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UNIVERSITY OF LÜNEBURG

C | A | U Christian-Albrechts-Universität zu Kiel

Workshop

Responsibility for Sustainability.
Combining the Perspectives of Economics and Philosophy

June 21–24, 2012 | Camp Reinsehlen, Germany

Sustainability Economics Group, *Leuphana University of Lüneburg, Germany*
Ecological, Environmental and Resource Economics Group, *University of Kiel*, Germany

Background

The vision of *sustainability* aims at justice in using natural resources as well as manufactured goods for the satisfaction of human needs and wants over the long-term future. This includes intergenerational and intragenerational justice, as well as justice towards nature. As the future is uncertain, however, a development path that is expected to be sustainable *ex ante* may actually turn out to be unsustainable *ex post*. This raises the question of 'What exactly is implied by and required for sustainability if current actions have uncertain future outcomes?'

Against this background, the workshop explores the hypothesis that the concept of *responsibility* can fill a gap in our thinking of how to define, and operationalize, sustainability under uncertainty. The philosophical concept of responsibility relates an abstract and general norm (e.g. sustainability) to the specific facts of a concrete action context (e.g. ecological-economic system dynamics), to guide action. It applies to actors at all levels of organization, including individuals, corporations, and governments. The concept is especially relevant in situations characterized by limited knowledge about the consequences of actions and asymmetry of agents (e.g. in terms of resource endowment or capacity to act), which typically prevail in decision contexts where sustainability is at issue.

Bringing together the perspectives of economics and philosophy, as well as related disciplines such as political science, the workshop will discuss in particular:

- principles of responsibility,
- limits to responsibility,
- trade-offs between different objectives of justice, other normative objectives and values,
- societal decision-making under uncertainty in view of long-term ecological-economic system dynamics,
- institutionalization of responsibility for sustainability.

Aims and Scope

The aims of the workshop are threefold: (1) Taking stock of the scholarly discussion of responsibility in view of sustainability. (2) Exploring the potential of conceptualizing sustainability under uncertainty as responsibility. (3) Developing new approaches and concepts for future research on responsibility for sustainability under uncertainty.

The workshop brings together a small and focused group of approximately 25 participants, including 10 eminent invited speakers, in a stimulating environment for an intensive and fruitful discussion. Participation is by personal invitation only.

Invited Speakers

Geir Asheim	University of Oslo, Norway
Christian Becker	Pennsylvania State University, USA
Donald A. Brown	Pennsylvania State University, USA
Patricia Glazebrook	University of North Texas, USA
Frank Krysiak	University of Basel, Switzerland
Jessica Nihlén Fahlquist	Technical University of Delft, The Netherlands
Edward Page	University of Warwick, UK
Thomas Petersen	University of Heidelberg, Germany
John E. Roemer	Yale University, USA
Garrath Williams	Lancaster University, UK

Venue

The workshop will take place at the conference guest house Camp Reinsehlen in the heart of the Lüneburg Heath, just 30 minutes from Hamburg. The quietness and colorful vastness of its traditionally conserved landscape provides a peaceful atmosphere and recreational environment which should build the basis to stimulate fruitful discussions and productive research. The guest house's philosophy to live in harmony with nature and among each other, which serves the topic of the event, is furthered by the cheerful atmosphere and the celebration of the deliberate and exquisite slow food concept. Last not least, the heathlands are a nice example for a strongly coupled ecological–economic system.

http://www.campreinsehlen.de

Program

Thursday, June 21, 2012

before 6:00 pm	arrival and check-in
6:30 pm	welcome reception
7:30 pm	dinner

Friday, June 22, 2012

full day	scientific program, hike in the Lüneburg Heath

Saturday, June 23, 2012

full day	scientific program

Sunday, June 24, 2012

after breakfast	check-out

Hosts

The workshop is organized jointly by the *Sustainability Economics Group* at *Leuphana University of Lüneburg* (head: Prof. Dr. Stefan Baumgärtner) and the *Ecological, Environmental and Resource Economics Group* at the *University of Kiel* (head: Prof. Dr. Martin F. Quaas):

http://www.leuphana.de/en/stefan-baumgaertner.html

http://www.bwl.uni-kiel.de/eree/default.html

Contact

Scientific organizers:

Stefan Baumgärtner
baumgaertner@uni.leuphana.de
phone: +49.4131.677-2600

Martin Quaas
quaas@economics.uni-kiel.de
phone: +49.431.880-3616

Local and administrative organizer:

Klara Stumpf
stumpf@uni.leuphana.de
phone: +49.4131.677-2636

Travel Information

By plane:

The closest international airport is Hamburg (HAM). There will be a shuttle transfer from/to the airport for workshop participants.

By train:

The most convenient railway station is Wintermoor. The conference venue can be reached from the station by taxi.

Detailed travel information will be provided later.

Acknowledgement

The workshop is funded through a grant from the German Federal Ministry of Education and Research as part of its program *Economics for Sustainability* (www.wi-n.org/en/index.php).

FONA Economics for Sustainability BMBF

Federal Ministry of Education and Research

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Workshop program

Responsibility for Sustainability

June 21–24, 2012 | Camp Reinsehlen, Germany

Thursday, 21 June 2012

from 15:00	Arrival and check-in
18:30	Welcome reception (Hotel Lobby)
19:30	Dinner (Hotel Restaurant)

Location of all workshop sessions: “Rote Halle”

Friday, 22 June 2012

8:45–9:45	**Stefan Baumgärtner** (Leuphana University of Lüneburg) and **Martin F. Quaas** (Christian-Albrechts-University of Kiel): *Introduction: Responsibility for Sustainability*

Chair: Johannes Schiller (Helmholtz Centre for Environmental Research – UFZ)

9:45–10:45	**Christian Becker** (Pennsylvania State University): *Sustainability, ethics, and meta-responsibility for systemic development*
10:45–11:15	Coffee break
11:15–12:15	**Geir B. Asheim** (University of Oslo): *Three questions on sustainability*
12:15–13:45	Lunch break
13:45–16:15	Hike in the Lüneburg Heath (meet at Hotel Lobby)
	Coffee break

Chair: Martin F. Quaas (Christian-Albrechts-University of Kiel)

16:15–17:15	**Patricia Glazebrook** (University of North Texas): *Cash, care and climate: Response and ability in discourses of sustainability*
17:15–18:15	**Frank C. Krysiak** (University of Basel): *Responsibility and learning on a slippery slope*
19:00	Dinner

Saturday, 23 June 2012

Chair: Malte Faber (University of Heidelberg)

8:45–9:45	**Thomas Petersen** (Helmholtz Centre for Environmental Research – UFZ & University of Heidelberg): *Responsibility, sustainability and ethics*
09:45–10:45	**Jessica Nihlén Fahlquist** (Delft University of Technology & KTH Royal Institute of Technology): *Responsibility for sustainability – Individual virtue and institutional tasks*
10:45–11:15	Coffee break
11:15–12:15	**Donald A. Brown** (Pennsylvania State University): *Lessons learned for sustainability ethics from the climate change disinformation campaign*
12:15–13:45	Lunch break

Chair: Wolfgang Buchholz (University of Regensburg)

13:45–14:45	**Edward A. Page** (Warwick University): *Three problems of climate change justice*
14:45–15:45	**John E. Roemer** (Yale University): *North-South convergence and the allocation of CO_2-emissions*

15:45–16:15 Coffee break

16:15–17:15 **Garrath Williams** (Lancaster University):
Imaginary responsibility

Chair: Martin F. Quaas (Christian-Albrechts-University of Kiel)

17:15–18:15 Final discussion: Synthesis and perspectives, with brief statements from

Malte Faber (University of Heidelberg):
Research perspectives

Anja Humburg (Leuphana University of Lüneburg):
Science and society

19:00 Conference Dinner

Sunday, 24 June 2012

before 11:00 Check-out

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Book of Abstracts

Acknowledgement
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FONA Economics for Sustainability BMBF

Federal Ministry of Education and Research

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Three questions on sustainability

Geir B. Asheim

Department of Economics

University of Oslo

Abstract. In my presentation I will pose three questions.

Question 1: What is sustainability? The common definition of sustainability is that the present behaves in a sustainable manner if current well-being can potentially be shared with future generations. How can this definition be extended to situations where

(a) there are intra-generational inequalities (i.e., locations not only along time but also across space),

(b) there are inter-state inequalities (i.e., uncertainty),

(c) not all location-state pairs are inhabited (i.e., endogenous population and positive probability of extinction)?

Question 2: Is sustainability *good*? Wolfgang Buchholz (see Asheim, Buchholz, Tungodden, *JEEM 2001*) made the observation that only sustainable streams are good in productive economies when one stream is better than another if generations are treated equally and the social evaluation is sensitive to the interest of each generation. (In other words, any unsustainable stream is Suppes-Sen dominated.) Stéphane Zuber (see Zuber, Asheim *JET* forthcoming) suggested to combine equal treatment with axioms for discounted utilitarianism restricted to non-decreasing streams, leading to (extended) rank-discounted utilitarianism (RDU). Only sustainable streams are optimal under RDU in the Ramsey model and the DHSS model.

How can RDU be extended to situations (a), (b) and (c)? If the intergenerational aspects are important, then one possibility is to model different location-state pairs as inhabited by different people (implying that their lives do not extend through time and they are not subject to uncertainty). Then equal treatment corresponds to equal treatment within each state of people living at different locations. I will present results in the case where there is only one state (no uncertainty).

The general argument is that this kind of analysis might lead to better notions of 'goodness' than attempting to extend sustainability as a primitive concept to situations (a), (b) and (c).

Question 3: Do we have a duty to make choices that are morally right by promoting the good? A problem with the consequentialist position adopted under questions 1 and 2 is that people do not feel a duty for promoting the wellbeing of people living at far-away locations (in space and time). However, as is well-known, in the Ramsey model with a population consisting of a number of parallel dynasties, any stream considered good (in the sense of being Suppes-Sen undominated, or optimal according to RDU), can be implemented if individuals act as if they have sufficient non-paternalistic altruism for their immediate descendants in their own dynasties. One might claim that individuals are obliged to behave in this manner.

The situation changes drastically if the accumulated asset is not privately owned. I will consider a simple extension of the Ramsey model where individuals can choose between investing in a brown asset which is privately owned, and a green asset which has shared ownership. Investment in the green asset is the only efficient strategy, while investment in the brown asset is the only productive way to give their own descendants a head start in the intergenerational game. In this case a good outcome requires altruism across dynasties. This raises the question whether individuals (or even countries) are obliged to invest in the green asset if not coerced by a unified authority.

Contact:

Geir B. Asheim, Department of Economics, University of Oslo, g.b.asheim@econ.uio.no

Sustainability under uncertainty as responsibility

Stefan Baumgärtner [a], Bernd Klauer [b], Thomas Petersen [b], Martin F. Quaas [c], Johannes Schiller [b] and Klara Helene Stumpf [a]

[a] Leuphana University of Lüneburg, Germany

[b] Helmholtz Centre for Environmental Research – UFZ, Leipzig, Germany

[c] Christian-Albrechts-University of Kiel, Germany

Abstract. We suggest conceptualizing *sustainability under conditions of uncertainty* as a specific *responsibility* of presently acting persons. The imperative of sustainability is widely understood to imply justice among presently living persons, between present and future generations, and towards nature. Present actions are taken to be sustainable if they fulfil the criteria of this threefold justice. Yet, under conditions of uncertainty, the future outcome of present action is inevitably uncertain. As a consequence, a human action that is *expected* to fulfil the criteria of sustainability *ex ante* may turn out to fail them *ex post*. For example, despite the best possible conservation efforts taken today a particular piece of nature can be destroyed due to some unforeseeable chance event which is beyond human control, such as a volcano eruption. This raises the question of 'What exactly is implied by and required for sustainability if present actions have uncertain future outcomes?'

Against this background, we propose to conceptualize sustainability as a specific *responsibility* of present actors. The philosophical concept of responsibility, in general, links abstract and general norms and concrete actions of concrete persons in concrete action contexts (Baumgärtner et al. 2006, 2012). It, thus, provides guidance for present actors and their actions. Substantially, it can be specified with regard to sustainability as a six-place predicate. It essentially takes into account actors' limitations of knowledge and capacity to act, thus avoiding overburdening.

We argue that the concept of responsibility can fill a gap in our thinking of how to define, and operationalize, sustainability as a domain-specific expression of justice under uncertainty. Being a well-founded concept in philosophy, politics and law, it gives structure to the question of how to make the abstract and general norm of sustainability operational for present action in a concrete and specific context.

Keywords: justice, responsibility, sustainability, uncertainty

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Contact:

Stefan Baumgärtner, Sustainability Economics Group, Leuphana University of Lüneburg, baumgaertner@uni.leuphana.de

Sustainability, ethics, and meta-responsibility for systemic development

Christian Becker

Department of Philosophy

Pennsylvania State University

Abstract. I discuss ethical aspects of sustainability with particular focus on the concept of responsibility. I begin with an outline of the ethical dimension of sustainability and argue that sustainability implies specific (partly new) ethical challenges that cannot be address by simply applying traditional moral philosophy. Rather, we need a specific approach of *sustainability ethics* in order to adequately analyze the ethical dimension of sustainability. I suggest an approach of sustainability ethics that is inspired by virtue ethics, ethics of care, and critical theory and refers to both the individual and systemic ethical challenges of sustainability. I then focus on the systemic ethical challenges. For this, I introduce the concept *meta-structure.* A meta-structure is a composition of basic assumptions, basic evaluations, driving forces, and institutionalizations. Meta-structures influence human self-identity and set humans into specific relationships with other humans, future generations, and nature. Crucial examples are *science, technology,* and the *economy.* I discuss the characteristics of such meta-structures and their ethical implications with regard to sustainability. I particularly focus on the underlying paradigms of growth and rational control, and on the inherent systemic increase of complexity, fragmentation and decreasing half-life of elements of meta-structures. I argue that these characteristics are ethically problematic with regard to sustainability. The dynamic of meta-structures causes an increase in ignorance, uncertainty, and surprise, and undermines the stability of inter-temporal relationships between generations. Black Swan phenomena – unforeseen events of surprise – are not given and appear at a constant rate. Rather, human activity – particularly the way meta-structures develop – influences their appearance. The crucial role of meta-structures for sustainability has ethical implications for the conceptualization of responsibility in the context of sustainability. Responsibility with regard to sustainability does not just mean responsibility of individual persons for their actions and responsibility of (certain parts of) the current generation for preserving the basis of life for future generations. Responsibility for sustainability also means meta-responsibility of the current generation for the way meta-structures evolve and impact the possibilities of future individuals to live well and act responsible. In a broader sense, one may define responsibility for sustainability as the

responsibility of the current generation for not undermining the potential of other contemporaries and future generations to develop their potential as sustainable and responsible persons. I finally discuss the role of economics with regard to this kind of responsibility for sustainability. I particularly focus on concepts of economic rationality and the sophisticated way economics deals with systemic complexity.

Keywords: meta-structures, responsibility, sustainability ethics, sustainable person

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Contact:

Christian Becker, Pennsylvania State University, Department of Philosophy, 240 Sparks Building, University Park, PA 16802, USA, cub20@psu.edu

Lessons learned for sustainability ethics from the climate change disinformation campaign

Donald A. Brown

Environmental Ethics, Science, and Law

Pennsylvania State University

Abstract. Recent sociological literature describes a well-organized, well-funded climate change disinformation campaign to undermine the scientific and economic basis for action on climate change that has been operating in the United States and several other developed countries for approximately twenty years. This paper will describe this campaign, identify the campaign's major participants and their funding describe the key tactics of this campaign and subject the tactics to an ethical analysis. On the basis of this ethical analysis the paper will distinguish responsible skepticism, something to be encouraged in climate and sustainability science, from disinformation, an approach to sustainability problems that is deeply ethically abhorrent. In light of lessons learned from this experience, this paper will make recommendations on the need to develop new norms that should guide scientific and economic claims about sustainability problems.

Keywords: climate change ethics, climate change, climate change denial, climate change disinformation campaign, responsibility for sustainability, sustainability ethics, ethics and scientific uncertainty, climate change policy, responsibility for climate change

Contact:

Donald A. Brown, Environmental Ethics, Science and Law, Pennsylvania State University, Dabrown57@gmail.com

Cash, care and climate:

Response and ability in discourses of sustainability

Patricia Glazebrook

Department of Philosophy and Religion Studies

University of North Texas

Abstract. Sustainability discourse can be broadly sorted according to two different interpretations of sustainability, depending on whether concern is with economics, development and resource management, or ecology and ecosystem sciences. Speakers in the former understand sustainability consistent with the Brundtland Report, and tend to talk about conservation and intergenerational justice in quantitative terms; speakers in the latter talk more qualitatively in terms of interdependence, balance, harmony and stability. This discussion aims to reconcile these discourses. I come with assumptions from ecofemnism (that the domination of nature and the political domination of marginalized people are deeply inter-related) and environmental justice theorists (that the degradation of the environment is inseparable from issues of human justice) but also the ecological economist's understanding of "ecosystem services" that human interests depend upon ecosystem maintenance). I draw on gender theorists' understanding of relationality and care ethics to argue that responsibility in the context of sustainability means the capacity to respond (response-ability) to adaptation needs of ecosystem community members.

I first argue that so-called "late capitalism " i.e. consumer culture is inherently unsustainable because its concept of agency is limited to the neoliberal citizen, i.e. the wage-earning consumer whose enlightened self-interest is autonomously expressed in their purchasing power. Participants in subsistence economies are understood in the logic of consumer culture as inferior or inadequate agents, and the goal of development is to help emerging economies empower their citizens into being more effective consumers. In contrast, I argue that subsistence economies can and sometimes do function as alternative ethics of care that take stakeholder participation in and contribution to ecosystem stability to be definitive of community membership. Principles of response-ability include 1) recognition of value beyond the monetary; 2) accountability for ecosystem use, degradation, or harm, i.e. non-exclusion of "externalities;" and 3) identification of needs and contributions through institutionalized practices of listening, supporting, and relational co-determination. Case studies briefly detail challenges in food security, oil production, and wind power in West Africa and India. In these case studies, unsustainability is causally attributed to failure to listen and respond to

community members, while alternative, responsible, sustainable models are shown to be already embedded within the systems themselves. I am thus arguing that responsible sustainability and sustainable responsibility can already be found in the alternative economies of the global South, whose voices are typically silenced in sustainability discourses.

Keywords: sustainability, responsibility, developing countries, subsistence, agriculture, energy, livelihood, climate change, care

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Contact:

Patricia Glazebrook, Department of Philosophy and Religion Studies, University of North Texas, 1155 Union Circle #310920, Denton, Texas, USA 76203-5017, tg@unt.edu

Responsibility and learning on a slippery slope

Frank C. Krysiak

Department of Business and Economics

University of Basel

Abstract. Sustainability is a criterion for assessing intergenerational distributions of well-being. It is therefore most relevant in cases where decisions have long-lasting consequences, as is the case for climate change, soil degradation, and biodiversity loss. As the relevant consequences can often not be predicted with certainty, sustainability is increasingly discussed as a criterion for evaluating decisions under uncertainty. However, three aspects that are typical for long-term environmental problems are largely absent from the economic sustainability debate.

First, in many cases, uncertainty is not (automatically) resolved over time but can only be resolved by experience. We do not really know how well human beings can live in a world that is on average 6 K warmer until we have experienced this state. This aspect is neither captured by the literature on (quasi-) option values (see, for example, Arrow and Fisher (1974) or Pindyck (1991)) nor by concepts of sustainability under uncertainty (such as, Woodward (2000) or Krysiak and Krysiak (2006); Krysiak (2009)).[1] Averting changes limits the possibilities for learning, which introduces a value of experimenting into sustainability.

Second, in many environmental problems, there is the danger of stepping on a slippery slope. Seemingly small changes may start dynamic processes (ecological or societal) that eventually lead to unwanted large-scale changes. Often, we do not even know ex ante which actions could potentially initiate such positive feedback effects. For example, the extinction of a key species may cause unforeseen further extinctions and alter ecosystems substantially. It may be costly or even impossible to stop these dynamics once they have begun. Contrasting the first point, this effect strengthens the notion of conservatism in sustainability.

Finally, it is not obvious to what extent present actions can be said to be causal for future well-being, because the state of the world that a future generation will experience depends not only on contemporary actions but possibly also on the actions of intermediate generations as well as on unforeseeable events. Thus the question arises to what extent the present generation is responsible for future outcomes. This question becomes particularly important in cases where the first two points are relevant. To what extent is the present

[1] Some aspects of learning are captured in Weitzman (2009). However, the analysis does not consider potential benefits of learning.

generation responsible for large-scale changes that result from small actions and that cannot be foreseen? Or to what extent is it responsible if it experiments with changes that are reversible, but future generations choose not to revert them and thus facilitate an eventually detrimental process?

To adress these points, I will combine results from two ongoing research projects. On the one hand, I will analyze optimal decisions in a setting where (a) the future consequences of present actions are uncertain and can only be learned by experiencing these consequences and (b) there is a risk of starting a detrimental dynamic process that may not be reversed (in principle or by choice). I will use a very simple model to show how the option of learning by experience and the risk of "skidding down a slippery slope" influence optimal decisions. In particular, I will discuss how discounting alters the relative importance of conservatism and experimenting.

On the other hand, I will use the idea of partial responsibility (Vallentyne, 2008) to discuss to what extent we can be said to be responsible for a future generation's well-being in a world with uncertainty. In particular, I will examine whether partial agency (i.e., the extent to which present actions alter the distribution of future outcomes) can be used as an alternative to discounting in the above "slippery slope setting" for defining intertemporal preferences. Thereby, I will contrast a conventional analysis based on discounted utilitarianism with an analysis based on a measure of agency.

Keywords: sustainability, uncertainty, responsibility, agency, positive feedback, climate change

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Contact:

Frank C. Krysiak, Department of Business and Economics, University of Basel, Peter Merian-Weg 6, 4002 Basel, Switzerland, Frank.Krysiak@unibas.ch

Responsibility for sustainability –

Individual virtue and institutional tasks

essi ca i hl n a hlquist

Department of Philosophy

Delft University of Technology, The Netherlands

Division of Philosophy

KTH Royal Institute of Technology, Stockholm, Sweden

Abstract. The focus of this paper is individual and institutional responsibility for sustainability and the relationship between these two.

When discussing responsibility for sustainability we first need to make some distinctions and clarify the concept of responsibility. The first distinction which should be made is the one between backward-looking and forward-looking responsibility, a distinction which unless acknowledged cause confusion and sometimes unnecessary disagreement. Backward-looking responsibility is mainly concerned with causation and blame. In an environmental context, this would mean "Who is to blame for environmental problems, climate change and the lack of sustainability?" The question, then, is who caused the problem and who is to blame for it. In contrast, forward-looking responsibility is focused on the future and more concerned with how to solve problems and achieve results rather than who caused the unwanted situation ichardson oodin ihl n a hlquist an de oel). In our case the question would be "Who is responsible for achieving a sustainable society?" o rward-looking responsibility could be conceived in two ways. First, forward-looking responsibility could be defined as task responsibility, i.e. a matter of seeing to it that a certain state-of-affairs is achieved (Goodin 1995). Second, it could also be conceived as a virtue (Williams 2008).

I have argued elsewhere that forward-looking responsibility is the most fruitful notion in the context of environmental problems ihl n a hlquist). In this paper I will argue that we need both concepts of forward-looking responsibility, i.e. responsibility as a virtue and task responsibility. Whereas it is crucial that individuals develop and cultivate responsibility as a virtue, it is equally imperative that institutions take on the task responsibility to create a context in which individual responsibility is facilitated and cultivated. As will be seen, there is an interesting link between individual responsibility and institutional responsibility and virtue ethics and the ethics of care are well equipped to explicate that relationship. In contrast to

other ethical theories, these theories have a strong developmental and gradual perspective on morality. Virtues are thought to be developed gradually from infancy through childhood and adults are virtuous to differing degrees. Only a few, if any, are fully and ideally virtuous. To become virtuous, in our case responsible, a person has to be educated and habituated in a certain way, gain experience and be inspired by role models and exemplars. Institutions, e.g. governments and industries, with their resources, power and knowledge are best equipped to take on the tasks involved in creating a context in which individual responsibility for sustainability is facilitated, encouraged and developed.

Keywords: forward-looking responsibility, virtue ethics, task responsibility, individual responsibility, institutional responsibility

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Contact:

essi ca ihl n a hlquist, Department of Philosophy, Delft University of Technology, The Netherlands, Division of Philosophy, KTH Royal Institute of Technology, Stockholm, Sweden, j.a.nihlen-fahlquist@tudelft.nl

Three problems of climate change justice

Edward A. Page

Department of Politics and International Studies

Warwick University

Abstract. Global climate change raises profound questions for normative theorists. The human impacts of climate change will be sufficiently broad, and generally adverse, to threaten the well-being of very large numbers of existing and future persons; and these impacts, if unmanaged, could also be expected to exacerbate inequalities between social groups in all states (Parry, Canzani and Palutikof 2007; Page 2006; Adger 2010). Within this context, an increasing focus of climate change scholars has been the questions of distributive justice and political legitimacy raised by climate change and policies for its management. In this chapter, I explore three problems that have generated substantial treatment in the growing literature devoted to this normative dimension of climate change. First, the problem of determining the share of the capacity of the atmosphere to assimilate accumulations of greenhouse gas that each state ought to be able to exploit as a matter of justice. I call this the 'justice in emissions' problem see hue 3 ; Caney). econd the problem of specifying a just division of costs and benefits associated with our attempts to solve the justice in emissions problem and, in addition, to tackle human disadvantages arising from climate changes that can no longer preventable. I call this the 'justice in burdens' problem (Caney 2010; Page 2008). Third, the problem of translating justly distributed climatic entitlements and burdens into a coherent set of national, regional, and global climate policy responses that are consistent with established norms of global justice such as those concerned with international development and political legitimacy (Paavola 2005; Bodansky 1999). I call this the 'justice in governance' problem. I argue that normative theorists have hitherto been unable to construct a uniquely plausible solution to the three problems that could be adopted as action guiding by parties to the UNFCCC. This is not, however, a cause for alarm either normatively or practically. While normative theorizing can help clarify rival philosophical accounts of the three problems for the benefit of policymakers and negotiators - as well as explore the fit between these accounts and established norms of global justice - the selection of climate policies is ultimately a matter of deliberation amongst states seeking agreement on a climate solution that none could reasonably reject.

Keywords: climate change, distributive justice, historical responsibility, political legitimacy, environmental governance

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Contact:

Edward A. Page, Department of Politics and International Studies, Warwick University, e.a.page@warwick.ac.uk

Responsibility, sustainability and ethics

Thomas Petersen

Helmholtz Centre for Environmental Research – UFZ, Leipzig

Philosophical Seminar, University of Heidelberg

Abstract.

1. "To be responsible for something is to be answerable for it." Originally, responsibility is a term of the juridical or political sphere. The question for responsibility has two aspects: a) the ascription of certain actions and deeds "Who did it?") and b) the justification of someone for these deeds or, in a religious context for someone's life as a whole which life is thought of as of a whole of actions. Two points should be remarked in respect of this meaning of the term in the beginning: first, to speak of responsibility is possible solely in a *retrospective view*; one is responsible (or not) for actions, deeds (or, e.g. in a religious context: thoughts) already accomplished. Second, until the end of the 19th century responsibility was not playing a central role in ethics but rather was having only an auxiliary function.

2. In the 20th century, however, responsibility became a prominent term in ethics and political philosophy. Further, the term responsibility is now understood in a *prospective* sense. As Hans Jonas emphasised in *The Imperative of Responsibility*, responsibility now does not refer to *things already done* but to *things yet to do*. – What is new in on as' conception of an *ethics* of responsibility? Why not say instead of "I am responsible to do something" simply "I am obliged to do something"? The crucial point is, indeed, that we are, according to Jonas and others, not simply responsible for future actions but for the *fulfilment* of certain tasks, the achievement of certain goals, like the preservation of the environment, the existence of mankind, for future generations (their wellbeing) or, for sustainability. The difference between simple obligation and responsibility in a *prospective* sense is twofold: First, the responsible actor has discretionary power in fulfilling the tasks he is responsible for; there is no precept to act in an exactly defined way. Second, to assume responsibility presupposes power, knowledge and the ability to cope with the unintended side consequences of the actions to be undertaken in order to achieve the intended objectives.

3. In respect to the required power, knowledge and ability to control unintended side consequences responsibility may be distinguished into (i) *negative responsibility* (not to endanger an objective or not to harm somebody or something), (ii) *positive responsibility* (to further or support an achievement to contribute to someone's wellbeing) and iii) *guarantor responsibility* (to stand for or to guarantee for a achievement of a certain goal). This

differentiation may also be combined with other types of responsibility, i.e. legal, moral and political responsibility, and therefore the concept of responsibility forms an analytical tool to decide which actor (government, firms, consumers etc.) should bear which responsibility in complex situations such as the search for sustainability.

4. Sustainability can be achieved only under conditions of uncertainty and ignorance due to the complexity of the cultural and natural world. Responsibility is a concept designed for such situations of complexity in which it is often unclear what the right thing to do is and what not. Ethics always has recognized the complexity and inherent uncertainty of the world in which we have to act, but treated uncertainty as a pure factual one which does not touch the clarity and certainty of ethical precepts. The introduction of the concept of responsibility, however, throws new light on uncertainty and ignorance; for there emerges somewhat like an *ethical uncertainty* that could meet the uncertainty of the world. The latter insight was the crucial point which was raised in ax Weber's *ethics of responsibility*. Our faculty to deal with uncertainty and ignorance is *power of judgment*; hence power of judgment is via the concept of responsibility likely to take a central role in ethics again, albeit in a way different from that in Aristotelian ethics.

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Contact:

Thomas Petersen, Helmholtz Centre for Environmental Research – UFZ,
thomas.petersen@ufz.de

North-south convergence and the allocation of CO_2 emissions

Humberto Llavador [a], John E. Roemer [b], Joaquim Silvestre [c]

[a] Universitat Pompeu Fabra

[b] Yale University

[c] University of California, Davis

Abstract. We postulate a two-region world, comprised of North (calibrated after the US) and South (calibrated after China). Our optimization results show the compatibility of the following three desiderata:

(1) Global CO_2 emissions follow a conservative path that leads to the stabilization of concentrations at 450 ppm.

(2) North and South converge to a path of sustained growth at 1% per year (28.2% per generation) in 2075 upon which welfare per capita is equalized globally

(3) During the transition to the steady state, North also grows at 1% per year while outh's rates of growth are markedly higher.

The transition paths require a drastic reduction of the share of emissions allocated to North, large investments in knowledge, both in North and South, as well as very large investments in education in outh. urprisingly in order to sustain orth's utility growth rate some output must be transferred from South to North during the transition.

Although undoubtedly subject to many caveats, our results support a degree of optimism by providing prima facie evidence of the possibility of tackling climate change in a way that is fair both across generations and across regions while allowing for positive rates of human development.

Keywords: convergence, CO_2 emissions, north-south, climate change, sustainability, growth.

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Contact:

John E. Roemer, Department of Political Science and Department of Economics, Yale University, john.roemer@yale.edu

Imaginary responsibility

Garrath Williams

Department of Politics, Philosophy and Religion

Lancaster University

Abstract. Throughout the literature on climate change, authors imagine our generation as responsible to, or being held responsible by, those who come after. Sometimes the story is told in terms of a merely implicit accusation: for example 'The old folk crouching by their peat fires will tell their disbelieving grandchildren of standing naked mid-winter under jet streams of hot clean water…' in the well-known passage from Ian McEwan). Perhaps more often it is directly accusatory: 'What were they thinking?'; 'How could they leave us in this mess?'; was this 'the age of stupid'? ometimes such stories even collapse in on themselves when we imagine that no one is left to make the accusation: it is sadly conceivable that a future earth will, thanks to the actions of human beings alive today, no longer support human life.

In my paper, I would like to consider some limits of this imagined responsibility, while emphasising its particular strengths. In particular, I want to suggest that there is a doubly imaginary quality to this trope which is wholly fitting to our subject matter: the fact that the future can only be imagined not demonstrated; and the fact that 'we' – the living billions of people who will bequeath this unknown future – are not a genuine collective actor. Thus invocations of 'us' 'our choice ' 'our common future') are always proleptic. That is they are attempts to call for concerted action where we presently lack an adequately shared appreciation of our situation and adequate institutions to coordinate our responses and initiatives. The perspective of an imagined responsibility is entirely appropriate, then, to two perennial facets of human agency that are also the greatest obstacles to our taking responsibility – those attending long-term impacts and those attending collective action. In these respects, indeed, I will suggest that such imaginary and relatively untheoretical narratives are actually more apt to guide action than theories of intergenerational or environmental justice. Despite their seemingly more sophisticated and sober character, such theories are not only imaginary: they are also unrealistic, since they lose contact with the basic realities of human agency.

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Contact:

Garrath Williams, Department of Politics, Philosophy and Religion, Lancaster University, g.d.williams@lancaster.ac.uk