of land is cultivated using fertilizers, for example, in that year that land is productive. But, for the coming year the land would either not produce a crop or one that is less than the previous season due to the increase of acidic content of the soil.

Many people have a trust and confidence in science that science can simply resolve any problem. However, the reality is that science is not capable of solving all the problems; and so, in this context environmental ethics should come to the fore. Recent development warned that if countries, entrepreneurs, scientists and governments continue the current trend, the world would become a hell for the coming generations. As a species, we should be responsible for our children. We should provide them with a livable world, not threat or jeopardize their existence and their future (World Commission on Environment and Development, 1987).

This paper aims to show the gap/limitations of science and technology in solving environmental problems, and argues the need for environmental ethics, one of the sub-fields of applied ethics, to the fore alongside science.

The paper is a desk research in which secondary sources of data from various literature are used in order to deal with the subject matter at hand and meet the objective intended to realize as previously stated.

#### *Ethical dimension of environmental problems*

Global environmental problems such as poverty, desertification, flooding, wildfire, deforestation, and global warming are continuing areas of discussion for scholars, governments and scientists, especially ecologists. Because of the diverse effects brought about by the global environmental crisis, various groups and scholars have tried to put forward solutions. Until recent times, people put their faith and confidence in science and technology for solutions to environmental problems (Jacobs, 1999). Politicians and decision makers also assume that science and technology form the key to environmental problems.

This fact suggests that people pay little emphasis to the ethical dimension of environmental problems or to their solutions. According to Stenmark (2002), there are reasons why people place their confidence (consciously or subconsciously) in science and technology. One possible explanation is that the ecological threats which confront us are often not immediately accessible to our ordinary senses. People believe that the present environmental problems require complex scientific devices and knowledge. Another underlying reason might be that since science provides objective answers based on fact in a field where otherwise emotions and conflicts of interest abound, it is only natural that we should make use of science to guide us in this matter (Stenmark, 2002, p. 8). Similarly, Des Jardins (1993) says:

*The tendency in our culture is to treat such issues [environmental problems] as simply scientific, technological or political problems. But they are much more than this.*

Consistent with the last statement of Des Jardins, in recent years, environmental philosophers and other thinkers doubted the supposition that only science and technology would bring about solutions to environmental problems. For instance, Stenmark (2002) argues, “[i]t has often been observed that environmental problems have an ethical dimension”. These philosophers, however, do not deny the relevance of science and technology in our understanding about environmental problems; rather they want to incorporate the ethical dimension of environmental problems to science and technology. In what follows, this paper elaborates on the ethical dimension of environmental problems and shows the difference between factual scientific explanation and ethical explanation of environmental problems.

In order to grasp the ethical dimension of environmental problems, I think it is better to see it in comparison with the limitations of science and technology. Stenmark (2002) states that science can tell us “what is the case; why it is the case; and what can be done to change things”. For instance, science provides us the following information: the level of the increase of CO<sub>2</sub> in the atmosphere, the decrease of biodiversity, the polluting concentration of various chemicals and information about the thinning of the Ozone layer and so on. Finally technology provides us with the practical means required to carry out these changes. However, Stenmark (2002), argues that:

*We are unable to develop an environmental policy or carry out certain environmental measures purely on the basis of this scientific information.*



Scientific explanations fail to forward value judgments that are relevant for environmental policy and decision making. Rather, scientific explanations remain at the level of describing how or why something is the case. He states that “the idea that ecology (or some other science) can tell us what attitude we ought to have towards nature is unfounded” Stenmark (2002). Nevertheless, this does not mean that ecologists cannot provide empirical knowledge relevant to environmental problems. However, Stenmark (2002) says that “it is impossible to deduce how human beings ought to behave and act with the ecosystem of various kinds”. This point suggests that environmental philosophers wish to relate the question of environmental problems with the normative assessment of the relation between human beings and the natural environment:

*[A] more reasonable position is that ecology is a scientific discipline akin to any other scientific discipline and one therefore, which makes no direct moral claims, consequently, ecology cannot serve as a moral guide in any adaptation to nature (although it can naturally propose possible measures for adoption), nor is it within its competence to decide what value human beings should assign to nature (Stenmark, 2002).*

This distinction of “is” and “ought” is an important point in philosophy. In philosophy, there is what we call *the naturalistic fallacy* which arises when there is a failure to distinguish questions of fact from questions of value. This fallacy is committed when we argue that because something is the case, it ought therefore, to be the case (Henderson, 1993). To put it differently, whenever we say something is good or bad, valuable or worthless, we must go beyond describing what is normal or natural. Stenmark (2002) argues,

*But what is good or evil, worthwhile or objectionable cannot be deduced automatically from a description of what constitutes a natural/artificial process or state of affairs in nature.*

The above points show that when we limit ourselves at the level of analysis of environmental problems based on science and technology, we fail to argue how we ought to act and behave with regard to environmental matters. As Henderson (1993), clearly puts this point, “It is obvious that environmental questions in contemporary western democracies are largely defined as scientific matter” (as cited in Stenmark, 2002). This conclusion, indeed, appears to be somewhat shocking for many decision makers and natural scientists. Science cannot tell us what we ought to do. Rather, it tells us what we can do. This point was emphasized by Max Weber who observed that “Science is like a map that can tell us how to get to many places but not where to go” (as cited in Hughes, 2000).

What are the issues incorporated in the ethical dimension of environmental problems? The following normative questions are worthy of consideration:

- What should we as human beings value?
- What kind of beings are we and what do we wish to be?
- What lives ought we to live?
- How should we as human beings behave towards other beings?

These are some of the questions encountered in the normative assessment of environmental problems. To summarize, it is arguable that environmental philosophers stress seeing the problem of global environmental crises in the contexts of normative assessment of the relation between human beings and nature. Value judgments are therefore decisive when it comes to dealing with environmental problems, and without

them it is impossible to make decisions about environmental issues. Stenmark (2002) states that in order to solve environmental problems, we should consider the following points;

*Scientific and social studies of the relationship between human beings and nature and, a critical and constructive analysis of people's various ethical judgments, their views of nature, their worldviews and the consequences that all these different positions have for the creation of a sustainable society.*

Indeed, science and technology are necessary categories in an effort to deal with ecological problems, but are not sufficient in such endeavors. As White (2001), rightly states:

*What we do about ecology depends on our ideas of the man-nature relationship. More science and more technology are not going to get us out of the present ecological crisis until we find a new religion, or rethink our old ones* (White, 2001, p. 5).

Unless we examine the underlying assumptions and values that we hold, we can never effectively deal with ecological problems merely because "What people do about their ecology depends on what they think about themselves in relation to things around them" (White, 2001, p. xx). Treating ecological problems requires another equally important dimension besides science and technology, that is, self-examination of our values and worldviews.

*Environmental and ecological controversies raise fundamental questions about what as human beings we value, about the kind of lives we should live, our place in nature, and the kind of world in which we might flourish. In short, environmental problems raise fundamental questions of ethics and philosophy.* (Des Jardins, 1993)

Human beings should rethink their relationship with the things that surround them, and only such re-evaluation of our beliefs and values will help us to get to the heart of the ecological crisis. Disastrous ecological backlash cannot be avoided "simply by applying to our problems more science and more technology" (Des Jardins, 1993, p. 4).

## **Conclusion**

In the 21<sup>st</sup> century globalized world, information and knowledge flows uncontrolled wherever humans exist with the help of science and technology. You can learn, treat through e-communication. You can communicate with anyone from all corners of the world. Technology makes life easy to manage and easy to lead. It improves the quality of billions of people throughout the world. Besides, science increases productivity with limited resources, and reduces the level of dependency on natural resources. Science helps people not to exploit it without limit. People can more easily manage various human and natural problems such as diseases, earthquakes, and poverty. Science helps people to produce alternative environmentally friendly sources of energy; however, science also affects the natural environment due to the continuing egoistic anthropocentric activities of mankind. People exploit nature without limit. They treat nature as just means to satisfy their own needs, and do not offer a thought as to nature having a value of its own. However, nature pays back in equal measures, and sometimes even worse, with what you act against in ecological debt. Thus, though science is important in improving the lives of mankind and in protecting the environment, science is not self-sufficient and cannot do it alone. Rather, environmental ethics should work alongside science for the purpose of protecting the environment and mitigating environmental problems that the world faces today.

## Notes

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