Environmental Virtues for Climate Future Narratives

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Abstract

References to the information in this section on continental reconstructions, mass extinctions and biodiversity are included in the EarthViewer educational software which can be accessed from https://www.biointeractive.org/classroom-resources/earthviewer.

Introduction

Despite all the international efforts to reduce greenhouse gas emissions, the concentration of carbon dioxide in the atmosphere continues to increase at a steady rate. Even the full commitment of policymakers against climate change and implementation of the Paris Agreement would not be enough to prevent global warming by the end of this century. Climate change is defined as a global commons problem with temporal and spatial dimensions where the differentiation of responsibilities and vulnerabilities threatens global action (Gardiner, 2006).

To solve the problem of spatial and temporal dimensions, scientists use climate models to assess the costs of action and inaction both globally and also in a time horizon until the end of the 21st century. At the core of these models lies human activities creating additional radiative forcing to earth with scale on the same degree compared to natural radiative forcing – mainly from solar and geochemical cycles – causing climate variability which started long before human civilizations appeared on earth. Climate change was perceived positively as prevention of another ice age at the beginning of the 20th century whereas scientists nowadays also consider climate extreme events such as the stopping of Thermo-haline circulation or the albedo effect from melting of continental and sea ice in polar regions (Hulme, 2008). However, both the temporal and spatial distance of these events and also the uncertainties underlying the empirical evidence leave us in a situation of difficulty to act.

As the future is uncertain, modellers have developed climate future narratives as a baseline to cover the different pathways through which human societies as a whole could evolve until the end of the 21st century. These directions are referred to as shared socioeconomic pathways which are characterized depending on the level of challenges to climate mitigation and adaptation. This is the problem of the utilitarian where climate mitigation efforts require the reduction of total welfare whereas increasing welfare could also be directed to climate adaptation efforts (Berdinesen, 2018). However, decision making for welfare maximization which doesn't consider environmental externalities and doesn't act according to environmental virtues risk losing everything in case of a climate extreme event.

Also as current greenhouse gas emissions will determine the extent of climate change in the future, the temporal dimension of actions require the development of additional shared policy assumptions depending on largely uncertain discount rates used for comparing the welfare of current and future generations (Cafaro, 2011). Placing nature as our locus of environmental value requires also the fair distribution of resources between humans and other species while respecting the climate as life supporting and regulating system. Despite human civilizations have consumed nearly half of the global carbon budget in the atmosphere defined

by climate target under the Paris Agreement (Alcaraz *et al.* , 2019), we have not been able to develop feasible environmental ethics towards our climate which supported our welfare during the Holocene geological epoch.

Moral sentiments towards our climate

Despite the uncertainties in policies and actions against climate change, human behaviour towards nature has evolved from exploitation to conservation and finally to preservation during the history of human civilizations (Saito, 1998). The ancient civilizations had also exploited natural resources for maximization of their utility which has resulted in local environmental problems mostly defined as the tragedy of the commons. The rapid advance of human civilizations after industrialization and scientific advancements supported capital surplus which Norton defines as a shift from transformative value for survival in the wild to demand value for human welfare (Stephens, 2005). Eventually, the history of nature coincided with the history of human civilizations promoting humility and wonder as environmental virtues (Lindberg, 2016).

The marginal utility from production and natural capital is optimized based on the elasticity of substitution between them. The value of the environment in the narratives is mainly instrumental with a locus on human welfare based on the intensity of our relations with nature (Elliot, 2005). As these narratives don't present any normative rules on how we should live to protect our climate, the solution to climate change is by reducing population growth and changing consumption and production patterns calling for future generations to act with environmental virtues (Pianalto, 2013).

We don't know that future generation will act according to environmental virtues to protect our climate by sacrificing their welfare. We also don't know whether current regional rivalries between human communities will be put on hold in face of a climate alarm. But we can be sure that climate change will force the depletion or even extinction of nature as we know currently if we continue to act without any environmental virtues. Sandler (Sandler, 2006) proposes the identification of the environmental virtues through their relations with distinctive environmental values. There are various studies in the literature relating personal values with environmental behavior by categorizing values based on egoistic, altruistic, hedonic and biospheric orientations (Poortinga, Steg and Vlek, 2004). These values have human individuals as their source and bearer based on a utilitarian perspective to maximize total welfare including human made and natural capital.

The egoistic and altruistic values put the locus of value on human individuals where individual welfare would contribute to the welfare of communities which increase total welfare and availability of their usage for the protection of nature. The biospheric values shift the locus of value on nature through relations with human societies to contribute to welfare maximization with the investment of natural capital. These values are not sufficient to support actions to protect our climate as they lack any transformative values towards abiotic systems which contribute to climate change.

Environmental virtue ethics

With the advance of environmental ethics and virtues since the 1970s, Thoreau has regained attention from philosophers who have been distracted by utilitarianism which is in most cases the source of the problem of the global commons such as climate change (Cafaro, 2001). Thoreau gives intrinsic value to nature in his famous Walden and lists virtues for good life such as health, freedom, joy, friendship, experience, knowledge (of oneself, nature and God), personal culture and satisfaction. Thoreau reformulates economy as contrary to classical utilitarianism in his central passage of Walden as ". . . to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived. . . . I wanted to live deep and suck all the marrow out of life . . . to know it by experience, and be able to give a true account of it in my next excursion."11Thoreau, H. D. (1908). Walden, or, Life in the woods. London: J.M. Dent. pp. 81-82.. The direction of value is from human individuals as the source and towards wilderness as the locus of value.

Shaw (Shaw, 1997) recommends the environmental virtue ethics approach based on both the philosophical but also the scientific writings of Aldo Leopold during his profession as an ecologist. Leopold includes

the existence of biotic and abiotic systems as the locus of value together with their instrumental value for humans. The land community is both the source and the locus of value depending on relations between humans and the environment as humans constitute a part of this community. To protect the harmony in the relations of humans with their biotic communities, Leopold adopts virtues based on humility and respect towards nature and recommends a paradigm shift moving bearer and locus of value from humans to the biotic community writing "When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanized man, nor for us to reap from it the esthetic harvest it is capable, under science, of contributing to culture."22Leopold, Aldo (1970). *A Sand County Almanac with Essays on Conservation from Round River* . New York: Ballantine Books. pp. xviii–xix..

Rachel Carson includes wonder towards nature in addition to humility and is considered one of the founders of environmental activism (Stein, 2012). The problem of intangibility and difficulty to assign moral obligations towards nature is solved by Carson by observing and writing essays on the wonders of nature and disseminating these to children who would most appreciate them. The curiosity of children towards nature provides unforgettable events and puts wonder as a prior environmental virtue as Carson writes "It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood. If I had influence with the good fairy who is supposed to preside over the christening of all children I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with artificial things, and alienation from the sources of our strength."33Carson, R., Kelsh, N., & Lear, L. J. (1998). *The sense of wonder* . New York: HarperCollins Publishers. pp. 42-43..

Environmental virtues for climate change

Climate scenario development since the Kyoto Protocol is considered as the problem for the maximization of human welfare as a whole under socio-economic and environmental constraints. At first, this caused problems between developed and developing countries as there are large inequalities between their welfare and developing countries are susceptible to institutional failures to supply basic needs such as food and water under the changing climate conditions (Jakob and Steckel, 2016). Secondly, the temporal scale of climate change imposed the usage of discounting the welfare of future generations compared to the current generation. But future generation could either be better off having the capacity to generate higher welfare or worse requiring the transfer of welfare from previous generations. Also how this could work from second or third to the unknown n'th generation remains to be unclear.

Utilitarianism is also based on preferences where there could be substitutes or complements for endowments which could generate a pareto-optimal utility maximization. Climate future narratives focus not on individuals but holistically on the human species with their cumulative population and their production resulting in greenhouse gases as an environmental bad commodity. Singer (Singer, 2006) comments on the adversaries of inaction based on utilitarianism that discounting the unknown future and waiting for the unexpected climate extreme events would result in degradation of total welfare. Protection of the climate as a life supporting and regulating system requires individuals to define nature as the bearer and locus of value influencing their environmental behaviour.

Humanity faced much moral crises before climate change which has been resolved mainly through mitigation efforts to reduce their adverse consequences (Symons, 2019). The advancement of science also started the space age and the digital age which neither Thoreau nor Leopold had an experience during their lifetime (Hill, 1983). However, the three paradigms of ecology – the biotic community, super-organism and ecosystem – already were integrated in to human history by that time and continue to support the foundations of environmental philosophy today.

Basic conceptual problems due to being in a state of alarm

International efforts against climate change historically focused on the mitigation of greenhouse gas emissions to the atmosphere as this is the origin of the problem. This is analogous to the moral obligation of conserving cultural heritage or natural parks as human activities have an adverse effect on our thin and already fragile atmosphere. The moral maxim of the land ethic defined by Callicott as "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."11Callicott, J. Baird (2014). *Thinking Like a Planet: The Land Ethic and the Earth Ethic* . Oup Usa. pp. 3. provides us a reference for using virtues such as humility and wonder towards nature and respecting our climate as a life supporting and regulating system.

However, there are many actions that still threaten the integrity and stability of nature and contradicts the findings of climate scientists. Imagine a family taking a ferry in the Bosphorus Strait enjoying the winds blowing the wings of seagulls and watching them diving in the surface waters preying on fish. Independently of their orientation of values which could be egoistic, hedonistic or biospheric, there is an aesthetic value in their experience that contributes to their utility.

One might argue that seagulls are higher-level animals with their beautiful feathers and athletic maneuvering capability which could be considered for extension of the intrinsic value of humans. But science shows that seagulls are at the top level of a complex web of relations between the atmosphere and the oceans which all depend on tiny phytoplanktons as the source of primary production. We can only notice these phytoplanktons when their populations artificially bloom from additional nutrient inputs to the oceans. However, they are also affected by oceanic currents forming their habitat for production which can be damaged as a result of human actions resulting in reduced primary production.

When we take into consideration the temporal dimension of humans and seagulls, scientific evidence presents different tracks for their evolution. We know that birds as we know them evolved from their ancestor theropod dinosaurs which struggled to survive the Cretaceous mass extinction 60 million years ago. Humans along with other mammals took this mass extinction event as an opportunity and evolved throughout the oceans and lands of earth growing in their population and their skills for adaptation. Although the ancestors of humans and seagulls were rivals during their geological history, their destiny during the Holocene epoch both depend on the extents of a future climate change22References to the information in this section on continental reconstructions, mass extinctions and biodiversity are included in the EarthViewer educational software which can be accessed from*https://www.biointeractive.org/classroom-resources/earthviewer*..

Including the abiotic systems to this relationship spatially focusing on the Bosphorus Strait reduces the temporal scale to approximately 7000 years before present with the formation of the dynamic system between the Black Sea and the Sea of Marmara after the retreat of glacials towards higher latitudes. Long before our human civilizations emerged and flourished, nature was both the source and the locus of value through the relationships providing homage to humans and their communities with nature. The earth has already faced five mass extinction events during its geological history each time recovering with a higher number of biodiversity. However, the earth is entering a new geological epoch after the Holocene while preventing climate change focuses on utilizing the welfare for mitigating and adapting to climate change.

The family taking the ferry boat knowing themselves, nature and their geological history would be aware of the requirement to conserve the integrity, stability and beauty of these relationships. As humans are only a temporal agent in the complex web of geological and biological relations we have no other option but to respect nature with humility and wonder towards the magnificence of life which originated long before our evolution. Our communities have extended to include the biogeochemical interactions of the earth as we have evolved to become on of the main radiative forcing on our earth. As humans struggle to survive during the geological epochs of our earth, our moral responsibility is towards our own species whereas our survival depends on our relationship with nature.

Yet our efforts for the protection of the climate are ineffective as surface temperatures on land systems have risen nearly twice as much 33IPCC, 2019: Summary for Policymakers. In: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management,*

food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla et al. (eds.)]. In press. and oceans have taken up 90% of the excess heat 44IPCC, 2019: Summary for Policymakers. In: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* [H.-O. Portner et al. (eds.)]. In press. from our warming climate system since the pre-industrial period. As a result, climate science focuses both on mitigative efforts for the protection of the unknown future but also on adaptative efforts for protection of the immediate posterity. However, the adaptation choices range from socially acceptable planting of mangroves in shallow coasts to prevent tsunamis to socially controversial geoengineering methods for balancing the radiative energy budget of the earth (Gifford, 2011). But our efforts to mitigate the impacts of climate change require international collaboration based on individual preferences to reduce carbon emissions.

The scenario development for climate change is criticized for neglecting the feed-backs from nature to human socio-economic development (Rosa*et al.* , 2017). These feed-backs could be positive on a utilitarian scale in case nature services contribute to the development or negative in case of irreversible damage such as the collapse of fisheries or landscape changes turn fertile into non-arable land. Also, these pathways still resemble the continuation of human history whereas the history of nature already moved from taming the non-human wilderness into protecting our human environment in the 20th century.

Discussion and conclusion

The paradigm shift from current production and consumption patterns of humans to more environmentally conscious behaviour is also emphasized in the climate future narratives. However, the ethical foundations for why we should care for nature has both not been accepted at the international level but also is considered as mainly vague to direct our actions. The moral principle of avoiding extreme value requires an equal distribution to both production and natural capital which leaves out the problem of climate change without an effective solution.

The collision of human history with the history of nature resulted in an understanding of our place on earth as simply one of the nodes of the complex web of relations between our earth and its biotic and abiotic constituents. We are only a small subset inside the history of nature with no other option than to show respect towards ecosystems, nature and the earth which we depend on for a living. This paradigm shift is only possible if we can preserve the focus of our moral responsibility towards climate as life supporting and regulating system.

We are actually bound to our relations with nature where our utilities drive our decisions and the conservation of nature requires our commitment to science combined with an appreciation of its limits. However, these relations are not sufficient to promote our action to protect the climate as our moral responsibilities are not on the same level towards the unknown future and our immediate posterity. Therefore, our values towards nature should be enforced by environmental virtues towards our earth and climate as life supporting and regulating system.

Humility towards nature requires our understanding of our position in the earth system and putting our locus of moral responsibility towards nature. Wonder is best represented by children with awe towards nature and accepting science as a major tool for gaining knowledge of oneself and nature. While we construct our ethics towards humans individually, the integrity and stability of nature as a whole require defining the locus of value on the earth holistically. The locus of value can only be nature as our climate depends on the interactions between biotic and abiotic systems and finally the forcing from human activities requiring environmental virtues for effective climate action.

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