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Sigtuna Think Piece 2
Climate Capabilities and Climate Change Education Research

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Abstract

This think piece introduces the views of Amartya Sen, Martha Nussbaum and others on the capabilities approach to climate change ethics research. Furthermore, it suggests that the capabilities approach can help climate change research in identifying if, and if so which, intrinsic values of people's wellbeing are vulnerable to climate change.

The think piece introduces a climate-capabilities reading of documents associated with the IPCC Fourth Assessment Report (IPCC, 2007). Furthermore, it suggests that climate change education research may include descriptive and comparative, normative, critical and meta forms of research to investigate the various meanings of climate change wellbeing in spaces of capabilities. Furthermore, climate change education research may contribute to climate change research in identifying how education may help students identify individual, social and environmental conversion factors. That is, factors needed to convert, for example, adaptation resources into actual beings and doings – into climate capabilities.

Introduction

Climate change[1] involves serious moral challenges. Despite this, ethics and educational research have not paid much attention to the moral dimension of climate change education.[2/3] This think piece will suggest some climate change education research questions that are based on what a climate change moral landscape would look like according to the Intergovernmental Panel of Climate Change (IPCC)[4] from the point of view of the capabilities approach (Sen, 1993; Nussbaum, 2000)[5] Thus, the suggested climate change education research stems from an ethical[6] analysis of selected elements of IPCC's fourth assessment report.[7]

There are several general and implicit reasons for why we need climate change education research that highlights the relationship between climate capabilities and education for sustainable development (ESD). First, climate change is one of our time's most serious environment and development questions and is therefore central to ESD. Second, anthropogenic climate change involves serious moral conundrums regarding human wellbeing.[8] Hence, clarifications of these moral conundrums are of importance because ESD is typically focused on the significance of values and democracy in environmental education. The capabilities approach offers such clarifications. Third, climate change is characterised by harbouring possibly unsolvable epistemic uncertainties, potentially catastrophic eco-social consequences as well as ethical, political, economic and scientific conflicts of value (Bäckstrand, 2003, my translation from

Swedish). Climate change educational research needs to take this into consideration to clarify how ESD may respond to such complexities. Fourth, the moral conundrums of climate change are currently framed in a dominant, thus limited, paradigm of distributive justice. Hence, ESD and climate change education research need to encompass also non-distributive concepts of climate change justice, for example, climate capabilities rather than distribution of resources and welfare goods, to offer other solutions to the serious conundrums associated with climate change.

Climate Change Ethics Pluralism

When facing widespread decrease in human wellbeing and searching for significant and relevant research questions relevant to climate change education, it is important to use an open approach that regards ethical theories as '... intellectual frameworks that support the analysis and solution of particular moral problems' (Stone, 1995:133). That is, in order to suggest research questions relevant to climate change educational issues we can use the capability approach to produce a temporary, selective and complementary map of the moral landscape of climate change, which however limits:

> … the objects of significance, the questions of relevance, and the strategies or methods of relevance. In short, we 'map' the morally relevant situation according to our … ethical theory, in the same way as we for instance 'map' the … world in accordance with geological theories.[9]

The capabilities approach attracts our attention to whether the IPCC addresses intrinsic values of human wellbeing and whether certain intrinsic values are left unnoticed. Keeping in mind that it guides us according to specific coordinates and has boundaries outside of which it leaves us without guidance, we might identify whether or not and which 'real freedoms people have for leading a valuable life' (Robeyns, 2003:61)[10] the IPCC addresses. The foundation of the capabilities approach is the intuition that every individual human being is entitled to be and to do what he or she has reason to be and to do. Such beings and doings are codified in the concepts of capabilities and functionings (Sen, 1985),[11] which capture what real opportunities you have regarding the life you (may) lead. Furthermore, as argued by Sen (1993, 2005) and others working on the capability approach, the space of capabilities delimits intrinsically valuable elements (capabilities and functionings) from instrumental valuable elements of human wellbeing (e.g. resources, material and immaterial goods). Sen developed the concept of capabilities in a context of theorising alternatives to economistic, for example welfarist, views of poverty. This is important to keep in mind as the capabilities approach is often under critique for being overly liberal (Robeyns, 2005).

Capabilities research often captures such intrinsic values or positive freedoms, i.e. capabilities/functionings in generic and/or particular set lists of capabilities. In the mapping of key documents of the IPCC I have used a set list consisting of Life, Knowledge and Appreciation of Beauty, Work and Play, Friendship, Self-integration, Coherent Self-determination, Transcendence,

Other Species, and Mobility (Alkire & Black, 1997; Robeyns, 2003; Nussbaum, 2005; and Kronlid, 2008a).

A Limited Moral Landscape

The IPCC's fourth assessment report (2007) (indirectly) relates to five elements of the generic set list of capabilities: Life, Knowledge (but not Appreciation of Beauty), Work (but not Play), Transcendence, Other Species and Mobility. The following discussion focuses on Knowledge, Work, Transcendence, and Mobility.[12]

Knowledge
The IPCC often refers to the question of loss of knowledge systems due to ecosystem shifts caused by climate change:

> The loss of local knowledge associated with thresholds in ecological systems is a limit to the effectiveness of adaptation. (Folke, *et al.*, 2005)[13]

This is related to the concern that climate change threatens people's ability for practicing theoretical and practical knowledge, i.e. the resilience of theoretical and practical knowledge systems (rational and meaningful [coherent] on their own terms) are affected by climate change. Accordingly, it is argued that climate change causes shifts and flips in ecosystems that threaten the resilience of indigenous knowledge systems (IKS). Timothy B. Leduc (2007:247) affirms the IPCC's claim and argues that the changing climate changes the adaptation knowledge of Inuit people – *Inuit Qaujimajatuqangit* (IQ):

> IQ was real at the time because the planet was not changing. They knew what was going to happen to the weather for four seasons. But today the weather has so changed that IQ is pretty much gone, it can no longer predict because of the change in climate.

This is affirmed by, for example, the World Wildlife Fund's climate witness, Sámi reindeer herder Olav Mathis Eira from Norway:

> The most urgent change for us, the Sámi people who live of the reindeer, has been the winter rains. […] In the old days this used to happen only every 30 years and we had ancient methods of foretelling the weather. Now this is no longer possible.[14]

Furthermore, modern knowledge systems (MKS) are also affected by the climate in flux.[15] This is underlined by the IPCC, which communicates uncertainties of consequences of present and future climate change in terms of very high, high, medium, low, and very low confidence (ranging from at least nine out of 10 chance to less than one out of 10 chance) of being correct. Furthermore, the IPCC communicates uncertainties in terms of likelihood regarding 'probabilistic assessment of some well-defined outcome having occurred or occurring in the

future'; virtually certain, very likely, likely, about as likely as not, unlikely, very unlikely, and exceptionally unlikely ranging from >99% probability of occurrence down to <1% probability (IPCC Summary for Policy-Makers, 2007:21).

Thus, both IKS and MKS are vulnerable to the complexities of climate change. This underlines that experiencing risks of loosing certain abilities to be rational in the face of a changing climate can, despite differences in adaptation capacity, vulnerability and material standard, be equally threatening to indigenous and modern[16] cultures.[17]

Work

This discussion will focus on the ability to exercise some degree of excellence in work, which is frequently mentioned in the fourth assessment report (IPCC, 2007). The IPCC claims that climate change affects resource-dependent work among the poor and among women (IPCC, Fourth Assessment Report, Ch. 17, Box 17.5:730) and underlines work changes in European communities dependent upon ski tourism (IPCC, Fourth Assessment Report, Ch. 17, Table 17.1:722). In addition, erosion of beaches and coral bleaching affecting local resources in small Islands will affect, for example, small fisheries, affecting also the tourism business (IPCC, Summary for Policy-Makers, 2007:15). Furthermore, extreme weather and climate events in the mid to late 21st century will affect people's ability to execute excellence in their work in agriculture and forestry and industry, settlement and society sectors (IPCC, Fourth Assessment Report, Ch. 17, Table 17.1:722).

Increased heavy precipitation is very likely to damage crops, increase soil erosion and hamper the ability to cultivate land. Additionally, flooding caused by increased precipitation will very likely cause disruption of settlements, commerce and transport and put pressure on urban and rural infrastructures. Moreover, increased land degradation, lower yields/crop damage and failure and increased livestock deaths as well as increased risk of food and water shortages with reduced hydropower generation potentials and potential for population migration are likely in areas affected by drought (IPCC, Fourth Assessment Report, Ch. 17, Table 17.1:722).

The IPCC predominantly addresses work as a resource and as a process instrumental to human wellbeing. From a capabilities approach however, the IPCC's results and predictions indicate that climate change threatens people's intrinsic abilities to execute excellence in work in affluent as well as scarce communities.

Transcendence

Although the IPCC mentions a statistical relationship between adaptation and religion,[18] no references are made to the possibility that climate change may affect people's ability to transcend.

Transcendence is analogous to religious praxis (Bergmann, 2005:56) and varying trajectories in people's lives situated in specific socioeconomic, ecologic and cultural contexts construct and create the ability to transcend (Bergmann, 2003; Bergmann, 2005:56). Thus a person's ability to transcend interrelates with other everyday faculties of life. Timothy Leduc's (2007) cross-disciplinary research on indigenous transcendence testifies to how specific indigenous transcendence is threatened by climate change. Leduc's work focuses on problems associated

with climate change research's efforts to understand and make use of Inuit apprehensions of a changing environment gets involved in reductionist interpretations of Inuit spiritual conceptions. Leduc focuses on the Inuktitut term '*Sila*' that climate change research has interpreted as an Inuit spiritual power associated with 'weather'. Through a triangulating transdisciplinary research approach (Leduc, 2007:241) reaches two meanings of *Sila*, *Silarjuaq* (something great that simply is and the substance of life) and *Silatuniq* ('a practical wisdom for living within this land' [244], that can attend to *Silarjuaq*) (243). According to Leduc, both *Silatuniq* (the doings) and *Silarjuaq* (and beings) of *Sila* are vulnerable to climate change. First, the Inuit ability to transcend is being threatened by the ways in which climate change researchers anthropomorphise and reduce its meaning to fit modern environmental management models. Second, it is threatened because the environmental pressure of the changing climate induces an enforced uncertainty regarding their understanding of *Sila* (Leduc, 2007:247–248). Hence, climate change and the modern climate change discourse threaten *Sila* as a specific contextual transcending practice, which might have important consequences for the Inuit community in question.

Mobility

The IPCC indicates that climate change affects voluntary and involuntary geographical movements and addresses mobility as both a reactive (Adger, *et al.*, 2006:8)[19] adaptive strategy for people in communities that have reached their resilience[20] threshold, and as a limit of adaptation strategies (IPCC Fourth Assessment Report, Ch. 17:734).[21]

Mobility research highlights that constrained social and geographical mobility collude in times of crisis.[22] Thus, the extent to which geographical mobility is vulnerable to climate change is related to our ability to be socially and technologically mobile. The IPCC alludes to this, suggesting that 'the spatial patterns of existing social networks in a community influence their adaptation to climate change' because it determines 'the success and patterns of migration as an adaptive strategy' (IPCC Fourth Assessment Report, Ch. 17:734). Hence, the effect to which people experience 'stranded [geographical] mobility' (Grieco & Hine, 2008:65) is directly related to people's social mobility, and is hence intrinsic to wellbeing (Grieco & Hine, 2008).

Drawing on both climate change research and mobility research it becomes possible to identify the identities of the mobility poor and those who have access to mobility resources, consequently to delimit the climate change vulnerable individuals and social groups from resilient ones. Furthermore, access to social mobility resources sets limits for access to geographical mobility resources. This highlights that climate change induced stress on resource systems (private car ownership, factual public transport, etc.) in geographical space may further cement the boundary between the more vulnerable and the less vulnerable in developing and developed countries.

Climate Change Education Research

Based on a the capabilities approach reading of key documents associated with the Fourth Assessment Report (IPCC, 2007), we can assume that climate change threatens certain abilities, thus that climate change increases pressure on human flourishing. However, the emerging moral landscape is quite limited as it leaves abilities intrinsic to human wellbeing and dignified life – for example, appreciation of beauty, play, friendship, self-integration, coherent self-determination – unnoticed. In addition, capabilities like transcendence and mobility are merely brushed upon or treated as instrumental rather than intrinsic to wellbeing.

The capabilities approach teaches us the important lesson that the abilities to know, work, transcend and be mobile accounted for above are intimately connected. Thus, if climate change threatens one or several of these capabilities it is likely that other capabilities will face increased vulnerability as well. On the other hand, strengthening, for example, the ability to transcend will probably strengthen one, several or all the other capabilities as well.

Educational research teaches us that learning takes place in the space of capabilities, in expanded spaces of beings and doings. Learning is possible and learning conditions are likely to be improved if learner's spaces of capabilities are expanded and enriched. So, what does this mean for climate change education research? I will end this think piece by suggesting some research areas and questions.[23]

Descriptive and comparative climate change education research

The aim of descriptive climate change education research is to systematically describe the form and content of climate change learning processes and clarify the reasons for why certain learning processes occur. Such learning processes may involve learning about the changes of the climate, vulnerability, adaptation, mitigation and resilience. In addition, it involves systematic and stringent clarifications of if, which, and how climate change affects the learner's capabilities and how life, work, mobility, appreciation of beauty, play, friendship, self-integration, coherent self-determination etc. can or do affect their learning conditions. Such empirical research could focus on, for example, how transcendence is affected by climate change in Mongolia[24] and how this is related to climate change education. It could also involve comparative analysis of climate change learning processes in educational practices located in communities of different levels of vulnerability and resilience in Sweden, South Africa, Zambia, etc., and among various groups of learners. In addition, historical comparative climate change education research could be helpful for understanding how learning about the climate has been executed in different countries and educational practices prior to the current climate change discourse boom.

Meta forms of climate change education research

The purpose of engaging in meta forms of climate change education research is to study climate change language in educational and learning practices. What is the meaning of key concepts like 'climate change', 'climate change education', 'vulnerability', 'resilience', 'adaptation' and 'learning capacities' in terms of the capabilities approach in current global and local ESD discourse/s, in policy texts, in teaching material, etc.? Furthermore, meta forms of climate change education

research investigate meaning making in climate change learning in different ESD discourses. Thus these involve both empirical and philosophical research. Meta forms of climate change education research are important for the dimensions of climate change education research listed in this paper and can also clarify how various capabilities are interconnected in various climate change education learning processes. For example, in the Inuit example above the ability of knowledge, of work such as reindeer herding, and of transcending are deeply interrelated. Accordingly, if climate change threatens one or several of these capabilities it is likely that other capabilities will face increased vulnerability as well. However, if this is true, strengthening, for example, the ability to transcend will probably strengthen one, several or all the other capabilities as well. This result is obviously of immense importance for climate change education research if capabilities are significant for meaning making and learning.

Normative climate change education research

Normative climate change education research focuses on systematic and stringent argumentation for a, or several types of, climate change education. Unlike research traditions that like to refrain from normative assumptions, ethics and other fields within the humanities are well skilled in normative research. Based on carefully outlined assumptions about the meaning of learning and the nature of learning processes it is important to argue for and against certain types of climate change education and/or for and against certain theoretical standpoints associated with climate change ethics and climate change education. Questions concerning whether certain capabilities are more important than others for climate change education and climate change learning processes are important for normative climate change education research. Furthermore, it is important to identify and argue for how various forms of climate change education may include ways to convert vulnerability, adaptation, mitigation, and resilience resources into functionings. In fact, learning how to adapt and mitigate and to reduce vulnerability and enhance resilience can be seen as learning how to convert resources into functionings.

Critical climate change education research

Critical climate change education research locates its themes and problems in a, or several, particular political, cultural, religious, etc. contexts. The main purpose of critical climate change education research is to clarify the form, content, and meaning of learning processes in relation to the interests of various actors in global and local climate change arenas. Thus, critical climate change education research focuses on, for example, how certain religious, political etc. contexts contribute to expanding the spaces of capabilities, thus expanding learning opportunities for people vulnerable to climate change and to people more resilient to the effects of climate change. Furthermore, critical climate change education research can clarify how certain political, etc. contexts may facilitate or exacerbate learners' access to conversion factors and how learning to, for example, adapt to climate change is connected to both accesses to adaptation recourses and to converting skills. As Robeyns puts it, '[i]f a person is disabled, or in a bad physical condition, or has never learned to cycle, then the bicycle will be of limited help to enable the functioning of mobility' (2005:99). Thus, being able to be mobile includes being able to 'convert the characteristics of the commodity (e.g. a vehicle) into a functioning'

(Robeyns, 2005:99). Furthermore, critical climate change education research may open a space for systematic critical reflections on the role of personal, social (political) and environmental conversion factors in climate change education.

Conclusion

Climate change threatens people's capabilities, hence it increases pressure on human flourishing. The capabilities approach can be used as a research approach to climate change ethics to study whether and if so which intrinsic values that are being threatened by climate change in various social, ecological, and economic contexts and on a generic level. Based on a reading of documents associated with the IPCC Fourth Assessment Report (2007), I can conclude that on a generic level, the moral landscape of the IPCC is quite limited because the IPCC merely touches upon a few of the capabilities highlighted by capabilities research. Hence, knowledge, work, transcendence and mobility are locations in the topography of the limited moral landscape of the IPCC.

Educational research teaches us that learning takes place in spaces of capabilities, in expanded spaces of beings and doings, in people's concrete circumstances of adaptation and vulnerability. Hence, learning is possible and learning conditions are likely to be improved if learner's spaces of capabilities are expanded and enriched.

This means that we need climate change education research that can help us identify how learners' spaces of capabilities may be expanded and enriched in different social, ecological and economic contexts. Drawing on the assumptions that the world is one and many and that the complexities associated with climate change means that we have a shared global systematic problem manifested in a myriad different concrete ways in people's everyday life across the globe, we need many different kinds and modes of climate change education research. Therefore, I have suggested in this think piece that we may develop descriptive, and comparative, normative, critical and meta forms of climate change education research.

Based on my experiences from the Sigtuna Dialogue we should not set a limit to research creativity when it comes to climate change education research. Hence, we should embrace methodological, ethical and theoretical diversity and while not letting go of high academic standards realise that these standards are also being given their legitimacy in context.

Notes on the Contributor

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Endnotes

1 Throughout this paper, the term 'climate change' refers to anthropogenic climate change.

2 Page (2007), Northcott (2007), Garvey (2008) and Adger, *et al.* (2006) are some important exceptions.

3 This paper is part of an ongoing research project *Climate Capabilities* (2008–2010) financed by the Swedish research council Formas, the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning. Parts of it will be published in David O. Kronlid (2010) in Bergmann & Gerten (eds) (2009).

4 The International Panel for Climate Change (IPCC) is the leading scientific body for the assessment of climate change. Chaired by Mr. Rajendra Pachauri, the IPCC synthesises current climate change research in its assessment reports.

5 Amartya Sen developed the capability approach as an approach to wellbeing and social justice that focuses individual's entitlement to capabilities, i.e. to positive freedoms. Martha Nussbaum and others later developed the capabilities approach into a research field widely recognised within development ethics and development policy.

6 Ethical analysis or 'ethics' means 'the philosophical inquiry into the nature, extent and justification of the ethical claims which are made on human beings …' (Dower, 1998:2–3). In this sense, IPCC documents reflect (implicit and explicit) certain moral claims and assumptions regarding climate change.

7 The analysis focuses on the Working group II's (WGII) *The Summary for Policy-Makers* and Chapter 17, 'Assessment of Adaptation Practices, Options, Constraints and Capacity'. The summary for policy-makers contains the key scientific findings and is the core document in which the IPCC communicates its results to the media, academia and policy-makers. Hence, from a discourse theoretical point of view, *The Summary for Policy-makers* is the most authoritative among the IPCC documents.

8 The fact that climate change affects people's health, mobility, education, work, consumption, etc. is clearly an indicator of this.

9 Kronlid (2003:55–46).

10 Robeyns (2003:61).

11 Alkire & Black (1997) 'prefer the term "flourishing" – which also communicates the sense that people pursue and participate in but never fully realize' the dimensions of wellbeing 'once and for all' (268). I use 'functions' and 'flourishing', and 'elements on capability set lists' and 'dimensions of flourishing' interchangeably.

12 A discussion of the missing capabilities (appreciation of beauty, play, friendship, self-integration, and coherent self-determination) and how they relate to other dimensions of wellbeing are of significant importance and will be dealt with in coming publications.

13 Here cited from Chapter 17, 'Assessment of Adaptation Practices, Options, Constraints and Capacity' in the *IPCC Fourth Assessment Report*, 2007:734.

14 http://www.panda.org/about_our_earth/aboutcc/problems/people_at_risk/personal_stories/witness_ stories/?uNewsID=113580, accessed 22 May 2009.

15 Leduc makes this point as well.

16 The term 'modern' does not imply that indigenous cultures are 'pre-modern'. Rather, 'modern' refers to lifestyles and knowledge systems typical for affluent growth economies characterised by de-contextualised education, reductionist research and learning and a separation of the spiritual and the worldly.
17 Contextual and individual differences in vulnerability and power can of course produce various consequences of such experience. This question will be further elaborated in coming publications.
18 The ability to transcend refers to a person's ability to relate to some more-than-human source of meaning and value. See IPCC, Fourth Assessment Report, Ch. 17, Box 17.5:730).
19 In this chapter, adaptation is understood as institutional (inter- and transnational, national, and local) and/or individual proactive, reactive and inactive responses to climate change.
20 'Resilience' refers to 'the self-repairing capacity of ecosystems' (Folke, *et al.*, 2005:558) but could also refer to the self-repairing capacity of eco-social systems.
21 Mobility researchers also allude to a dimension of mobility sometimes referred to as the meanings attached to geographical mobility, sometimes as existential mobility, and sometimes as symbolic mobility. See for example Cresswell, 2006; Kronlid, 2008a and 2008b. Hence, in order to understand fully how climate change affects mobility we need to understand how various mobilities (social, geographical, symbolic, existential, etc.) interlink.
22 Grieco & Hine (2008:67): 'Routine neglect of the relationship between transport and social exclusion was the mother of the New Orleans crisis.'
23 My suggestions can easily be applied to other ESD areas as well.
24 A minor field study focussing transcendence in Mongolia is currently being planned at the department of curriculum studies in Uppsala, Sweden.

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