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The Green Economy

Volume 3: Papers from the 2014 course

Edited by Arild Vatn



Student Papers

Thor Heyerdahl Summer School in Environmental Governance

Volume 3

Papers from the course

'The Green Economy'

June 16 – 27, 2014

Arild Vatn (Ed.)

Department of International Environment and Development Studies, Noragric
Faculty of Social Sciences
Norwegian University of Life Sciences

The Thor Heyerdahl Summer School (THSS) in Environmental Governance offers PhDs and young researchers the opportunity to develop high level skills in analyzing governance issues such as climate change, biodiversity conservation, the sustainable use of biological resources, water management, and pollution. The Summer School creates an arena for critical reflection on the present status of both theory and practice in the field, and an opportunity to discuss alternatives to current developments and solutions.

The annual two-week THSS is hosted by the Department of International Environment and Development Studies, Noragric, at the Norwegian University of Life Science in Aas, Norway. The THSS is also supported financially by the Thor Heyerdahl Institute, Noragric's institutional agreements with partners in the South and the Research Council of Norway. THSS has a reference group consisting of scholars from CICERO, the Fridtjof Nansen Institute, the Norwegian Institute of International Affairs (NUPI) and the Thor Heyerdahl institute. The THSS is endorsed by the European Society for Ecological Economics, the International Society for Ecological Economics and the Earth System Governance Project.

The student papers in this publication are the result of the third THSS in 2014. The views expressed in the articles are entirely those of the authors and can not be attributed directly to the Department of International Environment and Development Studies (NMBU/Noragric) or any of the above-mentioned partners. Extracts from this publication may only be reproduced after prior consultation with the coordinator of the THSS at Noragric.

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Introduction

This report covers student papers produced by participants of the third course of the Thor Heyerdahl Summer School in Environmental Governance. The topic for this course was 'The Green Economy' and attracted a group of very strong PhD students and young researchers. It also involved several renowned researchers as teachers – see the attached program. The Summer School is organized by the Department of International Environment and Development Studies at the Norwegian University of Life Sciences. It offers PhDs/young researchers the opportunity to develop their skills in analysing environmental governance issues. It provides an arena for critical reflection on the present status of both theory and practice in the field, and the search and assessment of possible alternatives to current practices. The course on global environmental governance ran from June 16 – June 27, 2014. More information about the program is found at http://www.umb.no/thor-heyerdahl-summer-school.

The course covered frontiers of theory formation in the field of green economy; governance and institutional issues. It also made enquiries into a wide variety of empirical topics regarding the challenges we face concerning environmental problems and mode of economic development. There were strong emphasis both on the present 'turn to the market' in environmental governance as well as discussing alternatives. The course was truly interdisciplinary.

A fantastic group of students with diverse backgrounds and interests was brought together. One of the tasks of the course was to join together in groups, agree on a theme of common interest, and analyse the chosen topic drawing on the tools and insights developed during the course. While outlines were made during the two weeks students met in Norway, the writing took place after participants returned to their home universities/institutes.

The results of their work are presented in this publication. The papers cover a wide range of topics from analysing policies to combat biodiversity loss to a study of the clean development mechanism, as well as from justice in environmental policy to valuation and the problem of time lags. What follows is a brief presentation of the altogether 8 papers included in this report. The presentation is based on the paper abstracts.

The first paper by Elke Pirgmaier and Emil Urhammer starts off by noting that we live in times of global crises, where economic, social and ecological problems are increasingly entangled and therefore require novel answers. Economics is today holding a hegemonic position and dominates the way we understand and relate to the problems we face, and it continues to gain new territory. This is reflected in a value hegemony framing everything from biodiversity to carbon emissions in monetary terms. We consider this a democratic problem since the diversity of values is thus not fairly represented in our current mode of decision-making. We believe that the solutions to the grand problems of our time lie in a democracy where multiple values can be communicated. In order to provide inspiration for thinking about such a democracy, this paper provides an overview of a wide range of philosophical positions on values and value pluralism and analyses how values and value pluralism are treated in a selection of articles in ecological economics. The paper concludes that the treatment of values and incommensurability in ecological economics

can be characterized as ambiguous. There is a need for further research on the theoretical aspects of these issues.

The course covered a variety of positions regarding the issue of the Green Economy spurring intense debates among participants about its meaning and implications. A group consisting of Dalia D'Amato, Nils Droste, Sander Chan and Anton Hofer looked into this by conceptualizing a subset of the multi-faceted debate around the implications and applications of Green Economy to provide reflective grounds for approaches towards the concept. The group used qualitative content analysis and participatory research to investigate perceptions of the participants of the course. The spectrum of disparate perceptions observed among the respondents is accommodated within a two-dimensional model. The dimensions are 1) the degree and nature of necessary societal change in relation to the current economic model and set of institutions, and 2) the role of research in delivering such change. The paper briefly discusses the model in light of existing literature on the topic to support self-reflection on the potential and limitations of the Green Economy and on the meaning and the role of research to promote required changes towards sustainability.

While the two first papers have mainly theoretical and conceptual ambitions, the other six have a more case based foundation. Daniel Caixeta Andrade, Soumyajit Bhar and Gudila Ancelm perform a comparative analysis of environmental sustainability of Brazil and India over the period 1970 to 2008. To do this, they employ a selected set of indicators: i.e., the domestic material consumption, the material intensity, the metabolic rate, the ecological footprint and bio-capacity, the ecological deficit/surplus, and the adjusted net savings. The indicators utilized in this study suggest that India is performing better than Brazil in a sustainability point of view, with the ecological deficit/surplus indicator as an exception. The paper also includes a statistical analysis to measure the correlation between economic growth and the selected sustainability indicators. The results revalidate the fact that there is a major compromise across economies between economic development and sustainability of the economy. While it is shown that Brazil's economy is decarbonizing in the study period, the pressure on the environment is higher in Brazil than in India. A projection-based analysis revealed that India will be achieving the same level of human development as Brazil at a much lower level of environmental pressures. Hence, the authors conclude that the Indian economy is more sustainable that Brazilian. The paper conclude by offering some policy recommendations flowing from the analysis.

Thereafter follow two papers looking at the green economy through the 'lenses' of biodiversity offsets. Ross Gillard, Ourania Papasozomenou[1] and Ellen Stenslie nanalyses how the ideas of the Green Economy has lent legitimacy to market-oriented policy change with the introduction of biodiversity offsetting (BDO) in the United Kingdom. Combining theories of institutional change from classic institutional economics with Blyth's (2002) five hypothesis of institutional change, the paper expound the rise of biodiversity offsetting in England as motivated by the wider context of a green economy. The analysis illustrates how biodiversity offsets during a period of environmental and economic crisis came to be the preferred method to address loss of ecosystem services. With the aid of powerful economic ideas of economic valuation of natural resources from the Green Economy, proponents of biodiversity offsetting in the UK successfully created an institutional and policy space that their mechanism would fill. The authors maintain that

[1] Humboldt-Universität zu Berlin

the successful transformation of policy is explained mainly by BDO's promise of a win-win between economic development and environmental protection, and its potential to create new financial assets and markets for economic actors.

Jessica Goddard, Ekin Kurtic and Ida Sognnæs follow up by examining ways in which BDOs "capture" value. More specifically, they analyze the tools of biodiversity offset creation in terms of the inclusion or exclusion of the values that are invoked in the discursive justification for BDO. The authors ask: How do BBOP's primary tools of cost benefit analysis and metric creation constrain what values can actually be captured? What is lost between principles (found in BBOP documentation and justification) and application (using the suggested tools)? To answer these questions, the group analyze both the discourse on value and the technical operation of "capturing" these values using metrics and CBA in BDO creation. Through this analysis, they show that the techniques reveal a tension vis-à-vis the discourse of multiple values on the one hand, and the aims of capturing and quantifying these values on the other hand. In other words, they find that a discrepancy exists in the BBOP approach between an all-encompassing attitude towards values and closed-ness of tools of quantification used in the creation of biodiversity metrics or currencies. These tensions are understood as internal contradictions that emerge from BBOP's own approach and the authors conclude that this fundamental contradiction reflects how BDO proponents deal with and intend to accommodate the critiques against the quantification and capitalization of nature. The discourse of flexibility in fact operates as leverage for accommodating the BDOs, and the calculative practices, in every context. They suggest that without closer attention to these internal contradictions and tensions, one cannot fully comprehend how the practices of capitalization and marketization of nature and non-monetary values operate discursively and practically.

Next follow two papers on REDD+ (reduced emissions from deforestation and forest degradation). In the first of these, Wendy Miles and Raymond Samndong explore the progress of REDD+, focusing on the issues of enhanced well-being, community inclusiveness, and ultimately an improved level of "citizen power" (Arnstein 1969). Since the Mega-Rice Project in the 1990s, villages on Indonesia's Kapuas River have been targeted for multiple development and conservation interventions. Over the past decade, Bikoro Territory in the DRC has experienced a series of agricultural development and forest governance projects. Using empirical research from the DRC and Indonesia, they analyse interviewees' assessments of their present participation in REDD+ compared to previous external interventions in the region. In both studies, REDD+ is perceived by locals to have more equitable benefits distribution, improved information sharing, and increased community involvement compared to past interventions. Yet, local voices remain absent in project conception, project management, and in the Indonesian case study, project closure. This leads the authors to question whether local participation is being employed as a means to an end (to legitimize REDD+ and supply the carbon market), or as a transformative process of empowering those affected by these interventions.

In her paper, Mariateresa Silvi focuses at the promise that REDD+ projects have the capacity to create win-win situations where CO_2 emissions cuts and sustainable development in the global South can go hand in hand. She notes that the legitimacy of these projects ultimately depends on the size of the second win relatively to the costs carried by local communities. The paper focuses at one of the two funding mechanisms

available for the payment of ecosystem services under REDD+ schemes to Southern countries – i.e., the market-based solutions as opposed to state-funds. Mariateresa argues that this approaches may: i) produce projects with an emphasis on conservation objectives as opposed to developmental objectives in the participating country; ii) exacerbate pre-existing inequalities in the distribution of income and resources; and that iii) the price volatility of carbon markets may prove detrimental to the long-term financial sustainability of the project, thus undermining the long-term feasibility of developmental outcomes. The implementation of REDD+ project requires in most cases changes in and creation of new institutions – likely to be long-term. In a market-based scenario however, this change is not matched by an equally long-term certainty regarding the developmental/compensatory activities involved as they are tied to the uncertain future of carbon markets. An example of market-funded project, the Kasigau Corridor project in Kenya is analyzed to illustrate the relevance of the hypothesis in a concrete case.

The last paper of the report is by Lan T. Pham, Julius Kapembwa and Deepak K. Gautam. They look at implications of the concept of the green economy for the South. They note that the concept of green economy is designed and developed in the North but has many implications and great importance for the South and Least Developed Countries. The paper discusses the adoption of the green economy model in the South through the case of the Zambian mining sector. Although efforts have been made to strengthen institutional basis for greening the mining industry, Zambia faces significant challenges including political prioritization of economic growth over environmental protection, weak regulatory frameworks and capacities, and asymmetric power between mine investors and local communities. The authors conclude that green economy can only take effect in the South with political will, effective institutions and capacity to enforce the institutions as well as equal standards by local governments and those of the North.

Noragric/NMBU, June, 2015
Arild Vatn

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Value Pluralism and Incommensurability in Ecological Economics

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Abstract

We live in times of global crises, where economic, social and ecological problems are increasingly entangled and therefore require novel answers. Economics is today holding a hegemonic position and dominates the way we understand and relate to the problems we face, and it continues to gain new territory. This is reflected in a value hegemony framing everything from biodiversity to carbon emissions in monetary terms. We consider this a democratic problem since the diversity of values is thus not fairly represented in our current mode of decision-making. We believe that the solutions to the grand problems of our time lie in a democracy where multiple values can be communicated. In order to provide inspiration for thinking about such a democracy, this paper provides an overview of a wide range of philosophical positions on values and value pluralism and analyses how values and value pluralism are treated in a selection of articles in ecological economics. The paper concludes that the treatment of values and incommensurability in ecological economics can be characterised as ambiguous. There is a need for further research on the theoretical aspects of these issues.

1. Introduction

"Aspects of the world are valuable.
That constitutes reasons for action" (Raz 2000:1).

Since the emergence of increasing, human caused, ecological disasters, such as loss of biodiversity, oceanic plastic pollution and mass deforestation, the issue of environmental values has become increasingly important. All over the world destruction and seizure of habitat is causing fierce conflicts, the settlement of which more often than not have devastating outcomes for the species and people who depend on and are constituent parts of these habitats. Economic valuation often plays an important role in such conflicts and economic valuation principles have become powerful political tools that influence decisions and actions regarding habitats all over the world. In this form of valuation, in order for any value to be taken into account it must be given a price and pass through machineries, such as cost-benefit analysis or payment for ecosystem services.

This raises a question of democracy. Is this a just way of representing opposing value interest? Is the interest of the indigenous to protect their habitat just as fairly represented

in these methods of valuation as is the interest of the multinational oil company? According to many ecological economists, this is certainly not the case, and in order to address the injustices and biases of monetary valuation they, among others, have proposed alternative approaches to valuation and settlement of environmental conflicts (Martinez-Alier et al. 1998 and Kallis et al. 2013).

Often these alternative methods of valuation are based on a non-reductionist view on values, which hold that it is not possible to reduce all values to one single value. This is in opposition to the monist view on values, which hold that all values can be reduced to one value and measured by a common metric (O'Neill et al. 2008). The former view is often referred to as value pluralism (ibid.), and it seems fair to say that most ecological economists belong to the pluralists when it comes to values and valuation. However, reading the ecological economics literature on these issues reveals a tendency to focus mostly on the development of alternative valuation methods and less on the more philosophical aspects of values and valuation. In order to fill this gap, this paper summarises a series of philosophical positions in relation to values and value pluralism and investigates how these are reflected (or not reflected) in a selection of ecological economics articles. To guide our investigation, we propose the following research questions: "How are values and value pluralism articulated as philosophical topics"? "How is value pluralism operationalized in a selection of the ecological economics literature"?

In order to answer these questions we have performed two literature reviews; one for each of the two. The first is a review of a loosely defined selection of literature concerning environmental ethics, values and conflicts. This selection, counting 9 articles and two books, was collected using combinations of words such as *values, value pluralism, ontology* and *intrinsic values* in Google Scholar, Web of Science and bibliographies. An analysis of this literature is conducted in section 2. The second review is based on a systematic search in the journal Ecological Economics using Web of Science and Scopus and the following key terms: *value pluralism*, *plural value(s), incommensurability*, and *incommensurable*. This resulted in 26 articles that are analysed in section 3.

2. Axiological positions

When confronting the issue of value pluralism, two aspects have spurred our interest: the first is the ontological status of values and the second is the question of value incommensurability. The first could also be termed the being of values, while the second concerns the (im)possibility of measuring values using a common metric. In the following, we will discuss various methodological approaches to these two aspects.

2.1 The ontological status of values

It is beyond the scope of this paper to account for all the philosophical positions regarding the ontological status of values or to offer an exhaustive taxonomy of these often repellent positions. However, we still wish to give a rough account of some significant and opposing approaches to the ontological status of values.

The first approach, we wish to mention is often referred to as *objectivist* or *value objectivism* (Gracia 1976). This view conveys the understanding that values exists objectively and independent of human conceptions. This means that objects possess qualities, which are intrinsic and as such constitutive of the object (French 1965). Along

these lines Crowder talks about moral objectivity, which states that there are basic human goods that exist and maintain their fundamental qualities regardless of what people might think of them (Crowder 1998). This type of reasoning about values can also be termed *realism* or *value realism* (O'Neill et al. 2008).

In direct opposition to the objectivist view we find an approach which is commonly referred to as *subjectivist* or *value subjectivism.* In this view value is a characteristic of the subject (Gracia 1976). Hence value does not reside in the object but in the perceptions and thoughts of the individual subject, which means that the value of a given object is dependent on how a subject perceives it: to one subject a specific tree might be worthless, while to another the same tree is precious.

A constructive rejection of the two preceding positions can be found in a *relational* view on value, which holds that values exist as a relational quality between a subject and a desired object (Gracia 1976). In a sense this view is objectivist, since it assigns the value to the object, however, this value only exist due to a particular situation which brings the object in relation to a desiring subject (Gracia 1976). The relational view on values can be taken to an extreme by rejecting the usefulness of the subject-object dichotomy. This is the case in Latour's empirical philosophy, which proposes the idea of *being as other* (Latour 2013). Being as other means that any entity exists by virtue of other things, thus subject and object emerge together and cannot be separated; they exist in reciprocity. This view can be applied to the issue of values, by saying that it does not make sense to separate the value and the valuer; they exist by virtue of each other and in relation to a multiplicity of other entities. This can be used to form a *constructivist* view on values, where values exist as multiple, hybrid entities composed of relations between human and non-human constituents.

Finally, there are more practice oriented views, which emphasise that social practices are necessary for the existence of value, since values emerge from social practices and cultural development (Raz 2000). Along these lines O'Neill et al. (2008:1) claim that "There are no such *things* as values. There are rather the various ways in which individuals, processes and places matter, our various modes of relating to them, and the various considerations that enter into our deliberation of action". Familiar to this is the view that institutions such as rules and norms that govern social practices become holders of values (Vatn 2005).

To finish this brief treatment of the ontological status of values, we wish to touch upon a long and on going discussion within environmental ethics regarding *intrinsic* and *instrumental* value. The main crux of this discussion regards the question of whether the mere existence of an entity can make it valuable. This leads to the following definition: "[…] a thing has intrinsic value only if it is judged that, considered in isolation, abstractly, by itself, and without regards to its consequences, its existence is better than its nonexistence" (Elliot 2005:51). This means that a thing has intrinsic value, if its mere existence is more valuable than its nonexistence.

The polar opposite of intrinsic value is called *instrumental* or *extrinsic value*, which Elliot defines as the value of being instrumental in bringing intrinsic value about. Thus, a thing has instrumental value "[…] if it is an instrument that assists in bringing something into existence which is intrinsically valuable" (Elliot 2005:45). This definition links instrumental value to the concept of intrinsic value. However, in our view, it is possible to talk about instrumental value without connecting it to intrinsic value. It is possible to say that a forest can be instrumental in providing valuable things, such as clean water,

peacefulness and beautiful sceneries without having to clarify whether these things have intrinsic value or not. In this sense, it makes sense to say that the forest has instrumental value without a clarification of whether this leads to intrinsic value.

Isomorphic to the preceding, it is possible to define intrinsic and instrumental value in terms of whether a thing can be considered an end in itself or merely a means for something else. If a thing is an end in itself it can be said to have intrinsic value. If it is merely a means for something else, it can only possess instrumental value (O'Neill et al. 2008). This definition relates to Thompson & Barton (1994) who suggest that the distinction between intrinsic and instrumental value resides in a distinction between ecocentrism and anthropocentrism. In this view, the appreciation of intrinsic value is an expression of ecocentrism, while the view that things are valuable only as instruments for human satisfaction reflects anthropocentrism. An ecocentric view on a forest would then be to say that the forest has value simply because it exists, while an anthropocentric view would hold that it has value because it is instrumental in providing valuable services and experiences to human beings.

Some of the earlier mentioned positions in relation to the ontological status of values can be recognised in various discussions of intrinsic and instrumental value. It is thus equally possible to have a moral objectivist and a relational view on intrinsic value. The moral objectivist view is probably the most common view on intrinsic value, since it fits well with the idea that a thing can be valuable in and for itself regardless of how other things relate to it. It is, however, possible also to have a relational view on intrinsic value saying that "[…] a thing has intrinsic value if it is approved of by a valuer in virtue of its properties" (Elliot 1992:140). This statement conveys the idea that value can be an intrinsic quality of a thing, even though this value will only exist in relation to a valuer and certain properties.

Despite the intellectually appealing aspects of the philosophical discussions of intrinsic and instrumental value, we find them rather speculative and displaced from the concreteness of the environmental and social problems of our time. Yes, it is interesting to try and categorise values philosophically, and it certainly does not exclude considerations of values in more concrete social and political contexts. However, to spend efforts discussing, for instance, whether a thing would have value, if nothing else existed (Elliot 2005) simply seems meaningless. We therefore feel encouraged to call for a more pragmatic approach to values that try, less speculatively, to investigate the existence and characteristics of values in specific places and moments involving multiple and often opposing concerns.

2.2 Incommensurability and value pluralism

As mentioned earlier, we live in times of environmental conflicts and controversies. All over the world struggles regarding habitats, resources and pollution take place involving multiple stakeholders and concerns. Often such conflicts are sought settled by attempts to commensurate opposing values by the use of monetary measures that assign the settlement of conflicts to markets or to calculative technologies such as cost-benefit analysis. In spite of the cunning elegance of some of these settlements, they never really seem to satisfy all concerned stakeholders. In most cases environmental conflicts result in great losses, especially for marginalised groups such as indigenous people or threatened species, who are often forced out of their lands or habitats.

This inappropriateness of monetary measures in solving value conflicts could be claimed to have its roots in value incommensurability, which means that the multiplicity of human values cannot be comprehended under one measure. In this sense, it is not possible to reduce all values to one super-value that can ultimately settle value conflicts (Crowder 1998). This is, however, what environmental economists are trying to do and what many ecological economists argue against.

Core to this disagreement is the distinction between value monism and value pluralism (O'Neill et al. 2008). Environmental economics is based on neoclassical economics, which confess to value monism: the idea that all values can ultimately be reduced to one value by the use of a single metric. Whether this value is pleasure, happiness or human dignity varies, however in neoclassical economics this value is called utility and the metric that quantifies it is money (O'Neill et all. 2008). From value monism follows the possibility of commensuration between values and the optimal settlement of value conflicts, which is the settlement with the highest net utility measured in monetary units (O'Neill et al. 2008).

The opposite of value monism is called value pluralism, which means that it is not possible to reduce all values to one value. In this context, incommensurability means the nonexistence of a single metric which can measure the quantity of all values and thus determine the optimal outcome of value disputes. Value pluralism implies that there is no "one size fits all" recipe for settling value conflicts. There is no given ranking of values which can always be applied. This calls for multiple means of valuation, if environmental conflicts are to be justly settled (Martinez-Alier et al. 1998).

The question of incommensurability transcends the previously described positions on the ontological status of values, in the sense that opposing views on the being of value, might still agree on the incommensurability of values. According to Crowder (1998) value pluralism has its roots in moral objectivity, which states that there are fundamental human values, such as liberty, justice and equality that exist and maintain there fundamental qualities regardless of what people might think and do. Since these values are fundamental, they are irreducible, which means they must be plural. In this view, there is a connection between the objective status of values and their plurality. However, we do not consider moral objectivism a necessary precondition for neither value incommensurability nor pluralism.

This view can be qualified by reference to French pragmatism as articulated by Boltansky, Thevenot and Latour and interpreted by Centemeri (2014) and Blok (2013). As Centemeri points out, there is an emphasis in French pragmatism on *modes of valuation*, which discovers and distinguishes sources of incommensurability not in the objective status of values, but in modes of practical engagement and coordination (Centemeri 2014). This does not rule out the question of objectivity, however, instead of objective values, Centemeri observes, French pragmatists stress the importance of modes of objectifying values based on codified knowledge and expert judgment. This indicates an implicit rejection of a substantive view on objects and values in favour of an emphasis on practices of objectification and valuation (Blok 2013, Centemeri 2014).

3. Value pluralism in ecological economics

This section explores how value pluralism and incommensurability are discussed in the Journal *Ecological Economics*, following three streams of thought: what do ecological economists mean when they speak about values, value pluralism and incommensurability? Why do both concepts matter in the community? And: What is being suggested as ways to conceptualise them in practice? We are well aware that the notions of plural values and incommensurability are implicit in a vast number of articles; however, in this study we only include the literature where the terms are made explicit.

A concise definition of "value" can be found only in two of the 26 articles. Lo understands values in a subjectivist sense as "personal judgments or dispositions as to what is right or desirable, and assumed to be of fundamental subjective construct preceding formation of preference, which refers to a ranking of alternatives and is seen as the immediate precursor of personal choices" (Lo 2013:84). Based on this understanding he illuminates that ecological economics is based on an alternative theory of value that draws on multiple philosophical strands, Sagoff's (1988) citizens values thesis and John Rawls's (1971) theory of justice being the most prominent ones. Yet there has not been an evolution to establish a value theory that explicitly takes into account environmental values and larger society wellbeing and future generations *(*Lo 2013*).* In a similar spirit, Chan et al. combine different ethical theories to define values comprehensively as "the preferences, principles and virtues that we (up)hold as individuals or groups" (Chan et al. 2012:10). In this meaning values refer to both fundamental ideals (held values such as justice or happiness) and also to the relative importance we attach to things (assigned values, such as monetary values of commodities) (Chan et al. 2012). To capture the diverse nature of values the authors suggest classifying them along eight dichotomies and applying different empirical valuation methods to account for different kinds of values.

Value pluralism is a colourful term for ecological economists that does not seem to demand specific explanation. It shines through that it is indeed a foundational normative pillar of the community; however, references made are mainly tacit and implicit, even in those articles that contain value pluralism as a keyword. The seminal article by Martinez-Alier et al. (1998) is generally THE reference point. Yet even there a clear characterization of value pluralism is largely absent. The authors describe the act of "valuing" as something that includes different perspectives and practices, hence there is a general agreement that framing any particular one dimension as "the true, real or total picture" is reductionist and thus has to be rejected, no matter whether physical or sociological reductionism is concerned (Martinez-Alier et al. 1998:282). Physical reductionism would be, for instance, defending an energy theory of value where all value is reduced to energetic terms; sociological reductionism could mean a position where all social phenomena are explained as emerging from one dimension, e.g. structure. Martinez-Alier et al (1998) defend that there are no universal values or ethical system that is correct. Söderbaum paraphrases value pluralism in the same spirit as the whole spectrum of "possible ideological or ethical viewpoints" (Söderbaum 1994:54). The other way around, accepting that there are different perspectives and different philosophical and ethical rationalities other than utilitarianism on how to deal with socio-environmental problems means accepting value pluralism (Spash 2013). This stance matches the nature of ecological economics as a discipline driven by issues of (in)equality, (in)justice, moral and

environmental values. On the other hand, valuing also includes different criteria and standards that might, as a general rule, end in valuation conflicts (Martinez-Alier et al. 1998). Going to church on a Sunday morning can be better than sleeping long according to one criterion but worse according to another. This framing establishes value pluralism as a multi-criteria problem: there is no optimal solution but only compromise solutions that require methods and tools that enable people to balancing out different conflicting criteria.

Lo (2013) introduces a subtle distinction between value plurality and value pluralism. For him value plurality means that there are a number of different categories of values, whereas pluralism indicates a normative position that renders an appreciation of plurality possible. As emphasised by Lo and outlined above, value pluralism is primarily considered an ethical and normative position that aims to complement economic values by a range of social, ritual, symbolic, ecological and other values. However it goes beyond that to include a political commitment to oppose developments that narrow down the expression of values (e.g. the increasing commodification of nature). Advocacy of democratic institutions that enable the diversity of values to speak and be heard is put forward as the main strategy.

Let us now turn to the notion of incommensurability. In order to get a deeper understanding of this second principal concept of our paper, we consider it easier to start with a discussion of commensurability first. In a nutshell, commensurability is the "enemy" reductionist mainstream economics approach to dealing with value. According to orthodox theory, economic value equals exchange value, i.e. the value at which goods change hands, usually measured in monetary terms. Monetary values assigned to goods and services make them comparable and tradable in markets, and "the market", in turn, is considered capable of producing "true value". Concerning environmental problems there is recognition of market failure that can be solved by either creating actual markets to internalise externalities into the price mechanism or by creating surrogate markets (shadow prices). There are two shapes commensurability can take. Strong commensurability is defined as a "common measure of the different consequences of an action based on a cardinal scale of measurement" (Martinez-Alier et al. 1998: 280), i.e. numbers taking the form of real numbers 52, 73, 9, etc. Weak commensurability, on the other hand, is a common measure based on an ordinal scale of measurement, i.e. ranks in the form of 1st, 2nd, 3rd, etc. Another crucial distinction is the one between strong and weak comparability. If one term exists by which options can be ranked, one speaks of strong comparability, whereas if this one term does not exist, weak comparability is implied. Weak comparability is the strongest form of not-being-able to measure and compare within and between options. A situation characterised by an inescapable value conflict. Martinez-Alier et al. (1998) argue that ecological economics rests on weak comparability only. This is a very strong assumption and what is commonly understood by incommensurability.

Incommensurability is defined as "the absence of a common unit of measurement across plural values" (Martinez-Alier et al. 1998:280) or "the fact that it is impossible to reduce all relevant features of an object, service or system to a single dimension" (Van den Bergh et al. 2000:53). In other words, ecological economists believe that because values are heterogeneous in nature, they cannot be compared quantitatively with each other, "not even in principle" (Kapp cited in Martinez-Alier et al. 1998:280). This is especially relevant for environmental decisions as they raise ethical and moral issues that are not

comparable with choices people make about ordinary consumer goods. Some values such as justice, love, or respect for non-human beings are seen as sacrosanct and thus considered taboo to be traded-off with other values (Temper and Martinez-Alier 2013). Chan et al. (2012) present several reasons why values are considered incommensurable. One is that because some values are central to worldviews ("sacrosanct"), leaving them out would risk losing the basis for all meaning and value. Another is that some values need to be personally experienced to be fully appreciated, e.g. in the case of transformative values associated with a site ("You had to be there.").

Most of the articles analysed take value pluralism and incommensurability as central properties in environmental decision-making as given. They are most often treated interchangeably and used as straps around the core analysis of papers. Several authors use a very similar way to frame and embed their arguments. Typically, the storyline goes as follows: incommensurability of values and/or value pluralism are mentioned in the introduction of the article as fundamental pillar of ecological economics (mainly citing Martinez-Alier 1998 and other (but few) "usual suspects" such as O'Neill, Vatn and Spash). These references seem to be taken as justification for not being explicit about what is meant by the respective terms. Following, the mainstream compression of values is attacked as being insufficient, misleading, distracting and ineffective and an argument is constructed that effective sustainable development policies demand dealing with conflicting interests and priorities, usually by means of creating some form of deliberative institutions or other new (mainly participatory) decision support methods. An epistemological claim for various sources of knowledge often follows, and a link to post normal science is established. The article usually ends by making some reference again about the importance of value pluralism and/or incommensurability. This approach is taken, for instance, by Shmelev and Rodriguez-Labajos (2009) with a case of multidimensional sustainability assessment in Austria; Ananda and Herath (2009) with a case of forest management policies in India; Bebbington et al. (2007) with a case of sustainability assessment models; or Zendehdel et al. (2008) with a case of a group consensus method applied in Iran.

Having established how our key terms are used (or not used) in the core ecological economics literature, we turn to the question why plural values and incommensurability matter for ecological economists. There is widespread agreement that the nature of the problems around (un)sustainability is fundamentally different from standard applications in economics. "Estimating costs and benefits […] is of little help if the problem faced by contemporary societies is one of values, ethics, ideology and even world views" (Söderbaum 1994:55). Ecological economists are generally not against economic values to natural resources but against the sole use of them. As ecosystem features are highly complex, dynamic and interrelated, their value cannot be condensed in a simple metric. Environmental risks and economic risks are not comparable at all because the nature of them is just too different. Damage to the environment is considered non-monetary in principle, often irreversible, and a collective problem.

Against this background, almost all articles contain a fundamental critique of the mainstream orthodox approach, with varying degrees of acidity. Söderbaum's article is primarily a critique of the mainstream cost-benefit framework to environmental problems (1994). Another example is provided by Temper and Martinez-Alier (2013) who attack net present value, using a case story from India. Overall, severe concern is raised that reducing values to a single one-dimensional standard in market and monetary

terms leads to "risk with human health and survival" (Kapp cited in Martinez-Alier et al. 1998:279). It is argued that it is highly misleading to take decisions based on only one type of value (Martinez-Alier and Temper (2013) providing a full account of the example of climate change; Spangenberg (2007) of biodiversity). By not respecting and accounting for irreversible and irreplaceable environmental damages and losses several goals of ecological economics are endangered simultaneously, e.g. social justice, or addressing the different faces of inequalities.

Decision-making processes are understood as situations were plural values and interests are omnipresent. In other words, decision-making is, at its core, about dealing with conflict. Ultimately, the challenge is to openly articulate different shades of values and finding ways to constructively dealing with them. Taking into account plural values and incommensurability does not mean that all conflicts can be solved, but they allow a deeper understanding into their nature and how they can be balanced out by political compromise and increasing transparency of the choice process (Martinez-Alier et al. 1998). "Environmental policy […], in order to be realistic, should […] deal […] with the higher dimensions of the system, those in which power relations, hidden interests, social participation, cultural constraints, and other "soft" values, become relevant and unavoidable variables that heavily, but not deterministically, affect the possible outcomes of the strategies to be adopted" (Martinez-Alier et al. 1998:282). It is argued that conflict might help sustainability. This view stands in stark opposition to the mainstream view that values can be "objectivised" and glossed over by presenting numbers at the end of a value-compressing exercise as "facts". Again, the standard utility model is completely compensatory, i.e. decisions involve trade-offs that can be offset by a large enough advantage over the disadvantage. For ecological economists, on the other hand, there are issues where no trade-offs are involved (Martinez-Alier et al. 1998 and Kallis et al. 2013). Whether people value something or not, there are certain critical parts without which ecosystems and thus life support systems do not function in the long term.

So, what are the implications of value pluralism and incommensurability in practice? If we assume that there is no and should not be one common unit of value to compare different options the key question arises: how can conflicts be resolved? What tools and strategies do we have to mediate between different values and situations of conflict?

An essential avenue of capturing different values comprehensively is by the application of a broad range of social-science tools and methods. Chan et al. (2012) make a case for such a multi-method and multi-metric approach. They argue that "market-mediated values", for instance, can generally be accessed by applying monetary valuation, whereas "non-market-mediated values" largely cannot. For "biocentric values" (e.g. intrinsic value for non-human beings) and "other-oriented values" (e.g. future people) deliberative approaches are more suitable than economic valuation methods. Some forms of values demand a richer form of communication such as narration. On top of this differentiated tackling of values, a combination of methods seems sensible to account for the fact that usually more than one kind of value is involved (Chan et al. 2012).

Multi-criteria analysis is one of the methods mentioned by most of the authors as a promising approach to compare alternatives under incommensurability of values. It is a methodology to structure complex problems in matrix form, with alternatives on one axis and evaluation criteria on the other. The matrix can consist of qualitative, quantitative or both types of information and can be applied for macro, micro and project evaluation. This framework is expected to enhance a decision process by fostering transparency and

notions of quality and process. Originally not participatory, the approach was further developed to include working with different stakeholders to increase the quality of deliberation, an approach called social multi-criteria analysis (Garmendia and Gamboa 2012).

Biophysical indicators or satellite accounts are another, though only briefly mentioned, option by Martinez-Alier et al. (1998), Söderbaum (1994) and Spangenberg (2006) to represent plural values. Non-monetary measures of the environment matter as they are a relatively direct way to assess both quantities and qualities of environmental media. As such, measuring material use in tons, energy use in Joules or water use in litres or the toxicity of chemical substances seem appropriate for effectively assessing environmental problems. The development and use of such measures also distinguishes ecological economics from environmental economics, where values are traditionally expressed in monetary terms.

The precautionary principle is put forward by Aldred (2013) as another approach based on incommensurability claims. He argues that the precautionary principle can be justified on the basis of a combination of uncertainty and incommensurability. If uncertainty is high, a low incommensurability claim is sufficient to justify the application of the precautionary principle, and vice versa. Opposing views of some economists that the precautionary principle cannot be practically applied he tries to make a case in the context of climate change decision-making. Drawing on political philosophy he argues that incommensurability implies a discontinuous ordering of possible outcomes, which fits the nature of the climate change problem as "climate risks and economic risks are not comparable at all" (Aldred 2013: 137). However, he largely remains unclear about how to operationalise the concept, but rather provides, in his own words, "an explanatory framework for helping decision-makers structure their thinking in a way that focuses discussion and so might facilitate debate and agreement" (Aldred 2013: 139). At the end, he briefly mentions that safe minimum standards endorse incommensurability claims alike.

Deliberative valuation methods are propagated as the most prominent "group of methods" for dealing with plural values. Deliberation means "a particular sort of discussion that involves the careful and serious weighing of reasons for and against some proposition. It is the act of considering different points of view and coming to a reasoned decision that distinguishes deliberation from a generic group activity. Emphasis is given to the product that arises from discussion (e.g. a decision or set of recommendations), and the process through which that product comes about" (Antunes et al. 2009:933). In addition, deliberative approaches "presume the existence of irreducible conflicts in values and beliefs" (Lo 2013:85). Based on Habermas' account of communicative rationality, they are interactive processes of communication coordinated through discussion and socialisation of individuals with the goal to achieve generalizable interests or, in other words, a workable agreement. This is based on the assumption that people are capable and willing to listen to each other and open about sharing subjective values. The hope is that after deliberation people become more sympathetic to each other's position (Lo 2013). A plethora of disaggregated and ethically open methods are suggested, such as citizens' juries, multi-criteria mapping, trade-off analysis, participatory modelling methodology, deliberative visioning, participatory multi-criteria analysis, or alternative water forums (Antunes et al. 2009, Kallis et al. 2013, Kenyon 2007) While strongly

propagated in the ecological economics community, Kallis et al. (2013) highlight that these methods are still marginalised.

Value articulating institutions are highlighted as a way of framing methodologies fit for wrestling with different values so that plural values can speak (Kallis et al. 2013). They are sets of rules that shape social processes of valuation by addressing questions such as: Who shall participate? In what role? What data is considered relevant? How is data processed? (Vatn 2005). The choice of specific value articulating institutions influences what values are included, what are excluded, and what type of conclusion can be reached (Vatn 2005). An example of a plural value articulating institutions is courts, as they enable different logics to be sustained, e.g. historical justice, or expressing values of recognition or responsibility (Kallis et al. 2013).

Besides the application and combination of different methods and methodologies in a sensible way, two other strategies are highlighted in the literature as paving the way towards value pluralism in practice: a more conscious use of language and looking for alliances within and beyond academia. The use of specific language is propagated as one way to change discourses about values. The argument is that certain languages supress other languages and thus values. Concepts such as ecosystem "services" and "natural capital" are not innocent but increasingly frame human-non human relationships as exchange value relationships and thus have to be approached with caution or rejected altogether (Kallis et al. 2013 and Spash 2013 respectively).

Teaming up with other research fields is suggested as another strategy to strengthen a value pluralistic position. Kallis et al. (2013) argue that ecological economics could strengthen its opposition to the mainstream by gaining insights from Political Ecology on issues of power, institutions, institutional change, and explanations why mainstream economics became to dominate. The authors describe that while plural values is a hobby-horse for ecological economists its implementation will remain difficult and "politically ineffective if they do not recognize the social processes and dynamics that make this normative proposal so hard to implement … Why does the World Bank or International Union for Conservation of Nature promote markets for ecosystem services and not deliberative forums? Without a social, political-economic theory such as the one offered by political economists, the critique of ecological economics will remain a methodological and normative one and will not go far" (Kallis et al. 2013:100). In the same spirit, Spash (2013) emphasises that the broad nature of ecological economics based on value pluralism demands links across heterodox schools of thought, e.g. to critical institutionalists, evolutionary and feminist economists, and critical realists. Chan et al. (2012) join the canon by expressing that anthropologists, sociologists, ethicists, etc., attempt to account for a broader set of values too and that alliances to those fields are necessary to make decision-making frameworks more comprehensive in values. Some authors (e.g. Chan et al. 2012 or Hardy and Patterson 2012) formulate the need for extending alliances beyond academia to include other stakeholders as well, such as policy makers, practitioners, CSO representatives, or indigenous groups. These desired collaborations entail a plea for a post normal science approach towards research.

4. Discussion and conclusion

As PhD researchers learning about *Ecological Economics* for a number of years, we have been exposed to repeated claims that plural values and incommensurability are foundational pillars of the discipline. This motivated us to look more closely into this topic. Against this background it is very surprising to discover how little attention is paid towards both notions in the journal. Out of a total of approx. 8500 articles, only a handful of about 6 or 7 articles seriously tackle value pluralism and incommensurability. We are concerned that there is extremely little debate in the core journal about one of the roots of the field and wonder why this is so. Is theory not considered useful to inform normativity? Couldn't a deeper understanding of what values are, how they emerge and exist inform dealing with value conflicts? We believe that it could.

The lack of theoretical grounding gives way to a pragmatic approach of dealing with different values. The main focus within the ecological economics community clearly is on how to put plural values and incommensurability into practice. However, it seems to be some sort of "pick and choose" approach, i.e. author A proposes this method, author B that one, author C yet another one. There seems to be general agreement that the mainstream approach is generally "bad" and that deliberative/democratic/participatory methods are generally "good" but in the sample literature from the journal there is little systematic investigation about what deliberative methods actually are, why they are better, in what contexts, and what their potential problems are[2]. The pragmatic approach taken rests on a huge assumption that more democratic processes will lead to less unsustainability and that social cooperation based on communication is a way to resolve conflicts. Democracy in general, and direct democracy in particular in the form of more public engagement, appeal as a way to achieve consensus about plural values, especially in the case of collectively held sustainability problems. It remains an open question whether this is really the case. The question what the evidence is for and against democracy as a tool to deliver sustainability remains unasked and largely unquestioned. Although we do see great advantages of participatory deliberative processes, we also argue that they are no guarantee for dealing with plural values per se. Participatory approaches are loaded with difficulties and raise questions such as, how to cope with influential social actors who shape opinions? How to make sure that facilitators have the relevant skills to manage participation processes effectively? How to avoid artificial consensus? We suggest that more research is needed to show how, when and why deliberative methods are successful in addressing plural values and to understand why they are still marginalised. Until now the methodologies suggested in the literature are rather technical and largely do not address issues of power: Who values? How? And why? We support voices that suggest learning from other fields such as political ecology (Kallis et al. 2013) or classical institutionalism (Spash 2013) to better understand the dynamics underlying valuation.

In the section about axiological position, we described different positions in relation to the ontological status of values. In spite of a very limited explicit treatment of this subject in the reviewed ecological economics literature, it is still possible to discover expressions of some of these positions. The subjectivist approach to values can be found in Lo's definition of values, which emphasises the personal and subjective origin of values

[2] Lo and Spash (2013) form the exception by showing that not all forms of deliberative methods defend value pluralism, e.g. deliberative monetary valuation (DMV).

(Lo 2013), while the objectivist approach can be found in the view that vital elements of ecosystems are objectively valuable, regardless of human valuation, due to their importance for the overall functionality of these systems (Martinez-Alier et al. 1998, Kallis et al. 2013). Even though it is possible to find both subjectivist and objectivist approaches to values, the most prominent approach seems to be an understanding of values, which emphasises practices of valuation and value articulating institutions (Vatn 2005). This conceptualisation of values is somewhat parallel to French pragmatism, as touched upon earlier, in the sense that it reflects an interest in how values are articulated through modes of valuation. In this view, the question of incommensurability becomes a question of struggles between opposing modes of valuation.

We find that such questions have not been exhaustively treated in ecological economics, and that there is a need for furthering the research on values and methods of valuation. Ecological economics has contributed to the conceptualisation of value articulating institutions such as multi criteria analysis and deliberative methods, but it seems to us that this work can be seen as basis for continued research in and further development of these institutions[3]. This connects to our view that the solution to the problems of our time is a democratic issue. If we want to change things, then we need to transform our democratic institutions and processes. In our view this calls for increased attention to values and value articulating institutions.

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Green economy researchers: between revolution and pragmatism.

How do young researchers perceive the need for societal change and the role of science?

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Abstract

The Green Economy is a strategic development concept of the United Nations with a broad array of potential meanings and implications. Consequently, it is subject to academic conceptualizations, operationalizations, reflections and criticism. The aim of this paper is to conceptualize a subset of the multi-faceted and at times polarized debate around the implications and applications of Green Economy and to provide reflective grounds for approaches towards the concept. Using qualitative content analysis and participatory research, we investigate perceptions of young researchers from various disciplines working on issues related to the Green Economy. The spectrum of disparate perceptions observed among the respondents is accommodated within a two-dimensional model. The dimensions are 1) the degree and nature of necessary societal change in relation to the current economic model and set of institutions, and 2) the role of research in delivering such change. We will briefly discuss the model in light of existing literature on the topic. We hope this paper will support self-reflection on the potential and limitations of the Green Economy and on the meaning and the role of research to promote required changes towards sustainability.

Keywords: Green economy, Pragmatism, Radicalism, Methodological pluralism, Societal transformation, Sustainability

1. Introduction

Political agenda setting on the global level often leads to broad and overarching concepts that many decision makers agree upon, while allowing for a wide range for

interpretations. This appears to be the case with the concept of the Green Economy (GE), which was presented at the 2012 UN Conference on Sustainable Development in Rio de Janeiro as a vehicle for sustainable development and poverty eradication. A general GE definition was proposed by the United Nations Environmental Programme (UNEP): an economy that results in 'improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities' (UNEP 2011, p. 2). UNEP's concept, however, has also been criticized as a 'red herring' due to its focus on economic growth and the concept's inability to resolve 'the basic contradiction between ever-expanding human activity and a finite world' (Spash 2012, p. 98). This poses the question whether GE is a sufficiently transformative concept to enable real sustainable development.

At least at academic level, the GE discussion poses a double challenge to science. On one hand there researchers from different backgrounds take part in the discussion, posing a challenge of interdisciplinary communication and collaboration (e.g. between social and natural scientists). On the other hand the GE concept requires both academic operationalization and societal implementation, posing a transdisciplinary challenge of interaction between the realms of research and public policy making field. To face these challenges, researchers will need to reflect upon the content and meaning of the GE and their own role in it (cf. Farley 2012). In other words researchers need to ask: to which extent research should refrain from policy making, politics and society and to what extent researchers should engage in these fields.

During the 2014 Thor Heyerdahl Summer School (THSS) on Environmental Governance at the Norwegian University of Life Sciences (NMBU), a group of early career and graduate researchers discussed multiple connotations and individual perceptions of the GE, as well as the role of scientists beyond sciences. The authors of this paper, being participants in the THSS themselves, saw an opportunity to engage with other participants in a deliberative space to better understand predominant framings and interpretations of the GE among young scholarship, and to determine how interactions between researchers, politics and society are regarded. This paper is the outcome of this participatory research. We focussed on the role of research in society, and on individual attitudes and perceptions of researchers towards the GE. Consequently, our research question is: *How do young scholars perceive the Green Economy concept, the need for and degree of societal change, and the role of research in promoting this change?*

In order to capture different understandings of the GE, we presented a definition to participants without implying the contested notion of economic growth as a starting point: the GE is a strategic concept to help address allocative and distributive problems within planetary boundaries. We applied an inductive content analysis (cf. Mayring 2000) of data gathered from our focus group discussion and survey questionnaires. The structure of the paper is as follows; section 2 describes the research methodology, section 3 presents some results of the empirical investigation; section 4 discusses the implications of our sample of perceptions of the GE and science in the light of transformations towards sustainability; section 5 concludes.

2. Methods

This paper presents the results of a qualitative content analysis of data obtained through questionnaires, and a focus group discussion among all participants. We, the authors, have reflected on the participatory observations during and after the THSS. In this section we explain our methods of qualitative content analysis: describing the sample from which data was drawn; elaborating on our inductive approach; using questionnaires and focus group discussions; and explaining the subsequent coding process.

2.1 Qualitative content analysis

In content analysis a well-defined set of tools is employed to investigate content features of any kind of media. In our analysis content analysis mainly focused on texts in questionnaires and in transcriptions of focus group discussions. Content analysis was employed to check for the absence or presence of certain keywords, phrases and concepts. Due to the variety of methodologies and applied procedures available within the content analysis, it was necessary to identify and select the most appropriate approach for our purpose. The classical/conventional content analysis - where codes are derived from and defined during the actual data analysis - is also known as inductive category development (Mayring 2000). This approach is appropriate when researchers to describe a phenomena (assumed or existing) in absence of a suitable theory (Kondracki and Wellman 2002; Mayring 2000). We argue that such was the case, as no clearly predefined categories were available that describe the relation between research and the GE, while examination of our data could inform category development.

Reliability and validity are vital to all types of content analysis. Individual categories of content analysis need to be defined as precisely as possible in order to assure that different analysts will get the same results. Furthermore, the content as a whole needs to be analysed by means of applying well-defined categories. Regarding this, the context needs to be analysed in terms of existing syntax and the available semantics – all kind of latent ambiguity or probable intentions have to be treated with care (Berelson 1952). To this effect, the authors of this study went through several iterations of defining and redefining categories, repeatedly examining participants' first-hand. To prevent possible theoretical biases, the interviews were transcribed to represent participants' perspectives as objectively as possible. Our content analysis is therefore data driven and can inductively help to develop concepts and models that better locate the GE in relation to researchers.

2.2 Sample of participants

Our survey was conducted among the participants of the THSS on the GE, held 16-27 June 2014 at the Norwegian University of Life Sciences. The course admitted 24 participants (including the authors of this paper), who were selected through a competitive process. Formal requirement to be considered for enrolment were: candidates had to be PhD student or researcher of proved academic quality. The main concern in the screening of motivations was whether candidates' interest and research topics were compatible with the overall theme of the summer school, namely the GE. The selected participants have different academic backgrounds (including social sciences, ecology and economics) and a total of 20 of different nationalities, including from Africa, America and Europe. According

to Arild Vatn, the organizer of the course, the theme of the GE was chosen especially because it evokes different ideas and framings and would therefore be 'pushing contrasting things', while still focusing on 'the relation between economic processes and nature'. The leading idea of the THSS was thus not built around a fixed understanding of the GE. Rather, it was designed to maximize deliberation. Not only was the selection of early career researchers diverse, invited speakers came from different disciplines, and had widely varying understandings of, and positions towards, the GE.

2.3 Data gathering: participation, questionnaires and focus group discussion

Given the closeness and familiarity with the course and its participants, the authors have benefited from intensive involvement and personal observations during the course. A key component of this research was the participatory and self-reflective approach.The authors participated in the entire summer school and therefore could gain an in-depth understanding of the ongoing discourses.

One week into the THSS, semi-structured questionnaires were distributed to all participants of the course except the authors (20 respondents in total). Respondents had about 36 hours to respond in their own privacy. The questionnaire included questions about personal perceptions of the GE; of the nature and extent of necessary societal change; of the role of research in delivering change; and of personal contributions and visions. After receiving responses to the questionnaire, the authors organized and moderated a focus group discussion, evolved around two main points: 1) the perceived need of change towards a more sustainable economy; and 2) individual and personal understandings of the role of research in change processes. As discussion starters, we put up five concepts on a blackboard, namely: 'status quo', 'pragmatism', 'evolution', 'radicalism', and 'revolution'. Participants were invited to associate these initial words with concepts, ideas, discourses or even names of individual researchers (in this case, names of THSS lecturers were used as 'surrogates' to identify or symbolise particular visions or ideas). Many concepts and ideas were added on the blackboard, as participants freely talked and associated. The exercise was very interactive, while the authors of this paper moderated and documented the discussion.

2.4 Coding and positioning process

The process of data analysis included a first reading of questionnaires and the transcribed focus group discussions, texts were read in detail in order to develop appropriate codes and categories (Coffey and Atkinson 1996; Morgan 1993; Morse and Field 2005).

A code is a word or short phrase capturing the essential meaning of a portion of data. The draft of the coding scheme was revised and refined in an iterative process, until the final version (see Appendix). Individual codes were then sorted into more general categories such as Values (common general values and ideas shared in the group), green economy (opinions / ideas), and two dimensional categories regarding the perceived need for societal change ('revolution' for drastic change and 'evolution' for incremental change), and the role of research in promoting change ('radicalism' for critical revision of the current research processes and 'pragmatism' for a collaboration with existing institutions). Section 3 further elaborates on this process, and condenses the results into a four quadrant model. In addition, we examined personal statements regarding the

concept of green economy, and using the codes we developed, positioned the GE concept within our model, based on the positions of participants (including the authors).

2.5 Literature review

We conducted a non-exhaustive literature review in order to check the plausibility of categories and the model developed. Some research has been conducted on the role of science for sustainability (cf. Cash et al. 2003; Costanza 1992; Irwin 1995; Kates et al. 2001; Norgaard 1989). Scholars have differentiated 'weak' from 'strong' sustainability, which comprise larger categories of quite different and varied approaches (cf. Neumayer 2003; Ott and Döring 2004). Moreover, scholars have also distinguished 'radical' (cf. Kemp 1994; Adams 2003; Ehrenfeld 2005) from 'pragmatic' sustainability (cf. Sayer and Campbell 2004; Littig and Griessler 2005; Spash 2009).

Summarizing, we could find several positions that relate to our model (see section 3). In this context radical means substantial and systemic changes in business and societal values. Pragmatic does not refer to the philosophical current of American pragmatism, but to a 'hands on' attitude which considers choices within an extant economic system. Research on science and researchers has, moreover, been the mainstay of 'science and technology studies' (cf. Pielke 2011). Regarding critical voices there a body of literature on 'greenwashing' (cf. Laufer 2003) and 'green capitalism' (cf. Sullivan 2009) or 'green grabbing' (cf. Fairhead et al. 2012). The literature review will be briefly referred to in section 4, where we discuss the implications of our model and potential similarities to other concepts. The perceptions and attitudes captured by the conceptual model proposed in the results are connected to the debate on the role of science for sustainability and the political approach to reform. Very often there is call for applied, interdisciplinary, transdisciplinary, sometimes democratic science for sustainability (Cash et al. 2003; Costanza 1992; Kates et al. 2001; Sayer and Campbell 2004; Pielke 2001) and methodological pluralism (Norgaard 1989; Popa and Guillermin 2014; Spash 2009). A study by Sandbrook et al. (2013), for example, suggested that perspectives of conservation professionals and academics on the growing use of markets and market-like instruments in the context of biodiversity conservation are far more sceptical than than the positions articulated by their organisations. Torgerson (2001, p. 472) writes: 'A central tension marks thought about prospects for a green economy. […] The question […] is whether a functional politics of system adjustment and adaptation is the right path or whether a green economy depends on a constitutive politics aimed at creating a system that is altogether different.' Furthermore, existing literature (Neumayer 2003; Ott and Döring 2004) proposes a differentiation in 'weak' and 'strong' sustainability approach (perhaps somewhat similar to the definitions of Evolution and Revolution in our model). The concept of 'Pragmatism' is not explicitly recognized by the positions we would call pragmatic (Adams 2003; Ehrenfeld 2005; Laufer 2003), however it has explicitly been criticized from positions we would rather call radical (e.g. Spash 2009). In synthesis, while fairly abundant literature exists on the issues discussed in this paper, we have focused on empirically drawing these positions and highlighting differences and similarities among them, under a conceptual lens. In any case, such different positions are often not as sharply distinguishable as in theory.

3. Results

The qualitative analysis of the data obtained from the questionnaires and the focus group resulted in several codes, sorted in four categories: 'Values', 'Green Economy', 'Necessary societal change', 'Role of research'. The latter two categories include two sub-categories each, respectively 'Revolution' and 'Evolution', and 'Radicalism' and 'Pragmatism'.

The category 'Values' includes 22 codes that refer to values and ideas among the participants. These include the recognition of 1) intertwined 'social equality and social justice' issues (count 38) that evolve around unsustainable production-consumption patterns (materialism), land and human rights, (corporate) power, conflicts and wars, intergenerational justice, (rising) inequality and poverty, (increasing) privatization and/or economization, and North-South relations; 2) 'ecological and environmental problems' (count 26); for example, biodiversity and habitat loss, and climate change; and 3) multiple responsibilities of research and researchers, for instance, 'knowledge generation' (count 26) and teaching and (facilitating) learning processes (count 20). While respondents have their own specific set of values, values and problem statements could sufficiently be generalized into commonly understood categories relating to Green Economy and sustainability for the purpose of this research.

Opinions and perceptions of the GE, however, were more diverse. 'Green Economy' includes 12 codes describing respondents' ideas and perceptions. The GE is largely understood in terms of a 'three-pillar model of sustainability' (count 18) and as a 're-enforcement of the current political and economic structure' (count 15) involving a variety of stakeholders (count 14). These expressed statements include descriptive understandings, as well as personal value judgments. GE is seen by some as a way to promote 'Growth without damage' (count 11), motivated by 'Good intentions' (count 7); and an instrument to pursue dialogue with 'Stakeholders'. However, others stressed that GE is 'not innovative and critical enough' (count 9), 'unrealistic' (count 6), as a 're-branding of old ideas' (count 4); or as 'contradictory' as there could be no continued growth within ecological boundaries (count 4). This diversity in notions about the Green Economy showed us that respondents are divided as to whether they belong within the 'circle of GE', or whether they place themselves outside of it (Figure 1).

We have identified two dimensions among which the respondents differ the most: The first dimension is 'Necessary societal change', which includes codes related to the respondents' perception of the degree and nature of perceived necessary societal change in the face of environmental and social problems, and their perception of achievability. This category is divided in two sub-categories, namely 'Evolution' (8 codes) and 'Revolution' (12 codes). The second dimension is the 'Role of research', which relates to respondents' perception of the role of research in the promotion and the implementation of societal change. This category is divided in two sub-categories, namely 'Pragmatism' (8 codes) and 'Radicalism' (9 codes). Based on the two categories 'Necessary societal change' and 'Role of research' and on their four sub-categories, we sought to capture the perceptions of participants regarding the degree and nature of research an necessary societal change in a bi-dimensional model the (Figure 1). The horizontal axis, identified by the extremes of 'Evolution' and 'Revolution', describes the nature of desired societal change. The vertical axis, identified by the extremes of 'Radicalism' and 'Pragmatism', refers to the attitudes participants have towards scientific contributions in societal change. The words we used to describe the extremes of the axes have several meanings

and a long etymological and philosophical tradition. They spontaneously arose in the discussions during the course and were frequently repeated by several participants. Their meaning and conceptual implications were long discussed during the focus group. Based on the codes resulting from our data and with the auxiliary use of the Oxford Dictionary (2014), we derived the following definitions of the extremes within our model. "Revolution" refers to an intended change towards an alternative economic and institutional system defined as being structurally different from the current one. It is seen as "fundamental change". "Evolution" refers to an incremental and self-organizing change within the current system. We define the current system as the growing international market liberation, while an alternative system is negatively defined by being opposed to the current one. It is seen as a "transformative change". Both evolution and revolution are referred to as institutional change. "Radicalism" is characterized by a critical attitude and a certain non-negotiable set of values and their defence. Some respondents, for example, referred to it as a "critical assessment of our options". "Pragmatism" is etymologically bounded to its action-oriented connotation, especially focused on feasibility. For instance, a respondent suggested that 'Trial-and-error is better than doing nothing'.

Following the analysis of the participants' perceptions regarding the Green Economy concept and the role of research, the GE seems to resound mostly as an approach to pragmatically improve the current system through incremental actions that include an active role of researchers (see the left-downward centred circle shape of GE in Figure 1). We furthermore positioned the participants (according to their statements) and ourselves (individual reflections) within the above four quadrant model (see the anonymised 'X's in Figure 1). This preliminary positioning process – of course – can only provide the basis for an incremental process that might lead to a more precise insight of the underlying network structure. A complete network structure would include both the outside view as well as the ego-centered network: view of one specific participant. Therefore, a potential follow-up research would need to include a series of individual interviews (ideally including every single participant of the Thor Heyerdahl Summer School 2014) to either confirm or to adjust the currently determined positions. In the following, we describe each quadrant.

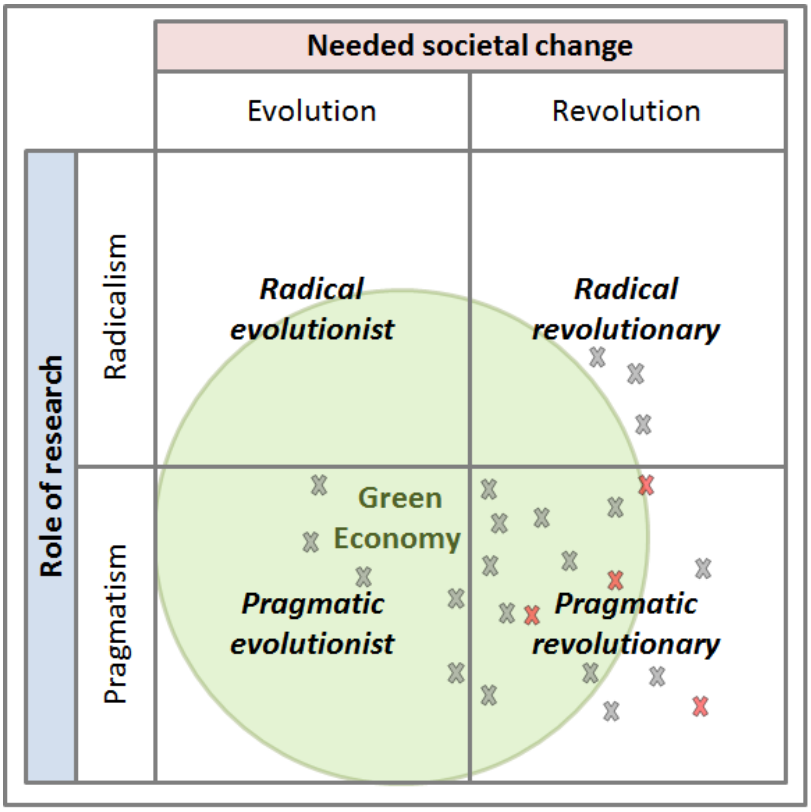


Figure 1. Perceptions of young researchers on science, societal change, and on the Green Economy. The horizontal axis is the perceived need for societal change (Revolution vs Evolution), while the vertical axis refers to attitudes towards the role of science (Radicalism vs Pragmatism). The Green Economy is mainly perceived as an approach within the current system (evolution) and an action-oriented style of research (pragmatism). The 'X's represent preliminary determined positions of the summer school participants (including the authors, red colour 'X's) that respectively derived from analysing responses and from individual reflections. Within a possible follow-up research, each participant would be given the opportunity to reflect his/her preliminary determined position and to undertake possible alterations.

Radical evolutionist: '*Radical conservatives actually exist*' (Participant in the focus group discussion). This quadrant includes a radical defence of values that are present in the current system, such as economic growth and capitalism. From a radical evolutionary perspective, ecological and sustainability problems stem from a not yet perfected global capitalist system. Consequently, problems cannot not be solved but through the more consistent application of means within the current system. Arguments associated with this position are built around unified and mainstream theoretical visions of a capitalist world. Change takes place through self-organizing techno-industrial progress or through social innovation. In this view, a free market and the abolishment of subsidies will dramatic increase demand for the most (e.g. energy and resource) efficient solutions and innovations; through ongoing commodification of services and pollution rights, damages will be minimized and benefits maximized. Social inequality can be minimized as the wealth of the rich will trickle-down to benefit the others. Research strategies from a radical evolutionary perspective are similarly based on the assumption that the current pattern of economic growth could solve social and ecological problems. Rather than aiming at fundamentally criticizing the capitalist system, a researcher in this perspective would argue that the current system is not capitalist enough, and he/she would be

inclined towards the study towards and the application of technological development, market-based solutions, free trade, and the eradication of government intervention.

Pragmatic evolutionist: '*Revolution and a new system will not come timely enough. Let us try to pursue change within the current system, until something new arises.*' (Participant in the focus group discussion). The "pragmatic evolutionist" believes that efforts should be directed towards mitigating the failures of the current system, with flexibility, experimentation, and practical, workable solutions. Stances can include strategies of internalization of externalities, policy mixes in regulation, economic instruments, technological innovation and social creativity. In this context, 'acting on solutions' is about identifying feasible solutions within the current system and applying them. It requires no fundamental change in current power and institutional structures. The concept of path dependency, as in adaptive change, is about the path of least resistance in improving the system. The main strategy consists in working with and within the current system and making positive contributions to politically feasible options. This allows for a plurality of visions and elasticity to compromise. There might be a perception that improvement is necessary, but a systemic change is not intended. Research strategies from a pragmatic evolutionary perspective assume the inevitability of capitalism and economic growth - at least on the short and medium term -. However, in this perspective social and ecological problems are also associates as inherent to the current system. The research in this perspective is to address these inherent ills through the creation and application of solutions that enhance the resilience of the current system.

Pragmatic revolutionary: '*Pragmatism and evolution will bring us to the boundaries of pragmatism, entering radicalism*' (Participant in the focus group discussion). The 'pragmatic revolutionary' explicitly seeks for an alternative system, but also believes that there is no singular and valid vision, but a plurality of those. This requires a need to compromise in deliberation. Underlying this stance could be the idea that abrupt and fundamental change will lead to violence and should therefore be avoided. A new system should be reached through a context dependent, adaptive, and systemic strategy. Existing instruments are not sufficiently innovative to deal with the inherent and deeply rooted problems of current institutions. Visionary processes and spaces have to be created. This calls for an intentional change and the acting on feasible solutions that lead to fundamental change and ultimately an alternative system. For this to happen, current power and institutional structures need to be challenged and changed, for instance by engaging with unconventional agencies in deliberative processes. A pragmatic revolutionary researcher would combine fundamental critique of the current system with deliberations of possible alternatives, perhaps actively creating spaces for deliberation beyond academia. Transformations do not need to happen quickly, in fact, slower, deliberatively reflected transformations are preferred. The end-state of incremental changes, however, should represent a fundamentally different system from the current capitalist system.

Radical revolutionary: '*I totally don't want to extend this past to the possible future that we have'* (Participant in the focus group discussion). The "radical revolutionary" is characterized by a non-negotiable set of values and seeks to fundamentally change the current system. The current system is perceived as fundamentally flawed. The required change is drastic and it is about fundamentally changing the quality and structure of e.g. the industrial metabolism, and can only occur through a unified front of progressive

agents. The radical revolutionary seeks to construct a unifying notion to replace the hegemonic economic system. To challenge and alter power structure and dominant values of the current system, visionary spaces and places have to be strengthened, where critical voices and visions of strong imaginative power are loud and clear enough to set systemic change in motion. The radical revolutionary vision fits a research strategy that shows the need for fundamental change and for options that fit in an alternative economic and social order. The radical revolutionary researcher disapproves of the capitalist system, while rejecting 'solutions' that increase the resilience and longevity of an inherently corrupt system.

4. Discussion

In this paper we aimed to conceptualize the debate in a stylized model, which may support academic and individual reflections on the debate around the role of science in and for a Green Economy. To capture the debate we identified general categories of 'problem statements' with regard to Green Economy shared by the participant, including 1) a common recognition of the need to address interlinked ecological and social problems; and 2) the need for research to provide options, guidance and solutions to policy making. With regard to the concept of Green Economy we recorded a great variety of opinions about Green Economy. Our results show that the Green Economy is generally perceived as a new framing for sustainability that may be associated with some stimuli for changes within the current political economy towards more environmental friendliness and social justice, rather than a concept of systemic change.

We devised two dimensions to capture a wide variety of views among researchers in our sample, of necessary societal change; of the role of research; and of positioning within or towards the Green Economy. In our model, the Evolution - Revolution axis signifies the need for societal change, where evolution refers to the perceived need of an incremental development of the current economic and institutional system, while revolution refers to the perceived need for fundamental change. The Radicalism - Pragmatism axis refers to the perceived role of research: Pragmatism seeks workable solutions and acts on a plurality of value systems, and therefore is willing to compromise in practical terms, while radicalism departs uncompromisingly from a single value system, which narrows the options for research to engage in problem-solving through incremental solutions. When applying this model to our sample, it is worth noting that we do not identify any of the participants as a radical evolutionist promoting the current system as the way towards sustainability. Some respondents could be identified as pragmatic evolutionists wanting to adapt the current system towards sustainability. Most may be 'labelled' as pragmatic revolutionaries that seek to reach an alternative and more sustainable system in an adaptive way. Finally, some might be radical revolutionaries that promote a disruption from the current system into an alternative one and do not share the approach of incrementally greening the economy.

These valuations of the Green Economy have great implications for the perceived role of scientists. Researchers who deem a different system necessary or might hope for incremental change are prone to organize their work accordingly. In our model, Green Economy is mainly located in the pragmatic evolutionary quadrant and only partly overlaps with the other three quadrants. This means that for each quadrant, there

potentially is a portion of researchers that does not operate in the context of Green Economy or sees it as a way forward.

5. Conclusions

In this paper we elaborated on method used and results obtained from a participatory research approach using qualitative content analysis of questionnaires and group discussion with 20 young researchers working on issues related to Green Economy from social sciences, ecology and economy. We identified a bottom line of generalized values and ideas shared by the participants, including the recognition of interlinked environmental and social problems and a number of responsibilities that research is called at fulfilling. We recognized, however, disparate and at times divergent opinions on Green Economy and categorize it as an approach that is pragmatically trying to improve the current capitalist system. We also identified a broad spectrum of perceptions regarding the degree and nature of needed societal change and the role of research in the field of Green Economy. We captured these dimensions in a four quadrants model. It is not our intention to reduce or flatten the observed plurality of ideas, opinions and feelings about Green Economy into crystallized positions. We recognize that these positions are far away from being bi-dimensional and not at all fixed. At the contrary, individuals can move across different positions according to context and time. The four quadrants in our model can be interpreted as a stylized description of reality. The edges and discrepancies between quadrants are more subtle than depicted in this paper, while different positions can be and in fact are interrelated.

Nonetheless, we think that this exercise can prove to be useful in conceptualizing a part of the theoretical landscape across which researchers in the field of green economy move. This paper is thus meant as a moment of self-reflection on the meaning of research itself, and its role in contributing to deliver visions, strategies and instruments towards a more environmentally-committed, just, and equilibrated society – for which Green Economy appears to be only a partial solution.

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7. Appendix

Codes	Definitions	Categories
Acting on solutions	Adopting an action-oriented approach.	Pragmatism
Activism and research	Should researchers be also activists? e.g., being involved in politics, in policy making, relate to media.	Values
Adaptive change	Working to ameliorate the instruments that we already have.	Pragmatism
Ambitious	The concept of Green economy is too ambitious, considering the multiple challenges that it is called to solve.	Green Economy
Alternative system	An alternative system to the current one, which is able to address the same problems (i.e., environmental and social) using different instruments.	Revolution
American pragmatism	The word 'Pragmatism' is sometimes used in debates and literature as stripped of the philosophical connotation belonging to the American pragmatism.	Pragmatism
Appropriate working conditions	Researchers need for appropriate salaries and long-term security, space, time and resources for good research.	Values
Awareness raising	The process of raising awareness about environmental and social problems and giving voice to silent stakeholders.	Values
Bottom-up	A bottom up approach to solving interlinked environmental and social problems e.g. local and context-specific experimentation.	Evolution, Revolution, Pragmatism, Radicalism
Change direction	In opposition to evolution, revolution is a more clear-cut change of direction.	Revolution
Change not quick enough	A new system will not come timely enough, so it is better to work within the current system, despite its intrinsic flaws, to change what possible.	Pragmatism
Contradictory	Green Economy is a contradictory concept as there cannot be continuous growth within ecological boundaries.	Green Economy
Critical assessment of our options	Understanding where we are and where we would like to go as society: not simply a 'blind' and 'fast' approach to problems.	Radicalism
Critical voice	A critical approach toward the current system.	Radicalism
Democracy in research	Multiple approaches / strategies versus a unified 'front' of researchers with a leading strategy.	Evolution, Revolution, Pragmatism, Radicalism

Ecological and environmental problems	The recognition of the existence of ecological and environmental problems (either mentioned specifically or generally) that need to be addressed e.g., biodiversity loss, climate change, etc.	Values
Evolution can lead to revolution	Evolution can eventually lead to a revolutionary change.	Evolution
Evolution not necessarily intentional	Evolution is seen as an unfolding process, perhaps apolitical or lacking intentionality.	Evolution
Freedom of expression	The need for research to be independent and not constrained or influenced by e.g., funding system.	Values
Fundamental	A change needed at the very core of the system.	Revolution
Good intentions	It is accepted that Green economy is based on 'good intentions' or anyway aims at doing good, e.g., alleviate poverty and solving environmental problems.	Green Economy
Growth without damage	A way to conciliate growth and ecological boundaries by adopting measures such as e.g., green technologies, re-thinking of employment.	Green Economy
Incremental change	A change of the system that is gradual, but positive.	Evolution
Interdisciplinarity	Research should be based on, and stimulate communication and interaction among different disciplines.	Values
Knowledge generation	Generation of knowledge regarding environmental and social problems, in order to work on possible solutions.	Values
Knowledge hub - 'learning and teaching'	The bilateral process of learning and teaching that can be perpetuated through research, publication, lectures, conferences in different context (local-national) and includes the possibility to interact and engage with others.	Values
Meaningful contribution	Desire by the researcher to contribute meaningfully to research, and ultimately to the World.	Values
Mixed feelings towards research	The researcher experiences mixed feelings towards research (e.g., anxiety, enthusiasm, passion).	Values
Multi-scale	Different problems exist at different scale, and there is need for a variegate set of solution that is applicable in different contexts.	Values
Motivate others	Among other reasons for doing research, there is the ability to motivate others and being motivated in return.	Values
More imagination needed	A more artistic approach to problem solving is needed, rather than relying on the old 'toolbox' that we already have.	Radicalism
Nature as asset	Nature is an asset and externalities need to be taken into account e.g., markets.	Green Economy

Need for change	Need for change, but what type and how (e.g. transformative, adaptive, fundamental) is not specified.	Values
Need for revolutionary thinking	Revolutionary thinking is needed in the field of Economics to really face environmental and social problems.	Revolution
No ivory tower	Science cannot be disconnected with society.	Values
Not enough innovative & critical	Green economy is seen as not innovative and critical enough.	Green Economy
Not normative	Green Economy is a political, non- normative notion.	Green Economy
Path-dependency	Evolution is influenced by path dependency. It is an unfolding change based on previous events.	Evolution
Personal interest / satisfaction	Researchers do research for personal curiosity, intellectual gratification and achievement, income.	Values
Positive change	Evolution, Revolution, Pragmatism and Radicalism are all oriented towards a positive change.	Evolution, Revolution, Pragmatism, Radicalism
Radicalism and evolution=views	Radicalism and pragmatism are seen as individual 'views' or approaches, while revolution and evolution are both oriented towards an institutional change.	Radicalism, Pragmatism
Radicalism can operate within current system	Radicalism can operate within the current system.	Radicalism
Re-branding	Referred to Green Economy, proposing old concepts in a different light to make them more appealing, without offering an actual solution.	Green Economy
Reinforce political & economic structure	In the context of green economy, a mechanism, method or language which obstacle a change of direction and reinforce the current political and economic system.	Green Economy
Revolution = violence?	As a general understanding, revolution can be perceived as pursued true violent means. However this is not always the case.	Revolution
Revolution and evolution= institutional change	Revolution and evolution are both oriented towards an institutional change, in opposition to radicalism and pragmatism that are seen as individual 'views' or approaches.	Revolution and evolution
Science-policy interface	The need / the role of science to provide information, solutions and guidance to policy makers.	Values

Seek for solutions	The responsibility and ability of the researcher to provide options / alternatives and seek for solutions to problems.	Values
Sense of responsibility / call to research	Doing research includes also a sense of responsibility and duty e.g., to 'give back' to society.	Values
Social equality and social justice	The recognition of the need for social equity and justice, including democracy, human rights, stop to wars and poverty, intergenerational justice.	Values
Stakeholders	Embracing dialogue with several or all stakeholders facilitating participation.	Green Economy, Values
Three-pillar model of sustainability	Sustainability is traditionally defined as embracing three dimensions: economic, social and environmental.	Green Economy, Values
Top down	Top-down approach to solving interlinked environmental and social problems, e.g. mainstream ideas, guidance to nations.	Evolution, Revolution, Pragmatism, Radicalism
Transformative	A change that is not path dependent or adaptive, but can lead to an ex novo condition.	Radicalism
Trial-and-error is better than doing nothing	An action-oriented approach is preferred, despite its possible limitations, to a theoretical approach or a very slow change.	Pragmatism
Undefined versus clear vision?	In the context of a radical approach seeking for a revolutionary change, is there need for a clear vision, or is it acceptable or even beneficial to have no clear vision?	Radicalism, Revolution
What is right to do	One should adopt a normative position on what is the best change for society all.	Radicalism, Revolution
Unrealistic	Green economy is unrealistic because economic growth cannot be conciliated with ecological boundaries; it does not deliver realistic / achievable solutions.	Green Economy
Working within the current system	Working within the current system, despite its intrinsic flaws, to change what possible.	Pragmatism

Toward environmental sustainability: a comparative analysis between Brazil and India

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Abstract

This article performs a comparative analysis between Brazil and India in terms of environmental sustainability over the period 1970 to 2008. To do so, we employed the following selected indicators: the domestic material consumption, the material intensity, the metabolic rate, the ecological footprint and bio-capacity, the ecological deficit/surplus and the adjusted net savings. Prior to this comparison exercise, we briefly describe the socioeconomic performance over the study period, indicating important changes in the economic and social dimensions in both countries, which certainly affected the environmental domain. The indicators utilised in this study suggest that India is performing better than Brazil in a sustainability point of view, with the ecological deficit/surplus indicator as an exception. We also performed a statistical analysis to measure the correlation between economic growth and the selected sustainability indicators. The results revalidate the fact that there is a major compromise, across economies, between economic development and sustainability of an economy. Although through some detailed intra-economic analysis it is shown that Brazil's economy is decarbonizing in the study period, however on a comparative scale Brazil's economy is leaving more externality of its environment. It is also highlighted that policy shifts do not reflect to that extent in sustainability indicators as the stage of development of an economy does. Finally a projection based analysis revealed that India will be achieving the same level of human development as Brazil at a much lower cost of environmental externality. From this it can be established that Indian economy is more sustainable that Brazil's one. As final remarks, some policy recommendations are emphasized in the light of this analysis.

Keywords: sustainability; indicators; ecological scale; Brazil and India, development, Social metabolism, material flow accounting.

1. Introduction

Since the 1980s, when the so-called Brundtland Commission formalised the concept of sustainable development (WCED, 1987)[4], discussions around the idea of sustainability have dominated academic and political arenas. The main message derived from the emergence of this concept is that economic growth and preservation of natural capital are not two conflicting goals. On the contrary, economic growth can and must be achieved and at the same time the environment as a whole needs to be preserved. Moreover, the emergence of the concept of sustainable development reflects a growing recognition that economic progress must respect the limits imposed by the ecosystems resilience.

Notwithstanding the motive of sustainable development as a political goal, it has definitely entered the political agenda of the vast majority of nations, but this concept still remains elusive (Carter, 2001), which greatly compromises the measurement of progress made by nations toward sustainability. This difficulty, however, can be minimised with the use of sustainability indicators, which seek to present a brief outline on what extent a country or region can be considered sustainable. Good examples of this kind of indicators is the ecological footprint and bio-capacity, which are commonly used to reveal whether human consumption compromises the regenerative capacity of the biosphere (Wackernagel and Rees, 1996).

In countries with rapid economic growth and/or intermediate income level, assessment of progress toward environmental sustainability[5] is even more relevant, since the results may indicate the extent to which the trajectory of these countries has been similar to that of currently developed countries, where economic growth was achieved with intense environmental degradation. The focus on these countries is even more relevant if we bear in mind that these nations still must strive for economic growth as to alleviate remaining poverty and to raise general quality of life standards of population. This is the case of Brazil and India, which are experiencing what mainstream economists call the 'catching up'[6] phase.

These countries are part of the group of leading emerging economies and altogether have been attracting great attention from academics and politicians due to their increasing geopolitical and economic importance worldwide. In addition, such countries also host significant portion of the world population that has been increasingly raising their consumption levels. Although this latter fact is unquestionably important for the improvement of living conditions of poor people in these nations, we must keep in mind the inevitable negative externalities generated in terms of environmental degradation throughout this chain of extraction, production, consumption and disposal. It is therefore necessary to monitor and evaluate the negative consequences of the economic rise of these countries employing a sustainability point of view. Moreover, it is paramount to

[4] According to the World Commission on Environment and Development, sustainable development is that one "that meets the needs of the present without compromising the ability of future generations to meet their own needs".

[5] The authors recognise that sustainability is a complex and multidimensional concept (see subsection 2.1). However, the environmental sustainability is the core sense focused on this paper. Even if the word "environmental" is not explicit, the reader should understand that environmental sustainability is being referred to throughout the paper.

[6] In economic theory, the catching up process generally refers to a convergence phenomenon in which developing countries tend to grow at a faster rate than developed countries. As a consequence, all countries will eventually converge in terms of per capita income.

assess whether the current economic growth occurring in these emerging economies has been following the same destructive pattern in terms of environmental deterioration. The question is if and how economic growth of present emerging countries can become qualitatively superior compared to the trajectory experienced by the current developed economies over the last century?

Having this main challenge in mind, this paper is aimed at assessing how much progress toward environmental sustainability that has been achieved in Brazil and India. To do so, we employ traditional sustainability indicators in the period from 1970 to 2008. We aim to perform a comparative analysis between these two countries in order to verify the existence of temporal trends in terms of sustainability. Overall, our main research questions are as follow: i) what are the trends in performance of Brazil and India in terms of key sustainability indicators? ii) are there any trade-offs between economic performance and sustainability indicators in these countries? We intend to provide initial answers for these questions, and we hope our analysis can help policy-makers to better assess the socioeconomic evolution in Brazil and India.

The paper is divided into three sections, besides this introduction and some concluding remarks. In the first section we provide a brief description of the Brazilian and Indian economic policies in the period 1970-2008 as well as an overview of the socioeconomic achievements made in both countries. The second section is intended to present our analysis on the progress achieved in Brazil and India using the following sustainability indicators: Domestic Material Consumption, Ecological Footprint and Adjusted Net Savings. The third section presents a comparative analysis of both countries and we try to devise some policy implications for both the Brazilian and Indian contexts.

2. Economic policies and socioeconomic development in Brazil and India from 1970 to 2008

This section briefly describes the Brazilian and Indian socioeconomic performance over the 1970-2008 period. Major economic changes have occurred in both countries and we intend to present them as a backbone for our sustainability analysis. We believe that progress toward sustainability is mostly influenced by the socioeconomic evolution of a specific country, and comprehending sustainability patterns requires and overall understanding of economic and social choices of a given society.

2.1. The Brazilian socioeconomic performance over 1970-2008

In Brazil the year of 1930 was the dawn of a national developmental phase which would last until the end of the 1970s. The main feature of this period was the pursuit of national industrialisation through an explicit import-substitution policy (Baer and Kerstenetzky, 1964). Not unlike many other Latin American countries (Baer, 1972), Brazil embraced this approach in order to stimulate the growth of its GDP and overcome a perceived sense of social backwardness. As for most of the twentieth century, the Brazilian economy has achieved one of the highest rates of GDP growth in the world, albeit with huge social and environmental costs. In the period between 1920 and 1980, the average annual growth rate in the Brazilian real GDP was 6.2%, whilst real per capita GDP rose by an average annual rate of 3.6% (Barbosa, 1998). The 1970s was certainly the decade when Brazil's

real GDP grew at its faster rate; however, the 1980s started a period of low GDP growth coupled with macroeconomic turbulence.

The pace of real GDP growth was far less vigorous in the period from 1970 to 2008. Throughout these 39 years, Brazil's real GDP increased by 348.9% or at an average annual rate of 4.0%. Over the same period, per capita real GDP grew by 124.9% (from US$ 3,834.3 in 1970 to 8,622.7 in 2008)[7] or at an average annual rate of 2.2% (Figure 1). Some mainstream Brazilian economists regard the last quarter of the twentieth century (with the exception for the 1970s) and the first decade of the 21st century, as disappointing in terms of economic performance (Carneiro, 2007). Moreover, they believe that the low-growth dynamic of the Brazilian economy caused it to 'fall behind' with respect to many other economies over the last three decades – much unlike the 1955-1980 period when Brazil managed to experience what mainstream economists describe as a 'catching up' phase (Arend and Fonseca, 2012).

In Brazil, the population grew at an annualised growth rate of 1.8% over the study period. In 1970 and 2008 the population growth rate was 2.5% and 0.9% respectively (a diminution of 62.6%). The Brazilian Institute for Geography and Statistics (IBGE, 2013) projects that the Brazilian population will reach its maximum in 2042, when it is expected the country will be populated by 228.4 million people. In 2060 the Brazilian population is projected to be 218.2 million inhabitants.

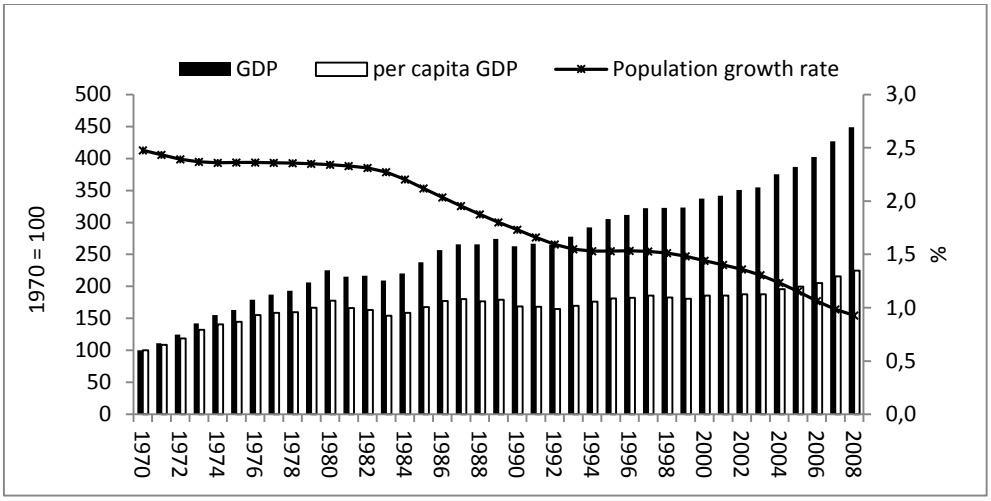


Figure 1: Index of real GDP, real per capita GDP, and population growth rate: Brazil, 1970-2008.

Source: World Bank (2014).

When considering the composition of the Brazilian GDP (Figure 2), it is clear that the services sector has increased its relative importance in the Brazilian economy. In 1970 it accounted for 49.4% of the Brazilian GDP and in 2008 its share rose to 66.2% (a rise of 34.1%). At the same time, agriculture and industry sectors reduced their relative importance (diminution of 52.1% and 27.2% respectively). As for the agriculture, its share dropped from 12.3% in 1970 to only 5.9% in 2008. The same occurred for the industry: in 1970 its share in the Brazilian GDP was 38.3% and in 2008 this figure was 27.9%. The overall reduction in the relative importance of the Brazilian industry has

[7] Priced in constant 2008 US dollars.

raised a debate whether Brazil is suffering from what economists call "early de-industrialisation" (Marconi and Rocha, 2012).

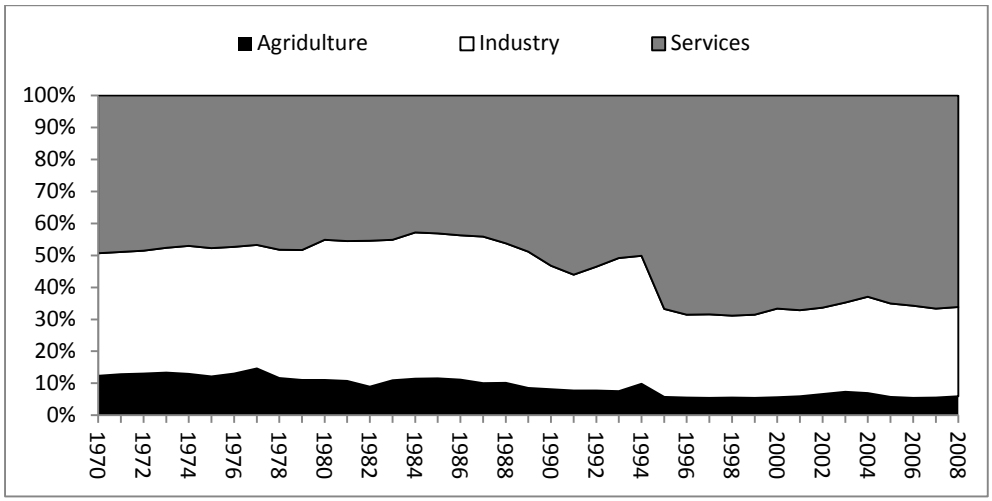


Figure 2: GDP composition: Brazil, 1970-2008.
Source: World Bank (2014).

According to Mortatti (2011), the main conditioning factors behind the growth in per capita GDP in Brazil from 1970 to 2010 were high levels of gross fixed capital formation, human capital improvements, and an increasingly open Brazilian economy with respect to international trade. It is worth mentioning, however, that this 40-year period comprised at least four distinct stages in the Brazilian socioeconomic history, indicating that it is unwise to jump to general conclusions about the GDP growth pattern in Brazil from 1970 to 2008. Each of the four decades within this period had its own particular economic features that should be taken into account when analyzing Brazil's economy[8]. The peculiar characteristics of each decade resulted in a highly fluctuating real GDP-trajectory with similar implications for per capita real GDP growth (Figure 3). Of note are the very low annual growth rates in per capita real GDP in the 1980s and 1990s. Indeed, the Brazilian per capita real GDP in 1999 was only 8.3% higher than its value in 1979.

[8] The overall features of the Brazilian economy over the 1970-2008 period were discussed by several studies, like Malan and Bonelli (1977), Bacha (1977), Valença (1998), Barbosa (1998), Amann and Baer (2000), Cinquetti (2000), Bresser-Pereira (2003), Amann (2005), Carneiro (2007), Baer (2008), and Fonseca et al. (2013).

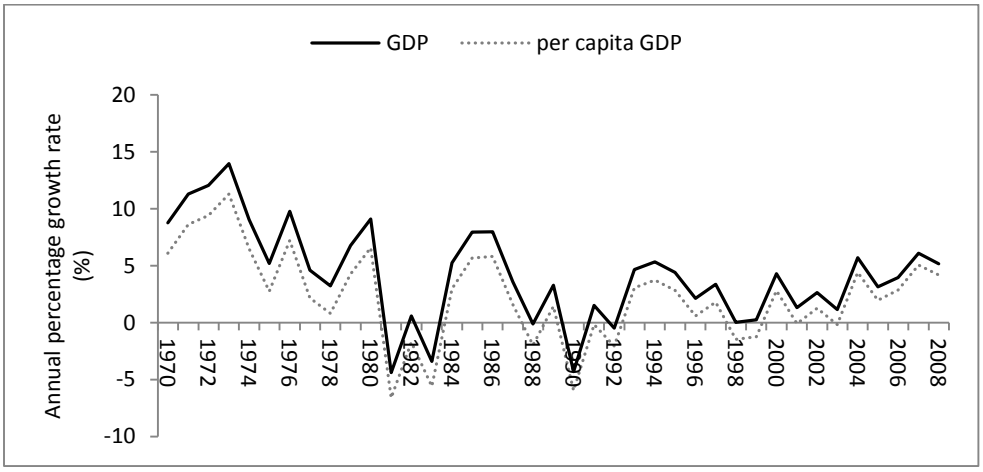


Figure 3: Annual GDP and per capita GDP growth rates: Brazil, 1970-2008.
Source: World Bank (2014)

The most striking feature of the real GDP growth experienced in Brazil is the lack of improvements in the distribution of income among the general population. Despite progress toward a stable macroeconomic environment and remarkable advances in the educational system, income inequality is still very high, ranking Brazil as one of the most unequal societies in the world (Sotomayor, 2008). However, in the last decade of the study period (2000-2008) considerable progress was made toward a more just society. The percentage of the population living under the extreme poverty line dropped from 18.4% in 1976 to 7.6% in 2008. The Gini index also fell from 0.62 in 1976 to 0.55 in 2008 (Ipeadata, 2014). In terms of socioeconomic development, as measured by the Human Development Index (HDI), Brazil has made a significant stride: the Brazilian HDI has increased from 0.52 in 1980 to 0.72 in 2008, which is equivalent to an overall rise of 37.2% (UNDP, 2014).

Regarding economic welfare, the estimates of the Genuine Progress Indicator (GPI) for Brazil (Andrade et al., forthcoming) reveals that genuine progress has been achieved in Brazil, although the rate of the progress was nowhere near as marked as it could have been, and many Brazilians continue to live in abject poverty. Furthermore, by the end of the first decade of the 21st century, the marginal cost of GDP growth in Brazil was very high – so much so, it threatens to undermine Brazil's capacity to boost per capita economic welfare in coming decades.

The social outcomes achieved in Brazil in the first decade of the 21st century were mainly due to improvements in income distribution. In October 2003, the *Bolsa Família* Program (Family Grant Program) was launched as the result of the merger of four pre-existing cash transfer programs. The program is now recognized as the largest conditional cash transfer mechanism in the developing world, and is aimed at reducing current poverty and inequality by providing a minimum level of income to extremely poor families (Lindert et al., 2007).

A recent report issued by the McKinsey Global Institute (Elstrodt et al., 2014) brings to attention the main challenges that Brazil must address if it wishes to deepen the socioeconomic achievements obtained over the last decade. According to Andrade et al. (forthcoming), Brazil needs to enter a new era of development that is capable of delivering broad-based prosperity to the vast majority of its citizens. Regarding sustainability issues,

the authors claim that Brazilian policy-makers should focus on strategies to reduce the environmental costs of GDP growth in Brazil. This can be best achieved by adopting policies aimed at reducing the material and energetic intensity of the Brazilian economy[9].

2.2. The Indian socioeconomic performance over 1970-2008

After independence, from 200 years of colonial rule, on the year 1947 Indian economy was largely agrarian with around 70% of the work force employed in agriculture (Singh et al., 2012). Prevalence of both the state owned and private owned sectors has given it the status of a "mixed economy" (Mukherji, 2010). There was a predominant belief among the policy-makers, that colonialism had harmed Indian industry. To combat that harm, the Indian development strategy was articulated as modernisation through state-led industrialisation. In this case it is particularly state-led as private industrial effort was viewed as inadequate for the task of extracting public good and positive spillovers from the process of industrialisation (Singh, 2009). Public sectors enterprises were created to occupy the leading role in all industrial sectors including steel, chemical, engineering as well as trade and finance.

Another important view of the policy-makers at the time of independence was about the role of international trade and finance. There are two predominant academic arguments for policies to restrict the international trade and finance, in addition to the strong grown negative perceptions about the openness to international trade, formed during colonial times (Singh, 2009). The first argument is of infant industry, which suggests protection of external competition is necessary for full-fledged growth of domestic industries. Expectedly in this case, the role of caring parents was self-assigned on the complete state control over, predominantly, the international import. The next argument is about export restrictions, as exporting goods that are also domestically produced can result in inelasticity of demand and thus does not really contribute in growth (Singh, 2009).

One more vital feature of post-independence Indian economic policies, which can be even considered as the over-arching context, is that of inclination toward socialist ideology as practiced by Russia (Singh et al., 2012). This really promoted moderate consumption as against massive accumulation or use of 'luxury goods'.

Expectedly, these stringent policies on privatization and international trade have not resulted in impressive output in terms of growth. Throughout literature, Indian sluggish growth rate of 3-3.5% has been derogatively described as "Hindu rate of growth" (Mukherji, 2010). Industrial modernisation and green revolution in the last few years of the 1960s could not contribute to any enhancement in the "Hindu rate of Growth" and thus slow growth rate prevailed throughout the period over 1956-1974. Moreover, in addition to the poor performance of Indian economy, the examples of privatisation led rapid growth of East-Asian economies, especially South Korea and Japan, have put immense pressure on Indian policy-makers to consider other obvious alternatives of economic liberalisation. Under these circumstances, 1975 is being marked as the starting of a new era of deregulations of private investment and that further consolidated in the 1980s (Mukherji, 2010). However, these policy shifts remained at the level of mere piecemeal deregulations of various industrial sectors, solely depended on the discretion

[9] This means that Brazil needs to improve the relative decoupling process that would result a higher productivity when it comes to material and energy use.

of political power. Hence, there was hardly any planned reform of the economy, even the Foreign Direct Investment (FDI) and restriction of international trade was very much in place. However, even the encouragement of domestic private investments have managed to push forward the performance of the overall economy in terms of growth and Indian economy started achieving 5% growth rate consistently.

In the literature there is a persistent debate about which change in policy actually managed to direct the fate of the Indian economy and made it into the one of the largest economies of the world. De-Long (2001), Rodrik-Subramaniam (2004), and Kohli (2006) argue that the deregulation phase of 1980s has actually set the stage for massive growth in the economy. On the other hand, Virmani (2004) as well as Panagariya (2004) see 1991's major economic reform towards liberalisation as the trump card behind economic success (Bhalla, 2008). However, it cannot be denied that the root of major financial crisis of 1990-91, that eventually left no option for Indian Government but to liberalise the economy, can be traced back to the decade of 1980s. One of the indications of crisis are rightly pointed by Mukherji (2010) as

> The Indian economy underwent domestic deregulation but did not engage significantly with the global economy after 1975. Its trade as a percentage of GDP, which was 16% in 1980, remained at the same level in 1990. The same figures for China were 22% and 35%, respectively.

Restriction on debt-free FDI (foreign direct investment) from multinational corporations is another important reason behind this crisis. In 1990, the high level of fiscal deficit, international scenario (Gulf War) affecting the oil prices along with this influence of international agencies especially IMF (International Monetary Fund), led the Indian Government to take the radical decision to liberalise the economy. In this package of liberal reforms, restriction on FDI has been taken off along with tariff liberalisation especially in intermediary goods was accompanied with a significant devaluation of Indian Rupee (Mukherji, 2010). In one word, it can be said that at the abovementioned period of time the economic globalisation of the Indian economy had taken place.

During the Post-liberalisation period, Indian economy grew quite strongly and growth rate started crossing 6% consistently. However, after 2003-04 the Indian economy really took off and started growing at the rate of 8%-9%. Bhalla (2008) shows that the decline in the 'real interest rates' is the most likely cause of this late surge in the growth rate of the Indian economy.

Overall, the Indian GDP featured a rise of 585.4% over the 1970-2008 period, which is equivalent to an annual increase rate of 5.2% per annum. The average income of each Indian (the per capita GDP) increased 223.9% (from US$ 340.1 in 1970 to US$ 1,101.7 in 2008)[10] or at an annual rate of increase of 3.1% per annum (Figure 4). Over the study period, the growth in India's population dropped from 2.2% in 1970 to 1.3% in 2008. The average growth rate of the population throughout this 39-year period was 2%[11].

[10] Priced in constant 2008 US dollars.

[11] In 2008 the Indian population reached 1.17 billion people. It is expected that India will be populated by 1.69 billion people in 2050 (UN Population Division, 2010).

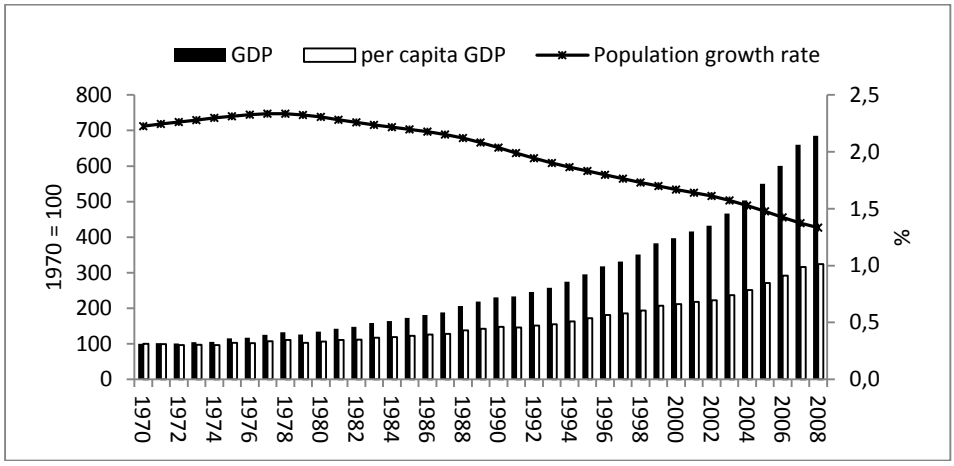


Figure 4: Index of real GDP, real per capita GDP, and population growth rate: India, 1970-2008

Source: World Bank (2014).

Figure 5 displays the composition of the Indian GDP over the study period. The agricultural sector was the only one that reduced its share: from 42% in 1970 to 17.8% in 2008, which is equivalent to a decrease of 57.6%. Both industry and services sectors increased their relative importance in 38.1% and 43.5% respectively over the 1970-2008 period. The industrial sector accounted for 20.5% of the Indian GDP in 1970 and it increased to 28.3%in 2008. As for the services sector, its share rose from 37.6% in 1970 to 53.9% in 2008. Altogether, these figures allow the conclusion that India shifted from an agrarian economy in the beginning of the study period to an economy led mainly by the services sector. It is worth mentioning that – despite some minor fluctuations – the industrial sector in India is still depicting an increasing pattern, which might indicates that India has not completed its industrialisation process[12].

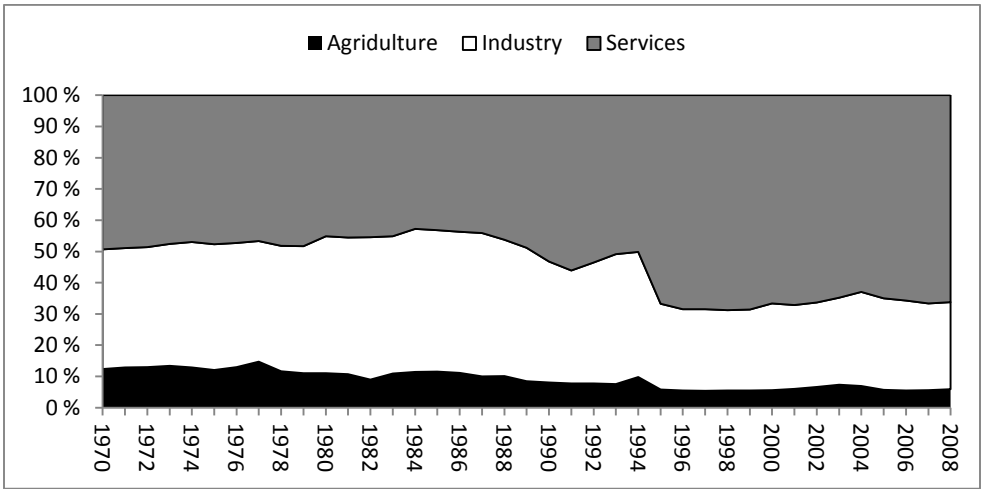


Figure 5: GDP composition: India, 1970-2008.

Source: World Bank (2014).

[12] This is in contrast with the pattern shown by the Brazilian economy. In Brazil the industrial sector has been steadily decreasing its share in GDP in the past years, whist the agriculture and services sectors accounted for 5.9% and 66.2% of the Brazilian GDP in 2008.

Not unlike Brazil, the GDP and per capita GDP in India also presented a fluctuating trajectory over the study period (Figure 6). Of note are the high rates of growth in both GDP and per capita GDP in India after 2003, being the exception the year of 2008 in which both growth rates dropped by 60.3% and 69.7% respectively due to the massive world financial crisis.

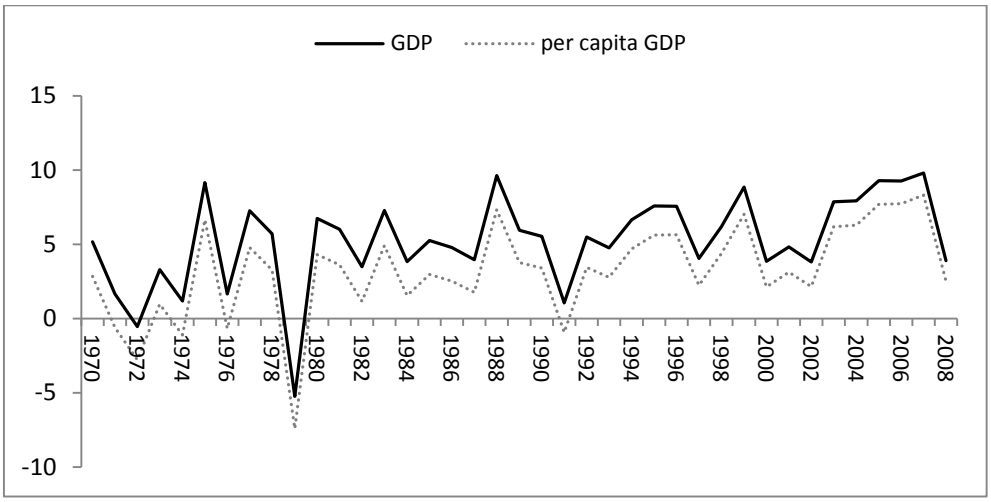


Figure 6: Annual GDP and per capita GDP growth rates: Brazil, 1970-2008.
Source: World Bank (2014).

In terms of human development, the HDI in India has increased from 0.35 in 1980 to 0.53 in 2008, which is equivalent to a rise of 54.5% over the study period. The economic welfare of the Indian population – as measured by the GPI – rose 66.2% between 1987 and 2003 (3% per annum), whilst the per capita GPI in India increased 22% over this same period (1.2% per annum) (Lawn, 2008).

So to summarize in terms of economic policy shifts and subsequent reflection in the economic growth rate of Indian economy, the considered time period (1970-2008) for this paper can be divided into four major parts, i) the slow growth period with complete state control(1970-74)[13], ii) the period of preparing the ground for liberalisation with the declining state control (1975-90), iii) the period of liberalisation (1991-2003), iv) adequate policy shifts to realize uninterrupted high growth rate (2003-08).

3. Sustainability in Brazil and India

This section aims to present the progress towards sustainability that has been achieved in Brazil and India. This is intended to be done by presenting the evolution of some key sustainability indicators in both countries over the 1970-2008 period. Prior to that, we perform a brief literature review on how to measure sustainability.

[13] In the terms of realisation of higher economic growth rates than 'Hindu growth rate' though this period can be extended up to 1980.

3.1. How to measure sustainability: a literature review

The concept of sustainable development is a philosophy of resource consumption that believes it is important to conserve and preserve natural capital for future generations at the same time meeting the needs of human being. In between 1972 and 1992, this concept was progressively evolved with a series of international conferences and initiatives. The first UN (United Nations) Conference on the Human Environment held in1972 in Stockholm was one of the major international gatherings to discuss sustainability at a global scale. The conference prepared several recommendations that led to the establishment of the UN Environment Programme (UNEP) with the creation of different national environmental protection agencies.

In 1980, the recommendations from Stockholm were further elaborated in the World Conservation Strategy (WCS) which collaborated with the International Union for the Conservation of Nature, the World Wildlife Fund (WWF), and UNEP aimed at advancing sustainable development by identifying priority conservation issues and key policy options (IUCN et al., 1980). The foundation of the concept "sustainable development" was first used in the United Nation's Brundtland Commission in 1983 known as the Brundtland report, *popularized in Our Common Future*, a report published by the World Commission on Environment and Development in 1987. The concept "sustainable development" is concerned with the human degradation of the environment and the relationship of this process to the future social and economic challenges facing humankind.

Brundtland's explanation recognises the reliance of human beings on the environment to meet their needs and welfare in a much wider sense than just exploiting environmental and or economic resources at local to international level of development (WCED, 1987; Hopwood et al., 2005). This definition touches three pillars of sustainable development including economic development, social equity and environmental protection. Therefore, sustainability indicators should focus on how far the actual use of resources is away from the aforementioned key domains (Rennings and Wiggering, 1997). To attain sustainable development, a country must acknowledge some challenges toward sustainability indicators. Different types of indicators should be considered to reflect changes in quality of life which are compatible with the current situation of ecological limits (Moran et al., 2008). Achieving sustainable development of a nation should be an ambitious and a primary goal towards sustainability. A nation must improve the welfare of its population along with the quality of life while conserving the natural system to support life in all its diversity. True sustainability is only achieved when progress is realised in the economic, social and environmental domains.

Regarding the measurement of sustainability, the use of indicators is useful not only for policy decision-makers and government officials (Rennings and Wiggering, 1997), but also because they can potentially reflect the economic growth, socioeconomic development and environmental dimensions. They can be used as a tool to illuminate the economic growth, environmental development, socioeconomic development and communication for different functions (Brugmann, 1997). The necessity for these indicators is their usefulness in assessing the sustainability for the future environmental, political and socioeconomic development (Briassoulis, 2001). To meet these, the criteria of policy relevance, analytical soundness and measurability, different indicators as indicated by Moran et al. (2008) can be assed accordingly. They help to communicate

information and provide a signal that is not immediately noticeable (Hammond et al., 1995) about the progress toward sustainable development.

In the following, we have attempted to portray the most traditional indicators employed to measure sustainability. Our goal is to briefly describe these indicators – all of them used at some point in this paper. We do not intend to develop a methodological discussion about them, which does not diminishes the importance of this debate. In doing so, we shall focus or brief review indicators like the Domestic Material Consumption (DMC), Ecological Footprint (EF), Genuine Progress Indicator (GPI), Adjusted Net Savings (ANS), and Social indicators (Gini Coefficient and the Human Development Index (HDI)) that are commonly used to communicate information about progress toward sustainable development in its various dimensions.

3.1.1 Domestic material consumption (DMC)

DMC is the term that indicates the annual total amount of raw materials that is directly used in the economy (used domestic extraction plus imports), minus all the physical materials that are exported (Weisz et al., 2005). It provides an assessment of the absolute level of use of resources, and combined with Gross Domestic Product (GDP). It further provides insight into whether decoupling between the use of natural resources and growth of the economy is taking place. This means that data on material consumption and GDP can indicate the material intensity of a specific country, as well as the metabolic rate[14] when data on population are available.

DMC provides a basis for policies to decouple the growth of the economy (GDP growth) from the use of natural resources so as to achieve a reduction of environmental degradation resulting from primary production, material processing, manufacturing and waste disposal. It is important to take into consideration that the term "consumption" in DMC indicates "apparent consumption" and not "final consumption", and thus refers to "total primary energy supply" as stipulated by Haberl (2001). However, the DMC indicator does not include unused domestic extraction and indirect flows of imports and exports, being only a proxy for the actual total material consumption.

3.1.2 Ecological Footprint (EF)

The concept of Ecological Footprint (EF), introduced by Rees and Wackernagel (1994), measures the biologically productive area necessary to support current consumption patterns, given prevailing technical and economic processes. The EF encompasses the area of biologically productive land appropriated exclusively to produce the resources used and to assimilate the wastes generated by the population (Moran et al., 2008). EF portrays how much the consumption patterns of different populations contribute to this state of affairs (Holmberg, 1999). It is taken as an effective tool for policy-makers to communicate the natural capital reality and potential implications of ecological overshoot, a core driver behind the unsustainable state of the world (Wackernagel et al., 2002). At the same time, this indicator can help people assess their ecological impact and compare this impact to nature's capacity to regenerate (Holmberg, 1999). To understand the sustainability of a given nation, the land area of EF is compared with the actual area of land available (bio-capacity or carrying capacity). That means when EF of a nation is larger than its bio-capacity, the nation has an ecological deficit which means that the

[14] Metabolic rate is the per capita material consumption.

consumption exceeds the bio-capacity of a given area and ultimately the place is unsustainable (Qin-P et al., 2008).

By determining human impact on the planet's limited biological productive area, the EF tool tests a basic ecological condition for sustainability, which ultimately provides the results of its analysis in spatial units and that can easily be communicated. Such analyses provide a benchmark to present ecological performance compared with potential available natural resources and ecosystem services; and identify challenges for lightening an economy's ecological load.

3.1.3 The Genuine Progress Indicator (GPI)

Genuine Progress Indicator (GPI)[15] provides a composite index that imitates GDP but consider the benefits provided for the nonmarket activity that would not be factored into GDP along with social and environmental costs provoked by GDP growth (Thiry and Cassiers, 2010). The use of GDP in the system shows that the more we spend, consume and produce the more the GDP grows. However, the application of the GDP and money based accounts fail to address things that really matter in our lives. It does not account for the physical well-being of people in the society. A system like GPI is beyond the money expressions and closer to measuring "that which makes life worthwhile" is required. It is necessary to use the GPI because it addresses three areas, namely; welfare equivalent income, sustainable income and net social profit. The advantages of employing GPI is that it measures the "welfare a nation enjoys at a particular point in time given the impact of past and present activities" which is more perfect measure of true welfare than GDP (Lawn, 2003). In the social context, the GPI shared principles of sustainable development in the sense that the GPI makes an explicit adjustment to personal consumption expenditures for improvements or declines in distributional equity (Talberth et al., 2007). Such indicator presumes sustainable development must be equitable since a social sustainable system must achieve equitable distribution.

3.1.4 The Adjusted Net Savings (ANS)

Unlike GPI, the Adjusted Net Savings (ANS) is an indicator of sustainability that measures the true rate of savings in an economy. It was initiated by the World Bank in between 1970-2006, and estimated for more than 190 countries due to high visibility (Thiry and Cassiers, 2010). It takes into consideration the investments in human capital, natural assets - depletion of natural resources and damage caused by pollution. The ANS "*seeks to provide national-level decision makers with a clear, relatively simple indicator of how sustainable their country's investment policies are*" (Bolt et al., 2002). The ANS is a good measure of prospects for well-being as it indicates a nation's ability to sustain a consumption stream which is what matters for sustainability, not only being limited to the consumption flow at a particular time as measured in GDP.

3.1.5 Social indicators (Gini Coefficient and the Human Development Index)

The Gini coefficient is a widely accepted measure of inequality and presents the income distribution of the nation. It was established as an ad hoc measure of income inequality (Dorfman, 1979) with standard measurement that varies between zero (0) and one (1).

[15] Refer to Lawn and Clarke (2008) for detailed explanation on theory of the GPI indicator, as well as the methods used to calculate the different items that comprise the GPI.

That means if the Gini coefficient is 0, there is complete equality (when everybody has the same income) whereas 1 indicates a complete inequality (an individual might have all the income while others have none). The use of this standard measurement makes easier to notice if inequality is rising or falling to certain amount of absolute incomes. The concept of inequality is based on the way individuals perceive his position in the society acknowledged as an important aspect of their welfare. However, the growing inequality in income distribution reveals a combination of different factors which ultimately affect the socioeconomic dimension of the nation.

Likewise, the Human Development Index (HDI) is used as an indicator for socioeconomic development (UNDP, 2005). This index overall measures the human well-being that captures individual residents of a nation, how they enjoy long, healthy, and creative lives (Moran et al., 2008) with absolute standards. HDI is a globally available proxy metric for progress toward human development goals, as exemplified in the Millennium Development Goals (MDGs). The HDI accommodate life expectancy at birth, adult literacy rate, gross school enrolment ratio, and GDP per capita (UNDP, 2004). Based on metric progress, when a nation reaches HDI score of 1.0 it means that a nation has attained the maximum value for each sub-index. An HDI value of zero implies that the country is at or below the minimum value for all sub-indices. However, the UNDP set a grade of 0.80 HDI score as the limit between medium and high human development.

Recently the debate of closely related concepts in the field of sustainable development notably the "Green New Deal", "Green Growth" and "Green Economy" have emerged (Brinket al., 2012). These concepts were globally erupted out of its specialist moorings in environmental and ecological economics (UNDESA, 2012) as well as in the mainstream of policy discourse (UNEP, 2011).The mentioned concepts were used in different ways and have different roles and meanings. The first concept – "Green New Deal" – acts as a catalysts and the concept "Green Growth" is an approach toward a "Green Economy", which has an essential meaning of attaining the objectives of sustainable development. The concept of green economy does not only demonstrate the interest on the environment or favour political perspectives over another but the green economy is an economy that enhances human well-being and social equality while significantly reducing environmental harmful and ecological scarcities (UNEP, 2011; 2012). Examples of "green economy" actions range from investments in low carbon technology, less consumption to resource efficient and enhancement of ecosystems quality.

3.2. Measuring environmental sustainability in Brazil and India (1970-2008)[16]

This subsection presents the evolution of key sustainability indicators in Brazil and India over the study period. Here we just describe the trajectory of the following indicators in both countries: the Domestic Material Consumption (DMC), the Material Intensity (MI), the Metabolic Rate (MR), the Ecological Footprint (EF), Bio-capacity (BIO) and Ecological Deficit/Superavit (ED or ES respectively), Ecological Footprint to World Bio-capacity Ratio (EF/BIO_w), and Adjusted Net Savings (ANS). In the next section we will perform a deeper analysis of those indicators as well as devise some policy implications.

[16] As it has been highlighted, this paper focus on the environmental dimension of the sustainability concept. This implies that only indicators connected to this dimension will be used in this subsection, although the early one (subsection 2.1) has described a more comprehensive set of indicators.

In terms of DMC, we can notice that in both the countries there has been a massive increment in domestically-consumed materials (figure 7). In Brazil, the DMC rose from 618.4 million tonnes in 1970 to 2.94 billion tonnes in 2008, whist in India the DMC grew from 1.33 billion tonnes in 1970 to 5.33 billion tonnes in 2008. The Brazilian DMC showed a total rise of 375.8% and the Indian DMC increased 300.8% over the study period, which is equivalent to an annual growth rate of 4.2% and 3.7% respectively.

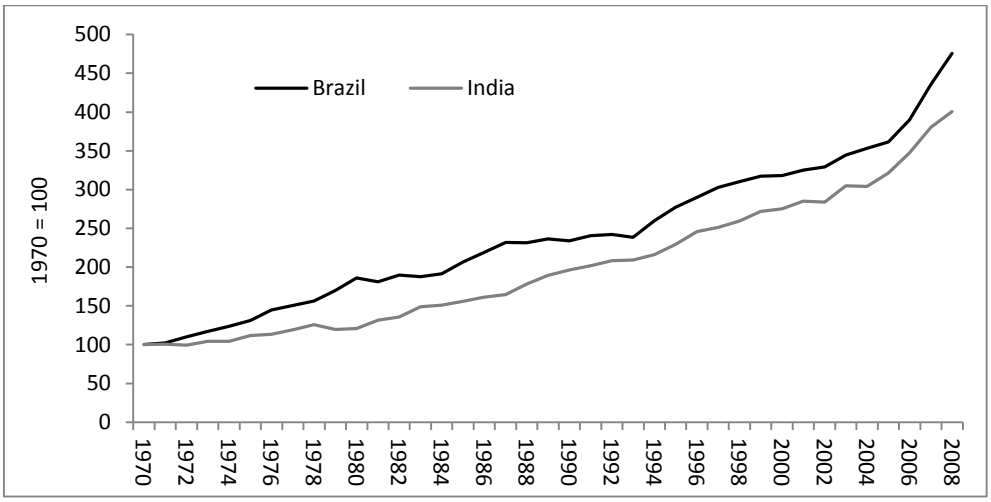


Figure 7: Index values of Domestic Material Consumption: Brazil and India, 1970-2008.
Source: UNEP and CSIRO (2012).

The DMC in India is higher than in Brazil due to the fact that the Indian population was 6.13 times higher than the Brazilian population in 2008. Therefore, the per capita DMC is xx times higher in Brazil as compared to India in that year. Moreover, Brazil has experienced a more intense biophysical growth of its economy than India – see Figure 7. While the Brazilian DMC increased 4.8 times over the study period, the figure for India is only 4. These figures indicate that Brazil increased its ecological-economic scale faster than India; although in 2008 the Indian ecological-economic scale was 1.8 higher than the Brazilian one in absolute terms. In terms of its composition, the most interesting feature of the Brazilian material consumption is the relatively stable share of biomass, construction minerals and fossil fuels, and the increasing share of metal ores and industrial minerals. In India, all the material categories presented are showcasing increasing share in the total domestic material consumption, biomass consumption being the exception. It is worthwhile to mention the massive rise in the fossil fuel share in India, which has grown from 7.3% in 1970 to 14.2% in 2008 (a total rise of 94.8%.

Figure 8 shows the material intensity for Brazil and India from 1970 to 2008. It is clear that India performs better than Brazil in terms of eco-efficiency. While the Indian material intensity dropped from 11.4 Kg/US$ in 1970 to 6.5 Kg/US$ in 2008 (a reduction of 42.7%), the Brazilian material intensity rose from 3.2 Kg/US$ in 1970 to 3.4 Kg/US$ (a rise of 6.4%). This is an important difference between these two countries and this fact has important implications regarding sustainability prospects for both economies. At a first glance, higher the material intensity in a specific country, higher are the environment costs associated with GDP growth. Further analysis will be presented in the following section.

Regarding the metabolic rate (the per capita material consumption), the average Brazilian consumed 6.4 tons of materials in 1970 and 15.3 tons in 2008, which is equivalent to a total rise of 137.9% or to an annual growth rate of 2.3%. Over the same period, the average Indian consumed 2.4 tons of material in 1970 and increased this consumption to 4.7 tons per capita in 2008. This is equal to a total increase of 92.5% in the Indian metabolic rate, or to annual growth rate of 1.7%. Despite of the higher ecological-economic scale in India, Brazil presented a higher metabolic rate (Figure 9) due mainly to its stronger growth in DMC and lower population. If each Indian consumed the same amount of material as an average Brazilian, the DMC in India would have reached a massive amount of 18 billion of tons in 2008, which is 511.9% higher than the Brazilian DMC in this same year. The higher metabolic rate in Brazil can be associated to the fact that Brazil is in a relatively more advanced phase of its 'catching-up' process. In other words, we can infer that Brazil has initiated earlier its transition to an industrial socio-metabolic regime[17] when compared to India.

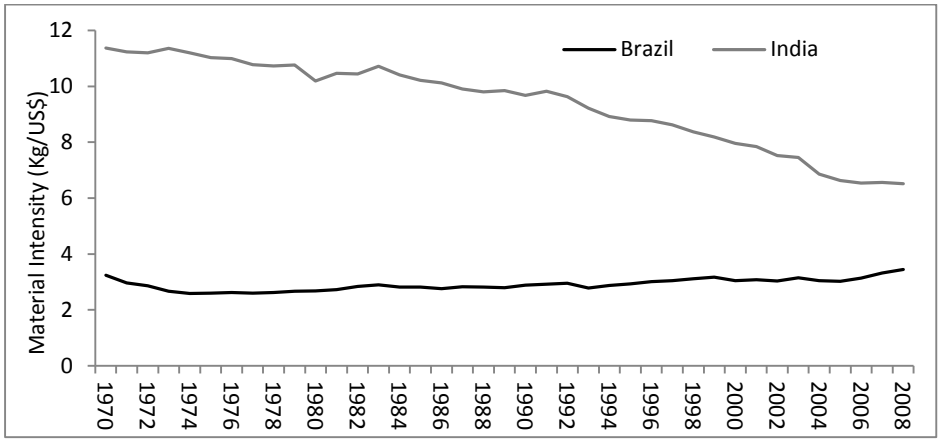


Figure 8: Material intensity: Brazil and India, 1970-2008.

Source: UNEP and CSIRO (2012).

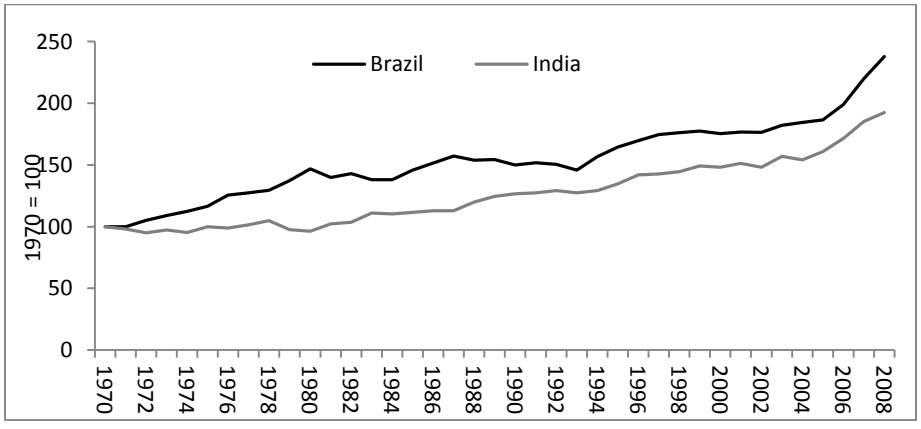


Figure 9: Index values for the metabolic rate: Brazil and India, 1970-2008.

Source: UNEP and CSIRO (2012).

[17] According to Haberl et al. (2011), socio-metabolic regimes are relatively stable configurations that characterise the evolution of socio-ecological systems. Until the present, the authors identify three different socio-metabolic regimes: hunter-gatherers, agrarian societies and industrial societies.

The analysis above explicitly employs a material flow accounting (MFA) approach, and it suggests that India is performing better than Brazil from a sustainability point of view. This perception comes from the slower growth in the Indian ecological-economic scale (biophysical dimension)[18] and its metabolic rate, as well as the stronger reduction in the Indian material intensity.

A different picture, however, emerges when Brazil and India are compared in terms of their ecological footprint, bio-capacity and ecological deficit/surplus[19]. As indicated by figures 10 and 11, over the entire period Brazil had an ecological surplus, although it has been decreasing since the initial year. At the same time, India featured an increasing ecological deficit over the period 1970-2008, which means that in India the country's bio-capacity is not sufficient to provide natural resources that Indian people need[20]. It is worthwhile mentioning that the average Brazilian per capita bio-capacity and per capita ecological footprint are 2,402% and 265% higher than the Indian ones, respectively. In Brazil, the ecological footprint per person increased 24.9% over 1970-2008 whist the same Indian indicator increased 17.6% over the same period. Per capita bio-capacity, in Brazil and India dropped 46.3% and 18% over the study period, respectively. As a consequence, the Brazilian ecological surplus shrank 57% (from 15.6 gha per person in 1970 to 6.7 gha per person in 2008), and the Indian ecological deficit rose 161.6% (from – 0.1 gha per person in 1970 to - 0.4 gha per person in 2008).

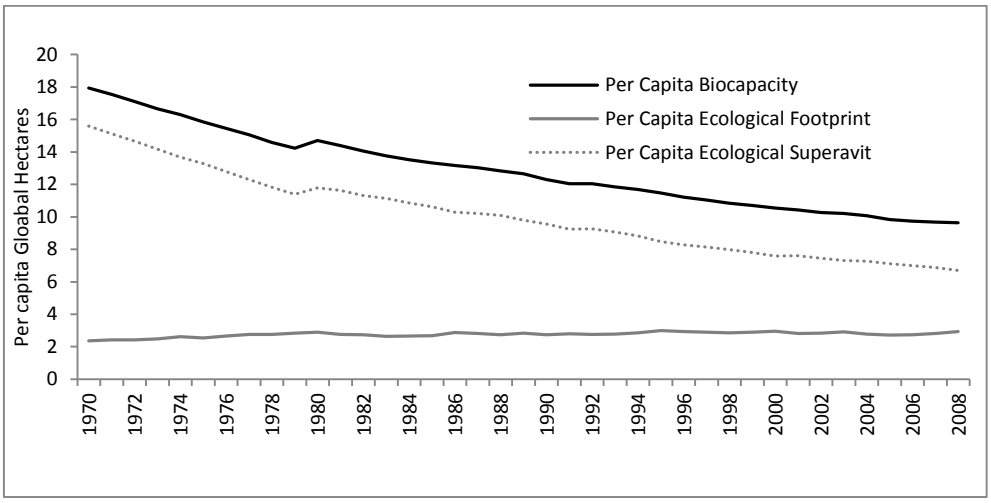


Figure 10: Per capita bio-capacity, per capita ecological footprint and per capita ecological superavit: Brazil, 1970-2008.

Source: Global Footprint Network (2014)

[18] It must be borne in mind, however, that the level of India's ecological-economic scale is larger than the Brazilian scale, which can be associated mainly to the dimension of population in both countries.

[19] Ecological deficit/surplus is given by the difference between ecological footprint and bio-capacity. Note that when ecological footprint is greater that bio-capacity we have ecological deficit. On the contrary (bio-capacity greater than ecological footprint), we have ecological surplus (or ecological superavit).

[20] These results do not change in terms of total ecological footprint and total bio-capacity for both countries.

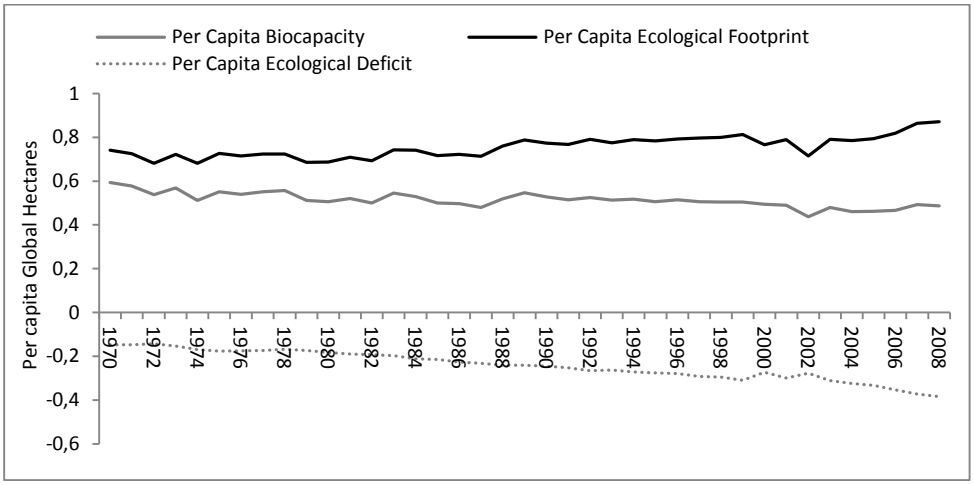


Figure 11: Per capita bio-capacity, per capita ecological footprint and per capita ecological deficit: India, 1970-2008.

Source: Global Footprint Network (2014)

Moran et al. (2008) argue that in order to be partially sustainable, the per capita demand on natural resources in a specific country must be less than the global bio-capacity available worldwide. This per capita ecological footprint to world per capita bio-capacity ratios (*Š*) for Brazil and India are shown in figure 12. Taking this indicator as a sustainability parameter, it can be said that Brazil is not sustainable since 1974 when the ratio *Š* became higher than 1. On the contrary, this same ratio is less than 1 over the entire period in India, which means that the Indian per capita ecological footprint is below the per capita world bio-capacity. It is worth mentioning the increasing trend in *Š* in both countries: in Brazil and India the *Š* ratio rose 94.8% and 83.5% over the1970-2008 period, respectively.

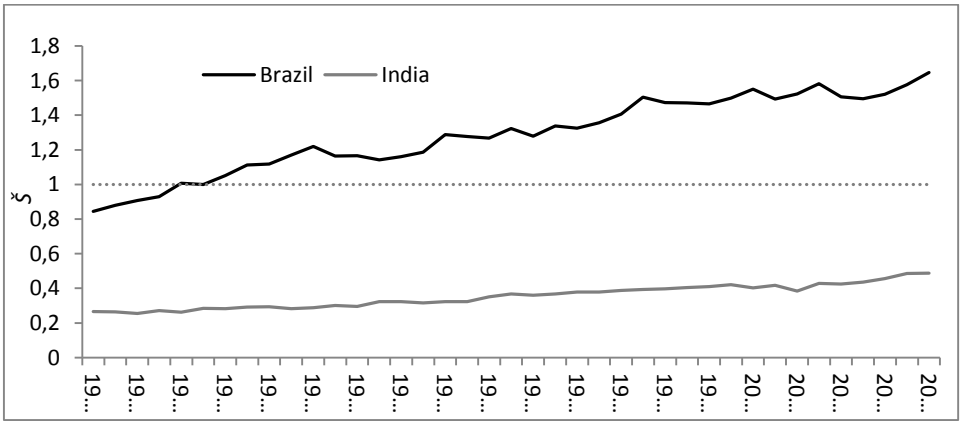


Figure 12: Per capita ecological footprint to per capita world bio-capacity ratio: Brazil and India, 1970-2008.

Source: Global Footprint Network (2014)

In terms of adjusted net savings (ANS) (Figure 13), Brazil performed a very fluctuating trajectory while India had a more consistent increasing path. Although it is difficult to precisely indicate the causes that affected ANS over the study period in both countries, it seems that in Brazil the ANS in the 1980s has increased due to the erratic economic

performance during this decade, which might affected the consumption of fixed capital (one of the items included in the ANS indicator). Relatively low level of education expenditure in Brazil during the 1990s can be one of the causes of the decreasing trend in the ANS indicator between 1994 and 2000. From 2000 to 2008 the ANS rose again in Brazil mainly due to the increase in education expenditures. It is interesting from 1995 onwards the ANS in India became higher than in Brazil as a percentage of GNI (gross national income). This fact can be the result of a more intense increase in the Indian gross national savings and investment in human capital.

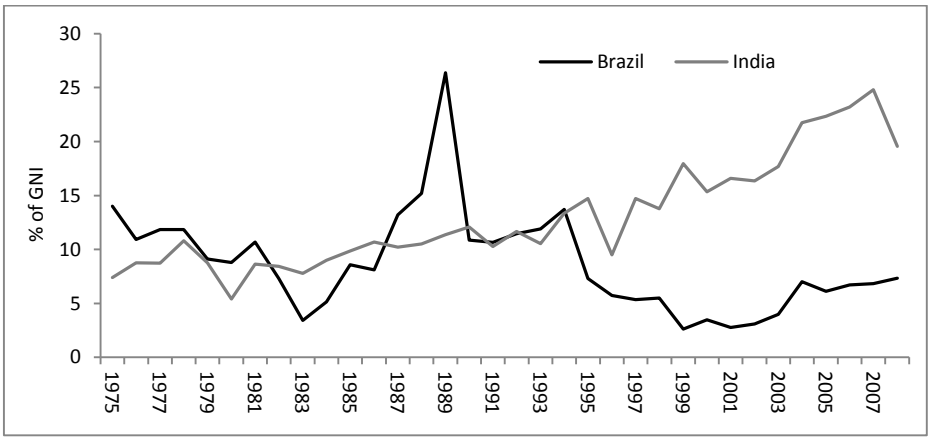


Figure 13: Adjusted net savings: Brazil and India, 1975-2008.
Source: World Bank (2014)

The ANS indicator analysed above suggests that India is performing better in terms of sustainability than Brazil during the last 15 years of the study period. Regarding the five indicators described in this section, the Brazilian performance in terms of sustainability is better than the Indian one only in terms of ecological footprint and bio-capacity as Brazil has an ecological surplus while India has an ecological deficit. Obviously one must take into account the huge stock of natural capital possessed by Brazil, which naturally increases its bio-capacity. The other indicators employed in this study indicate that India can be considered more sustainable than Brazil. However, all indicators have their own limitations and one should bear in mind the immense differences in both countries regarding the population dimension and the current phase of socioeconomic development. Brazil is considered by the World Bank as an upper middle income country and India is still considered a lower middle income nation. However, the Indian economic performance in the 2000s might change this reality in the coming years. It remains unclear though to what extent both countries have incorporated the sustainability view in their economic and social dynamics. This is an important research agenda insofar Brazil and India (as well other BRICS) countries become more relevant in the global scenario.

4. Interfaces between GDP growth and environmental sustainability indicators in Brazil and India

To understand the relationship between economic growth of an economy, especially a developing one, with its sustainability as well as human development potential, both

inter-economy (between two indicators of both the economies over the entire time period) and intra-economy (within two indicators of an economy over various portion of the entire time period) correlation coefficients have been evaluated. The Bootstrapping method[21] is used to evaluate each set of correlation coefficients along with it standard error. As Human Development Index data is available for only seven years for the entire study period, other indicators are reduced to those seven years for evaluation of correlation coefficients between economic growth and sustainability potential with human development potential. To handle the drastic population difference between these two economies all the considered indicators are considered at the per-capita level. As already indicated, the following are different indicators considered to evaluate performance at various fronts.

- Economic Growth: i) Gross Domestic Product per capita (GDPpc)
- Sustainability Potential: i) Domestic Material Consumption per capita (DMCpc), ii) Ecological Footprint upon Bio-capacity (EF/BC), iii) Adjusted Net Savings per capita (ANSpc,) iv) CO_2 Emission per capita (CO_2pc)
- Human Development Potential: i) Human Development Index (HDI)

The general trend obtained from these correlation coefficients will be highlighted and then exception will be discussed to foster more nuanced understanding of possible drivers behind these patterns.

The correlation coefficient between GDP per capita and HDI, DMCpc, EF/BC shows a high positive correlation for both the economies as shown in the figure 14 and there are no significant intra-economy differences; however, correlation coefficients between GDPpc and ANSpc, CO_2pc don't adhere to the same patterns. These patterns very evidently imply that economic growth, especially for large developing economies, significantly undermines the capacity of an economy to be environmentally sustainable. Moreover, the high positive correlation between GDPpc and HDI for both the economies indicates the indispensability of economic growth for developing economies. Hence, both of these insights clearly point to the fact that our economies are completely embedded in a finite biophysical reserve and thus infinite economic growth can't be considered as a recipie for solving issues of poverty and to deliver human development with maintaining sustainability. Rather the entire discourse of development needs a conception of definite threshold and a sense of sufficiency, through which maximum or optimum human development can be achieved with a decent level of sustainability.

[21] Bootstrapping is a *resampling* technique used to obtain estimates of summary statistics

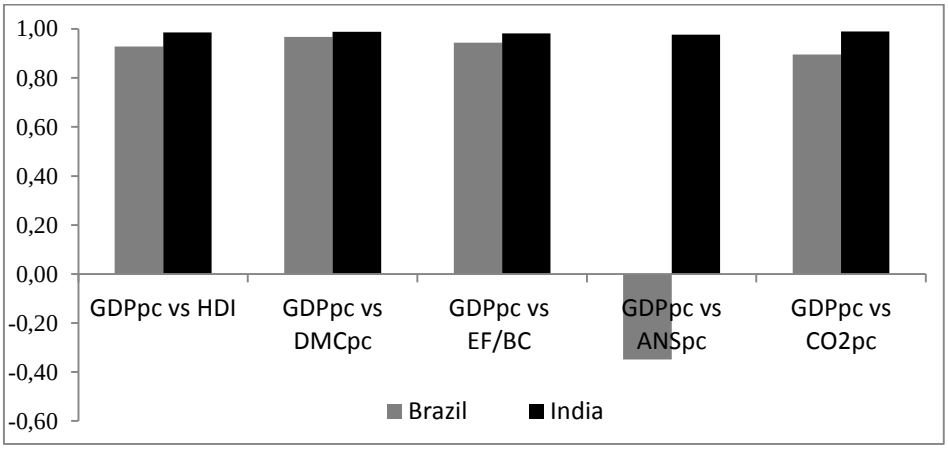


Figure 14: Inter-economy Correlation coefficients over the period of 1970-2008

Source: Own calculation based on World Bank (2014), Global Footprint Network (2014), UNEP and CSIRO (2012).

Now coming to the exception, as already indicated the correlations between GDPpc and ANSpc, and GDPpc and CO_2pc are quite different for both these economies. In this context it is worth mentioning that the difference is extremely significant for the first pair, but for the second it is just enough that it can't be ignored. First the 'just enough' difference will be discussed and then the more significant one will be explored.

For India, there is a strong positive correlation observed between GDPpc and CO_2pc. However, this is not exactly the case for Brazil. Brazil shows rather a comparatively weak positive correlation between the two. The scenario does not change in case of the correlation coefficients between DMCpc and CO_2pc for both the economies. Possible driver behind this difference becomes clear once more intra-economy analysis is devised, especially for Brazil. In the further analysis, it is clearly revealed that over the four decades (1970-79, 1980-89, 1990-99, 2000-08[22]) Brazil's economy is relatively decarbonizing and thus the correlation of CO_2pc with GDPpc and DMCpc is shifting from a very strong positive correlation to an extremely weak positive correlation as shown in the figure 15. The scenario is completely opposite for India as over those decades the correlation has changed from a weak positive correlation to a very strong positive one. This clearly directs to the fact that is already flagged, as though both these economies can be categorized under the same category of 'rapidly emerging economy'[23] still both of these are in two completely different phases of development.

[22] Though it is not a complete decade, still for sake of uniformity it will termed as a decade for the rest of the paper.
[23] Mostly commonly used terms is 'BRICS'.

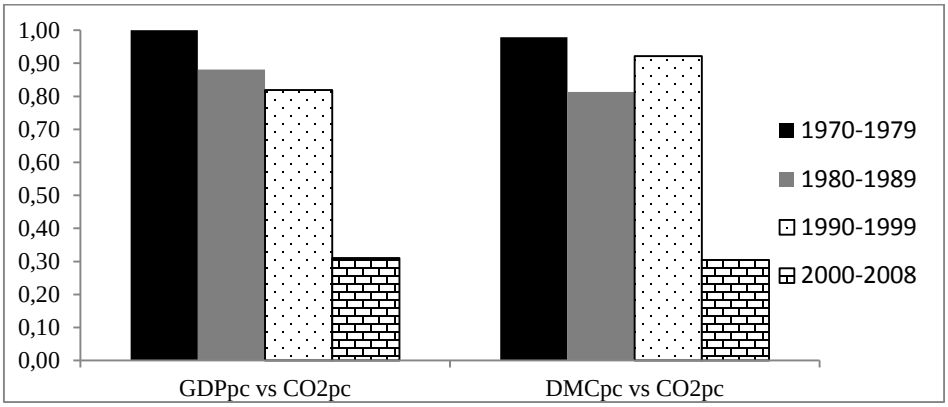


Figure 15: Intra-economy Correlation coefficients for Brazil over the period 1970-2008

Source: Own calculation based on World Bank (2014), Global Footprint Network (2014), UNEP and CSIRO (2012)

Now coming to the other major dissimilarity between these two economies, that is the nature of correlation between ANSpc and GDPpc. It shows a very strong positive correlation for India, where as for Brazil it is a weak negative correlation. Hence according to definition of ANSpc and the weak sustainability[24],with more GDP growth India is achieving more environmental capital resulting in better environmental sustainability; however, the scenario is completely opposite for Brazil. Just like the earlier example, similar intra-economy analysis is carried away for Brazil. The pattern obtained for GDPpc, as shown in the figure 16, is very interesting as it shows an oscillating pattern over the various decades. As in the first decade (1970-79) correlation was moderately negative, but it becomes moderately positive in the second one. In the third decade (1990-99) it becomes again moderately negative and finally in the last decade it shows a strong positive correlation. Following the definition of weak sustainability and the negative correlation of ANSpc and GDPpc for Brazil's economy, it can be concluded that Brazil's economic development is leaving a high negative externality on its society as well as Brazil's development is more at the cost of its natural resources. The second points can be revalidated from the fact, already highlighted earlier, that there is 57% reduction of Brazil's ecological surplus over these four decades, whereas for India it has almost remained same.

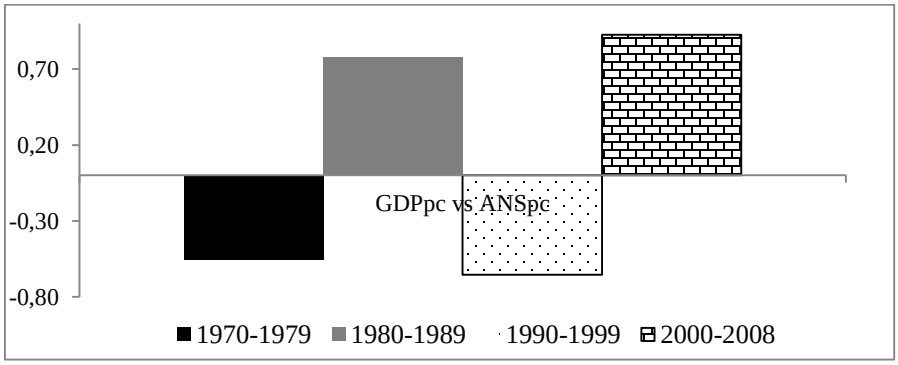


Figure 16: Intra-economy Correlation coefficient for Brazil over four decades

[24] Weak sustainability is the idea within *environmental economics*, which states that *'human capital'* can be substituted by *'natural capital'*

Source: Own calculation based on World Bank (2014), Global Footprint Network (2014), UNEP and CSIRO (2012).

Finally it can be summarized that patterns obtained were quite uniform for both the economies and thus does not leave much scope of formulating causal explanation with the subsequent changes in the economic policies in both the economies. Patterns seems to emerge more from the fact that whether an economy is growing or not, rather than the underlying policy shifts that are responsible for that growth. The following statements will clearly validate the above claim.

- Correlation coefficient between GDPpc with DMCpc, EF/BF and CO_2pc over four decades seems to suggest that there is substantial difference between 1970-79 and 1980-2008 as shown in the figure 17, not between, as generally expected, pre-liberalization (1970-90) and post-liberalization (1991-2008) period. Hence as discussed, beginning of economic growth in India during 1980's immediately started to reflect in sustainability indicators.
- Similarly for Brazil there is considerable amount of difference in the similar correlation coefficients[25] for the period 1970-79 and 1980-2008. Although the difference is completely opposite to the India's case (correlation coefficients are more positive in the first decade and comparatively lower in the rest of the time period), still it is following the same logic about the stage of an economy. As 1970's was the last rapid growing phase for the Brazil's economy and in period of 1980-2008 it was undergoing a low growth stage, trying to recover from the economic crisis of 1980's.

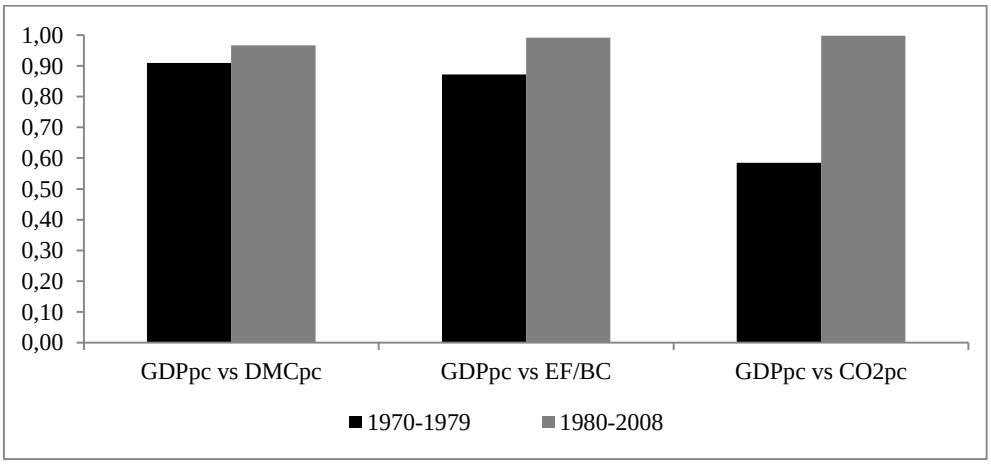


Figure 17: Intra-economy Correlation coefficient for India over1970-1979 and 1980-2008

Source: Own calculation based on World Bank (2014), Global Footprint Network (2014), UNEP and CSIRO (2012)

Another important point to be noted here is that the kind of developmental policies were in place for Brazil during 1970-79 (can be summarized as FDI driven import substitutions policy) was completely different from the ones were in place for India during 1980-2008 (can be characterized as an cascade of changes towards a liberal economy from a very

[25] Especially the correlation coefficient between GDPpc and CO_2pc.

strict state control). Hence, it can be rightly concluded that economic growth for developing economies is generally achieved at the cost of undermining its sustainability. However, it cannot be completely generalized without taking into account, as already it has been pointed out, at what the stage of development the economy is.

Here, both the considered economies clearly are in two stages of development and that has been echoed in most of the indicators, irrespective of whether it is economic, sustainability or human development indicators. Hence, at this stage any relative conclusions, in terms of which economy is comparatively more sustainable or achieving higher human development at a lower environmental cost, are impossible. Thus to overcome this barrier, a projection exercise is conducted with the following assumptions.

- Performance in Human Development Index is taken as the final objective of economic development.
- Value of various indicators (HDI, GDPpc, EF/BC, DMCpc) for Brazil's economy are kept constants at the level of year 2008.
- With the estimated linear trend of last ten years (out of ten years only 5 years is available), HDI of India is projected to reach Brazil's 2008 HDI.
- Similar linear trend for GDPpc, EF/BC and DMCpc for India is estimated to project their level at the year when India's HDI matches Brazil's HDI of 2008.

The result is of quite interesting, as only in the year 2027 India is reaching Brazil's HDI of 2008, i.e. 0.716. However, these projected GDPpc, EF/BC and DMCpc for India are only 23%, 43% and 40% respectively of Brazil's 2008 standard. Hence, it can be justly concluded that India will realize similar human development with better sustainability than Brazil. Proper reason behind this phenomenon needs more in-depth investigation and clearly that is out of the scope of this paper. However one fact should be flagged in this regard is that India's GINI coefficient in the year 2005 is only 59% of the same for Brazil. This indicates that, the comparatively unequal society of Brazil might be the reasons for losing sustainability to achieve the same amount of overall human development.

5. Discussions and Conclusions

Based on our analyses, the following policy recommendations, particularly for developing economies, need to be flagged:

- Firstly, as already indicated, GDP growth at times is extremely necessary for developing economies to cater to the largely unfulfilled needs of its populations. However, considering the indicated strong trade-off between GDP growth and other sustainability indicators, a more sufficiency based approach is necessary. Thus the focus should be more on optimal GDP growth that can help in realising a desired amount of human development at the cost of minimal loss of sustainability. Both countries eventually will need to consider the possibility to make the transition to a qualitatively-improving steady-state economy as it is argued by ecological economists. Endless growth in GDP is not possible in a finite world, so Brazil and India must focus their economic and political efforts to an

economy whose main objective is in the continuous improvement of human life without physical expansion;

- Secondly, the importance of redistribution of wealth is absolutely imperative. This approach is closely linked with the first recommendations as for achieving desired human development, the GDP growth may not be the only solution. Rather more emphasis should be given in terms of more equal distribution of the already appropriated wealth of the nations;
- Thirdly, the improvement on the technology front is undeniably essential as that can help to attain a substantial amount of growth of GDP without compromising the sustainability of an economy to a large extent. Improvement of efficiency and focus on service sectors based industries resulting decarbonizing, is also equally important for rapidly growing economy; as already it might be the case for Brazil;
- Fourthly, the population growth control must be included in the political priorities in both countries. Obviously this issue is relatively more serious in India, where the population is higher than 1 billion people and the basic needs of massive percentage of population are not yet satisfactorily fulfilled. Brazil also needs to deal with the population issue, but in a different manner. The Brazilian population is aging fast and the labour productivity must increase in order to offset the diminution in the supply of workforce. Besides this, the public health system in Brazil in tremendously inefficient and might not be adequate to provide basic health care to the Brazilian elderlies in the near future.

As a very last word, we would like to highlight, completely acknowledging the major limitations of this kind of macro-economic indicators based approach, the importance of this kind macro scaled inter-economic study in providing insights for some alternative developmental models. Especially in the present era of Anthropocene, we need to more such studies to show us some direction for ensuring sufficiency for all without majorly scarifies the sustainability of our life-supporting ecosystems.

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The Power of Ideas in Institutional Change: The Green Economy and Biodiversity Offsetting in the UK

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Abstract

This article analyses how the ideas of the Green Economy has lent legitimacy to market-oriented policy change with the introduction of biodiversity offsetting (BDO) in the United Kingdom. Combining theories of institutional change from classic institutional economics with Blyth's (2002) five hypothesis of institutional change, we expound the rise of biodiversity offsetting in England as motivated by the wider context of a green economy. This was done with the intention of linking institutional change in the former with the influential ideas of the latter. Our analysis illustrates how biodiversity offsets during a period of environmental and economic crisis came to be the preferred method to address loss of ecosystem services. With the aid of powerful economic ideas of economic valuation of natural resources from the Green Economy, proponents of biodiversity offsetting in the UK successfully created an institutional and policy space their mechanism would fill. Their success is explained mainly by BDO's promise of a win-win between economic development and environmental protection, and its potential to create new financial assets and markets for economic actors.

1. Introduction

During times of institutional change, the distribution of power, position and resources can change. Most institutional scholars agree that often, radical and/or rapid changes occur during times of crisis when the prevailing institution's capacity to articulate the values of its actors is called into question. The current business-as-usual economic paradigm is in the midst of multiple crises as it does not acknowledge the finitude of resources in pursuit of economic growth nor does it provide sufficient room for measuring multiple values and promoting alternative institutional logics to profit maximization. Just a few of the symptoms include environmental degradation and resource scarcity, waste and pollution, socio-economic inequality, and social and financial instability. These pressures are destabilising the current institutions, both within economics and environmental issue areas, and are providing a window of opportunity for alternative approaches to be proposed. Such proposals may take the form of incremental appeasement or radical transformation, however ideas of a Green Economy (i.e. pursing growth but in an environmentally friendly way) has been vociferously supported as a win-win solution

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which can benefit all actors. This powerful discourse of 'green growth' has gained political currency and has, in combination with persistent ideas of neo-classical economics and neoliberal ideology, lead to an increased acceptance for the use of market based instruments for environmental protection.

When policy makers are changing institutions to protect environmental goods, they may choose from a range of economic or legal instruments. The state has the power to command, for example by using taxes or standards. However, the use of trade and markets have gained favour over the last few decades. Biodiversity offsetting is an example of such trade, where private or state actors pay landowners to adopt and maintain environmentally beneficial behaviour. While promoted as a way of attracting private funds; public bodies are actually in many cases the main buyers of payments for these 'ecosystem services' (see Vatn et al. 2014). This serves to illustrate how the powerful market rhetoric about insufficient state regulations and the need for market-based policies is driving environmental policy change into a setting where private actors become more powerful and where their needs and wants must be facilitated.

Biodiversity offsetting, a market-based instrument, is the focus area of this article. Our case departs from the biodiversity policy of the United Kingdom. Previously a state led regulatory framework was responsible for biodiversity protection in the UK. Since 2010, a more market-oriented and green growth infused agenda has been proposed and partly adopted (Natural Environment white paper/DEFRA 2011). One particularly illustrative component of this white paper is the proposed 'biodiversity offsetting' policy and its pilot projects. In effect, this mechanism allows for the offsetting of biodiversity loss and environmental harm caused in one place by compensating for it elsewhere. However, the valuations, metrics and methodologies of this mechanism are highly contestable (see Sullivan and Hannis 2014).

This article analyses how the wider ideas of greening the economy has lent legitimacy to such proposals, and how these can reveal a lot about the influence of both structures and actors during a period of institutional change. One significant example is how the Environment Bank Ltd offers a brokerage service; facilitating the link between land developers and habitat conservers by purchasing and trading biodiversity across space and time. Thus, a new market emerges and biodiversity becomes the latest fictitious commodity.

The paper will start by introducing some of the core ideas of the Green Economy and outlining biodiversity policy in the United Kingdom. Institutional change theory and political economy hypotheses are introduced and applied. After showing how the Green Economy ideas have legitimized biodiversity offsetting as a desirable policy solution, the implications of this emerging institution are considered. Finally, some conclusions are drawn and further research recommended.

2. The Ideas of the Green Economy

Despite decades of efforts towards sustainable development, the world is in crisis. We are facing major loss of biodiversity, climate change, financial crisis and a fuel and food crisis. In the case of the UK, there has been a long-term decline in multiple ecosystem services, at the same time as pressures from climate change, population growth and demands have increased (NEA 2014). Economic growth has been accompanied with an accumulating

environmental degradation, but while economic growth seems to be slowing down, the environmental crisis is remains. However, as growth has been established as the main goal and index of success for an economy, a reduction of economic growth is by no means seen as desirable; hence, the emphasis is placed on finding solutions for combined economic growth and environmental protection. This is where Green Economy enters the discourse as an alternative after decades of focus on sustainable development.

The concept of a Green Economy has gradually crept into the mainstream discourse about sustainability, especially after the Rio+20 Conference. With its emphasis on use of markets and `green' investments, the ideas of the green economy sit comfortably within market environmentalism. Market environmentalism believes in continued capitalist economic growth, and suggests that environmental management and degradation should be addressed by "extending the institutions of the free market into further dimensions of the environment, setting prices for environmental 'goods' and 'services' " (Adams 2008, p. 138).

The United Nations Environmental Program defines a green economy as one that "results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP 2011, p. 1). Their advice to policy makers is clear: as growth is driven by investments, investments needs to be channeled into areas where they reduce emissions and pollution. By now, most large, international organisations such as the World Bank, the OECD and the UNEP have developed their recommendations for green growth and a green economy (World Bank 2012; OECD 2012; UNEP 2011), as have national governments across the world.

A Green Economy both recognizes and demonstrates the value of natural capital. Natural capital should be rebuilt as a critical economic asset, and capital should be channeled into e.g. ecosystem protection. The UNEP report (2011) makes a compelling economic and social case for investing two per cent of global GDP in greening ten central sectors of the economy in order to shift development and unleash public and private capital flows onto a low-carbon, resource-efficient path. A part of this is that governments should engage with the private sector and create new markets and market-based mechanisms. In order to accommodate this, it becomes necessary to measure as well as evaluate some changes in stocks of natural capital in monetary terms. However, this is complicated by the characteristics of ecosystem services as complex, interconnected and process-oriented resources. While efforts to place a monetary value on ecosystem services have been ongoing for a long time (see e.g. Daily 1997), markets and economic valuation methods are still unable to recognize all types of values and the often unknowable dynamic workings of ecosystems. This is furthermore related to a plurality of value dimensions, difficulties related to demarcation and property rights systems, as well as incommensurability (see Vatn 2005).

According to UNEP (2011, p.1) «achieving sustainability rests almost entirely on getting the economy right». It is clear that sustainable development remains a core of policymaking rhetoric, but green growth is increasingly seen as the way of achieving it, thereby developing a new discourse when the old discourse was losing its traction in economic policymaking (Jacobs 2013). While earlier discourses had a politically and economically unattractive focus on costs and the need to limit growth, the ideas of green growth and the green economy holds a promise to keep the economy growing. It therefore gains stronger support from economic interests than sustainable development has, especially from powerful, environmental industry and business interests (ibid).

The ideas of the Green Economy have gained traction due to widespread disillusionment with prevailing economic paradigm and its inability to address sustainability, causing crisis fatigue. Increasing environmental degradation and environmental risks combined with a wealthy private sector provides a new context in which environmental policy is negotiated. The Green Economy has as such provided legitimacy to those who are in favor of the increased use of markets for environmental protection. Promising not only funds for environmental protection and investments, the Green Economy promises the creation of new, green jobs, in areas such as natural capital asset management and activities like community based conservation or payment for ecosystem services (PES) schemes. This is a central argument in why national governments choose policies like biodiversity offsetting.

The manifestation of the Green Economy is perhaps most clearly seen in the efforts of TEEB, The Economics of Ecosystems and Biodiversity. TEEB is a global initiative introduced at the G8+5 Summit in 2007. Its aim is to provide evidence of the economic and social benefits of ecosystem services and biodiversity by highlighting their non-monetary and monetary values, and estimating the costs of their loss and degradation. Thus, the value of ecosystem services is to be recognized, demonstrated and captured (TEEB 2013). TEEB provides a menu of policy options for policy makers of various levels, which includes policies such as PES and other market based instruments.

The list of reports represented here is far from exhaustive, however, all these eefforts, on both national and international level, emphasise the need to have a mix of policies in order to ensure sustainable delivery of ecosystem services. These can be anything from legislation, voluntary initiatives, incentives, awareness raising etc. Significantly, regulatory approaches are not seen as sufficient, unless combined with market-based incentives and complemented by voluntary schemes (see e.g. NEA 2014). While the aspect of learning and knowledge exchange is important, experiences with neo-classical economic valuation tools such as cost-benefit-analysis and related methods often do not integrate learning and communication into such institutional frameworks (see Vatn 2005).

3. Green Economy and Biodiversity Offsetting in the United Kingdom

Under the TEEB framework, TEEB Country Studies (TCS) identify the most important national ecosystem services and recommend how these can be integrated into policies (Hedden-Dunkhorst 2013). According to representatives from the UK, country studies can then be linked to national efforts of transitioning to a green economy, as the green economy is a 'leading economic concept' (Hedden-Dunkhorst 2013, p. 7). The United Kingdom was the first country to complete a comprehensive National Ecosystem Assessment (NEA), influenced by the Millennium Ecosystem Assessment (MEA) and TEEB (ibid.). The 2011 UK National Ecosystem Assessment (UK NEA) concluded in a similar way to other studies that while ecosystems are important for well-being and economic prosperity, they are undervalued in economic decision-making (UK NEA 2014). This made the basis for the ´Natural Environment White Paper' delivered by the Department for Environment, Food and Rural Affairs (Defra) also in 2011 (ibid). This was a time when the implementation of economic valuation of ecosystem services in the UK gained traction. In

fact, in 2011, the UK Government formed a private actor led Green Economy Council to support the government in its green transition, with an aim to minimizing costs and maximizing opportunities for business. Participants include business leaders from various industries with the expressed aim of advising government on infrastructure and investments, and helping government in reducing what it sees as 'unnecessary regulation'.

For biodiversity offsets more specifically, their use of started as early as the 1970 in the United States of America, for wetland mitigation. They are now a global phenomenon to mitigate loss of biodiversity from economic and industrial development (Burgin 2008). Biodiversity offsets (BDO) can be defined as "voluntary conservation activities that are designed to offset residual, unavoidable damage to biodiversity caused by development activities" (op.cit, p. 808).

BDOs have become increasingly popular as a tool to protect natural areas. They are an alluring construct; just like the green economy promises the successful marriage between economic growth and environmental protection, biodiversity offsets promises to combine conservation and economic development. Still,, they are controversial in regard to the ecological loss vs. uncertain gains (Bull, Suttle et al. 2013). While methodological approaches are still in the process of being developed, offsetting is widely adopted across the world. A review by Bull, Suttle et al. (2013) concluded that 'biodiversity offset schemes have been inconsistent in meeting conservation objectives because of the challenge of ensuring full compliance and effective monitoring and because of conceptual flaws in the approach itself'(p. 369). It is not within the scope of this paper to discuss experiences with offsetting in detail; suffice to say that their track-record is reflected in the critique and debate about BDO in the UK context.

The entire mechanism rests on the premise that commensurability can be calculated i.e. that aspects of a natural environment can be converted into a single metric ('units of biodiversity') and then priced and traded like any other commodity to secure 'no net loss' (Ten Kate, Bishop et al. 2004). For a detailed discussion of the specific metric calculations being proposed, see Quétier and Lavorel (2011). The number of contestable issues that arise during implementation of biodiversity offsetting (BDO) is considerable (McKenney and Kiesecker 2010, Maron, Hobbs et al. 2012), but if the principle assumption is accepted then the potential for this mechanism to resolve industrial development/environmental impact dilemmas is significant. In fact, it is this role of this idea, and the larger discourse of a Green Economy from which it stems, in driving BDO and environmental management policy in England that is of interest here.

The Biodiversity Offsetting Pilot Scheme in the UK was established in April 2012, consisting of six voluntary pilot areas that agreed to establish pilot groupings of Local Planning Authorities (LPAs) and other interested stakeholder organisations to pilot the concept of biodiversity offsetting in England. In so doing, the pilot areas would also test the biodiversity offsetting metric developed by Defra (Defra 2012). Examples of the principles for biodiversity offsetting include: no change in existing levels of protection for biodiversity, real benefit delivery through effective management of compensation for biodiversity loss, expanding and restoring habitats, enhancing England's ecological network and ensuring additionality, i.e. that the gains would not have happened anyway without intervention (Defra 2011).

The six pilots are: 1. Coventry, Solihull and Warwickshire, 2. Devon 3. Doncaster, 4. Essex, 5. Greater Norwich, 6. Nottinghamshire. While the BDO policy in England is still in

the pilot stages, it is generating considerable interest and debate (Sullivan and Hannis 2014). As such, it is ripe for analysis, potentially producing insights into processes of institutional change and policy innovation. Various government sponsored information streams and research projects underpin the Department for Environment, Food and Rural Affairs' (Defra) BDO policy development but the influential role of other national and international governmental bodies, as well as non-state actors, can also be seen. Sullivan & Hannis (2014, p. 3-5) cite a number of existing policies and reports that have prepared the ground for the introduction of Defra's proposals.

Concurrent to the written policy context, there have been public consultations, academic conferences and social actions all giving voice to competing discourses seeking to influence the perceived legitimacy and the final shape of BDO policy within and beyond England. As it stands, a set of BDO guidelines have been produced and six local councils are working with Defra and private actors on piloting them. The feedback from these pilots is intended to add to Defra's evidence base for developing BDO policy on a national scale. Early findings from an interim report (Collingwood Environmental Planning, 2013) suggest that existing organisations that would be responsible for BDO at a local level will need to be reviewed in order to increase their capacity because no specific additional resources have been made available and awareness of BDO both internally and among developers is low. Similarly, there is concern about how BDO will dovetail, or clash, with existing environmental compensation mechanisms.

If the proposed BDO guidelines become national policy, whether voluntary or regulatory, a number of changes to current environmental management institutions and polices could be expected. Not least of which would be the creation of a new publicly supported market for trading biodiversity whereby developers assume the role of the buyer and natural environment stewards take on the role of supplier. Such a private market arrangement already exists in England and is operated by brokers like The Environment Bank. Incorporating such a market mechanism into public environmental management policy would signal another step toward the commodification of nature (Sullivan 2013). It is here suggested that the rise of BDO in England, and the institutional change it would bring, rests on the Green Economy framing of, and solutions to, industrial development/environmental impact dilemmas.

4. Understanding Institutional Change

To understand the process of introducing and running (implementing) the new institution called biodiversity offsetting and evaluating what it represents, one must understand what institutions are, how they change, and how they influence the world we live in.

4.1 Institutions

For classical institutional economics, the *collective* is important and institutions are enablers of realms of choice. For Commons (1924) institutions are legal relations a) between individuals and b) between individuals and the state. Bromley (1989) defines institutions as "*rules and conventions of society that facilitate coordination among people regarding their behavior*" (sic) (p.22). We see here that for classical institutional economics, institutions are purposefully constructed by the collective with the purpose to alter interactions between members of a going concern.

Vatn (2005) agrees with Commons and Bromley when he sees institutions as socially and as purposefully constructed. He defines institutions and offers a typology of them according to their form and their motivation. Institutions are thus "*the conventions, norms and formally sanctioned rules of a society. They provide expectations, stability and meaning essential to human existence and coordination. Institutions regularize life, support values and produce and protect interests*" (p.60). Conventions (like language) address and simplify coordination problems. Norms differ from conventions in their incorporation of values. Norms are socially created and internalised rules to define and support values in a situation with conflict potential. The last category, formally sanctioned rules combine *i*. an act which is either allowed or forbidden with *ii*. an agent or a system with sanctioning authority. This third category is referred to by Commons (1924) and Bromley (2006) as legal correlates (dualities) and their purpose is to create order and resolve conflicts. As Bromley stresses, these institutions "carry the expectation of legal sanction" (*ibid*, p. 51). These institutions (legal correlates) define what individuals "must or must not do (duty), what they may do without interference from other individuals (privilege), what they can do with the aid of the collective (power) and what they cannot expect the collective to do in their behalf (no right)" (Bromley 1989, p. 43).

For the purpose of this study *institutions are seen as social constructs that define choices in a going concern, let that going concern be a family, a community, a firm or a nation.*

4.2 Institutional Change

Institutional change is the creation of an institution in an area where no institution existed until that moment, or the replacement of an existing one. Theories of institutional change address the questions of how and why the institutional status quo changes. They approach these questions through different perspectives. Some theories start off from the assumption that change is spontaneous or designed, while others make the distinction between whether it is initiated by the "top" or the "bottom" of a hierarchy.

Vatn (2005) proposes a typology of reasons for which institutions change in the case of designed institutional change. Institutions will thus change when based on the following three grounds: *a)* Hopes to improve efficiency – the reduction of transaction costs and the uptake of technological advancements. *b)* The alignment with interests, values and power and *c)* Response to crises/shocks. Transaction costs are argued by neoclassical economists to be reduced through the protection of present or future benefits streams through the establishment of *property rights*. However, the question of who will be granted that right is a question of whose *interests* are protected and advocated and whose interests will be denied. The last ground upon which institutional change is predicated is that of a response to a crisis. Adapting to a crisis requires new institutions. Vatn (ibid) however cautions on the possibility that crises might legitimise changes that would otherwise not be accepted.

Bromley and Anderson (2012) see institutional change as more general and advocate that change occurs because the status quo ante is not working as expected. Is a result of human volition, which is the focus of Bromley (2006) where he views institutional change as a deliberative action occurring when a surprising event takes place and doubt is settled. The surprising event might be that the current institutional status quo fails to "conduce to agreeable outcomes" (p.35). *Created and available imaginings of the future* (volitional

nature of institutional change) are evoked. Institutional change then becomes public policy in the making.

Classical institutional economics understand public policy as being founded upon two choices. The first choice concerns deciding on "socially acceptable institutional arrangements [...] that both constraint and liberate individual action at the operational level" (Bromley 2006, p.34), that is, deciding looking at the future and clarifying who would partake in that choice. The second choice concerns the boundaries between autonomous and collective decision-making.

Autonomous is understood here as atomistic, market-like setting for decision-making. This choice is informed by the possible benefits of alternative institutional set-ups and by the cost of possible mistakes. And these two choices regarding public policy are for the state to make. As Bromley notes, the state is the "manifestations of the hopes and interests of their citizens" and as such "retain authority over these two types of choices" (p.34). They are both grounded on necessity, culture and situation. We see here that public policy cannot lead to the exact same outcomes (institutional set-ups) in different settings and with different desired outcomes in mind. Public policy is simultaneously the mirror and the compass of a state. It shows the current situation of the state and points at a desired, future direction-/outcome. Dissecting the ideas behind biodiversity offsetting and green growth will then point us to the direction the UK public policy is moving to.

What animates the policy process in the first place, in other words, what drives it, is the process of invention, of realisation that there is something not agreeable with the existing institutional status quo, and the apprehension that the future outcomes of such a situation would be unwanted and preferably avoided. So, decisions are made now, looking at the future. Policy process is animated by the wish to avert costs in the future and thus to secure gains.

Once this apprehension is settled, new created imaginings are required. These take the form of an imagined and desired state of being that a society wants to achieve. Created imaginings are a vision to be realised. Because different individuals within a society will have different created imaginings, there are some organised groups of people whose task is to mould and to converge these diverse created imaginings into one common plausible imagining. These groups are parliaments, think tanks, consultants, experts and so on (see figure 1 for some examples in the UK context). It is only then that policy formulation can begin. Collective action is undertaken to modify existing institutional arrangements or to create new ones. This is a never-ending process in a democratic society. A new problem is identified, which is attributed to existing institutional set-up and whose negative effects society wants to avoid/avert, plausible created imaginings diverge and emerge and finally institutional change occurs, that is, institutions are modified or newly introduced. This process was highlighted by Bromley (2006) who wrote: "[...] the emergent created imagining is the outcome in the future for the sake of which the new institutional arrangements must be implemented now" (p.75).

The new institutional arrangements to be implemented, and indeed the policy process as a whole, are collective action *in restraint, liberation, and expansion of collective action*. These emergent created imaginings are settled through reasoning, through reason giving. It is precisely towards these reasons that we must turn if we are to understand the institutional status quo and the process of change.

Mark Blyth (2002) approaches institutional change and public policy with a slightly different and yet complementary way to classical institutional economics. Blyth offers an

explanation on how exactly the status quo comes to be understood as undesirable and emphasises the crucial and instrumental role of *economic ideas*. He fills the gaps of Bromley's approach to institutional change, by operationalising Bromley's concepts of warranted belief and created imaginings.

Blyth uses ideas and economic ideas interchangeably as he is concerned with the influence of ideas on public policy. It is often presumed that there are two distinct spheres of action, the political and the economic. In institutionalism this distinction is seen as obsolete and redundant, as it is the political (the institutional) that defines the rules, the setting, the conditions under which the economic sphere operates. Therefore, when discussing ideas in public policy, their economic manifestation needs not be separately emphasised. Under this perspective we can accept Blyth's ambiguity in interchangeably using ideas and economic ideas, as they are –for institutional economist, essentially the same.

Blyth's approach offers a linkage between Bromley's reasons and ideas. For classical institutional economics reason is the justification of action in terms of a desired future state it is expected to bring about. We act now in a specific manner because we expect that a specific action will bring about a desired outcome in the future. One can say that that reasons for action are constituted by goals and means. For Blyth reasons are ideas around which people organise, form coalitions and a basic precondition for action. Groups of actors (coalitions) will contest over ideas and prevalence. This is what Bromley calls reason giving. The prevailing idea will be the one to be adopted as a new institution.

Blyth proposes five hypotheses on the interplay of ideas and institutions. He tests them in the institutional responses to the 1930s crisis in the USA and Sweden (turn to liberalism) and then to the neoliberal turn of the same two countries starting from the late 1970s.

4.3 Blyth's Hypotheses

In what follows, we briefly introduce Blyth's hypotheses and -where possible- engage them in a dialogue with Bromley's approach on institutional change. Furthermore, we will use these hypotheses to attempt to identify the reason (justification) for the uptake of biodiversity offsetting schemes in the UK.

i. The First Hypothesis assumes that *"In periods of economic crisis, ideas (not institutions) reduce uncertainty".* (Blyth 2002, p. 35.- emphasis in original)

Institutional change is not static, it is a dynamic process, that requires time (as noted by Bromley, it requires time to offer reasons for an action). When the status quo is deemed unsatisfactory there follows a period of time when actors operate under uncertainty, since there is no readily available solution to the problem at hand. One must be constructed. Economic ideas act as "interpretive frameworks that describe and systematically account for the working of the economy by defining its constitutive elements and providing a general understanding of their "proper" (and therefore improper) interrelations" (Blyth 2002, p. 37). Thus, economic ideas allow for the interpretation, rather than the mere simplification, of the complex situation actors find themselves in. Once a situation is interpreted, then uncertainty is reduced since actors can now explain what is happening and why. Once that is established, new institutions can be designed.

It would be useful at this point to elaborate on what is meant here with the term "uncertainty". What is uncertainty, and how does one reduce it? Blyth understands uncertainty as being faced with a situation that is unique, so that the agents have no prior experience or conception of what to expect, and therefore (since outcomes of this highly unique situation cannot be predicted) agents do not have a conception of what their interests in this situation are.

The next step in this syllogism is that agents' interests "can be defined only in terms of the ideas that agents themselves have about the causes of uncertainty" (op. cit, p. 32). We remind that uncertainty is the new, highly unique situation. These ideas that agents hold, allow them to diagnose the situation they are in (which could be a crisis), inform and determine their actions and ultimately shape the outcomes of the agents' actions. It then becomes clear that the ideas of the agents determine actions undertaken to reduce uncertainty (operate within a highly unique situation). Blyth illustrates this by using the example of the economy and advocates that agents having different ideas about how the economy works will opt for different actions, leading to different outcomes.

ii. The Second Hypothesis states that: *Following Uncertainty reduction, ideas make collective action and coalition-building possible*. (op.cit, p.37. emphasis in original)

According to the second hypothesis, once uncertainty is reduced, actors build distributional coalitions to achieve the common goals identified. As Blyth puts it, ideas "act as coalition-building resources among agents who, in periods of crisis, attempt to resolve the crisis by restructuring the distributional relationships that pertain among the principal collective agents in advanced capitalist nations: business, labor and the state" (p. 37). They enable collective action by "allowing agents to redefine existing interests under uncertainty and thereby redistribute the perception of existing political costs and benefits regarding alternative courses of action" (p.38).

Economic ideas shape the future by deciding what that future should look like. So in essence, economic ideas define what the common end goal of a collective action should be. To relate this with our discussion on classical institutional economics, this would be what Bromley calls created imaginings. Once agents know that they want, they can form coalitions to achieve it.

iii. The Third Hypothesis postulates that: "*In the struggle over existing institutions, ideas are weapons" (op.cit. p.39,* emphasis in original*)*.

Ideas are resources that actors make use of to achieve their goal. Actors use ideas as weapons. Once the cause of a crisis (unsatisfactory outcome, in Bromley's terminology) is identified, then actors are set on eliminating/changing it. And to that end, they use economic ideas, to delegitimise the existing institutional status quo. "Economic ideas are effectual weapons for transforming existing institutions precisely because *existing* political and economic institutions are the result of *past* economic ideas about how the economy works" (Blyth, 2002, p. 39, emphasis in original).

iv. According to the Fourth Hypothesis: "*Following the delegitimisation of existing institutions, new ideas act as institutional blueprints" (op.cit. p. 40,* emphasis in original).

Since institutions are the manifestation of ideas, then we can hypothesise that economic ideas act as institutional blueprints (once existing institutions are deemed undesirable). As Blyth puts it, they "dictate the form and content of the institutions that agents *should* construct to resolve a given economic crisis" (p. 40, emphasis in original). With the term

blueprint, it is here understood that the new institutions are in actuality derivative of economic ideas upon which they are predicated.

v. The Fifth Hypothesis concludes: *Following institutional construction, ideas make institutional stability possible (op.cit. p.41,* emphasis in original*).*

By generating conventions (conventions dictate what should be done from now on, and the proper way to go about doing things, previously referred to as blueprints) that make institutional coordination of agents' expectations possible, economic ideas provide stability. The newly constructed institutions reflect the prevailing ideas about how the economy should work, an idea shared by the agents. Acting within this shared convention, promotes stability since agents know what to expect. To relate with the Bromley's terminology, this would be the creation of a new institutional status quo.

5. Analysis

In what follows we will revisit the UKs Green Growth and Biodiversity Offsetting approach using Blyth's Five Hypotheses on institutional change.

In accordance to Blyth's *first hypothesis*, biodiversity offsetting in the UK came forward to reduce uncertainty arising during the economic crisis that begun in 2008 in combination with an accumulative environmental crisis and pressures on biodiversity rich land. The last few decades have, as perceived by Blyth, been characterised by uncertainty (highly unique situation), with rapid changes occurring in the nature of national and global economies. While market solutions are by no means a new phenomenon, they have become more and more common since the 1970s, especially in the UK. Post-war Keynesian economics were replaced by monetarist policies and a neoliberal ideology offering market-based solutions to fiscal, efficiency and environmental uncertainties (Harvey 2005). However, as this paradigm is increasingly undermined by environmental pressures, in the UK and more widely as illustrated by ecosystem assessment reports, uncertainty is beginning to return: new ways are sought to keep the economy running and functional, while at the same time maintaining and protecting the natural environment.

The institutional change we are discussing is a gradual, long-term type of change, driven by a multitude of reasons and ideas. Economic pressures towards the environment have gradually increased over time, and innovation in technology and finance has in many cases proven to increase such pressures. The acknowledgement that the current state of UK ecosystems is unsatisfactory has led to significant policy discussions, where a variety of approaches has been put forth. As described by Blyth, a solution must be constructed, based on agents' ideas.

Biodiversity offsets were invented to compensate for environmental impact; however, they are essentially a promise of a win-win between economic development and environmental protection. This idea is driven by introducing metrics (Defra 2012) to reduce uncertainty (a way out of a highly unique situation), linked to continued economic growth for the UK as well as representing a solution to large scale, national environmental challenges. Furthermore, BDO is portrayed as a 'natural' and interrelated policy to the current economy, it represents at both an innovative step in a new, more extreme direction, as well as a solutions that fits the existing framework well, namely the neo-

liberally oriented market economy. By identifying and promoting this idea and solution, proponents of BDO (see figure 1) are certain in their plan, and are able to convince others that this must be tried. They can effortlessly explain that while biodiversity loss is caused by a lack of monetary valuation on ecosystem services, biodiversity offsetting can solve this problem, and offer flexibility too. Thus, it became possible for the UK to continue within the current economic paradigm, by creating new institutions for biodiversity offsetting.

The coalition of actors supporting the adoption of biodiversity offsetting policy in the UK includes mostly state-based actors and private enterprises. A snapshot of some of the key players is presented in figure 1. Civil society actors are not completely absent from the debate. Many campaign organisations, community groups and academics have voiced opposition to biodiversity offsetting proposals. Sullivan and Hannis (2014) have shown the discursive lines along which these coalitions are divided and their findings suggest that those supporting BDO have a clear and relatively unified stance whilst those in opposition raise objections for a variety of different reasons. The extent to which this difference in coalition cohesion affects the influence of their respective arguments may prove to be important. In particular, those voicing opposition by using non-economic forms of valuation risk being de facto excluded from what is framed as an economic/planning discussion.

In terms of cost and benefit distribution the claims of financial pro BDO actors such as the Environment Bank are significant. The anticipated benefits for landowners and developers include some costs but also continued economic development and income, as well as access to valuable land resources that may have been previously restricted. Furthermore, the government can use the mechanism to reduce bureaucracy and running costs around planning applications.

Figure 1 shows the key actors advocating for biodiversity offsetting and it is also a suggestion of things to come. Each actor stands to gain from adoption of biodiversity offsetting and the establishment of a new market and institutional landscape for its implementation.

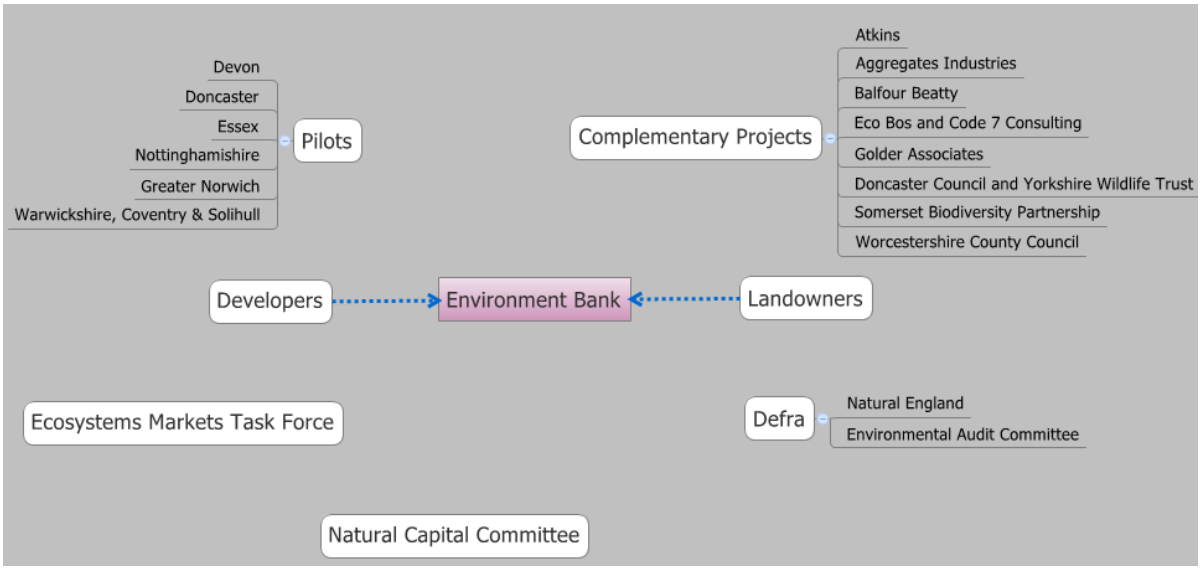


Figure 1: Organisations engaging with biodiversity offsetting in the UK

How the different takes on BDO evolved and were eventually shaped into (pilot) policies can be explained by Blyth's third hypothesis and we can see that economic ideas are indeed winning the battle to influence policy. National level biodiversity policy in the UK prior to the Natural Environment White Paper (2011) can be described as relatively stable set of norms, rules and regulations. With its state-centric emphasis on command and control regulation, particularly with regards to managing industrial development and natural environment trade-offs, this policy arena appeared at odds with a wider trend toward new environmental policy instruments that draw on civil society and markets (Jordan, 2008). Blyth encourages us to view ideas as weapons, and to be especially wary of the power of economic ideas. Already leant considerable legitimacy by decades of increasing influence in multiple policy arenas, the language of the market has forcefully called into question regulation based biodiversity policies in the UK, the EU and further afield, demanding they give account of themselves (within a battlefield framed primarily by economic valuation).

One of the most powerful weapons of argument deployed by economists is the cost-benefit analysis; the comparison of the expected costs and benefits between two or more courses of actions aimed at achieving the same outcomes. Applied to biodiversity protection in England, an analysis showed the existing regulatory framework to be failing to secure no net loss of biodiversity in many cases but also to be economically and effectively inferior to a market based alternative, the offsetting mechanism (Duke 2014). These measurable shortcomings are defined not as failures of policy design/implementation bus as 'market failures', thereby suggesting that the way to redress them is through 'market successes' rather than reflexive policy making.

After thus *destabilising the current institution* and shifting the linguistic terms of debate securely into the economic realm, the argument for biodiversity offsetting drew heavily on the idea of a green economy; an economy in which this once insoluble impasse of industrial development/habitat integrity can be resolved with a 'win-win' solution. For politicians, whose job depends on pleasing everybody (or at least a majority), the win-win solution is clearly the most desirable. By claiming to be able to safeguard biodiversity on a scale of 300,000 hectares per year whilst simultaneously creating a market with a value of more than £500,000 per year (Defra 2013a) and jobs, it easy to see how the metrics of biodiversity offsetting could make the mouths of policy makers water. At the heart of this 'double movement' of destabilising the existing institution and proposing a market-based alternative is the green economy assumption that economic development and environmental integrity are not incompatible, but are in fact complementary.

However, the battle of ideas is never entirely one-sided. A number of anti-offsetting agendas and discourse exist, with conferences, publications workshops and campaigns all aimed at questioning the appropriateness of the market-based solution (Sullivan and Hannis, 2014). Together these critiques draw on a widely cited set of criticisms levelled at what is seen as a process of commodification or commodification of nature, conservation and biodiversity (Robertson, 2004, Sullivan, 2013). Put simply, their ideological objection is aimed at the process of quantifying nature, insisting that socio-cultural valuation gets ignored or unfairly aggregated and the economic process argument is that financial markets consistently favour the already wealthy at the expense of the capital-poor or marginalised. Thus there appears a mismatch in argumentation. Whilst advocates stick to their win-win rhetoric and cite the robustness of their

econometric calculations, those resisting tend to argue on more value-laden and political terms. This is captured in Sullivan and Hannis' (2014) discourse analysis of written evidence given to the UK Government's consultation on biodiversity offsetting. The power of economic ideas looks set to outweigh the influence of non-economic ones.

Blyth's hypothesis appear to be vindicated, as ideas appear to be most prominent and most persuasive in this particular instance. Whether this is due to the wider pro-market policy paradigm in the UK or the political lure their arguments offer is unclear. Similarly, relational power and material resources clearly lie with the pro-offsetting coalition, making the specific influence of economic ideas difficult to isolate and judge.

As the fourth hypothesis suggests, to criticise and delegitimise is one thing but to *proffer viable and appealing alternatives* is another. With the aid of powerful economic ideas drawn from the international Green Economy and highly influential reports on economic valuations of natural environments, proponents of biodiversity offsetting the UK have created an institutional and policy space for their mechanism to fill.

No radical structural reform of government organisations is being suggested, just changes to their policies. Defra would still be the home of biodiversity policy. Supplementing its monitoring and enforcing of planning restrictions with the help of the Department for Trade and Industry, a new market for 3rd party offsetting would emerge. There, Defra and its subsidiary organisations (e.g. Natural England and the Environment Agency) would simply have a legalistic and administrative role to play, e.g. in defining the limit to transformation of land, as well as housing the policy documents and guidance. The market would take care of the rest. To make the advantages of biodiversity offsetting unequivocal, a blueprint for its adoption and implementation has been meticulously drawn out and is currently being piloted in England. The roadmap toward institutionalising biodiversity offsetting includes: principles for the very act of offsetting, economic calculations to provide a transparent evidence base, guidance for all key stakeholders and pilot and complementary projects to showcase the results.

Perhaps the most significant addition to the institutional landscape is the creation and utilisation of a new market and tradable commodity. Thanks to economic calculation and valuations within the offsetting system, units of biodiversity can be calculated and have property rights assigned to them. Thus, as the Environment Bank's projections suggest, two vast wells of demand and supply can be united to the benefit of nature, developers and the broker. With the help of the Environment Bank, developers (buyers) and landowners (suppliers) can enter into agreements that will facilitate development in one place and conservation in another. Such a market is already booming in the United States of America and in Australia, and the UK's equivalent is established and ready to blossom if offsetting becomes integrated into the national planning policy framework.

Defra has consulted with other organisations and non-state actors from the outset in order to develop the policy options and processes for integrating biodiversity offsetting into national policy (Defra 2013b). By helping to establish a market for biodiversity offsets, and even to some extent by piloting the policy in England, the UK Government has leant considerable legitimacy to the involvement of private for-profit actors in this policy arena as well as to institutionalising a new norm; markets should be harnessed to reconcile sustainable development trade-offs.

When an idea has become the proper way to go about doing something, it can be seen as a stable convention and blueprint. As such, e.g. economic agents have certain expectations to how the issue of biodiversity loss can be addressed through offsetting,

which give them flexibility and opportunities. According to Blyth, this is a phase of stability, where the idea about how the economy, and in this case, biodiversity offsetting should work, is a shared idea among agents. However, in the case of the UK, we are not there yet. We cannot talk about stability in the Biodiversity Offsetting sector in the UK, since it is still in the process of formulation. To which direction the UK public policy about green growth will move, remains to be seen.

6. Discussion

While payments for ecosystem services or other methods for putting a monetary value on environmental goods have been popular, they are highly contested. An eager private sector has identified economic opportunities that arise from various new policies creating markets for environmental benefits or enabling continued economic development. Politicians, eager to pursue economic growth and funding for policies, have accommodated the private sector in order to raise funds for environmental protection by creating these markets. These trends range from the local to the global level, and are widespread in multilateral efforts such as the increased focus on using markets to increase funding for environmental protection as well as the promotion of the Green Economy.

The shift discussed above comes within the broader context of a move towards multilevel governance where public and private actors (facilitated by the state) are involved in policymaking and implementation. This should not be taken as a de facto increase in democratic participation or redistribution of power (i.e. as a zero-sum game) but rather as an opportunity for actors to agitate, coordinate and renegotiate their role in the political economy. The ideas brought forward by these actors have manifested themselves in the types of policies being adopted and the way they distribute benefits and costs among stakeholders e.g. biodiversity offsetting shifts the impact of development across space and time as well as economic benefits among actors. Although the proponents in the UK are very vocal regarding the expected economic and environmental benefits, very little is said about procedural justice, socio-cultural benefits or the cost to the wider ecosystem where development does take place or where land management practices are altered elsewhere. Unsurprisingly, these issues are at the heart of opposition coalitions' arguments. There is strong scepticism, and outright accusation, around what is termed the commodification of nature. To many, BDO represents another instance of capitalist expansion enabling the already wealthy to further benefit, essentially allowing industrial developers and market brokers to profit at the expense of local communities and ecosystems.

Distributional effects are at the very centre of the BDO debate. Essentially, it is a market mechanisms designed to redistribute environmental change across space and time in order to facilitate industrial and capital growth. Whether such redistribution is even desirable to begin with already divides opinion and is embodied in arguments around the Green Economy. Specifically in the case of proposed BDO in the UK there are concerns from many that an unregulated market for 'biodiversity units' will reinforce already unequal power and economic relations as well as fail to take account of localised costs and benefits because of the way they aggregate these impacts up to a national ecosystem level.

What we are currently witnessing in the case of the UK Biodiversity Offsetting policy is in essence a war between different ideas on how the economy should work -or to use the concepts available to us by classical institutional economic, a war of created imaginings. These ideas ultimately concern how we understand what the economy is and what it incorporates, the way it should be organised, the role of the state in it, and the relationship between society and the environment. In times of multiple crises, ideas are crucial in offering (or promising) continued stability. It is only natural that several ideas will contest over the niche offered by public policy. Which one will prevail? As put forth by Blyth's five hypotheses on how ideas determine institutional change, and as we illustrated here, actors have built coalitions, offered their arguments in whichever fora were available (or were made available) to them and it is then up to the collective to decide which idea warrants their trust. It is now up to the collective to decide which idea is worth keeping and which created imagining is more appealing.

7. Conclusion

After outlining the broad political economic context of the Green Economy, this article introduced the biodiversity policy arena in the United Kingdom. This was done with the intention of linking institutional change in the latter with the influential ideas of the former. In order to bring this process to life recourse was taken to institutional economics and the political economy work of Mark Blyth. Combining insights from the two, a set of five chronologically ordered hypotheses were put forward to explain the role of specific ideas of Green Economy and their influence on the UK biodiversity policy arena.

Like Sustainable Development before it, the Green Economy is a malleable concept, which can be molded to suit a range of normative agendas and interests. In the case of UK biodiversity policy we have seen how the wider ideas of the Green Economy and TEEB, such as economic valuation and a strong preference for market-based policies, have been used to simultaneously undermine the existing state-led approach and to provide a convincing blueprint for a market-based alternative. Coalitions of proponents and opponents to this new, piloted institution are divided along many lines but the most coherent and politically saleable message comes from the proponents of biodiversity offsetting who are making clear claims about the distribution of costs and benefits.

To what extent these claims are well-founded, or even inclusive of all parties and their considerations, remains to be seen. As a new institutional arrangement solidifies around biodiversity offsetting in the UK and the first evaluations from the pilot projects are analyzed the debate will surely continue. Further research revisiting the discursive and actor coalitions as well as monitoring parliamentary publications and debates will be necessary to observe the emerging (in)stability of biodiversity offsetting beyond the pilot stages. These internal institutional dynamics should also be linked to wider processes of governance, markets and environmental change to see how well BDO policy can continue to reduce uncertainty by ensuring stability for a continued economic development and provide powerful economic arguments for supporting and developing this market-based approach.

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Values in Biodiversity Offsetting: Contradictions in Discourse and Calculation

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Abstract

In this paper we examine the ways in which biodiversity offsets (BDOs) "capture" value. More specifically, we analyze the tools of biodiversity offset creation in terms of the inclusion or exclusion of the values that are invoked in the discursive justification for BDO. We ask: How do BBOP's primary tools of cost benefit analysis and metric creation constrain what values can actually be captured? What is lost between principles (found in BBOP documentation and justification) and application (using the suggested tools)? To answer these questions, we analyze both the discourse on value and the technical operation of "capturing" these values using metrics and CBA in BDO creation. Through this analysis, we show that the techniques reveal a tension vis-à-vis the discourse of multiple values on the one hand, and the aims of capturing and quantifying these values on the other hand. In other worlds, we find that there exists a discrepancy in the BBOP approach between an all-encompassing attitude towards values and closed-ness of tools of quantification used in the creation of biodiversity metrics or currencies. We approach these tensions as internal contradictions that emerge from BBOP's own approach and conclude that this fundamental contradiction reflects how BDO proponents deal with and intend to accommodate the critiques against the quantification and capitalization of nature. The discourse of flexibility in fact operates as leverage for accommodating the BDOs, and the calculative practices, in every context. We suggest that without closer attention to these internal contradictions and tensions, we cannot fully comprehend how the practices of capitalization and marketization of nature and non-monetary values operate discursively and practically.

1. Introduction

Diversity, or the existence of variety, has a strong association with what seems natural and even desirable in life. Its formalization in the realm of biology or ecosystem sciences has afforded us multiple ways to evaluate the impact of human activity on other life forms. Knowledge of biodiversity loss in concrete terms is critical to this awareness. For example, an estimated 52% of the planet's wildlife have perished since 1970, with habitat loss and degradation being the largest threat (WWF 2014). That biodiversity itself holds value to our society is relatively unchallenged. Yet how we acknowledge, describe, and protect this value is fodder for an unfolding global debate. How one acts once value is acknowledged

depends significantly on what type(s) of value is (are) identified, and how. It is this normatively charged process of establishing and acting on value that centers the controversial status of biodiversity offsets (BDOs). A BDO is defined as "a no net loss (or net gain) conservation outcome" (BBOP 2012d:13) that aims to compensate the negative impacts of development projects on biodiversity by offsetting: developers compensate adverse impacts by restoring biodiversity elsewhere. Our focus in this paper is on how the tools of biodiversity offset creation include or exclude the values that are invoked in the discursive justification for BDO. In other words, we aim to address how biodiversity offsets "capture" value.

A 2010 study on the state of biodiversity markets found that 64 programs for offsets and over 600 mitigation banks existed worldwide (Madsen, Carroll, and Moore Brands 2010). Attempts to standardize the BDO process are well under way. In this context, we focus our investigation on Forest Trend's Business and Biodiversity Offsets Program (BBOP). BBOP is an expansive alliance of over 75 organizations that are collectively working to standardize best practices of biodiversity offsetting and to put them on the policy agenda globally. Their engagement with industry and government is high-touch, providing a library of technical reports that guide potential developers through steps to account for biodiversity value. By looking at such technical documentation, we ask: How do BBOP's primary tools of metric creation and cost benefit analysis constrain what values can actually be captured? What is lost between principles (found in BBOP documentation and justification) and application (using the suggested tools)? We find that there exists a discrepancy in the BBOP approach between:

1. *Openness/vagueness* in terms of what values "should" be included. That is, an all-encompassing attitude towards values (i.e. all values are valid and should be included); and,
2. *Closed-ness/determinism* in terms of tools to measure value. That is, tools to quantify on the one hand intrinsic values of biodiversity and on the other hand cultural and socioeconomic aspects related to biodiversity. We hypothesize that difficult-to-quantify values are not adequately represented in BBOP's tools and thus visible or quantifiable values are given disproportionate weight in biodiversity offsetting design. To evaluate discrepancies between discussion and quantification of values, we analyze both the discourse on value and the technical operation of "capturing" these values using metrics and CBA.

Our analysis proceeds as follows. We first summarize the main scholarly discussions that pertain to the monetary valuation of nature, pointing to our contribution in these discussions: that is to investigate BBOP's claims to capturing value *on its own terms*. We then present BBOP's claims to account for multiple biodiversity values and identify how these claims stand in tension with BBOP's aim of commensurability. With a brief introduction to the neoclassical economic axioms underlying BBOP's approach, we analyze the conceptual and practical tools of calculation in BDO creation. We show how these techniques reveal a tension vis-à-vis the discourse of multiple values on the one hand, and the aims of capturing and quantifying these values on the other hand. By doing so, we approach these tensions as internal contradictions that emerge from BBOP's own approach. It appears that BBOP coopts potential critiques against BDOs through this process, limiting the space for open deliberation about how to value nature. We conclude with reflections on these findings and a call for critical researchers to explore the actual

tools of quantification in all practices that work to incorporate nature into monetary valuation.

2. Literature on Biodiversity Offsets

BDO proponents claim that offsets afford biodiversity conservation and economic development as mutually obtainable goals (BBOP 2012b; Bull et al. 2013; Duke et al. 2012; Sullivan and Hannis 2014). As such, BDOs are promoted as part of the *green economy*, which claims to remedy the economic and ecological crises of the 21st century through the economization of nature (Brand 2012). The green economy is advocated as a "new economic paradigm – one in which material wealth is not delivered perforce at the expense of growing environmental risks, ecological scarcities and social disparities" (UNEP (United Nations Environment Programme) 2011:1; quoted in Brand 2012). BDOs are therefore situated within this new paradigm.

Economic valuation of ecosystems has long been debated within academia and activist groups. On the one hand, proponents of these practices, which attribute economic value on nature and frame it as ecosystem services or natural capital, claim that capturing the commercial value of nature will finally bring attention to ecosystems into policy decisions and market actions (Costanza et al. 1997). Yet others argue that cost-benefit analysis and the corresponding valuation methods represent "an incursion of market-based norms and modes of arriving at choices into spheres where they are inappropriate" (O'Neill 2007:23). From this viewpoint, biodiversity offsetting represents yet another harmful expansion of the market. Ecological economists articulate the complexities involved in biodiversity and ecosystems that render the construction of single metrics impossible (Vatn and Bromley 1994). Others stress the need for the recognition of multiple values attributed to nature beyond the monetary value (Martinez-Alier, Munda, and O'Neill 1998; O'Neill 2001). Kallis et al. recently intervened on this discussion by arguing for a middle ground that holds a "pragmatic yet radical approach" (2013:103). They, on the one hand, are attentive to and critical of the neoliberal hegemony of "economism" that values nature only in monetary terms. On the other hand however, they argue for an approach that recognizes the pragmatics of transitory actions for change in economic systems such as making nature visible through economic valuation under certain circumstances.

Whether or not such a middle ground is achievable is a debatable issue. Sullivan and Hannis show that BDOs are sparking debate over "the value of nature, and the nature of value" (2014:20). Proponents of BDOs perceive it as a revolutionary mechanism that makes visible nature's value in a system that only sees monetary value. Conversely, BDOs are challenged as inappropriate schemes to address the intrinsic value of nature and the un-substitutability of specific natures in specific locations. They conclude that deliberation is inadequate to the task of reconciling the "value struggle" because pro- or anti-BDO discussants have different ideologies, rationalities, and ontologies that result in opposing "value frames" (Angelis 2001 quoted in Sullivan and Hannis 2014:20). In this paper, we are specifically concerned with unpacking the value frames of BDOs technically in order to see how they do or do not correspond to BBOP's discourse on multiple values and their complete inclusion.

Existing critiques on the commodification of nature in the neoliberal era (Angelis 2001; Castree 2008a, 2008b; Harvey 2007; O'Connor 1998) provide a backbone for our inquiry into value calculations in BBOP. Yet, it is important to note that even the proponents for putting a price on biodiversity and ecosystems recognize the complexities involved when the unit to be measured is nature; calls for further research and debate to develop more accurate representations of ecosystem dynamics accompany even the most authoritative articles on the topic (Costanza et al. 1997). The impossibility of constructing consistent and fungible units of nature for biodiversity credits is recognized in discussions of BDOs (Purvis and Hector 2000; Tregidga 2013). Scholars continue proposing better practices of BDOs that require attention to specific contexts (Bull et al. 2013). Both the methods and implications of valuing nature are as yet well-established in the literature and in practice. In what follows, we aim to go beyond the question of whether BDOs are tools of coopting nature or a revolutionary mechanism; we examine both the discourse and the actual tools of practices that control what gets valued in BBOP—the largest attempt to standardize methods for BDO value creation. We hope that a combined analysis of discourse and technique will expose any internal inconsistencies or incompleteness in the process of "capturing value".

3. Values in Biodiversity Offsets

The divisive landscape of values noted above has important implications for analyzing the work that values do within BBOP's BDO discourse. The recognition of multiple values in the creation of offsets stands as one of the main elements in BBOP's discourse. Accordingly, BBOP holds biodiversity offset outcomes accountable to *multiple* values: "A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach" (BBOP 2012d:18). Ultimately the goal of biodiversity offsetting is to achieve "no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity" (Ibid:9). BBOP conceptualizes the ecological value as "intrinsic value" and equates it to the type, amount and condition of affected biodiversity. This value represents ecological features that are valued because of their inherent worth independent of their value to anyone or anything else. "Use value," on the other hand, is associated with socioeconomic practices such as production of food and medicinal plants, materials, energy, or use of water resources and "cultural values" are associated with cultural practices such as recreation, sacred sites and spiritually important species (BBOP 2012c:19). While BBOP claims to take all these values into consideration, the distinguishing feature of BDOs relative to other conservation efforts is defined as the attempt to measure and find equivalence between the value losses and gains in development and offset sites (Ibid:19).

The requirement for "measurable outcomes" ultimately narrows how values find representation in decision-making. This is because the tools of CBA and biodiversity currency must be adequate to their objects of analysis (values); however, these tools can only use partial and quantifiable representations of values. The consequences of inadequate representation are thus tightly linked with the inclusion or exclusion of

specific values. Ultimately what gets used in the tool is a function of representation; i.e. how different components of biodiversity are described in their assessment. For example, BDOs often use a select list of key species for biodiversity assessments rather than all species. Species diversity is thus represented by a modified list of species before the qualitative evaluation is translated into the tools. What gets calculated for the currency is a function of how the tool assigns value to what gets represented. This suggests two layers of translation: 1) from reality (nature and values) to a modified qualitative representation, 2) from representation to quantitative value. Yet, BBOP acknowledges that the question of commensurability between biodiversity losses and gains is not separate from the variability of local biological, social and cultural settings:

> "Central to the design of a biodiversity offset is a transparent quantification of the biodiversity losses and gains at matched development and offset sites. Evaluating gains relative to losses is challenging for two main reasons. First, biological diversity as a broad unifying concept is understood to encompass all forms, levels and combinations of natural variation, at all levels of biological organisation (Gaston and Spicer 2004), as well as different kinds of human use and cultural values... Second, any given biodiversity offset project is characterised by a unique set of development impacts (defined by type, scale and intensity) and candidate offset sites (defined by geography, current ecosystem condition, and background rates of environmental impact; see BBOP 2009a)" (BBOP 2012c:3).

How can "transparent quantification" begin to accommodate "all levels of biological organization" and "different kinds of human use and cultural values"? We argue that BBOP's explicit prioritization of quantification contradicts their inclusive, flexible approach unless BBOP fundamentally believes that the resulting numerical values truly represent diverse ways of valuing biodiversity. To better understand this, we turn to the foundational theories that allow the money form of value to encompass and make tradeable a variety of diverse and non-commensurable values: neoclassical economics.

4. Neoclassical Foundations

According to neoclassical economic theory, environmental problems arise because the price on nature is too low (often zero). The neoclassical solution to environmental problems thus follows: put a price on nature, which is conceptualized as environmental goods and services. These prices can be found either directly – by creating actual markets for environmental goods and services - or indirectly – by constructing shadow prices. The latter is more relevant to BDOs, where shadow prices are constructed either by observing real market prices of related goods or through various economic valuation methods. According to neoclassical theory, these shadow prices provide information about people's preferences for the environmental goods and services in question; here biodiversity.

Two of the central arguments for monetary valuation are i) that it provides a way of arriving at decisions that maximize social welfare, and ii) that it provides a way of trading off conflicting objectives (how much conservation and how much timber production?). Welfare in neoclassical economics, however, takes on a specific meaning, namely the satisfaction of individual preferences, which corresponds to increased utility.

According to O'Neill "monetary valuation is an attempt to measure welfare gains and losses for the purpose of the application of a particular direct form of utilitarianism to public policy" (2007:38). This view implies that goods are substitutable as long as utility remains constant and hence supports the use of compensation.

At its core, CBA is based on the assumption that rational choice (dictated by utility maximization) requires a single measure of value: Shadow prices are used as inputs in order to compare benefits and costs on the same scale. From this, one can readily determine whether or not a project should be carried out, namely if benefits exceed costs.

Another argument for economic valuation (and the use of CBA) is based on effectiveness and pragmatism. This stems from the view that the policy-making community listens more to arguments stated in terms of monetary values (O'Neill 2007). Motivations for biodiversity offsets are usually justified by arguing that without a price, biodiversity loss will not be signaled properly and biodiversity will therefore remain outside of decision-making. By assigning biodiversity conservation projects monetary value BDOs also remove the need to deliberate root causes (e.g. over-consumption, weak regulation, capitalist mode of production) to galvanize action. In so doing, however, they acquire the assumptions built into CBA. Such assumptions have roots in a theoretical conception of individuals, value, time, history, and welfare that do not necessarily align with the multiple values of nature that exist in the world.

5. BBOP's Main Conceptual and Practical Tools: An Overview

In this section we present BBOP's primary discursive tools and calculation tools as pertain to our hypothesis that there exist a contradiction between the two. We analyze BBOP's library of documents for words, framings, and concepts that recur and form the basis for their choice of calculations when creating a biodiversity offset (See Figure 1). Here we reproduce fundamental definitions and provide clarifying points to understand BBOP's standardization of BDOs with language and calculations.

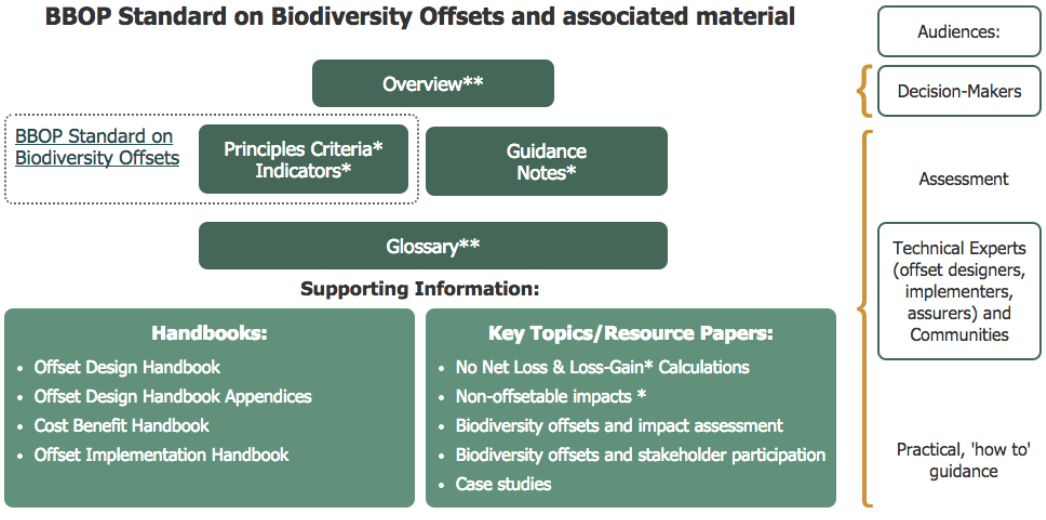


Figure 1. "BBOP Standard on Biodiversity Offsets and associated material."
Organizational chart of BBOP resources for biodiversity offset planning.

Source: BBOP(2012). "Standard and Guidelines." Retrieved March 30, 2015 (http://bbop.forest-trends.org/pages/guidelines).

5.1 Quantification

> "What sets a biodiversity offset apart from other forms of ecological compensation is that the project's residual impact on biodiversity is quantified and used to determine the amount, nature and scale of conservation outcome realistically required to offset that impact" (BBOP 2009b:28).

Quantification is central to biodiversity offsetting. It is intimately linked to measuring biodiversity, demonstrating no net loss (NNL), and determining compensation. These three elements of biodiversity offsetting are closely related to the tools used. To understand how quantification plays out in BBOP it is therefore crucial to understand how biodiversity, no net loss, and compensation are defined and relate to each other.

Biodiversity is defined by BBOP as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species (genetic diversity), between species and of ecosystems" (BBOP 2012a:5). Whereas this definition presents biodiversity as a purely ecological concept, the rest of BBOP tells us that biodiversity *offsetting* includes more than just that. The definition of biodiversity offsets tells us that biodiversity, no net loss, and compensation are all related concepts:

> "Biodiversity offsets are measurable conservation outcomes resulting from actions designed to *compensate* for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure and ecosystem function and people's *use and cultural values associated with biodiversity*" (emphasis ours, BBOP 2012a:8).

Thus, *no net loss* (NNL) of biodiversity includes not only intrinsic values (ecological aspects valuable for their own sake), but also use and cultural values *associated with biodiversity*. This is important to understand, as NNL constitutes the first of the ten BBOP Principles. *Compensation* is also central to biodiversity offsets, but here there are subtler distinctions. On the one hand "compensation involves measures to recompense, make good or pay damages for loss of biodiversity caused by a project," but on the other hand "compensation is *contrasted* with a biodiversity offset" (emphasis ours, BBOP 2012a:10). In BBOP, compensation is part of a continuum, which is illustrated in Figure 2. This figure shows how the concept of NNL determines *when* we have a biodiversity offset, and when we do not (in which case we have "only compensation").

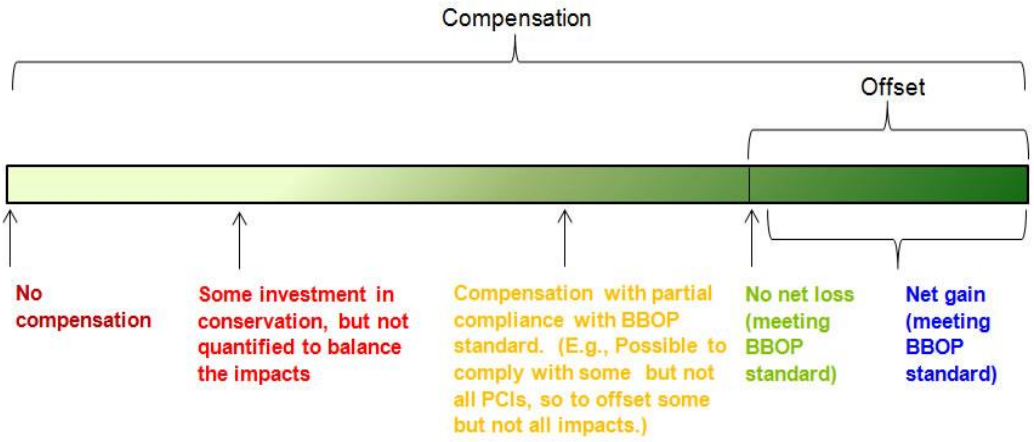


Figure 2 Distinguishing a biodiversity offset from compensation.
Source: BBOP (2012). Standard on Biodiversity Offsets. Washington, D.C.: Forest Trends. Page 14. Retrieved (http://bbop.forest-trends.org/guidelines/Standard.pdf).

In order to determine whether or not the NNL requirement is met, BBOP quantifies losses and gains using two different tools. The first tool is termed a 'metric' (or a 'currency') and is meant to measure the amount and quality of biodiversity (the intrinsic values). In some cases, metrics can be used also to measure use and cultural values of biodiversity. For instance, if a project reduces the abundance of a specific plant that is used for medicinal purposes, a metric that quantifies the abundance of this plant might be adequate to capture the socioeconomic values associated with its medicinal use. The second tool, cost-benefit analysis (CBA), is used when metrics are not seen as adequate for representing use and cultural values. The use of these two different tools—metrics for intrinsic values of biodiversity and CBA for use and cultural values of biodiversity—is reflected in the separation of the BBOP design process into two handbooks, the Offset Design Handbook and the Cost-Benefit Handbook. Thus, whereas both tools focus on values related to *biodiversity,* and both tools represent ways of *quantifying* gains and losses for the purpose of determining NNL, they differ in what *kinds* of values they represent.

5.2 Metrics

The metrics in BBOP correspond to a set of specific measurements that quantifies biodiversity. The term, which is used interchangeable with currency, represents "the unitary measures of biodiversity lost, gained or exchanged", which "varies from very basic measures such as area, to sophisticated quantitative indices of multiple biodiversity components which may be variously weighted" (BBOP 2012a:13). The particular choice of metrics is made on a project-by-project basis, with the most typical metrics shown in Figure 3 below.

Although BBOP is aware that metrics "cannot do justice to all components of biodiversity", they justify their use because they have "the benefit of being workable" (Ibid:28). Metric creation is thus a pragmatic endeavor representing a compromise between precise measurement and tractability: BBOP views metric creation as "a practical approach" and metrics as surrogates "for the entirety of biodiversity which can

realistically be measured" (BBOP 2009b:28). At the same time, the choice of metrics is crucial. The metrics form the basis for demonstrating NNL and thus for determining whether or not an offset is possible. Without the metrics it would not be possible to demonstrate "measurable conservation outcomes." CBA, we will see next, is used in *combination* with metrics in order to incorporate additional values associated with biodiversity and to make offsetting feasible.

Method	Area	Structural Quality	Condition of species populations & communities	How No Net Loss is defined / measured	Comment
Approaches to loss / gain calculations in existing law and policy					
Victoria / Australia habitat hectares method	✓	✓	×	Habitat hectares: area x quality units for selected COMMUNITY TYPES.	Focused on native vegetation and based on features of BIOTOPES which reflect condition, usually measures of structure.
US Habitat Evaluation Procedure	✓	✓	×	Habitat Units: area x suitability for selected species.	Area of habitat for individual species adjusted by habitat suitability index which reflects species' requirements and carrying capacity.
South Australia SEB Method	✓	✓	×	Hectares of land adjusted by an SEB ratio. Seeks a significant NET GAIN by: a) requiring an offset area to be determined either as a function of the area cleared multiplied by a factor (ratio) of 1:1 (e.g. degraded) to 10:1 (e.g. intact) – i.e. higher ratio for higher value land cleared, or, b) requiring an offset area to relate to the habitat value of the vegetation (tree) to be cleared multiplied by a factor which increases commensurate with an increasing tree score.	The SEB ratio method reflects levels of human modification of native vegetation and can be adjusted to take account of management costs and mitigation effort. Similar to the habitat hectares approach with the vegetation to be cleared and the potential offset receiving a habitat value score.
Western Cape of South Africa Provincial Guideline	✓	✓	×	Hectares of similar biotope adjusted by OFFSET RATIOS based on expert opinion and directed to achieve conservation policy outcomes beyond compensation for project-specific impacts. Presence of threatened species and special habitats given particular attention.	Offset ratios pre-determined in relation to the proportion of habitat remaining and its THREAT STATUS. The ratios are calculated to ensure that defined areas of ecosystems remain protected to meet conservation targets for each ECOSYSTEM TYPE. Presence of threatened species and special habitats given particular attention in evaluating whether or not impacts could be offset and how (in terms of not causing any change in threat status).

Figure 3 Metrics for loss and gain used in different approaches to biodiversity offsets.

Source: BBOP (2009). Biodiversity Offset Design Handbook. Washington, D.C.: Forest Trends. Page 71. Retrieved (www.forest-trends.org/biodiversityoffsetprogram/guidelines/odh.pdf)

5.3 Cost-benefit analysis (CBA)

"To be successful, biodiversity offsets should compensate indigenous peoples, local communities and other local stakeholders for any *residual impacts* of the project on

> their biodiversity based *livelihoods* and *amenity*. They also need to deliver the required conservation gains without making local people worse off, for example due to land and resource use restrictions created by the biodiversity offset. This requires a cost benefit comparison between the benefits of the offset and the costs to local people of the residual biodiversity related impacts of the project and of the offsets" (BBOP 2009a:4).

Cost-benefit analysis (CBA) is used by BBOP to make sure that no local people are made worse off. The CBA tells us whether the benefits (of offsets) are greater than the costs (of project and/or offsets) for the different groups affected by the project and/or the offset. Quantification, here in monetary terms, is necessary for the ability to compare different costs and benefits on the same scale: the CBA in BBOP represents an "assessment of the value to the community of project impacts and of offset costs, in terms that can be compared with the benefits of biodiversity offsets" (2009a:20). This monetary valuation is conducted using various *economic valuation* methods, which are used to establish equivalence:

> "The aim of valuation is to establish what offset activity would be equivalent to the project's residual impact. If valuation is applied appropriately, there is no economic reason why a cash payment should not be considered to offset a local community's loss of fuelwood or access to NTFPs [non-timber forest products] as a result of the project" (2009a:42).

An offset can involve the provision of alternative livelihoods (in BBOP's worked example, naturally growing medicinal plants are offset using a nursery that grows plants with similar medicinal effects), but it can also involve a payment scheme. In the latter case, the economic valuation methods are used to estimate the magnitude of the payments.

In order to choose the correct valuation methods, the offset designer is asked to classify the impacts in terms of types of values:

> "There are a number of methods for converting biodiversity impacts to monetary terms, depending on the type of impact. Different types of value require different valuation methods... Direct use values can be quantified using fairly simple methods, provided information is readily available on how and to what extent communities make use of biodiversity. Indirect use values are more complex to estimate, as they rely on modeling of biophysical relationships between the project's (or offset's) impact on an ecological function and the subsequent effect on economic activity. Non-use values require stated preference methods" (BBOP 2009a:54).

An overview of economic valuation methods used for different types of values can be seen in Figure 4 below. This list includes different use and cultural values. Intrinsic values are not included, as these are captured by the metrics. When choosing between valuation methods, the offset designer is told to use methods "appropriate" to the type of value in question and to "start with the simplest method and only move on to more complex methods if absolutely necessary" (BBOP 2009a:55). Thus, a pragmatic approach in line with the metric creation is taken.

Type of value	Examples	Valuation Methods
Direct use values (consumptive)	Fuelwood Medicinal plants	*Biodiversity proxies* MARKET PRICE METHOD
Direct use values (non-consumptive)	Recreation	Travel cost* HEDONIC PRICING* Stated preference (for recreation)
Indirect use values	Avoided erosion Pollution control Flood control Nutrient cycling	Damage cost avoided Replacement or substitute cost Dose-response functions combined with market prices
Non-use values	CULTURAL VALUES Religious values	STATED PREFERENCE: CONTINGENT VALUATION CONTINGENT RANKING CHOICE EXPERIMENT

Figure 4 Valuation methods for various uses of biodiversity.

Source: BBOP (2009). *Biodiversity Offset Cost-Benefit Handbook*. Washington, D.C. Page 55. Retrieved (www.forest-trends.org/biodiversityoffsetprogram/guidelines/cbh.pdf).

5.4 Combing metrics and CBA

Now the question is, how does the CBA presented in the Cost-Benefit Handbook combine with the metrics presented in the Design Handbook? How do the two tools together determine the design of biodiversity offsets? Figure 5 below gives a schematic illustration of how the two handbooks – and corresponding tools – interact. Essentially, the two handbooks start out with the same information, use different tools to focus on different aspects of the offsets, and then come together in the final selection. The CBA enters into the final selection after metrics have been used to measure biodiversity loss and gain at the project and potential offset sites: "The final step of the Cost-Benefit Handbook pulls together all the findings to specify an offset package that is both fair from the point of view of local stakeholders and effective in terms of delivering sustained conservation gains. This feeds into the final decision on the location and nature of the biodiversity offset activities in the Offset Design Handbook" (BBOP 2009b:15).

Metrics are accompanied by CBA in BBOP because NNL covers also "use and cultural values associated with biodiversity." That is, "a negative impact on the biodiversity based livelihoods and amenities (i.e. recreational, aesthetic and spiritual values) of local populations…needs to be compensated and restored in order to achieve the goal of biodiversity offsets: no net loss, or a net gain, of biodiversity" (BBOP 2009a:12). We have already seen that NNL is what distinguishes biodiversity *offsets* from pure *compensation*. But how do we know when NNL is achieved?

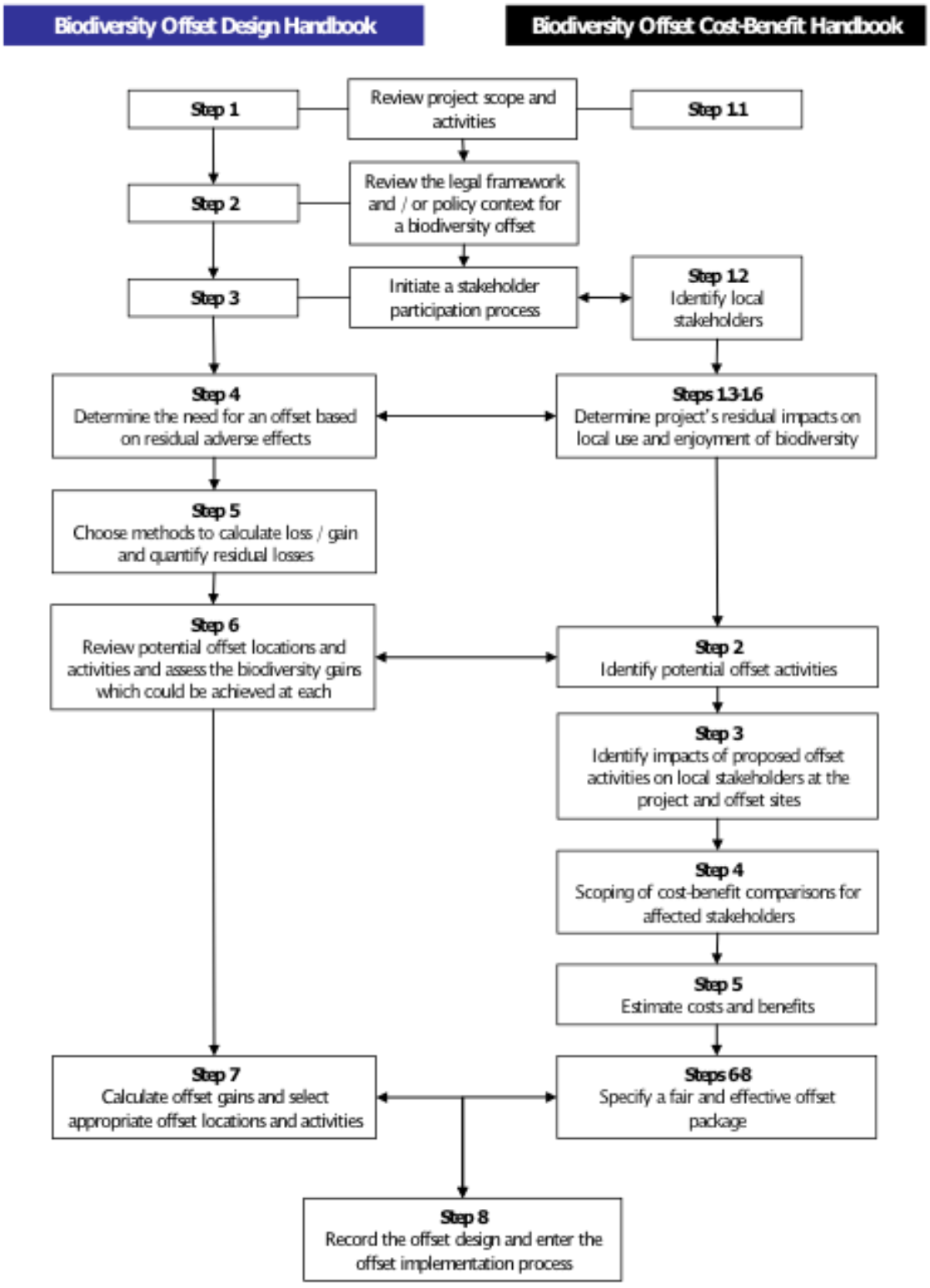


Figure 5 The relationship between the Biodiversity Offset Design and Cost-Benefit Handbooks

Source: BBOP (2009). Biodiversity Offset Cost-Benefit Handbook. Washington, D.C. Page 55. Retrieved (www.forest-trends.org/biodiversityoffsetprogram/guidelines/cbh.pdf).

The key to understanding this lies in the concept of non-offsetable impacts: BBOP Principle 2 tells us that "there are ecological and scientific limits to what can be offset" (BBOP 2012c:5). More specifically, "in essence, there are certain components of biodiversity that, due to their rare and/or highly vulnerable nature (and because they are needed to meet biodiversity conservation targets – i.e., are highly irreplaceable), would be very difficult, if not impossible to replace if they were to be lost. The clearest examples of this are critically endangered species or ecological communities that exist only in a small handful of sites offering the right habitat requirements and/or which are in rapid decline across their range" (BBOP 2012c:6). In other words, although *no net loss* refers to both intrinsic (ecological) and use and cultural values, the *limits* to what can be offset appear only to involve ecological aspects. For instance, a significantly negative impact on a critically endangered species cannot be offset with a payment. That would be considered compensation not offsetting. The only acceptable response to a situation like this would be to create an alternative habitat for the endangered species (or to ensure in some other way that its abundance does not decrease). A negative impact on a species that has socioeconomic significance, however, could in principle – as we have seen above – be compensated for by a payment. The end result, in this case, could still be considered an *offset* (as opposed to a pure *compensation*) because no non-offsetable impacts were made. Thus, *monetary compensation is more likely to be acceptable* when it comes to *human use and cultural values* than when it comes to intrinsic values. CBA is in this case used to calculate the amount of compensation that is necessary to achieve *no net loss*.

Thus, the NNL requirement appears more loosely defined for use and cultural values than for intrinsic ecological values (the latter involving a stricter requirement of like for like). To an extent, the NNL requirement for use and cultural values seems to have more to do with "ensuring a fair and effective offset package" than with biodiversity values per se. However, when one looks more closely at the BBOP documentation, one finds that NNL of use and cultural values also relates back to NNL of intrinsic values, albeit in a less direct manner. This is because, "while the emphasis in Principle 2 is on ecological limits to what can be offset, several other factors (scientific, technical, socio-cultural, financial and legal) influence the practical feasibility of achieving no net biodiversity loss" (BBOP 2012c:6). Ensuring that "no local people are made worse off" through CBA is important because it makes offsetting economically viable and socially sustainable: "Biodiversity offsets will have a greater chance of success if they fully compensate local stakeholders for any residual impacts of the development project, and provide incentives to local people to participate in delivery of the required CONSERVATION GAINS" (BBOP 2009a:12). Thus, the ultimate goal of BDOs still appears to be conservation in a traditional sense. The compensation of local people for related costs is a matter of increasing the chance of success.

Essentially, and according to the logic of CBA, negative impacts on use and cultural values can be offset by payments. This, however, sets CBA in BBOP somewhat apart from traditional CBA. Normally, CBA is based on the notion of *potential* pareto improvements. That is, compensation between people is not necessary for a positive result: as long as net benefits are larger than net costs, the winners can *in theory* compensate the losers. This compensation need not take place in reality. BBOP, however, goes further than this when they state that offsets "need to deliver the required conservation gains without making

local people worse off." This is equivalent instead to a pure pareto improvement, where *everyone* is better off. This compensation will naturally have to come from the project developers, which means that their expected profits will have to be larger than the required compensation payments. Whether this is the case depends on the circumstances of the project.

6. BBOP's Main Conceptual and Practical Tools: The Tensions

6.1 Internal Contradiction: Standardizing Flexible Approaches

Despite documented approaches toward achieving NNL, the exact process is far from standardized. BBOP has, however, made "standard" the use of biodiversity currencies, or metrics, to establish NNL. The requirement for context-specificity in tool selection significantly challenges standardization: "Unlike the case of carbon offsetting, where both emissions and offsets are measured in a single 'currency' (tonnes of carbon dioxide equivalent), there is no single measure that can adequately capture the diversity of life at all levels of biological diversity. Rather, it is necessary to choose from a suite of measures which are a suitable *proxy* or *surrogate* for biodiversity overall" (BBOP 2009b:68). This means that capturing value is highly dependent on how ecological, cultural, and other forms of value find representation in the choice of currency. Furthermore, "it is up to developers and their stakeholders to determine what is 'significant' on a case by case basis" (Ibid:44).

At the broadest level, there exists a contradiction between the call for flexible approaches and the establishment of currencies as a standard and necessary step:

> "There is no one-size-fits-all approach—a flexible, adaptive approach is necessary to achieve long-term conservation outcomes. To assure best practice, however, individual projects can work from a set of common principles when designing and implementing offsets to achieve no net loss of biodiversity. Here, the BBOP standard on biodiversity offsets (BBOP, 2012) offers a tool for transparent and rigorous accounting" (BBOP 2012c:3).

For BBOP, this call to flexibility persists as a way to accommodate the very real diversity of values and ecologies that exist across places. It also allows them to evade a thoughtful discussion on values and the adequacy of quantitative tools to their representation. "Transparent and rigorous accounting" are implicit values of quantification that receive little external validation or discussion. On a discussion of poor planning decisions leading to biodiversity damage, Tom Tew of the Environment Bank (BBOP member organization) recently argued: "The main causal driver is a lack of accountability. To deliver accountability, first deliver accounting. Measure what is lost and what is gained. We have a great opportunity through the offsetting metrics to do this now" ("To No Net Loss of Biodiversity and Beyond" Conference, September 16 2014). Currencies are the vessel for such measurements, and directly allow certain forms of biodiversity to find representation in the final value statement. Thus despite the rhetoric of flexibility and operational openness (allowing tools and outcomes to be selected on a case-by-case basis), BBOP advocates for a very specific platform—"explicit calculation"—to establish value:

> "Biodiversity offsets are based on the explicit calculation of biodiversity losses and gains at matched impact and offset sites. This is what distinguishes offsets from all

> other types of conservation activities. Irrespective of which biodiversity components are measured, it is impossible to demonstrate that gains match or exceed losses without going through this exercise. Multiple loss-gain assessments may be needed to account for different biodiversity components" (BBOP 2012c:4).

In short, loss-gain calculations, facilitated with currencies, are distinctive because their technique is irrespective of the underlying 'biodiversity components.' Biodiversity offsetting is thus touted as distinct because of its ability to abstract through quantification. This justification, coupled with the definition of BDOs as measurable outcomes, presents a significant paradox to the embrace of flexible approaches. The value of BDOs and the goal of measurable (and visible) outcomes are in terms that prohibit flexibility beyond quantification and currency creation.

Yet how does one reconcile the challenge to standardization that biodiversity currencies present? It would seem that BBOP's call for flexibility is in part an accommodation of green economy critics and the challenge of standardizing the approach to finding like-for-like. An analogy to natural capital affords us greater understanding. Maria Åkerman traces the metaphorical development of nature as capital and suggests its use as "a linguistic device, a fluid object" that allowed for diverse goals and theorizations to emerge and communicate across disciplines in the 1980s and 1990s (Åkerman 2003:429). Åkerman focuses on the definition's finality as reinforcing of "calculative practices" that limit nature to quantitative terms and initiate the "starting point for relationships of domination" (2003:444). Yet, the quantification of natural capital, or its valuation in money terms, is only successfully accomplished if the definition of nature itself is commensurable with the dominant economic paradigm. The effort here, then, is clearly one of confining and bounding our definition of nature to the discourse of market-based economics, where capital as a discourse itself represents a set of "internalized beliefs, embedded within material practices and modes of social relating within institutionalized frames" (Harvey 1996).

We might see biodiversity currency as a linguistic device, because it is both 1) a "fluid object"—changing definition from context to context in practice, and 2) a powerful calculative device that BBOP is currently advocating as standard. A discourse of flexibility and context-specificity provides fluidity to the concept so that any person or group can use it. The currency works two fold to quantify biodiversity and to incorporate it into a system of linguistic and material exchange (or "like-for-like" in BBOP's language). Its power as a calculative tool is thus precisely due to the flexible, adaptable nature, which can define and quantify values in almost all cases.

6.2 Exclusion by Quantification: Values

> "The values that survive the treatment are those that can be written in terms that have associated with them some kind of scientific authority – consider for example the special role that 'biodiversity' holds in national and international policy documents. Part of the justification for the use of such terms is their neutrality between particular thick conceptions of the good and thick normative frameworks. However…those terms do not capture the kinds of concerns that move responses to the loss of environmental goods…Resistance is articulated in terms of thick understandings of the good in question. No minimal moral language is able to capture the terms of those responses to the spread of market norms. The attempt to reduce

> the language of public discourse to some thin moral language carries then its own forms of marginalization of voices" (O'Neill 2007:133).

As we have shown, language in BBOP is set out to include all values. BBOP promises no net loss, or possibly a net gain, and it promises that everyone will be better off. But the "language" of BBOP's tools is of a very specific kind, and as long as these tools determine the outcomes, there will be exclusion. In particular, BBOP is based primarily on neoclassical tools when it comes to measuring the values in question. If the measurements were not central to BBOP, then the tools might be incorporated into a large framework of discussing values. However, measurement and quantification form the very core of BBOP. The tools offered by BBOP in fact explicitly exclude the full range of values they aspire to include, because they make nature commensurate with market concepts and approaches:

> "The market responds only to those preferences that can be articulated through acts of buying and selling. Hence the interests of the commercially inarticulate, both those who are contingently so – the poor – and those who are necessarily so – future generations and non-humans – cannot be adequately represented" (O'Neill 2007:187).

The categorization of different values in terms of direct and indirect use-values and non-use (cultural) values necessary for choosing the "correct" valuation method according to the BBOP Cost-Benefit Handbook, makes it seem like the valuation methods offers a complete set, i.e. one that is capable of measuring all values. This assumes that there is an appropriate valuation method for every value, and that every value can be expressed in monetary terms. However, the market entails only certain kinds of social relations. Commitment to a good can also be expressed by *refusing* to place a price upon it, a form of behavior that is ignored by valuation methods. Hence, the value represented by someone refusing to acknowledge monetary value would be excluded by BBOP.

Metrics based on surrogates similarly channel the inclusive-sounding definition of 'ecological' or 'intrinsic' value into values about win-loss comparisons. Metrics must "enable the calculation of residual losses and gains of use and cultural values of biodiversity" (BBOP 2012b:54). A metric's utility—to enable calculation—is as important as the value it claims to represent. Often surrogates are chosen to represent biodiversity value, and planners must identify "key biodiversity components" that reflect expert and local knowledge:

> "A necessary step in evaluating losses and gains is therefore to identify biodiversity components that can be used to represent all biodiversity affected by the project. This subset of components is selected as being characteristic or representative of the biodiversity of the affected area, and/or important for intrinsic as well as use and cultural value, and termed the 'key biodiversity components' (KBCs)" (BBOP 2012b:41).

The language here shows a further simplification of the values in question: biodiversity can be pieced into "components" and ranked by importance and representability ("key"). Therefore two layers of representation and simplification come between the metric and the underlying value. Surrogates represent key biodiversity components, which themselves represent the whole of a system's biodiversity. While basing choices on fewer details might be more accurate given limited data, it risks over-stating the representative character of both KBCs and surrogates. This alone shows that

metric and surrogate creation will favor those easily quantifiable, readily observable values. BBOP does state that surrogate metrics "are used with an understanding of the relationship between changes in the surrogate value and changes in the value of the underlying biodiversity of conservation concern, and evidence should be provided on this relationship" (BBOP 2012b:54). Yet this again implies a stipulation adequate to measurability and quantification: only those surrogates with an obvious causal relationship to the value they represent will shape 'biodiversity currency' choice.

Quantification serves as an abstract form of communication across space and cultures. The demand for commensurability and calculability presumes much about what local and practical knowledge will count in the valuation process. Indeed, the explicit translation of this knowledge into quantifiable terms through CBA suggests that BDO creation is a process of co-opting diverse knowledges into one dominant form: monetary value. In the case of physical biodiversity, currency creation requires layers of simplification that favor easily counted, visible parts as the basis for like-for-like comparisons. In both CBA and metric creation, quantification communicates a narrow vision of biodiversity.

6.3 Clear-cut answers

> "Whatever heuristic value scoring systems might have in making explicit and transparent the different factors that go to make up a judgment of the worth of a particular site, they cannot themselves serve to replace judgments. Where they do they disguise the fact that a professional judgment has been made" (O'Neill 2007:42).

O'Neill highlights fundamental challenges related to the use of numbers to justify decisions. This raises important questions with respect to the quantification that characterizes biodiversity offsetting in BBOP. The design procedure offered by the different handbooks, if followed closely, always result in clear answers. In most cases at least one site will be acceptable, and when there is more than one to choose from, the optimal site will simply be the one with the highest benefit to cost ratio. In other words, the offset planner is empowered and expected to create a clear ranking of the options. One could easily imagine a situation, however, where the impacted community is split. A situation in which some people are in favor of the offset, some are opposed, and some are indifferent. In fact, this seems to be a much more likely scenario than one in which everyone agrees, just like potential pareto improvements are much more likely to occur in real life than pure pareto improvements. More often, and as noted by those scholars closely following BDO implementation (Sullivan and Hannis 2014; Tregidga 2013), there are fundamental value conflicts. As O'Neill tells us, "the environment is a site of conflict between competing values and interests, and institutions and communities that articulate those values and interests. These cannot be reduced to a single measure, whether monetary or otherwise" (O'Neill 2007:26). How can any offset design procedure under these circumstances be expected to result in clear answers? This question preempts the role of experts that provide guidance and answers.

Biodiversity offsets are becoming objects that experts work with to address conservation issues. For example, BDO banks or brokers are already providing developers and landowners with simple tools to quote the credit value of their site's biodiversity. Timothy Mitchell writes that "expert knowledge works to format social relations, never simply to report or picture them" (Mitchell 2002:118). His work on the cadastral survey

in early 1900s Egypt traces not how knowledge about place, people, economy were "newly" discovered, but how new forms and sites of calculation allowed colonists to create space between representation (on a map or census) and reality (outside the survey office). At the scale of a colony it was “these processes of organization, movement, reformulation, and exclusion that set up the economy as a new sphere of calculability"(Ibid:117). Representation enabled the consolidation of reality that was not:

“more accurate knowledge, or even a greater amount of knowledge. Instead it represents a reformatted knowledge, information that has been translated, moved, shrunk, simplified, redrawn. What is new is the site, and the forms of calculation and decision that can take place at this new site" (emphasis ours, Ibid:116).

In other words, reformatted knowledge also reformats what decisions are possible, what values can be articulated and thus included. Expert knowledge on BDOs is scarce, but BBOP and its members are emerging as leaders in consolidating and standardizing existing knowledge. In this process, they are, like the surveyors of Egypt in Mitchell’s historical account, working “to frame and define the world that they [hope] to measure and survey” (Ibid:119). These measurements reformat complex knowledge of environmental systems into over-simplified representations. This affords expertise that claim to provide clear, seemingly objective, answers. Yet in nearly all cases, this clarity stems from a deeper ideological conclusion that economic development and environmental sustainability can be decoupled. The natural and social world, we contend, is being reformatted to support this belief.

7. Conclusion

The reduction of natural complexity to biodiversity offsets requires an abstraction from the lived experience of nature into the realm of capital production and circulation. Ollman writes that “an ‘abstraction’ is a part of the whole whose ties with the rest are not apparent; it is a part which appears to be a whole in itself” (1971:61). Such is the influence of placing people’s values solely in monetary terms (CBA) and nature’s value solely in quantifiable “components” or “aspects” (metrics or currencies). Nature’s parts will be perceived as whole in and of themselves—a perspective grounded in economics rather than ecology. The facilitator in this process, we have tried to illustrate, is the use of all-inclusive, flexible language that makes “fluid objects” of BDOs that seek to encapsulate objectified nature. Dominance of this process will ultimately shape new socio-nature relationships that perpetuate the expansion of capital; furthermore, “ecology will coevolve with the dominance of market thinking” and simplify the otherwise diverse and pluralistic methodologies we have to understanding our world (Norgaard 2010:1222). The consequence for society is a binding of imaginations and actions to the limits of markets, capital, and their contradictions. The abstraction and evaluation of nature from complex to simple, from reality to unit in circulation, requires a committed resistance against the discourse of free-market neoliberalism and equal care to considering how regulation of our actions will proceed without homogenizing away diversity of nature and diversity of thought. For “to be in nature at all, to be an aspect of nature, is to be in a world of relations among multiple phenomena. And this, Marx suggests, is the source of our joy as human beings, our particular species being” (Henderson 2009:269).

Biodiversity offsetting, habitat banking and other similar mechanisms of economic valuation of nature have henceforth been criticized as capitalization of nature in the neoliberal age. This capitalization, scholars show, stands both as a new frontier for profit and market expansion and a new way of defining and controlling nature. While taking these critiques as a basis for this paper, we have shifted attention to tease apart BBOP's own claims of capturing value. We paid close attention to the contradictory aspirations that appear in BBOP's biodiversity offset guidelines. On the one hand, BBOP seems to recognize multiple values of biodiversity (ecological, socio-economic and cultural) and argues for local specificities with a flexible approach. Yet on the other hand, BBOP advocates the use of metrics and cost-benefit analysis to measure and compare biodiversity losses and gains to achieve a no net loss. In fact, both of these points are argued to be among the distinguishing characters of BDOs as conservation practices. By focusing on the function of the metrics themselves, we have shown that their claim to calculate losses and gains prioritizes those easily quantifiable, readily observable values thereby excluding others.

We conclude that this fundamental contradiction reflects how BDO proponents deal with and intend to accommodate the critiques against the quantification and capitalization of nature. The discourse of flexibility in fact operates as leverage for accommodating the BDOs, and the calculative practices, in every context. We suggest that without closer attention to these internal contradictions and tensions, we cannot fully comprehend how the practices of capitalization and marketization of nature and non-monetary values operate discursively and practically.

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Community participation as a means or an end: Local Perspectives on REDD+ from Indonesia and the Democratic Republic of Congo

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Abstract

REDD+ designers can draw on decades of experience from development practitioners and a large body of academic literature on community participation. In this paper, we explore the progress of REDD+ on the issues of enhanced well-being, community inclusiveness, and ultimately an improved level of "citizen power" (Arnstein 1969). Since the Mega-Rice Project in the 1990s, villages on Indonesia's Kapuas River have been targeted for multiple development and conservation interventions. Over the past decade, Bikoro Territory in the DRC has experienced a series of agricultural development and forest governance projects. Using empirical research from the DRC and Indonesia, we analyse interviewees' assessments of their present participation in REDD+ compared to previous external interventions in the region. In both studies, REDD+ is perceived by locals to have more equitable benefits distribution, improved information sharing, and increased community involvement compared to past interventions. Yet, local voices remain absent in project conception, project management, and in the Indonesian case study, project closure. This leads us to question whether local participation is being employed as a means to an end (to legitimize REDD+ and supply the carbon market), or as a transformative process of empowering those affected by these interventions.

Key words: REDD+, Indonesia, Democratic Republic of Congo, community participation

1. Introduction and Theoretical Background

Various terms have been used to describe community participation in natural resource management, i.e. "community based" (Brosius and Tsing 1998), "collaborative" (Borrini-Feyerabend 1996), and "joint" (Poffenberger 1996). Trying to be more explicit about the possible democratic and empowering aspects of participation, terms like "participatory democracy" (Borrini-Feyerabend with Tarnowski 2005) and "empowered deliberative democracy" (Fung and Wright 2001, Mustalahti and Rakotonarivo 2014) have evolved. "Community participation" challenges those who seek it in development and conservation initiatives with questions like, "Who is included in the community?"; "What does it mean to participate meaningfully?"; "Who has the right to speak on behalf of and make decisions for the community?" (Baum 1999:187).

The concept of community participation is often portrayed as a universal 'good' and an aspiring goal for development and conservation programs. Yet, it is important to ask what the deeper purposes are for governments, NGOs, and businesses inviting community participation (Agrawal 2005, Bryant 2002) and what benefits (or burdens) these communities may experience depending on their role and power in these 'participatory' processes (Anau *et al.* 2003, Fox 2002, Fox *et al.* 2008). In other words, "participation" in and of itself does not necessarily benefit a community, and can potentially do harm. Appropriation of the use of "community participation" by government and international organizations can conceal its competing and refracted use as "a means of maintaining relations to the rules, for neutralizing political opposition and for taxing the poorest" (Cornwall and Brock 2005:1046). Communities are *informed* through the socialization process, which is used as a means to achieve the project objectives, while unequal power dimensions continue to exist between communities and intervening actors in these interventions (Brown 2002).

In this paper, we define participation following Cohen and Uphoff (1980:2149), as "*the involvement of a significant number of persons in situations or actions which enhance their well-being, e.g. their income, security or self-esteem".* Central to this definition is inclusiveness—the inclusion of people in decision-making, formulating plans, controlling resources and implementing decisions over interventions affecting their own lives (Agarwal 2001). Based on the above definition, this paper examines to what extent the local population was included in the REDD+ intervention in comparison to past development and conservation interventions in their communities. REDD+ (Reducing Emissions from Deforestation and Forest Degradation, plus the enhancement of forest carbon stocks, biodiversity conservation, improved livelihoods and other co-benefits) is an international forest carbon sequestrating and offsetting scheme that combines both economic development interests and environmental concerns. Given that this article is interested in community involvement in externally imposed interventions, REDD+ initiatives in Indonesia and the DRC were chosen as present-day case studies, and compared to past development and conservation interventions in the region.

The track record of community participation in development and conservation interventions has been widely criticized (Cleaver 1999, Penderis 2012, Vedeld 2012). Community participation in interventions has been used as a legitimizing instrument for improving project efficiency and effectiveness rather than a process of empowering community to address structural inequalities and issues of social justice inherent in these interventions (Rahnema 1992, Nelson and Wright 1995, Burkey 1993). Drawing from this argument, participation has been distinguished as a means as opposed to participation as an end (Oakley *et al.* 1991, Nelson and Wright 1995, Burkey 1993). Participation as a means implies engaging people to achieve project objectives and outcomes—a mechanism to increase project efficiency. Participation as an end implies a process of transforming and empowering to engage in project planning, implementation, influence decisions and control resources (Cleaver 1999). Although it is possible to achieve both improved project efficiency and local empowerment through increased participation, this distinction speaks to the embedded power relations and structural inequalities that exist in participatory spaces in these interventions (Cleaver 1999).

In the context of this paper, we extend the conversation on these two aspects of participation in development and conservation interventions by focusing on the power relations occurring within the arena of interaction between intervening agencies and

communities. Many authors have emphasized the importance of a more in-depth understanding of unequal power relations that occur within institutional spaces designed to facilitate community participation (Cleaver 1999, Cornwall 2004, Gaventa 2006, Penderis 2012).

One particularly useful framework for understanding the spectrum of 'community participation', and the range of power dynamics it can entail, is Sherry Arnstein's "Ladder of Citizen Participation"[29]. Her typology of participation helps illustrate the extent to which citizens have influence over a process and its end product (Arnstein 1969). The bottom two rungs on Arnstein's ladder are *manipulation* followed by *therapy*. These are levels of 'non-participation', in which the real objective is not to enable people to participate in planning, but to "educate" or "cure" them. The next steps up the ladder are *informing*, *consultation* and *placation*. The objectives of these are, according to Arnstein, "tokenism". The purpose of tokenism is to allow the have-nots to hear and express their opinions. Tokenism does not, however, ensure that those in power will heed citizens' views. The highest rungs of the ladder are *partnering*, *delegated power*, and *citizen control*. This is what Arnstein considers 'true participation' in a process and its outcomes. In these high rungs, communities and their representatives have solid negotiating power in a program, or full managerial power of that program. (Arnstein 1969). In this article Arnstein's typology is used to frame our understanding and articulation of local participation in past development and conservation interventions and REDD+.

The paper is divided into six sections. Section 2 describes the geographical context and explains the research methods used for the study. Section 3 presents the findings of the DRC case study. It shows that the Bureau Diocésain de Developpment (BDD), a non-governmental organisation (NGO) of the Roman Catholic Church, is the main development agency working to improve the livelihoods of people in Bikoro, the study area through the food security project. It also shows that BDD has chosen Organisation Paysanne de Development (OPD) (*Peasants Development Organizations in English*) to implement food security project in the study area. It shows however, that the social differentiation within these local institutions enables some groups to enjoy the benefits of these interventions and influence those who govern. BDD has been chosen to implement REDD+ activities in the project area and community participation in the current REDD+ activities has not changed. In the DRC case study, community participation as a process of empowerment in past development interventions was hindered by embedded power relations and material inequalities in the participatory spaces created by these interventions. While the local population are determined to fully participate in the current REDD+ intervention, these embedded power relations and material inequalities continue to hinder them to exercise their voices and influence decisions. Section 4 presents the results of the Indonesia case study, highlighting local impressions of community-level participation and benefits (or lack thereof) from the Mega-Rice Project, Borneo Orangutan Survival Foundation Mawas Area, and Kalimantan Forests and Climate Partnership REDD+ pilot project. Section 5 provides a discussion of the two case studies and argues that community participation as a process of empowerment in the past interventions is often cloaked as a means to legitimized these interventions and to achieve their outcomes while community voices over strategic decisions and control of resources are undermined. This is still the

[29] Pretty (1995) and White (1996) offer further typologies of participation.

case in the ongoing REDD+ interventions. Section 7 concludes the paper with a summary of its findings.

2. Site selection and methods for data collection

This paper considers the involvement of local people in two REDD+ interventions, in comparison to past development and conservation interventions in the two focal study areas. Data was collected from three villages on the Kapuas River of Central Kalimantan, Indonesia, and two villages in Bikoro District of the Democratic Republic of Congo. The authors were interested in three overarching questions: 1) In what ways were local people involved in past conservation and development interventions versus the current REDD+ project? 2) How do local people perceive the history of interventions in their communities, and describe their inclusion in these? and 3) Do local people's past experiences with external interventions influence their present-day perceptions of and inclusion in REDD+?

2.1 The DRC Case Study

2.1.1 The sites

This study was conducted in two villages, Ikalanganya and Buya I, situated in Secteur of Elanga northern part of Bikoro Territory, in Equateur Province in the DRC (Map 1). Equateur Province has a total area size of 403,292 km^2, equivalent to the size of France, and host 28% of the total forest area in the DRC (UNDP 2009). Bikoro Territory is situated in the southwest of Equateur Province, lying within the largest track of swamp forests in the world (UNDP 2009), making road construction and maintenance difficult (Yamba 2009). The territory is sparsely populated with a density of 18 people per km^2 (Klaver 2009). The population relies heavily on the forest for their livelihoods by practicing swidden agriculture, extraction of non-timber forest products, fishing, hunting and charcoal production (Gray 2012, Samndong 2014). Culturally, the Territory is made up of two main ethnic groups: the Bantu and the Batwa Pygmies[30]. The Bantu group is divided into different tribal groups (the Mongo, Ntomba, Ekonda and other migrant groups). The Mongo is the major tribal group in north of the territory, including the study area, while the Ntomba and Ekonda are the major tribal groups in the south of the territory. The Mongo tribal group that occupy the study area are considered as the main indigens (*ayant droit*) with customary claims to land and forest. The Batwa Pygmies make up about 20% of the population in Bikoro territory, but are considered as strangers in the study area with limited rights to land and forest.

This research site was chosen because Bikoro territory has experienced many projects related to agricultural development, forest governance and conservation (BDD, WFP, FAO, UNDP, ICRAF, OXFAM, IUCN and WWF) over the past ten years. Presently, Woods Hole Research Center (WHRC) in collaboration with the Ministry of Environment of the DRC has selected Bikoro Territory as a pilot site for the REDD+ project supported

[30] The term Pygmy is pejorative in some contexts. The term is used in this paper because it is well-known by the people in this region and clearly indicate the group I am talking about. The Pygmies in this region belong to the ethnic group Batwa and they are also referred to as *Peuples Autochtones* (PA) in French, which means indigenous people.

by the Congo Basin Forest Fund (CBFF). This paper examines community participation in past food security project in the study area implemented by the Roman Catholic Church Development Bureau, *Bureau Diocésaine de Développement* (BDD), and community involvement in ongoing REDD+ project in the study area. WHRC has chosen BDD to implement REDD+ activities in the project area.

2.1.2 Data collection techniques for DRC case study

The field research was conducted in May to June 2012, November 2012 to January 2013, and July to August 2014. Information was obtained through interviews, focus group discussions, household surveys and field observations. The interviewees included customary authorities, village administrative chiefs, staff members of BDD and other intervening NGOs (*Cercle pour la Defense de l'Environnement* (CEDEN), FAO, WFP, OXFAM) operating in the villages, and the executive members of the *Organization Paysanne de Development* (Peasants Development Organizations in English) village level organizations often created by intervening agencies to implement project activities in the villages. To capture the villagers' insights on their inclusion or exclusion in these interventions and their ability to influence village organizations recognized by BDD, I organized ten focus group discussions in the two case study villages (five discussions per village).

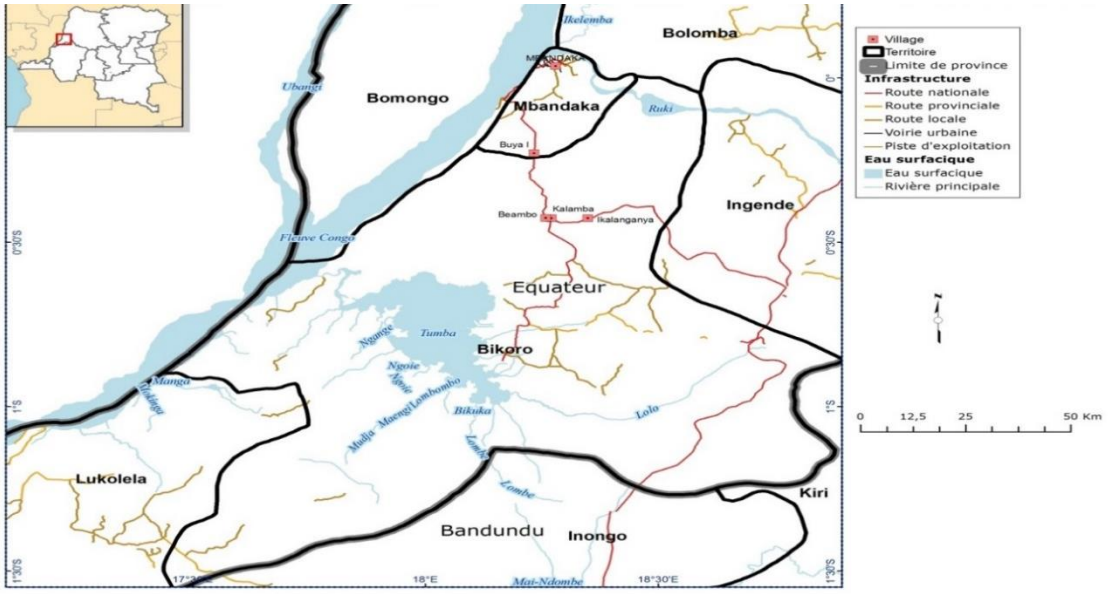


Figure 1. *Map of Equateur province showing the study area in Bikoro territory*
Source: Gregory Fiske, Wood Hole Research Centre, 2013)

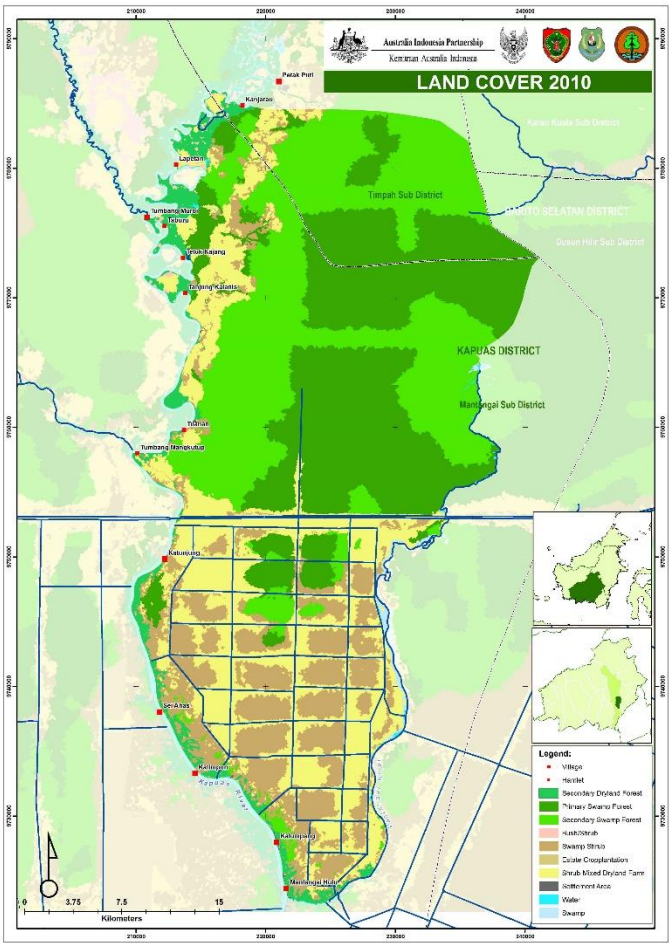


Figure 2. *Map of Kalimantan Forests and Climate Partnership REDD+ Pilot Project in Central Kalimantan, Indonesia* (map used with permission from the IAFCP)

2.2 The Indonesia Case Study

2.2.1 The site

This study took place at the site of the Kalimantan Forests and Climate Partnership (KFCP) REDD+ pilot project in Central Kalimantan (Indonesian Borneo), which overlaps with the Borneo Orangutan Survival Foundation (BOS) Mawas Area and is within the boundaries of the former Mega-Rice Project. KFCP targeted one entire "peat dome" covering 120,000 ha in Central Kalimantan (IAFCP 2009) (see Figure 2). The project was nestled between where the Kapuas River and the Mantangai River converge. The project area is home to a population of approximately 9,000 people, 90% of whom are indigenous Dayak Ngaju (IAFCP 2009). The northern 60% of the project remains forested, while the southern 40% of the REDD+ project has been drained, deforested, and burned, and thus the focus in this area is on the enhancement of (forest) carbon stocks through the rewetting of peat soils (an activity that falls under the "+" of REDD+). The KFCP area included fourteen settlements - seven villages and seven hamlets - located on or adjacent to this peat dome. Interviews and focus group discussions were facilitated in all seven villages, but the majority of local-level research presented here focused on the villages of Katunjung, Kalumpang, and Petak Puti, and their hamlets.

2.2.2 Data collection techniques for Indonesia case study

Local ethnographic research was conducted from January through December 2012. The analysis for this article was based on 148 semi-structured community-member interviews and 18 local focus group discussions (e.g. with women's groups, REDD+ reforestation employees, REDD+ village-level management, and village government). Further regional, national, and international-level interviews were conducted and inform this article. Sources of information were triangulated during field research and interviews were transcribed. NVivo software was used during the analysis of variations in local perceptions of community participation in the Mega-Rice Project, BOS Mawas Area, and KFCP REDD+ pilot project.

3. Food Security Intervention, the process of introducing REDD+ and early REDD+ activities in the Bikoro territory of the DRC

The food security project implemented by the Roman Catholic Church Diocesan Development Bureau (BDD) was one of the major development interventions in the villages selected for REDD+ pilot project by WHRC in Bikoro. To implement this project, BDD recognized the Peasant Development Organization (OPD) in these villages as partners. OPDs are intra-village voluntary organizations that span informal and formal elements of collective action in coordinating development-oriented agricultural service delivery and other village development projects. They often operate as a platform through which national and international development organizations can train villagers and supply materials to improve agricultural production and other development activities in the villages. The OPDs are often created and supported by intervening agencies to promote community participation in their interventions. The OPD is a separate village structure from the customary structure of the village and do not control access to land. The OPD emerged from mutual aid groups of shared agricultural activities and grassroots development initiatives. These groups have been reshaped and structured by intervening NGOs to carry out village development activities (see Samndong 2015).

These OPDs are registered and have a legal status.[31] Membership of the OPD is opened to everybody living in these villages and membership is based on a membership fee of 1 USD and a monthly contribution of .50-1 USD. Members of the OPD have as a duty to participate in meetings and engage in activities. The executive committee is elected for a four-year renewable term. Certain criteria are required to be elected to the executive committee, including: ability to read and write in French; speak well in public; have certain power resources (physical assets and level of education); command respect in the village; and be able to protect the interest of the village. The executive committee constitutes the final decision-making body of the OPD, oversees all the activities of the organization, organizes village meetings once per month, and calls for emergency meetings if the need arises.

Some of the OPDs in the villages were created with assistance of BDD. An official of BDD interviewed stated that:

[31] *Organisation Paysannes* (Loi de l'Association, *N° 004 du 20 juillet 2001; décret de 1956 sur coopératives*)

"As part of our capacity-building initiative, we have assisted some of the villages to create the OPD. We think this is the best way to promote participation in the villages and to ensure that the [project] benefits are distributed to all" - Interviewed, a senior official of BDD 4 June 2012

According to the BDD, working with the OPDs was the best means to engage the villagers to participate in village development projects. The reason being that the OPD is a village association made up of the villagers and the executives are elected by the members hence they should be accountable to the members.

The food security project transferred resources (funds for seeds, community farm equipment, village meetings, etc.) to the OPD through its executive committee, while providing information and building capacity. Given the financial requirements for active membership in the OPD, the poor and less privileged in the villages (Pygmy and women) are often unable to run for executive office. Although there were some women and Pygmies in the executive committee in the OPDs studied, they have very little influence in decision-making. Information gathered from the focus groups also indicated that seats reserved for the women and Pygmies in the committee are often a demand from the intervening agency (BDD), but in practice their voices are undermined. The training and resources they receive and the position given to them provides new status in the village and the villagers treat them with respect. The executive members become senior village elites and often participate in meetings together with the local state authorities.

Very few villagers in the two villages were included or benefited from the food security project. Only 15 households were selected by BDD through the OPD in a food security project in Buya I and Ikallanganya in 2010-2011. Buya I has a population of about 3,000 people and about 260 households while Ikallanganya has a population of about 2,000 inhabitants and about 143 households. Information from the focus groups revealed that all these households selected by BDD were made up of members of the OPD executive committees and their families (Samndong, 2015). In an interview with the president of BDD, he explained:

"We cannot work with all the population, and it also depends on our funding and the type of intervention. For our food security project, we work with only limited numbers of villagers in the OPD because of limited funding. We often support villagers with large farms who produce more for the market" Interview, an official of BDD May 2012

The BDD's choice to work with a limited number of villagers especially the most productive villagers is buying for success – participation as a means (Mohanty 2003, Baviskar 2005) and not necessary limited funding.

Villagers told us that while they participate in project activities as laborers and in village meetings organized by OPD, their voices are not taken into account. The villagers often lack ability to articulate needs and influence decisions as a result of limited information flow and lack of material resources. There has never been an OPD executive voted out of office in these villages or sanctioned through fines. The administrative officer of Bikoro Territory disclosed that:

"The local population is represented in BDD interventions in most cases by a club of friends who have high interest in the interventions. Most of the activities are organized by them or according to their directive. Only few villagers benefit from these interventions. Majority of the population live in poverty, hardship and poor social conditions" - Interview, administrator of Bikoro, May 2012

Membership in the OPD, according to information gathered from the focus-groups discussions, is open to all living in these villages with membership fees[32] (interest based inclusion). But, the Pygmies, the poor villagers and women (single and widows) are often excluded from projects funded by the OPDs because they cannot afford the membership fees and monthly contributions. In addition, the norms prohibit women to participate in decision-making process in front of the men. Thus financial resources and customary norms constrains the ability of Pygmies and women to participate in decisions of the OPDs. An OPD executive committee member explained,

> *"In the OPD, the Pygmies have the same attention as the Mongos. But the fact is that the pygmies don't like to join associations. They often refused to pay the association fees when they are members, and therefore cannot access the same rights as others. The association does not support any villagers that are not a member"* - Interview, executive member of the OPD in Beambo-Kalamba May, 2012

Wood Hole Research Centre (WHRC) manages the REDD+ pilot project in Equateur province. WHRC has recognized BDD as partner to implement project activities in the Bikoro pilot site. WHRC together with BDD organized the process of introducing the project in Buya 1 village of the Bikoro pilot site in July 2013. No village member was part of the team that organized the process of introducing the project in the village. According to WHRC, this is a consultative process to identify whether the communities are willing to consider a REDD+ project by using focus group discussions and other participatory exercises. The first process to ensure free, prior and informed consent (FPIC)[33] was to share information concerning the main objectives of the project with the community.

The FPIC workshop was organized for four days in the village. The first day started with a village assembly meeting. Information about the main objectives of the REDD+ project was share to the local population. Explanations why their village was selected for the REDD+ project was given. The information sharing meeting was open and free to all members of the village so that they could all express their concerns, perceptions and views about the project and its objectives. From information gathered from the focus groups discussion, the Pygmies and the young adults youths were not informed about this information sharing meeting. The individual that was assigned to announce the meeting to the villagers gave the information to selected households.

The process continued in the second and third days with a workshop that was designed to map out the villagers' livelihoods activities, constraints, coping strategies and village development challenges to identify project activities as alternative to reduce local pressure on the forests. Only few villagers were selected by instructions from the WHRC and BDD staff to participate in these workshops with per diem. The idea was to select ten village members who understood the village socio-economic situations and can clearly

[32] The first criteria to become a member is that you are residing in the village. Even though this was not clearly stated in the organization rules, the information from focus groups confirmed that a member of the OPD reside in the village. Equally, there was no member of the OPD from different village. The second criteria, which is more important, is the fees. The ability to afford the fees and the intention to pay are considered here. There are individuals in the village who can afford the fees but are not willing to become members for some other reasons. As for the Pygmies, poor, single women and widows the issue was not able to afford the fees. They clearly mentioned this as a primary factor in the focus groups.

[33] The staff of WHRC indicated to me that it was the first FPIC process and that the FPIC process will be organized at different stages of the project implementation before the signing of a contractual agreement with the local population.

articulate during the workshop. The section process was done by the village authority based on ethnic identity, sex, and age groups. Six groups of ten members per group were selected for the workshop—the customary landowners, migrants, men, women, youths and Pygmies.

Information gathered from the interviews and focus groups discussion shows that the villagers that participated in the information meeting and the workshops indicated a positive perception towards the information received concerning the REDD+ project. The villagers were happy about the information provided and the nature in which the meeting and the workshops were organized, allowing them to express their views and feelings freely. Many of the villagers confirmed that the information shared and the explanations motivated them to accept and support the project.

However, the women's group in Buya 1 confirmed that not all the villagers think well of the project. Some villagers believed, after experience from other projects, that it would be difficult for this project to engage all the households in the village. Some were skeptical about the project because many NGOs have preached about local development in the same manner, but implemented something else or disappeared. The Pygmies in Buya 1 were also skeptical about the project, since they have been excluded in many development projects in the village.

Based from the interviews and focus groups discussion, the information provided by WHRC and BDD concerning the project was accurate but insufficient for the local people to give their consent to the project. The information focused on the importance of forest conservation for ecosystem services and the potential benefits of the projects in terms of local development. No information about the potential risks and cost related to the project for the community was provided. While information about the livelihoods of the villagers was provided, information regarding land rights and user rights to the forest and its resources was not discussed. These issues are very important in the process of introducing REDD+ in the village to create awareness among the villagers about the risks and costs related to the project, before they can give their consent. There was no time allocated for the villagers to have internal discussions concerning the information provided and the results from the meetings. There was no information provided about how these development activities will be implemented and monitored at the village level.

. Although those who participated in the workshop accepted the project based on the information provided and the discussion in the meetings, the project goals had been designed before the FPIC process and the villagers had no control or power to influence the purpose, structure and goals of the REDD+ pilot project and the FPIC process. Even though all the results and outcomes of the FPIC process were presented to the villagers, they had no copies of these results. In addition, no decision-making process was organized for the villagers to give their consent to the project by vote or other democratic ways. The WHRC and BDD decided to start early REDD+ activities after the introductory process without any contractual agreement with the villagers. No system was established for lodging complaints, grievance and suggestion during the FPIC process. Based on these results of the workshop, some activities were decided by the project organizer for implementation. The villagers were not included in deciding these activities to be implemented. The activities to be implemented are associated to the project budget and timeframe the villagers are only consulted in identifying potential activities but not deciding on what to be implemented.

After the REDD+ introductory process, an early REDD+ activity was implemented by BDD as community benefit for REDD+. The activity was the construction of a water source (well) to provide clean and portable water to the villagers.. Based on information collected from the interviews and focus groups discussion, the villagers indicated very negative feelings and views towards the water project. First, the well that was constructed was unable to provide water to the villagers during the first dry season in 2014. BDD hired local technicians for the project and used low quality materials for the construction. The villagers were not involved to decide who would be hired, the materials and design for construction, or the budget for the project. The village authority (the customary chief and local administrative chief including some village elites) were involved in the activity to supervise and monitor the construction work. Few villagers were hired to work as laborers for the project. The majority of those hired were members of the OPD with the customary chief as president. Many of the villagers hired complained that they were either not paid or poorly paid. Some complained of using their own tools in the project without compensation. One woman in the women focus group confirmed that she was injured in the construction work and was not taken care of by BDD and the village authority. As demonstrated in the focus groups, the villagers were unhappy about this early REDD+ activity in the village as there were not involved in decision-making regarding the project execution.

4. REDD+, Development, and Conservation Interventions in the Kapuas District of Indonesia

The communities of Katunjung, Kalumpang, and Petak Puti in Central Kalimantan have experienced repeat development and conservation interventions spanning the past several decades, the most notorious of which has been the Mega Rice Project. President Suharto's Mega-Rice Project entered the area in the mid-1990s. Created as a food security project to feed Indonesia's growing population, the initiative aimed to convert one million hectares of lowland peat swamp and rainforest into rice paddies. The Mega-Rice Project was local people's first experience with a large-scale, externally directed, development project.

> *"We couldn't do anything so we accepted it when the president said they would establish 1 million ha of rice fields… President Suharto said we'd get 'jalan (roads), access, agriculture, plantations – this is a development program…' The locals never thought this level of environmental damage would happen."* - Male in his 70s, Katunjung village, May 5, 2012

> *"There was a sign with '1-million hectare project' on it… We couldn't say anything. We were afraid. Even if they ruin your kebun (garden) you were just quiet*." - 61-year old man, Kalumpang, September 29, 2012

The Mega Rice Project initiated the building of a massive canal system through the peat swamp, thereby draining the wetlands, creating access for loggers, and exposing the highly flammable peat soil. Drying peat, drying woody debris left from logging, the use of fire in traditional swidden agriculture, and an exceptionally long dry season due to El Niño led to massive forest fires in the region from 1997-1998. The 1997-1998 Indonesian forest fires in both Kalimantan and Sumatra, together resulted in 0.81-2.67 gigatons of

carbon were released in to Earth's atmosphere (Page et al. 2002). This is comparable to 13-40% of the total global carbon emissions during that period (Page et al. 2002).

> *"…after [the Mega-Rice Project] everything got burned... These giant fires stretched from rivers to rivers. Like from the Kapuas River to the Barito River to the Kahayan River…. The impact continues until today because of those fires."* - 61-year-old male, Kalumpang, Sept. 29, 2012

Much of the natural resource base upon which people on the Kapuas River depended was burned, and locally understood property demarcations were obfuscated. An estimated 23,000 Central Kalimantan residents sought medical help for respiratory diseases during the 1997-1998 fires (Suratmo 1998). The fires coincided with the Asian financial crisis and the fall of the Suharto regime, resulting in the complete abandonment of the project.

> *"This project was (President) Suharto's project. After Suharto fell, then the project was over. They took all of the timber from the forest, and all of the community's livelihoods activities were cut-off."* - Village Head of Mantangai Hulu, November 19, 2012

Although interviewees said that they also had played a part in the transformation of the rainforest through logging, they argued that their logging methods were simple, and their impact was comparatively small. The Mega-Rice Project, on the other hand, was a massive feat of engineering that, in combination with the fires, removed vast swathes of vegetation and altered the chemistry of the soil to such an extent that many native species could no longer grow there. Local communities were not the only ones concerned about the forest loss and land degradation that resulted from the Mega-Rice Project and 1997-1998 fires. Following the Mega-Rice Project, a series of externally driven projects came into these communities to try and salvage the environment.

The first was the Borneo Orangutan Survival Foundation (BOS), which worked with the provincial government to zone the "Mawas Area" in Block E of the former Mega-Rice Project for conservation. The Mawas Area overlaps with the northern half of what is the present-day KFCP REDD+ Pilot Project, where intact forest remains. Through field research, it became apparent that BOS had a poor reputation in the local communities. The word "afraid" commonly arose in interviews about BOS, because of the NGO's previous use of police and their threats to send local community members to jail if they housed or hurt an orangutan. The most important sources of conflict with BOS in the case study villages were the limited forest access and perceived absence of local benefits from the BOS Mawas Reserve.

> *"Villagers from the hamlets often look for gemor[34] in the (BOS Mawas) area, but the security in BOS has forbidden them from doing this… As a result, community members sometimes make fires in the BOS area because we are not allowed to enter the forest."* – Male in his 30s, near KFCP reforestation area, May 7, 2012

An interviewee recalling the community consultation process carried out by BOS described it like this,

> *"When [BOS] came here [in 2005] they didn't even do socialization… they just established their area and the masyarakat (community) was confused about what they were doing… In 2006, [BOS] gave a questionnaire to all of the villagers and in that questionnaire they asked [if there was] a facilitation or technology for doing agriculture, would you accept it? And they asked good questions like this about supporting our livelihoods. So people ticked yes, yes, and yes. And at the*

[34] Gemor (*Alseodaphne sp.*) is a non-timber forest product. The bark is collected and used to produce mosquito repellent.

bottom of that questionnaire they asked if the villagers agree with this program, and please sign. Because there were all these pretty questions about supporting livelihoods and getting facilitation and teaching about doing agriculture with modern technology and machines, [local people] said yes because they thought this would be a good program… [BOS] was just using the questionnaires to get locals to sign it, but there wasn't follow up…" - Male in his 50s, Katunjung, May 6, 2012

The next externally driven program to enter the area was the Central Kalimantan Peatland Project (CKPP). Comprised of WWF, CARE, Wetlands International, and BOS – and funded by the Dutch Government – this partnership worked to dam the canals and restore the wetlands. Soon after the project ended, the dams were either damaged naturally or removed by local people who use the canals for transportation. The project was not perceived as negative by interviewees, but it also was not seen as having any sustainable impact on the environment and their livelihoods.

The most recent project to enter these villages was the Kalimantan Forests and Climate Partnership (KFCP) REDD+ Pilot Project, active in the area from 2009 to 2014. Agreed upon by the Indonesian and Australian governments in June 2008, KFCP consisted of the Australian and Indonesian governments, CARE International, and the Borneo Orangutan Survival Foundation. The total budget for KFCP was AUD $37.47 million (Atmadja et al. 2014), funded through the Australia's International Forest Carbon Initiative and governed by the Indonesia-Australia Forests and Carbon Partnership (IAFCP). KFCP was the first project in these villages that involved the Australian Government, but the communities already had experience with CARE, BOS, and the central government from the previously mentioned interventions. Thus, when the KFCP REDD+ pilot project began, there was already an association for locals between it and past projects that had involved some of the same institutions and individuals.

"In the past, when BOS came, we filled out a questionnaire. When CARE (as part of CKPP) came here, they helped us with the fire fighting tools. We are thankful that they gave something to us. [CARE] showed up again in KFCP. And they are the same people like before… but KFCP [REDD+] is much better, because they are able to reach the community." – Male in his 40s, Katunjung, June 15, 2012

KFCP dedicated considerable resources and staff towards sharing information about their proposed work, and the potential payments for forest restoration and conservation. The project assigned university-educated indigenous Dayak Ngaju field workers to live part-time in every community. Their staff went house-to-house conducting research and sharing information, and they organized frequent community-wide meetings throughout the duration of the project. There was an extensive process of consultation in each village, and the project gained permission to enter the community through village-level agreements that were created and formalized through a series of community meetings that were widely publicized locally and open to the public. KFCP said that they would not restrict people from using mineral soils along the rivers, community forests, or areas that were already in cultivation. Although determining who 'owns' what land can be tenuous, KFCP reassured people that they had no intention to 'take over' people's lands, or enclose the area in the southern half of the project as BOS had done with the Mawas Area in the north.

The KFCP project had a heavy emphasis on the + of REDD+, i.e. the *enhancement of forest carbon stocks*. Because the deep peat had been drained, logged, and burned, KFCP needed a local workforce that could rewet, reforest, and rehabilitate the area. The

majority of carbon in this REDD+ project was stored *below* ground, in the deep peat soil. The cultivation food crops in mineral soils along the banks of the river had little impact on the overall carbon content of the project. But if the canals built by the Mega-Rice Project were not dammed to raise the water-level, or if fires from swidden agriculture spread from the mineral soils to the deep peatlands, then the project would not succeed in meeting its carbon emission reductions goals. Thus, KFCP management emphasized peatland rehabilitation and more controlled use of fire. KFCP management did not, however, try to interfere with local people's collection of NTFPs or with agriculture taking place outside of the pre-existing Mawas Area. There was little need for KFCP management to try and curb local farming in the target area (deep peat) due to the soil's infertility and distance from the villages.

KFCP established a "Livelihoods Programme" and each village negotiated the details of this program with KFCP for their community. The livelihoods programme included contributions of either rubber seedlings or *beje* (fish ponds) for every household when specific project goals were met. The programme also included peatland rehabilitation work packages that allotted temporary employment opportunities to every household, and in the process helped supply the work force KFCP needed. Implementation of these work packages was managed by village organizations specifically designed for the task. A second village institution with separate members was established to maintain accountability and prevent corruption. Both institutions were composed of elected community members. The "transparency" of KFCP's management and budget systems was frequently mentioned by local interviewees as a positive aspect of the REDD+ pilot project. The number of jobs the REDD+ program brought to the village was also widely appreciated. Work in the seedling nurseries was especially popular, as it was close to people's homes and it enabled women to earn a salary while they were pregnant or carrying an infant in tow. Many households also chose to have a family member participate in the reforestation work, but it was far from the village and demanded hard physical labor in sweltering conditions with no shade, causing some villagers to deem it too risky for their health.

Each village also had the right to withdrawal from the project through democratic vote at any time. Throughout the project there were multiple and well-known means for local people to lodge complaints and share their opinions – both in anonymity and in front of their fellow community members. Even though this was the case, villagers expressed uncertainty about what happened to their feedback after it was received by the KFCP field staff, and some locals said that they wanted responses to their answers from the project's central management – not the field staff, who were perceived as having limited power and sway in the overall project governance structure.

The number of local people involved in and benefiting from KFCP activities, the amount of interaction between the villages and KFCP, and the quality of their participation was an improvement over the BOS Mawas Area and the Mega-Rice Project. Although this is the case, local participation remained absent at some critical junctures of the KFCP REDD+ Pilot Project.

> *"[KFCP's staff] bring [the villager's suggestions] with them, but I don't know [what they do with it]. I think it never is passed along [to higher levels of KFCP]. I think they may just ignore our complaints and suggestions."* – 39-year-old female, Tuanan, June 14, 2012

First, although KFCP had established mechanisms for lodging complaints and suggestions, locals never knew if these comments reached higher levels of KFCP's governance

structure, and questioned if their views were really being valued or acted upon. Second, the project and its goals were designed before entering the villages, and although local villages could negotiate the details of the village agreements and work packages, they could not negotiate the underlying purpose, structure, and budget of the project. Third, although villages could vote to discontinue their involvement in KFCP, they had no control over whether the project would continue. Multiple villages and many community members wanted the program to be sustained, but the decision to cut the funding and end the program was executively made in Australia.

Since the closure of the KFCP REDD+ project in 2014, it has been repeatedly referred to as a failure in development and conservation circles and in public media. However, in the context of local participation, KFCP people is viewed in a better light than past projects for reasons that include: (1) project "transparency", (2) local staff that people trust and feel comfortable talking to, (3) jobs and opportunities equitably offered to every household in each community, (4) no regulations that forbid livelihoods activities, (5) program activities designed to build the capacity of community members and the village government, (6) a respect and adherence to *adat* traditions related to the land, (7) meetings specifically targeted at helping villages strategically communicate their development needs to the district and regional government, and (8) improvements to the local economy. Although locals are sometimes framed by outsiders as being ambivalent to the ecological impacts of deforestation and forest fires, extensive community member interviews demonstrated broad support for what locals understood as KFCP's environmental goals: (1) to reforest the area burned down by the Mega-Rice Project, and (2) to help the Earth's climate. Many interviewees said that although they had some reservations, they still welcomed KFCP, believed that it needed to be given a chance, and hoped it would succeed.

> *"We are still hoping with this project – because they give so much hope to us... It is true that the previous projects, like Mawas, created problems with the community because they came here and forbid the community from doing livelihoods activities... The Mega-Rice Project didn't forbid us from doing livelihood activities but they destroyed all of the forest. These kinds of projects already caused problems for the communities. It built our trauma."* - Male from Kalumpang village, November 17, 2012

Expressing hope that a project will succeed is different than believing it will. In 2012, local people were uncertain how long KFCP would last. Due to the short lifespans of past programs, locals wondered if KFCP would make it past its demonstration phase, if the carbon market would materialize, and if they could expect anything more than temporary employment from the REDD+ pilot initiative. What is of particular importance in this trajectory of local participation in outside interventions is the repeated cycle of high hopes and let-downs. With repeated experiences such as these, the level of local scepticism increases, and the sense of local sway over the ultimate outcome of these projects (whether it will continue or be closed prematurely) also diminishes, despite community participation. Commitments to community empowerment and economic development by intervening agencies in REDD+ can be jeopardized when the ultimate priorities and timelines of these programs are dictated by government agencies in the capital city, donor agencies from abroad, and externally-driven goals.

5. Discussion

The two cases presented above assess community participation in these interventions as a means to an end or as a genuine process of partnership where communities are transformed to engage in project planning, implementation, influence decisions, and control resources. The two case studies assess community participation in these interventions within two different contexts. In the Indonesia case study, community participation is assessed through time and in comparison to the sway of external agencies engaged in these interventions. The case study focuses on local communities' representation and positioning in the setting of project agendas nationally and internationally, which have direct impacts on their own lives and communities, and which they are invited to "participate" in. The DRC case study focuses on the dynamics and challenges of participation within communities targeted by external development interventions.

In the Indonesia case study, the ability of communities to influence the trajectory of projects such as the Mega-Rice Project and BOS Mawas Area was incredibly limited. Elsewhere communities have been able to stand up to such interventions. Brown and Rosendo (2000) describe how rubber tapers in Amazonian State formed alliances with international environmental and development organizations to establish legal rights for local utilization of the forest. But in Indonesia during the decades of 1990s and early 2000s, political structures constrained communities from building an effective platform to articulate their voices and contest the Mega-Rice Project and BOS Mawas Area. Communities participated in these interventions in more passive forms of co-option, manipulation, and in the case of the BOS Mawas Area, limited consultation, rather than as active agents (Arnstein 1969, Pretty 1995).

The evolution that Indonesia has been going through in its political structure—from a dictatorship to democracy with an active civil society, with an increasing number of platforms for communities to articulate their voices and influence decisions—enables greater community participation in the KFCP REDD+ pilot project. Villages regularly received information on the progress of the project, could consult outside NGOs not involved in the REDD+ intervention, were involved in the co-creation of democratic decision making processes for local-level REDD+ activities, and had village work packages that guaranteed employment opportunities (although temporary) to a representative (male or female adult, selected by the family) from every household. These factors all enabled a higher level of participation within the community than had been achieved by any previous interventions. However, "the community" (its members taken together as one collective stakeholder in REDD+) was under-represented and remained at a strong political disadvantage. The activities of KFCP focused on the socio-economic dimensions of empowering the community, yet could not overcome the larger regional, national, and international political dimensions influencing the control of resources upon which locals depend (Brown 2002). In this light, community participation can be interpreted as a means to achieve the project outcomes – an instrument to increase project efficiency. Such participation is associated to degrees of "tokenism" in Arnstein (1969), in which community members are informed, consulted, or 'placated' with benefits such as livelihood improvements, but never achieve managerial power and influence over the project. The project goals were predetermined, major decisions concerning the project were made by outsiders in remote venues, the communities had little or no control over

the project, locals were uncertain if grievances and opinions reached higher level authorities, there was no mechanism by which local communities could hold intervening agencies accountable, the choice to close the project was made without local consultation, and the communities had no control over preventing the project from ending. Although participation in itself is a process of empowering and facilitating social change, in practice the efficiency argument predominates many development interventions, with community participation and benefits sharing facilitated according to logistical needs and requirements (Cleaver 2001).

In the DRC case study, embedded community power relations and material inequalities continued to exist in the participatory spaces created by the interventions, and the process of social change and empowerment remained hindered. The majority of the villagers in the case study were historically poor due to land dispossession. Their weak financial resource base hindered their ability to engage with the OPD and BDD. The power of the OPD executive members is directly linked to the recognition received from the BDD. This power is however, amplified by the relative weakness of the villagers to demand accountability from these executives. Thus, the majority of the villagers do not have the ability to influence those who govern the OPD.

Because very few villagers received formal education in the DRC case study villages, they lacked outside access to information on the interventions, they had limited social infrastructures to mobilize material resources, and there was high social differentiation based on ethnicity, effective deliberation between the villagers and the OPD village executives was constrained. This then limited the ability of the majority to influence the decisions of a minority of village representatives. Although the villagers did not appear to apply so-called "weapons of the weak" (Scott 1985) to influence the project decisions in this study, Benjaminsen (2014) documented how villagers employed resistance behaviors in order to influence a REDD+ pilot project in Zanzibar after attempts to voice their concerns in negotiations were hampered.

The OPDs are not created out of local initiative grown from within the societies they claim to represent. They are initiated by external agents and actors to achieve legal recognition for non-state representation of local people. Many development interventions or projects establish or support formalized community structures but are often blinded to the historical and social context and the importance of path dependency in shaping these structures (Cleaver 2001). Gaventa (2004:25) also stresses that the nature of new institutional arrangements created to enable participation and power relationships that emerge within and around these spaces determine the level of inclusiveness. These OPDs have ended up as organizations that are neither fully acceptable to local people nor effective in delivering services to the people. This process of cultivating non-state actors in local communities in Africa to represent the interest of local people, and the subsequent poor performance of such local structures has been observed by other scholars (Ribot 2000, Kanyesigye and Muramira 2003, Oyono 2004). When these OPDs are created, there is a tendency for the local elite, partly due to their strong power resource base, to capture the role of political leadership. The strength of elite capture is also associated to the villagers' weak power resource base. When the OPD executives are recognized by the BDD, they often do not maintain dynamic communicative interaction with their fellow villagers. These elites know that the villagers cannot effectively sanction them, so they have no fear appropriating OPD resources for themselves. Similar cases have been documented in decentralized forest governance in other Central African countries,

notably Cameroon (Bayart 1993, Oyono 2004, Bigombe 2003). Even when the rules and regulations capture the opinion of local people, in several instances, the intent and spirit of these rules are consistently distorted by subsequent decisions by these authorities. All this suggests that future forestry interventions like REDD+, despite its social safeguards, could still be captured by deeply disguised forms of feudal-political and authoritarian control of decision-making processes (Ojha and Pokharel 2005, Sikor *et al*. 2010), and may reproduce political inequality between the ordinary villagers and the authoritarian authorities.

The food security project, the process of introducing REDD+ and early REDD+ activity had predetermined objectives, specific timeframe, and ways of engaging the villagers to manufacture success (see Mahanty 2003, Baviskar 2005). The OPD executive members are accountable to BDD and they have no control over the project goals. The executives of the OPD were recognized to speed up most of the process without bothering about their effects. The villagers' participation in the process was therefore a means to achieve the BDD's predetermined objective (increased local food production). This dimension of participation as a means to achieve project objectives rather than a transformative and empowering process does not go beyond labor supply in activities and attending meetings for per diems without articulating voices and influence decisions. The accountability of the local institutions involved remains 'upwards' towards the project management rather than 'downward' towards the villagers. The predetermined goals limit participants from influencing the wider structural factors shaping the projects (Cleaver 1999, Cornwall 2008, Penderis 2012). Hence, people are included as users, choosers and passive consumers of predetermined values and interests rather than makers and shapers of these values and interests (Cornwall and Gaventa 2001, Williams 2004). Meeting project targets becomes more important than seeking substantive participation (Cleaver 1999). Given the economic reality of the study area, participating as laborers in projects does help the majority of the villagers (the poor and Pygmies) but their sense of inclusion in the project remains temporary due to the project timeframe.

6. Conclusion

These two cases have shown that despite repetitive theoretical rhetoric surrounding the value of community participation, the transformative dimension of participation as empowerment is undermined by power relations existing both among the actors and within the institutional spaces of participation that they created. In the Indonesia case study, many of the factors that influenced the decisions that were made were beyond the control of local communities. Although the KFCP REDD+ project created activities to promote community participation, these practices were ultimately mechanisms to enable and legitimize the REDD+ pilot project, and ceased when the project ended. Local voices were absent in the most important junctures of the KFCP REDD+ pilot project: conception, overarching management, and closure. This is true for many development and conservation interventions in Indonesia and internationally.

In the DRC case study, the recognition of community-based institution in the hope of empowering the villagers in the intervention was constrained by embedded power relations within the community. While the community-based institutions claim to represent the communities, in practice they have been captured by local elites and serve

to reinforce inequality in power relations. This elite capture undermines the ability of the majority of the villagers to influence decisions. Agrawal and Gibson (1999) proposed that a key to the success of community-based institutions in development and conservation interventions lies in the need to develop and implement reasonable processes of decision-making that take into account different actors' interests and that are perceived as legitimate, accountable and inclusive. Cleaver (2001) also argues that development agencies often turn a blind eye to the historical and social context into which interventions are entering, and the path dependency of their local partner institutions (see also Vedeld 2002). Unless social inequalities and skewed local power dimensions are acknowledged and addressed, REDD+ and other interventions may further exacerbate these inequalities, adding insult to injury (Fraser 2008: 69) already being suffered by the more vulnerable segments of the local population.

Both cases demonstrate that community participation continues to be a means to an end rather than the goal in and of itself. All of the interventions explored in this article had predetermined goals, timeframes, and budgets. The most important project decisions were made outside of the communities. Community participation was instrumental in meeting these predetermined goals without influencing the wider structural factors shaping the interventions. Hence it appears that despite growing international calls for and literature on community participation over the past thirty years, the efficiency rather than empowerment argument for participation continues to predominate many development and conservation interventions.

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Legitimacy of REDD+: Does the funding mechanism make a difference? Exploring the impact of markets on legitimacy.

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Abstract

REDD+ projects promise the achievement of win-win deals where CO_2 emission cuts and sustainable development in the global South can go hand in hand. The legitimacy of these projects ultimately depends on the size of the second win relatively to the costs of local communities. This paper focuses on one of the two funding mechanisms available for the payment of ecosystem services under REDD+ schemes to Southern countries – i.e., market-based solutions as opposed to using state-funds. I analyze the potential of market-based solutions emphasizing output legitimacy – more specifically the social equity implications of REDD+ projects and identify additional problems compared to state-funded solutions. I argue that market-based approaches may: i) produce projects with an emphasis on conservation objectives as opposed to developmental objective in the participating country; ii) exacerbate pre-existing inequalities in the distribution of income and resources; and that iii) the price volatility of carbon markets may prove detrimental to the long-term financial sustainability of the project, thus undermining the long-term feasibility of developmental outcomes. The implementation of REDD+ project requires in most cases the change, destruction and creation of new institutions which will likely be long-term. In a market-based scenario however, this is not matched by an equally long-term certainty regarding the developmental/compensatory activities involved as they are tied to the uncertain future of carbon markets. An example of market-funded project, the Kasigau Corridor project in Kenya is analyzed to illustrate the relevance of the hypothesis in a concrete case.

1. Introduction

Systems for reducing Emissions from Deforestation and Forest Degradation (REDD +) has been created with the aim of instituting a "multilevel (global, national, local) system of Payments for Environmental Services (PES)" (Angelsen, 2013: 1). In recognition that deforestation and forest degradation contribute significantly to global GHG emissions – nearly 20% of the total (UN-REDD, 2015) – and consequently to global warming; REDD mechanisms were designed to provide economic incentives to countries in the global South to slow the pace of deforestation and forest degradation in exchange for payments from Northern countries.

Since its earliest negotiations on REDD in 2005 at the United Nations Framework Convention on Climate Change (UNFCCC), a wide range of concerns has been raised regarding: its suitability to deliver the expected outcomes of abating global greenhouse gas emissions; the suitability of economic evaluations to capture the environmental and social value that forests represent for local populations; and the legitimacy of a process

which introduces environmental governance changes by altering existing forests' access and property rights regimes.

This paper explores the latter issue by focusing on notions of legitimacy of REDD+ projects and on the way the choice of a particular funding format – i.e. markets – affects the project's overall legitimacy. At present REDD+ projects represent an extremely varied portfolio of solutions and an analysis of their legitimacy in terms of its outcomes must heavily depend on the analysis of the particular socio-economic context in which the project develops. Yet, it is important to identify common variables and isolate possible effects that they may have on the legitimacy of the project itself. I will focus on output legitimacy intended as the acceptability of the project outcomes for the interested groups.

REDD+ mechanisms are hardly described with neutrality. REDD+ enthusiasts describe its potential of achieving win-win deals where CO_2 emissions reduction and sustainable development objectives – e.g. poverty alleviation in the global South – can be achieved (Simula, 2009; Viana, 2009). However, the realization of the second "win" has been questioned by REDD+ opponents which see in REDD+ instances of "green grabs", a politically charged term which redefines the concept into narratives of (in)justice and (il)legitimacy. The term describes the process where previously self-reliant communities are deprived of their livelihoods and become dependent on the market for income and resources (Benjaminsen, Bryceson, Maganga, & Refseth, 2011). This second narrative falls into David Harvey's conceptualization of *primitive accumulation by dispossession* which is defined by as "the enclosure of public assets by private interests for profit, resulting in greater social inequity" (Fairhead, Leach, & Scoones, 2012).

The legitimacy of the outcomes of these projects ultimately depends on the size of the second win relatively to the price paid by local communities. In this perspective, the difference between an environmental protection and sustainable development program; and a case of green grabbing seems to lie in a blurry line drawn somewhere in the continuum that goes from enhanced to reduced social equity.

At present, the choice of a funding mechanism is probably the most contentious issue concerning REDD+, as it is believed that a particular source of funds will impact the project outcomes. To this extent I analyze whether market-based mechanisms for REDD+ have an influence over the realization of the second "win", and consequently the legitimacy of the project outcomes. Assuming that a just, win-win deal is possible, does the market make a difference? Do market-based solutions raise additional legitimacy issues compared to state-funded ones?

Section 2 presents a theoretical framework use to analyze the potential of market-based solutions to influence output legitimacy for the local communities involved. On the sole purposes of illustrating the concepts developed in this section, Section 3 contains the case-study of a REDD+ market-funded project. The Kasigau Corridor project in Kenya is assessed through a qualitative analysis of its output legitimacy. The analysis is conducted in the form of external evaluation, through the screening of project documents, monitoring reports and internal evaluations. Concluding remarks are drawn in Section 4.

2. Theoretical framework

2.1 Concept of legitimacy

Various and differing concepts of legitimacy are used in philosophy and social science

literatures, I will therefore start by narrowing down to a specific definition of legitimacy for the scope of this paper.

The main categorizations of legitimacy as found in the literature describe legitimacy as: i) input or output legitimacy; ii) descriptive vs. normative legitimacy; and iii) internal vs. external (Vatn et al., 2013). In this paper I focus on output legitimacy, as opposed to input legitimacy, defined as the permissibility of the outcomes of the project based on defined normative standards regarding its rational justification and its acceptance by the affected society (Vatn et al., 2013). The definition of output I will use considers the likelihood that rural communities, under different financing methods, achieve a just retribution. I will focus on external legitimacy since an internal/subjectivist assessment would imply an analysis of stakeholders' perception, which would involve a more thorough investigation on the field and falls outside the scope of this paper.

Evaluating the legitimacy of a project calls upon a theory of justice, which in turn is based on normative assumptions characteristic of a particular historical and cultural context. Without entering the details of a specific theory of justice and of its normative principles, I will focus on the ability of different REDD+ financing mechanisms to deliver the win-win outcomes promised by its proponents. Assuming that the participatory and negotiation process has been legitimate and therefore that interested parties have knowingly accepted to restrict the use of forest land in exchange for payments and development activities; I will investigate how likely market-based solutions are to achieve the developmental/compensatory ends of the deal.

Nonetheless, when discussing legitimacy, it is necessary to specify who are the subjects to whom results should be legitimate, as different actors will have different interests, goals and consequently different perspectives of a given institutional setting. In this paper I focus on just a subset of all stakeholders, on rural and forest dwellers.

2.2 REDD+ financing mechanisms

Two main ways of financing payments to Southern countries for the ecosystem services provided for REDD+ have been debated within the international community: a market-based mechanism or a state funded program. Additionally, hybrid forms of financing have been discussed containing elements of the two (Viana, 2009; Simula, 2009).

Even though the 2010 Cancun agreement doesn't propose a specific financing mechanism for REDD+ and it doesn't include specific mention of market-based mechanisms, many already refer to REDD+ as a market-based mechanism either because they sense that the prevailing proposals enforce market-based solutions or because they feel that even those projects that are currently publicly funded will eventually lead to the creation of carbon markets in the future (Benton-Connell, 2011).

These fears don't seem to be entirely misplaced since: i) large constituencies are in favor and lobbying for market-based REDD+ in the hope of buying cheap carbon offsets overseas[35] (Benton-Connell, 2011); and ii) public funding falls well short of the funding needs to cover for the GHG emission abatement which needs to come from deforestation[36] (Eliasch, 2008). In this scenario, studying the impact of market-based funding mechanisms for REDD+ on output legitimacy becomes particularly relevant.

[35] A recent study suggests that the cost of REDD+ is in the range of $2–10 per ton CO2e, including implementation and transaction costs while the cost of cutting industrial emissions could exceed $50 per ton CO2e. (Böll Stiftung, 2010)

[36] "If deforestation is to be halved by 2020, additional public/private finance of $11-19 billion a year to 2020 may be required to fill the funding gap left by compliance carbon markets as they grow." (Eliasch, 2008: 213).

2.2.1 State-funded REDD+

Northern countries, which are part of Annex I under the Conference of Parties (COP), would disburse payments from year to year to the governments of rainforest nations, or directly to project managers in the case of sub-national REDD+ programs; alternatively funds could be channelled through multilateral organizations. Payments will likely be result based, e.g. they may depend on the CO_2 abatement results achieved.

Possible sources of funds could come for example from the auction of the European Union's Emissions Trading Scheme, from development assistance funds or from the collection of national or international taxes on emissions to name a few (Böll Stiftung, 2010).

2.2.2 Market-funded REDD+

Market-based mechanisms would be privately funded by companies of countries in Annex I, which would pay to compensate for their CO_2 emissions; either through national or international compliance markets or through voluntary markets as part of their own internal corporate social responsibility programs (Böll Stiftung, 2010). Additionally a dedicated REDD+ compliance based market could be created to avoid flooding existing carbon markets (Simula, 2009).

2.3 Market-based REDD+ and output legitimacy

I will now introduce three criteria that will guide the analysis of output legitimacy and that will be applied to the case study presented in Section 3.

2.3.1 Program focus

In carbon markets ecosystems are commoditized and simplified to a unique unit of measurement, which denies "the more systematic, integrated, holistic dynamics of ecosystems and the social-ecological relationships through which people live" (McAfee, 2012). The commodity traded, prevented emissions of CO_2, gains absolute pre-eminence since that is the only unit value recognized and exchanged through the market, the unit of measurement, which is enforced by providers when placing their credits and by buyers when evaluating their investment.

In a state-funded mechanism, credit buyers are instead represented by states, which operate in the enforcement of their own environmental, developmental policies, and or multilateral agreements. They are political actors, which interact in the public interest and dialogue with other political actors enforcing other public interests. They are better equipped to include a plurality of values in their actions in force of their political accountability towards their nation, other nations and organizations. The same cannot be expected by private actors, which don't have a public mandate. It is thus to be expected that the focus in market-based solutions will mostly fall on the first 'win' – e.g. conservation objective.

Further, in the context of a market-based financing mechanism, the actors directly responsible for offsets are private companies. They finance conservation and development activities through the purchase of carbon credits on the market, and they have an obvious interest in buying their offsets as cheaply as possible. The cheaper they buy, the smaller the margins available for development projects. Therefore the main

actors involved in the market, credits providers and buyers, have conflicting interests. The achievement of conservation objectives is linked to making polluting activities costly, in this perspective both development and conservation are best achieved with high market prices.

However, in the presence of a conflict between providers and buyers, it is not unreasonable to think that the latter's higher negotiating power will win. Large private corporations in Northern countries can lobby to influence their governments' position on the negotiations of the form of market-based system for REDD+. As a Greenpeace exponent has argued, the most polluting industries threatened to remove their support to whole programs such as the California cap and trade system in case they wouldn't have gotten cheap overseas offsets mechanisms approved (Benton-Connell, 2011).

States in Annex I country list also have an interest in buying cheap offsets overseas and may have higher negotiating power in international negotiations to pressure Southern governments to offer offsets at their conditions. Yet, it is to be expected that in a state-funded mechanisms political actors on both sides are constantly involved and not just at the beginning of the process (e.g. during negotiations regarding the form of funding as in the market-based scenario). This gives the at least theoretical possibility to the political parties involved to eventually redress an existing power imbalance and adjust towards more equitable outcomes in a continuous political process.

2.3.2 Costs and benefits for the community

The opportunity cost of not using forestland and resources depends on alternatives available to individuals such as access to income generating resources, capital and knowledge. According to this logic, low income groups would settle for lower compensation levels, whereas better off groups may be able to negotiate for higher compensations (McAfee, 2012). This mechanism could potentially exacerbate inequalities, thus raising legitimacy issues in a distributive point of view. Private actors, such as private corporations do not have the mandate, nor the institutional interest to focus on distributive issues within the concerned communities in Southern countries. Therefore, an equitable distribution of the project's benefits in market-based mechanism could be hindered by pre-existing inequalities within countries and within communities.

A state-funded mechanism, which could reside within the state's own foreign development agency or be channelled multilaterally by one of the international agencies involved (UN REDD, FAO, UNDP, UNEP) would have the mandate, the focus and technical expertise to identify and address distributional issues.

When state funds are managed or administered by central or regional political authorities in the recipient countries, cases of corruption may actually divert them from the purposes they serve and be appropriated by corrupted politicians; be spent inefficiently and ineffectively; or follow a priority agenda which does not represent the concerned communities' own priorities. Yet, when this happens, they can be hold accountable for breeching their mandate both to the financing state and to their own state. Thus, enforcement and monitoring mechanisms can be expected to counter this kind of opportunistic or undemocratic behavior. As an example the Government of Tanzania had to repay part of the funds received by the Norwegian government for a REDD+ project after an external evaluation reported about misuse and misappropriation of funds (Naess, 2013). The Norwegian government also stopped collaboration with the ministry responsible for the misappropriation. Additionally, were local governments to use funds

in an undemocratic way (e.g. without consulting nor respecting local communities views and interests), hopes could at least reside in an internal political process towards democratization. The same possibility is not available in market-based solutions, where it is to be expected that the involvement of local or central authorities in REDD+ will be minimal after the initial set-up, thus leaving local communities without political representation with this regard nor the opportunity to appeal political authorities for processes they are no longer directly involved in.

2.3.3 Overall Program financial sustainability

Below I will introduce two arguments proposing that the financial sustainability of market funded REDD+ programs face short and long-term uncertainties.

Market price fluctuations

In a market base scenario, price volatility represents a key uncertainty regarding the flows of funds available to compensate participating communities for preserving their forests. The funds available may be too low to generate just compensations or continue the alternative sustainable development activities. Eventually the funds available could become too low compared to the income generated through alternative uses of the forest. Should the "the price of beef, soy or wood suddenly rise in relation to the price of carbon credits, forests could be instantly worth more dead than alive" (Benton-Connell, 2011).

Currently the compliance landscape is rather fragmented; there are a few regional markets such as the ones being developed in Australia, Japan and California, which in the near future may promote additional demand on the market of REDD+ credit (FCMC, 2013). However, in the absence of an international agreement under the UNFCCC setting a major international REDD+ compliance based market, REDD+ projects are currently battling for buyers within the relatively small voluntary carbon market (Cowling, 2013). Since it is unclear when compliance based markets will play a major role, it may be useful to briefly state the current outlook of the voluntary market.

Conservation International estimated the expected supply of REDD+ credits in the voluntary markets in 2013 to 25 $mtCO_2e$ against an existing demand of 6.8 $mtCO_2e$. In 2014, aware of this situation, REDD+ credits providers conceded to buyers' demands and sold at an average price of 4.2 US$ per $mtCO_2e$, a decrease by 43% compared from 7.4 US$ per $mtCO_2e$ in the previous year (Peters-Stanley & Gonzalez, 2014). Another recent analysis of voluntary carbon markets shows an almost continuous decline in the volume of purchased carbon offsets since the beginning of the last economic crisis –with the sole exception of 2011. Volumes traded in 2013 were 26% lower compared to the previous year. More specifically REDD+ credits transactions have fallen for a few years in a row, decreasing by 65% between 2010-2012, thus leaving projects developers with unsold credits (Cowling, 2013). This is the combined a result of oversupply and sluggish economic recovery in industrialized countries which curtailed budgets available for corporate social responsibility activities (Peters-Stanley & Gonzalez, 2014).

In the short-term prospects for REDD+ credits on the market are not positive. Because of the weakness of the voluntary markets and slow progress in international negotiations –e.g. towards the creation of an international compliance-based market-; analysts expect demand for REDD+ credits to remain weak, thus leading to significant oversupply and

further contraction in price over the period 2015-2020. The scale of the market imbalance is estimated to be such as to impose dire consequences on the stakeholders already involved in REDD+ projects, which may be forced to abandon their projects (FCMC, 2013; Cowling, 2013).

In the long-term the eventual consolidation of an international compliance based market under the UNFCCC will undoubtedly support an increase in demand. However, the relative level at which the market price will eventually stabilize in a compliance based market as well as the magnitude of its fluctuations cast uncertainties regarding the income available for the developmental/compensatory outcomes of the projects and ultimately, for the project financial sustainability.

Monopsony power and possible market bubbles

Besides the current conjuncture of weak demand and over-supply the current implementation of market funding for REDD+ is apparently plagued by two systemic flaws, which could further undermine its future sustainability.

- The difficulties of sourcing forest carbon credits may concentrate trades with the very few global intermediaries with the scale and resources required[37], thus leading to a situation of monopsony, where the scarcity of buyers gives them pricing power. Additionally, intermediaries and consulting firms may end up absorbing most of the final price of carbon credits leaving only marginal benefits to the producers. Thus, the bulk of carbon credits benefits would be mainly distributed among intermediaries, which are likely going to be a few multinational corporations within Northern countries (The Munden Project 2011). Under monopsony buying power, carbon credits providers would be under pressure to cut budgets, thus impairing the capability of REDD+ projects to deliver the promised development outcomes to the benefit of local communities.
- Carbon as a commodity is difficult to source and account, this hinders the vital process of clearing transactions in the market thus leading to below standards clearing or no clearing at all. This could lead to a bubble, which could disrupt the market and force communities to abandon REDD+ schemes (The Munden Project, 2011).

While states are not immune from fluctuations of available funds either, the uncertainties regarding the availability of state-funds may be considered of conjunctural nature –e.g. they may depend on external factors such as general economic outlook-. On the contrary, the uncertainties tied to a market-based scenario are also systemic; -e.g. the adaptation of price to ever changing levels of supply and demand is an inherent characteristic of the market-.

Additionally, state-funded REDD+ projects could instead make use of bilateral and multilateral agreements and rely on planned transfers for several years in previously defined amounts[38] as a way to reduce the uncertainties regarding the funds available at least for the period covered by an agreement. States and multilateral agreements may also rely on enforcement mechanisms that punish failures to comply on both sides. Conversely,

[37] "The expertise, travel requirements and operational scale required to follow IPCC-like standards almost certainly requires a multinational organization, one that is well-capitalized and capable of managing many clients at once"(The Munden Project, 2011).
[38] Amounts can still eventually vary in virtue of the performances achieved and of the measures set to deter opportunistic behavior.

there is no enforcement to be made on the market should it deliver a too low price, especially since the option to opt out may not be available at all times.

Conclusion

As described in the previous paragraphs, the unpredictability of carbon prices and structural aspects of the carbon market influence market-based REDD+ projects: i) in the short-term by threatening the achievement of development-compensation programs; and ii) in the long-term by undermining the survival of the entire mechanism.

The introduction of REDD+ mechanisms (state or market-funded) requires institutional changes at the cultural, property and access rights which alter for the long-term the use of forests and their relationship to the local communities. More in general, "commodification turns ecosystem services that in principle were in open access, public or communal property into commodities that can be accessed only by those having purchasing power", thus involving "a substantial institutional and social change" (Gomez-Baggethun & Ruiz-Perez, 2011). It is thus important that a long-term commitment from local communities in terms of institutional changes is matched by an equally long-term guarantee of the quantity of funds generated and in general of the overall program sustainability.

While state-funded projects may as well produce long-lasting institutional change, they are not exposed to the same degree of short and long-term uncertainty of market-based solutions.

Ultimately, in both state and market-funded projects, the legitimacy of the institutional changes introduced should be evaluated against the opportunities and alternatives they entail in a long-term perspective. The reversibility of the institutional changes introduced should also be considered case by case. For example, if the participation to REDD+ would entail a centralization of forest management, it is not obvious whether in a post-REDD+ phase, the new institutional asset could be reverted to its previous state or whether even within the new institutional asset, the concerned communities could have their previous livelihood possibilities restored (e.g. re-gaining access to use of forests for fire-wood or grazing etc.). In this case, in the lack of alternatives to REDD+, participant communities may find themselves locked in to the program whilst receiving compensations below their opportunity cost. An outcome, which would leave them worst-off.

3. Market-funded REDD+: A case-study

In this section, I analyze a case of market-funded REDD+ against the three criteria described in the previous section to the sole scope of better illustrating them. To gather evidence on whether the project can generate just compensations to the communities involved I focus on the following questions:

- Program focus: qualitative assessment of the main focus of the program, I try to assess whether there is an emphasis on either environment conservation or development outcomes. By analyzing project documents such as project descriptions and project reviews, I will gather evidence of possible trade-offs among the two goals and highlight which of the two is held in higher priority by

the project managers.

- Costs and benefits for the community**:** are the costs and benefits shared equally among participants? Are there exclusions or involuntary evictions?
- Overall Program financial sustainability: what are the risks associated to the short and long-term funding of the project?

3.1 The Kasigau Corridor REDD Project, Kenya

The Kasigau Corridor project in southeastern Kenya protects 500,000 acres of dryland forest that form a corridor between two National Parks, Tsavo East and Tsavo West. It contributs to an estimated 1 million mt CO2-e per year (VCS, 2014). The project has been designed and is currently managed by the Wildlife Works Inc. a company registered in Sausalito, California. It is said to benefit nearly 100'000 rural Kenyans through the distribution of carbon credits income and about 400 locals, which have been employed to support the project's developmental and conservation activities (Code REDD, 2012). The project implementation started in 2005, although the first carbon credits were issued in 2011. The project area consists of two parts, an estate leased by the Government of Kenya to Rukinga Ranching Company Ltd – the majority of which is owned by Wildlife Works Inc. (FCP, 2006)[39] – and a group of 13 community owned ranches which undersigned carbon agreements with the company after as many majority votes (Wildlife Works, 2011).

According to the website of Wildlife Works, it represents the first project "ever to be issued Voluntary Carbon Units (VCUs) for REDD under the Voluntary Carbon Standard (VCS), the most widely used carbon accounting standard among projects issuing credits in the voluntary market" (Wildlife Works, 2015).

The analysis of the output legitimacy of this project was done mainly through reviews of the project documents issued by the organizing company itself, and social impact evaluation commissioned internally. In the lack of independent external evaluations, the analysis is limited to what can be extracted by the mentioned corporate documentation. It is therefore possible that additional legitimacy issues arising from the distribution of benefits to the local concerned population in Kenya may not emerge from this analysis.

3.2 Program focus

The project documents highlight an emphasis on environment conservation outcomes as compared to developmental outcomes. The program is based on four main objectives in the following order: i) to protect in perpetuity dryland forests; ii) to conserve the biodiversity found in those forests; iii) to provide alternative sustainable development opportunities for the local communities; iv) to prevent the emissions that would otherwise occur if those dryland forests would otherwise be converted to subsistence agriculture (Wildlife Works, 2011). Three of the four objectives regard conservation, while the only development focused objective is stated as a compensatory measure for the loss of income and livelihood added by the project, following a "no-harm" approach. Instead of advancing development goals beyond a certain baseline, the focus is rather on

[39] "The majority shareholder of Rukinga Ranching Company is BenBo International, an offshore trust. BenBo International was established by a principal investor of both Wildlife Works Inc. and Wildlife Works Carbon LLC. Wildlife Works Inc. was granted a conservation easement from Rukinga Ranching Company in 2009 after the project start date of January 1, 2006."(FCP, 2006).

restoring the starting level to at least that baseline. The company's commitment to development objectives becomes further uncertain when analyzing the project details, where, as described in the next paragraphs, the pursuit of conservation objectives comes at odds with objectives of benefit sharing, inclusion and broader food security concerns.

3.3 Costs and benefits for the community

The introduction of the project has changed local livelihoods in several ways. In the pursuit of conservationist objectives, previous uses of the land for sustenance agriculture, logging, charcoal production, herd grazing have been disincentivized, made illegal and/or prohibited with the help of patrolling units. In compensation the project has implemented "many other income-generating, ecofriendly activities to the project area, such as ecotourism, built schools, trained local people in better dryland farming techniques and provided resources to health clinics"(Wildlife Works, 2011). The ownership of the profits generated through these income-generating activities is not clear from the project documents. REDD+ funds have been pooled in a trust fund, the Wildlife Works REDD Project Trust Fund (WWRPTF), composed by seven local committees, each of them chaired by Wildlife Works and by seven individuals elected by the communities. The committees can decide over the allocation of REDD+ funds. The proceeds from the sale of carbon permits is divided in three equal shares: a third of the carbon credit revenue goes to staff salaries and other operating costs; another third goes to community landowners to compensate them for not exploiting Kasigau's natural resources for profit and the final third is split between investors and carbon committees to be used for the income generating projects for local communities (Russell-Sluchansky, 2014). The project distributes opportunities to gain a higher income to individual farm holders by providing technical expertise and funds to convert agricultural activities towards more profitable activities. It provides infrastructures for education and health and it employs an estimated 400 community participants –the 0.4% of the people living in the area. The company is the main employer in the area, however the condition of such employment are not described.

It is unclear from the project documents if i) opportunities to increase gains from income generating activities are evenly distributed; ii) funds are directly distributed to the community; and if so iii) with which modality. In the absence of this information it is difficult to make a complete assessment of whether the distribution of benefits is fair compared to its costs distribution. However, a few observations can be drawn from the documentation available.

A survey conducted on 2007 on a randomly selected sample of participants on behalf of the managing company, highlighted that 62% of the respondents did not receive any direct or indirect support from the company, the share raised to 79% once the company's employed personnel was removed from the sample. Among the direct benefits participants listed employment, school support, payment of hospital bills, scholarships for orphan children and other benefits from projects. Among the indirect benefits respondents' listed the money that the company's employees spends in the local economy (Rietveld, 2007). The survey was undertaken before the company actually started selling carbon credits on the market, it is therefore possible that the distribution of benefits has changed since then. According to the survey, a few negative aspects of the project include; i) the scarcity of land induced by the conservation policies of the company which is creating competition for land between crops and cattle breeding; ii) an increase in

wildlife/human conflicts as a side effect of the increase of wildlife in the area; and iii) the exclusion of access from the Rukinga Ranching area for grazing cattle and firewood collecting which is punished with arrests. Furthermore, the few individuals that were previously relying on charcoal production have experienced the greatest loss of income. However, the individuals living in the project area villages are not the only ones affected by the project.

The project operates a systematic exclusion of pastoralists from any kind of consultation or participation. Although the presence of Somali pastoralists, which use the project area for grazing large cattle herds, is noted in several points in the project documentation (Wildlife Works, 2011: 12, 51, 95, 106); pastoralists groups are merely mentioned for the damage that their cattle provoke by preventing new saplings from growing. The damage is listed among the main risks that could substantially affect the project's GHG removal objectives. A project report prepared for potential buyers of carbon credits even suggests that an invasion of cattle grazers due to famine in adjacent communities may be prevented by increasing ranger patrolling paid with carbon credits funding[40] (*ibid.*). It should be noted that droughts represent a serious threat to food security in the country, the last drought hit the Northern regions of Kenya in 2011 and pastoralists were among the most affected groups. At the time one of the main coping mechanism for these groups was to move South in areas such as the Tsavo East National Park, close to the project area. The project area itself was classified as level 3/crisis in the food-security risk scale by OCHA (Short, 2014). In the occurrence of new droughts, the exclusion from the land operated by rangers may deprive pastoralists of a key coping mechanism against food-insecurity.

The exclusion of pastoralists from land access and rights reinforces a long history of ethnic favoritism in Kenya, which was reflected into the country's previous Constitution, allowing individual investors to ignore pastoralist rights under customary law while acquiring their land. The country's new Constitution, entered into force in 2010, has reversed the situation and it allows for the protection of land rights for pastoralists (IRIN, 2011). Interestingly the project doesn't seem to have been affected by this change. On the contrary project managers worked towards making the use of the project area for grazing by Somali pastoralists completely illegal: they paid landholders to stop leasing land to them, thereby excluding 3'000 heads of cattle and the large amount of people tending them from the project area (Wildlife Works, 2011: 51). One of the main stances of the company against pastoralists is that they cause historical wildlife migration and the preservation of the wildlife within the project area is one of the objectives of the project.

The exclusion of the project area from the land to be used as an emergency coping mechanism for pastoralists in the event of droughts and famine and not least the exclusion of pastoralist from participation to the program and from any customary rights they may have on the land, raises serious concerns regarding the equity of the project outcomes. In this view an egalitarian component to the project seems to be lacking and it poses a serious challenge to the developmental/humanitarian objectives of the program. States also have a documented track record of evictions and exclusion from the recognition of land tenure rights in conjunction with the implementation of REDD+ projects. However,

[40] The report reads: "Invasion of cattle grazers due to famine in adjacent communities, or lack of grazing elsewhere -Any influx of cattle only affects the quantity of grass in the project area and leads to no significant change in carbon stock. Again, this is possible especially as Somalis have used land in this area to feed and water their cattle over the years, sometimes with permission and sometimes without. However, given increasing aridity in the area, we believe Somali cattle herders will be forced to look elsewhere for rangelands. We will be using carbon funding to increase ranger patrolling to better protect the project area from illegal incursion."

in a state-funded solution, the political authorities responsible for the eviction will likely remain involved in the project throughout its duration, which at least leaves the theoretical possibility to appeal that same authorities and to hold them accountable. In a market-based scenario instead this possibility is not available as the involvement of political authorities fades once the project start.

A major impact of the projects on the livelihoods of participants is the introduction of cash crops such as jojoba oil to replace food crops. According to the project managers, cash crops lead to greater yields and are a better solution compared to the financially unviable sustenance farming it replaced. These crops seems to be more suited to cope with the area's arid climate than traditional crops such as maize. However, the consequences of displacing food crops with cash crops in a country affected by recurrent droughts should be further analyzed in a food security perspective. More specifically these changes are going to increase the participants' reliance on markets for the purchase of food staples. This could become critical in periods of droughts when food prices tend to rise steeply (FEWS Net, 2014). It should be investigated whether the eventual increase in purchasing power in the villages after the shift to cash crops is enough to enable them to buy on the market the food they previously produced for themselves, especially at "drought-time prices". If not, this change may hinder the community' self-reliance and increase their dependence on food aid (in a survey conducted on 100 randomly selected participants living in the project area, 43% of the interviewed acknowledged being a recipient of food aid during dry-seasons (Rietveld, 2007)).

The company acknowledges that the successful achievement of the conservation objectives depends on the community's satisfaction and compliance with the deal; in this sense satisfactory compensatory measures are necessary to achieve conservation goals. The strength with which the interested communities can effectively exercise this power depends however on the existing institutional asset, on the level of transparency and community participation; factors, which would be best analyzed through an independent evaluation on the field.

3.4 Overall program financial sustainability

The project was initially set up with REDD + funds and further developed into a second phase thanks to the proceeds from the first sales of carbon credits. The project doesn't have an end date but has set a crediting period of 30 years with VCS. Carbon credit sales are expected to finance the project from year to year. The carbon sale price is indeed the main risk to the program's financial sustainability: the lack of predictability on the voluntary market is the main challenge as the company itself acknowledges (Wildlife Works, 2011) (Nicholls, 2014).

The company is trying to overcome this risk by persuading clients to sign for multi-year commitments (Nicholls, 2014). The company has stated that the total annual revenue from the sale of voluntary carbon credits has ranged between $3.5 million and $7 million (Russell-Sluchansky, 2014). Among the clients that purchased Wildlife Works' carbon credits on the voluntary markets as part of their corporate social responsibility are Microsoft, Allianz, Audi, La Poste and Kering (owner of brands such as Puma, Gucci and YSL), Coca-Cola, Hershey's, Barclays, and BNP (Nicholls, 2014; Russell-Sluchansky, 2014). Complete data on the distribution of credits to clients and their price is not available. The portfolio of clients shows high profile multinationals, if the sales of credits would be concentrated enough among a few of them, they could potentially exert monopsony

power on the company and exert price-setting influences, however the information available doesn't allow to explore this possibility.

Yet, exclusive reliance on the private sector's purchase on the voluntary markets and the uncertainty regarding the creation of a UNFCCC backed compliance market represent a threat to the short and long-term sustainability of the project and of purely market funded REDD+ projects all together.

Finally, in the case the income generated through the sale of carbon credits would lead to below opportunity cost compensations, which options would be available for the communities involved? Again, in the lack of complete information on the institutional changes introduced by the company, it is impossible to give a complete account of such alternatives. However, a few points could be noted:

i) The Rukinga Ranch area has been leased to the company by the Government of Kenya, and became a Wildlife Works protected area in 2005. An internally commissioned evaluation found that since then access to the area for grazing or firewood collection has been completely prohibited (Rietveld, 2007). It is reasonable to expect that the lease is not linked to the implementation of REDD+, therefore in a hypothetical end of the project the access restrictions may remain.

ii) Power imbalances may have been created between the companies' employed personnel and other individuals in the community, it is noted that the income of the former is substantially higher compared to the rest (Rietveld, 2007).

iii) The replacement of sustenance agriculture with cash crops would probably need to be reverted as it is unlikely that the communities themselves would have access to international markets for the sale of e.g. jojoba oils and its by-products. The reconversion of land to food crops might require a transition period during which communities may have to increase reliance on the market for the purchase of food staples.

4. Conclusions

The current projection of public funds for REDD+ projects is currently well below projected needs, if approximately 20% of CO_2 emission reduction were to come from REDD+ activities. This is one of the reasons that has put market-based mechanisms at the center of international negotiations for a future role or REDD+.

Market-based solutions are met with hostility by stakeholders groups – such as groups representing indigenous populations and their rights – under the belief that they will further subtract decision and democratic power from the affected communities. It is thus important to understand whether the characteristics of market-based solutions affect the ability of REDD+ projects to deliver the win-win outcomes (e.g. conservation and development) promised by its proponents.

In this paper I have analyzed the possibility that market-based solutions raise additional legitimacy issues compared to state-funded ones; particularly with reference to the size and realization of the "second-win" or output legitimacy. Because of lack of focus, interest or expertise on developmental and distributive objectives and because of financial uncertainties, I argue that market-based mechanisms for REDD+ present additional concerns with regard to the legitimacy of its consequences when compared to

state-funded projects.

More specifically, I proposed three main arguments:

1. *Focus on conservation objectives.* Market-based REDD+ projects are expected to have a greater focus on conservation objectives as opposed to developmental/compensatory activities compared to state funded projects. This is for two reasons:

> i) States in Northern and Southern countries have a public mandate and are accountable to a plurality of values towards their constituencies and other constituencies which incorporate environmental but also developmental (domestic or international) objectives. This is in contrast with the market's one-dimensional world where avoided CO_2 emissions are the only target which is exchanged and paid for.
>
> ii) In a market-based scenario, companies in Annex I countries can exert lobbying influence for the approval of cheap offsets mechanisms overseas. This would negatively affect the financial means available for the developmental/compensatory activities (as well as conservation objectives). Chances are high that the same mechanism of conflicting interests and power imbalances exists among states; yet in a state-funded mechanism political actors are involved during the whole process (rather than just at its beginning), thus leaving the possibility to renegotiate towards fairer terms.

2. *Distribution of costs and benefits.* The market is ill suited to address pre-existing or newly arising distributive issues concerning REDD+. Rather it is likely to exploit them. If the price of offsets is set on the market by the alternatives available for local communities, it is to be expected that the poorest with fewer alternatives will settle for the lowest compensations, thus exacerbating pre-existing inequalities. Distributional equity is thus better ensured when managed by political authorities, which have also a political mandate to do that. While there are well-documented episodes of corruption and undemocratic use of public funds by political authorities, in a state-funded project enforcement and monitoring mechanisms are available to deter this kind of behaviors.

3. *Availability of financial flows to deliver the promised developmental outcomes*. When compared to state-funded solutions, market-based mechanisms are more financially unstable both in the short and in the long-term. In the short term this is due to the uncertainties regarding the creation of a major international compliance market, which opens up to a possible scenario of oversupply, declining credits price and serious financial viability problems for ongoing projects over the period 2015-2020. In the long-term, even if demand of REDD+ credits would find support in the creation of a broad international compliance market; the financial flows available for development activities would vary depending on the price level offered by the market and its volatility. Additionally structural characteristics of the carbon market may lead to financial bubbles and grant price-setting power to a few intermediaries to the detriment of project owners and of the communities involved.

For the reasons listed above, I propose that the successful achievement of win-win deals between conservation and development objectives under REDD+ is more likely when there is a continuous involvement of organizations with a long-term political mandate and a development focus. This is not granted but more likely possible under a state-funded setting. In a market-based scenario, the profit logic of private actors and the volatility of

carbon markets may prove detrimental to the achievement of just compensation and development goals for the communities involved.

Additionally, given that REDD+ projects often introduce important institutional changes regarding the use and property of resources with possibly long-lasting effects; it is important to ensure that the correlated compensatory/developmental activities are achievable and can also be sustained in the same long term horizon. Once again, systemic features of carbon markets are less likely to support this possibility.

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Implications of Green Economy for the South: A Case of Mining Sector in Zambia

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Abstract

The concept of green economy is designed and developed in the North but has many implications and great importance for the South and Least Developed Countries. The paper discusses the adoption of the green economy model in the South through the case of the Zambian mining sector. Although efforts have been made to strengthen institutional basis for greening the mining industry, Zambia faces significant challenges including political favour of economic growth over environmental protection, weak regulatory frameworks and capacities, asymmetric power between mine investors and local communities. We conclude that green economy can only take effect in the South with political will, effective institutions and capacity to enforce the institutions as well as equal standards by local governments and those of the North.

Key words: Green economy, the South, mining sector, Zambia

List of abbreviations

CMZ	Chamber of Mines of Zambia
ECZ	Environmental Council of Zambia
EEA	European Economic Area
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EMA	Environmental Management Action
EMP	Environmental Management Plans
EPB	Environmental Project Brief
EPF	Environmental Protection Fund
EPPCA	Environmental Protection and Pollution Control Act
FDI	Foreign Direct Investment
GE	Green Economy
GDP	Gross Domestic Product
GRZ	Government of the Republic of Zambia

ICMM	International Council on Mining and Metals
ICSG	International Copper Study Group
KCM	Konkola Copper Mines
LDCs	Least Developed Countries
MCMs	Mopani Copper Mines
MDGs	Millennium Development Goals
MSD	Mine Safety Department
NEAP	National Environment Action Plan
NPE	National Policy on Environment
OECD	Organisation for Economic Co-operation and Development
SNDP	Sixth National Development Plan
UNCSD	United Nations Conference on Sustainable Development
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNDESA	United Nations Department of Economic and Social Affairs
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UN-OHRLLS	United Nations-Office of the High Representative for the Least Developed Countries, Landlocked Developed Countries and Small Island Developed Countries
WB	World Bank
ZEMA	Zambia Environment Management Agency

1. Introduction

Every continent, region, country, and community has unique social, economic and ecological characteristics. Is green economy (GE) a panacea or a magic bullet that will cure the problems of economic growth, social inequalities between and within countries, and threats to overstepping the ecological limits of our planet? The concept of GE pervades the current development discourse just like the concept of sustainable development before. Debates rages on its meaning, its coherence, and its applicability. The Global North has dominated both the debate and the application of the concept. "Definitions, evidence, debates and increasingly, policies, have tended to be dominated by powerful countries and international groups" (Bass 2013, 3). But the Global South has also increasingly latched on to the concept of GE both theoretically and practically. Zambia, for example, has decided to devise a green growth strategy to be integrated into its national development plans (ibid. 18). In this paper we seek to contribute to the GE discussion by focusing on the adoption of this development model in the South. Specifically, we look at the Zambian mining sector.

The paper begins with an outline of what GE is. It is important to clarify the concept before we can apply it to any specific case. Secondly, we describe the mining sector in Zambia highlighting its economic and socio-political significance. The scope of this paper does not, however, permit us to discuss every facet of GE vis-à-vis Zambia's mining

industry. Instead, we primarily focus on the greening aspect of the mining sector in Zambia. It is however inevitable that the interconnected of the facets cannot allow us to completely eschew economic and social equity dimensions.

2. Understanding Green Economy

2.1 History and Definition of Green Economy

The concept of GE has been increasingly receiving attention by policy makers, researchers, and planners of development activities, especially since the United Nations Conference on Sustainable Development (UNCSD) known as Rio+20 held in June 2012. The conference renewed the commitment to the sustainable development agreed at Rio Summit in 1992 and put forward the agenda of the GE as a driving economic growth model to achieve sustainable development and eradicate persistent poverty and hunger which are the greatest global challenges facing the world today and the major goal of the Millennium Development Goals (MDGs). UNCSD reaffirmed the need of enhancing sustainable development at all levels integrating economic, social and environmental aspects and the importance of their inter-linkages. The outcome document of Rio+20 Summit "The Future We Want" clearly requested United Nations to support the implementation of GE policies and programmes. As a result of this, now GE has received wider attention across the world.

There is no universally agreed definition of green economy. This is problematic because a lack of clarity on the meaning of GE not only is theoretically unsatisfactory but also causes ramifications on interstate agreements as states may differ on which elements constitute GE and which ones take priority. This is predictable given the differences in political dispensations, levels of economic growth, available natural capital, and institutional capacity (UNDESA 2012, OECD 2012). GE is presented as an alternative approach for growth and development which can foster economic growth by sustaining and advancing environmental and social well-being. The United Nations Environment Programme (UNEP) gives a tripartite definition of GE as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP 2011, 16). The definition pinpoints three pillars of GE which are the society, the environment, and the economy. Similarly, according to European Economic Area (EEA), GE is a balanced development with three goals: to ensure ecosystem resilience, to improve resource efficiency, and to enhance social equity (EEA 2012).

GE is deemed as a better growth model by addressing the new challenges of economic growth such as the 2008 financial crisis while preserving environment (UNDESA 2012). It is unlike other prevailing economic development models that focus more on high economic growth through optimal utilization of resources giving low attention on negative externalities of resource use. These models have resulted in growth in some countries at the pain of high carbon emissions, resource depletion, and loss of biodiversity, climate change and persistent poverty in other countries. The GE model is a model which is thought to help improving eco-efficiency in the production and consumption of goods and services, to preserve and restore natural capital and its productivity, and to ensure equitable and sustainable development (UNEP 2012).

GE also emerges as a priority policy tool due to unequal distribution and use of resources. For instance, in 2005, the wealthiest 10% in the world accounted for 59% of all consumption and the poorest 10% people accounted only 0.5% (WB 2008). GE in comparison to the prevailing economic model seems to be more inclusive and tries to capture the issue of equality in the definition, "as one in which environmental, economic and social policies and innovations enable society to use resources efficiently-enhancing human well-being in an inclusive manner, while maintaining the natural systems that sustain us" (EEA 2012, 8).

2.2 Green Economy for the South

GE is designed and developed in the North. Nevertheless, the model has many implications and great importance for the South and Least Developed Countries (LDCs) which are hugely dependent on natural resources for their livelihoods. Its proponents argue that the GE can help to open an opportunity for sustainable growth both in terms of economic growth and employment in the South. They also claim that it offers significant opportunities for LDCs countries mostly located in the South to diversify their agricultural sector through horizontal diversification into organic crops. Furthermore, supporters of GE alternatively say that it might contribute achieving the MDGs by exploring key sectors for green economies, such as energy access, waste treatment, ecotourism, agriculture, sustainable urbanization, and forestry (UNEP, UNCTAD and UN-OHRLLS 2011).

A large section of the people in the global South depend on natural resources such as agriculture, forest resources, biodiversity, minerals and oil-extraction for their livelihoods, including large potentiality of renewable energies. From a development perspective, the key features of sustainable development comprising of environmental conservation, social development and economic growth with reduced impacts on the natural resource base, are still relevant in addressing the rural development issues due to the importance of ecological systems for the survival of whole communities (Musyoki 2012). In this regard, GE is seen as a basis potentially for them to develop their economy in a low-carbon and resource efficient path of economic growth as well as being an opportunity to address the infrastructure challenges in a sustainable way.

Most developed and emerging countries have already utilized their natural resources, which have led to a problem of substantial costs if one wants to "decarbonise" and the associated cost linked to retiring inefficient fossil fuel-based technologies. But LDCs still have the opportunity to utilize natural resources and avoid hurdles by maintaining and expanding sustainable economic activities. In this context, the GE, according to the United Nations through its agencies, provides a good opportunity for them to expand the sustainable practices such as low-carbon, labour intensive agriculture and community-based forestry (UNEP, UNCTAD and UN-OHRLLS 2011). Therefore, the importance of the GE in the global south is underscored by the possibility that "economic prosperity can go hand-in-hand with the ecological sustainability" (UNESCAP 2014, 1). Thus, it is asserted, LDCs are in better position to make the green turn than developed and emerging countries. In other words, they can achieve growth by leapfrogging the growth pathway of the North that has left in its wake deep socio-economic inequalities, environmental degradation and global climate change. In this respect, GE is as beneficial to the developing as it is to the developed world.

Mainstreaming of GE tenets in all relevant sectors is seen as being very important. Governments need to strategically integrate environmental, social and economic concerns in policy development, planning, decision-making and development investment-making. Proponents of the GE recommend that policies and programs be refocused to harness opportunities for communities to utilise locally abundant resources that could be renewable energy, agriculture and forestry that can translate into economic empowerment of the poor and vulnerable communities.

An important element of GE in the South is the recognition and encouragement of the linkages between businesses and local communities in which they operate. Some economic models foster the business-community disjunction in which profit-maximisation seems to be tied to exploitation of local communities and thus leaving the communities worse off or as enemies of the business. GE, from the UNEP conceptualisation above, stresses the locals as key players whether as employees, suppliers or as customers. Further, without relying on local resources and infrastructure, companies would not be able to operate. "It is difficult to separate community well-being from companies' viability and, in turn, overall economic growth" (United Nations Global Impact 2011, 5). Once community risks are acknowledged as business risks for the companies, they are more motivated to be more socially inclusive, to improve wellbeing for local and reduce adverse environmental impacts that put the health and safety of locals at risk.

We have so far outlined the GE model and the potential benefits it offers for LDCs. We will look at whether these potentialities of the GE can realistically be achieved in the socio-political and economic context of Zambia. We focus specifically on the country's economic backbone - the mining industry - to examine the extent to which the sector is responsive to the ideals of the GE. We shall further examine conflicts, if there are any, that exist between economic growth and environmental protection.

3. Green Mining Sector in Zambia?

3.1 Country Profile

Zambia is a landlocked low income African country. It has eight neighbouring countries which are Angola, Mozambique, Democratic Republic of Congo, Tanzania, Malawi, Botswana, Namibia, and Zimbabwe. According to the most recent country census of 2010, Zambia's population is just over 13 million people at the growth rate of 2.8% since the census of 2000 (Central Statistical Office 2012). The country has the total size of 752,614 square kilometre and population density of 17.4 persons per square kilometre (ibid.).

According to the United Nations, Zambia is among the least developed countries with 2013 per capita GDP of US$1540 (WB 2014). Between 2003 and 2006, the country's trade balance was improved from a trade deficit of US$321 million to about US$2 billion trade surplus. This drastic improvement was attributed to the sharp increase in copper prices during the interval on the international market. This also saw the mining sector contribution to Zambia's GDP increase from 6.4 to 11.8% (Environmental Council of Zambia - ECZ 2008).

Zambia's economy has been highly dependent on copper and cobalt production since its birth under British midwifery in the early 1900s. The Zambian economy has been

strongly linked to the development of the mining sector for many decades (WB 2011). First, the mining sector is the main attraction of foreign direct investment (FDI). In 2012, 86% of overall FDI went to the mining sector (ICMM and CMZ 2014). Second, this sector has contributed largely to national export earnings with average share of 70.3% during 2006-2009 (SNDP 2011). Third, mining taxes plus royalties has accounted for over 30% of total government tax revenue during 2009-2013 (ICMM and CMZ 2014). In 2012, Zambia was the world seventh largest copper producer (ICSG 2012).

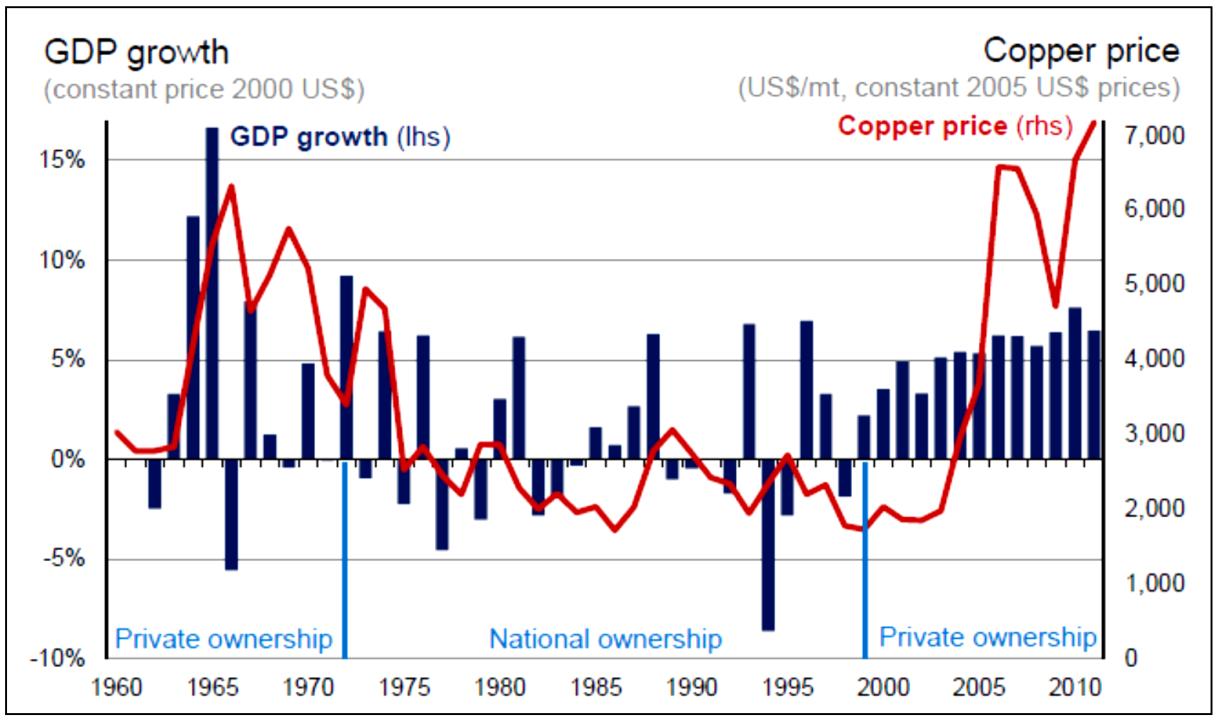


Figure 1: Ownership, Productivity, and GDP growth

Source: ICMM and CMZ (2014)

Political changes have had an impact on mining policies and ownership. Fraser and Larmer (2010) observed that the mining industry in Zambia underwent 'booms and busts' in response to global events and international demand for copper. Figure 1 shows changes in the types of ownership in relation to the copper price and GDP growth of Zambia. The first phase was the successful private ownership period starting from 1930s until the end of 1960s with a peak of copper production at 700.000 tonnes in 1969 (Adam and Simpasa 2009). Since 1970s, the mining sector had been nationalized as a part of the Mulungushi Reforms (ICMM and CMZ 2014). This period saw a collapse in production marked by the volume of copper production as low as 221.000 tonnes in 2000 and the sharp drop of copper prices. As a result, the economy of Zambia stagnated with many years of negative GDP growth rate. The privatization in the Zambian mining sector started again in 1997. Since then, a steady increase in copper production has been seen. Due to this increasing copper volume together with the high copper prices, the Zambian economic growth has been stable around 5%. It is expected that copper production will exceed 1 million tonnes by 2016 (ICMM 2013).

3.2 Mining and the Environment

This section presents a description of the state of the environment with respect to mining activities in Zambia especially on the Copperbelt. There seems to be a tension between economic development and the greening agenda. If anywhere, this tension is probably most evident in the countries whose economies are skewed towards mineral exploration, extraction, processing and transporting. Particularly citing heavy metal pollution, Ikenaka et al (2010, 729) note that "in recent years, there have been concerns about significant environmental problems caused by the mining of rare and major metals and metallurgical activities in African countries by domestic and foreign corporations". Mining activities are heavily reliant upon high carbon emissions resource-intensive processes. In such countries decoupling economic growth from carbon emissions and environmental degradation is particularly challenging. This is the case in Zambia where "increasing activities in the mining and the construction industries are proving to be a significant source of pressure on the environment" (ECZ 2008, 3).

Mining activities by far consume the largest amount of fossil fuels. For example, 58% of the country's diesel consumption is by the mining sector. Copper smelting contributed most of the 98% industrial emissions of sulphur dioxide totalling 346.7 kilotonnes per year (ECZ 2008, 27). This figure is expected to increase with increasing investments in mining. Although mineral exploration has comparatively little impact on the environment to mining and mineral processing, it still has significant negative effects. Some negative environmental impacts of mineral exploration include deforestation, water pollution, and land degradation, disturbance of flora and fauna and noise pollution. Mineral processing "plants and smelters have a greater impact on the environment due to abundant tailings produced which require large areas of land for their disposal" (ECZ 2008, 100).

Zambia has the most polluted city in Africa and tenth in the world. This is Kabwe which has mountains of mining dumps. The town has high levels of lead wastes that pose a huge health risk to the residents. The negative environmental impacts of mining are especially evident with the large-scale open pit such as the ones at Nchanga, Kansanshi, and Maamba Collieries. Other pits and dumps were left by small-scale operators in gemstone miners in places such as Ndola and Mapatizya. In total, the mining industry in Zambia produced 32 dumps containing 1,899 million tonnes and covering an area approximately 216,257 hectares of overburden, slug, tailings and waste rock dumps occupying land that could have otherwise been used for other developmental and livelihood purposes (ECZ 2008).

Mining environmental pollution and degradation has had a negative impact on health and safety of adjacent communities. For example, dust fallout from mineral extraction is responsible for contaminating the terrestrial environment such as soils, vegetation, and agricultural products. Substantial amounts of arsenic (7ppm), cobalt (18.9ppm), copper (253.8ppm), etc. have been found in cassava and sweet potatoes. According to the Environmental Council of Zambia (ECZ), significant amounts "of trace elements in soils together with emissions of sulphur oxides are responsible for a sharp decline in agricultural production in the polluted areas" (ECZ 2008, 106). Aongola *et al*. (2009, 4) have also noted that as a result of mining activities in the past "significant areas of land and water have become toxic due to mine and processing waste, in many cases rendering them unfit for use". Up to 700,000 tonnes of sulphur dioxide per year affect surrounding communities, soils, and ecology. The sulphur emissions are mostly from smelter plants found on the Copperbelt and North Western Province (ECZ 2008). The sulphur produces

acid rain that affects crops, land productivity, and the health of local communities while underground mining operations and metallurgical processing plants are responsible for ground water pollution. Acid rain corrodes metal roofs, kills vegetation, pollutes water sources and prevents many plants from growing. A study of heavy metal pollution found significant pollution in the mining towns of Kabwe and the Copperbelt. The heavy metals are also carried away to far off places thus affecting humans, plants, wildlife and aquatic life. For example Lake Itezhi-Iteshi is polluted by metals from the Copperbelt mines via the Kafue River (Ikenaka et al. 2010, Simpere 2010).

3.3 Towards Green Mining in Zambia

Although Zambia has not operationalised GE at country level, it acknowledges its importance "for Zambia given that ecosystem goods and services are a large component of the livelihoods of poor rural communities and ecosystems and their services often provide a safety net against natural disasters and economic shocks" (GRZ 2012, 47). Banda and Bass (2014) have also noted that despite not having a full-fledged GE strategy mapped out, Zambia already has shown 'glimpses of green growth'. The Zambian government has taken full cognisance of the international agenda towards ensuring sustainability of the environment in the face of demand for economic development. Efforts have been made to domesticate through legislation, policies and programmes, as well as international conferences and agreements on the environment and sustainable development. Notable international goals and guidelines are the Agenda 21 that came out of the Rio de Janeiro Summit of 1992 and, twenty years later, the Rio +20. Our aim here is to assess what, in this respect has been done or achieved in the mining sector that is the mainstay of Zambia's economy and yet one of the leading contributors towards environmental pollution and degradation.

3.3.1 Institutional Framework

In 1990 the Zambian government enacted the Environmental Protection and Pollution Control Act (EPPCA). This followed the realisation "that development without regard to sound environmental management had potential to lead to environmental challenges and disasters" (Zambia Environment Management Agency - ZEMA). The Act led to the establishment of the Environmental Council of Zambia for the purpose of coordinating environmental management in the country and implementing the environmental laws. The Act has been supplemented with policies and action plans to deal with more specific issues. These include the National Environment Action Plan (NEAP) of 1994 aimed at mainstreaming environmental issues into the country's social and economic development planning process. In 2003, the government formulated the National Policy on Environment (NPE) to ensure economic development activities did not damage the integrity of the natural environment. The MDGs, especially the one aimed at ensuring environmental sustainability (number 7), have also added force to government efforts. In order to include new issues and address emerging challenges, the EPPCA has been amended to the Environmental Management Act (EMA) of 2011 (ECZ 2008).

Following the Rio Earth Summit's linkage of environmental issues with economic development, the Zambian government has put in place several measures and mechanisms to ensure that the mining sector is in line with the GE. These are as follows:

- Since 1996 all mining firms are required to carry out Environmental Impact Assessments (EIA) at all their mines.
- In 1996, it became mandatory for all mining companies to submit Environmental Management Plans (EMP) to ZEMA before they could be allowed to go ahead with any mining activities.
- ZEMA, in conjunction with the Mine Safety Department (MSD), carries out annual audits to ensure that mines are complying with their EMPs.
- In 1995, an Environmental Protection Fund (EPF) was established to cater for costs of environmental degradation caused by mining activities. However, the EPF became operational first in 2008. Companies that comply more with EMPs pay less tax than those who do not (Government of the Republic of Zambia - GRZ 2012).

In addition to these, Zambia enacted the more specific legislation for mining with more specific focus on greening the sector. The Mines and Mineral Development Act number 7 of 2008 requires that before any mining licence is issued, certain environmental benchmarks must be satisfied. These are stated below.

> a) The need to conserve and protect: the air, water, soil, flora, fauna, fish, fisheries and scenic attractions, etc.
>
> b) The need to ensure that any mining or mineral processing activity prevents any adverse socio-economic impact, or harm to human health; in or on the land over which the license or right is sought (GRZ 2012, 24).

These requirements are a strong basis for advancing a GE through the mining sector as protecting the natural environment is the precondition for investment in mining. This, however, needs to be backed with an equally strong ethos for implementation. For example, the ECZ (2008) acknowledges that various species are under increasing threats from habitat alterations in national parks through human settlements, road construction, and mining. These anthropogenic ventures result in the fragmentation of the ecosystems, habitats and obstruct migratory routes to breeding and feeding grounds used by wildlife. However, the government went against ECZ when they decided to allow Zambezi Resources Limited to open a copper mining project in Lower Zambezi National Park. Therefore, biodiversity management continues to be a challenge in the country.

3.3.2 Some Positive Indications on the Ground

There are several initiatives of GE taking foothold in various sectors in Zambia. The country for example is implementing some projects under the Reduction of Emissions from Deforestation and Forest Degradation. The government has also embarked on expansive rural electrification programme aimed at reducing reliance on carbon fuels such as fuel wood or charcoal that contributes to deforestation and forest degradation. Another positive development is Zambia's participation in the Clean Development Mechanism through which it has committed to reduce greenhouse gas emissions. Through this mechanism, Zambia has made "investments are made in projects that result in reducing emissions and contribute to sustainable development" (ECZ 2008, 38).

The Zambian government has also made huge investments of up to US$2 billion in new hydroelectric power plants to meet increasing demand for clean energy for domestic and industrial consumers. Pertaining to mining, the laws and policies are providing

motivation for firms to adopt green strategies that include low or zero-carbon emission sources of energy. There are some new mining health and environmental standards, and low-energy, low-polluting machinery, and smelting equipment aimed at meeting international requirements (Banda and Bass 2014).

The mining sector has arguably shown how green growth is possible by simultaneously generating profits and saving the environment as well. Zambia's second largest mine, Mopani Copper Mines, for example, has reported major steps and accomplishments in reducing significantly (by 50%) emissions of sulphur dioxide into the atmosphere. It has invested in technologies for capturing the pollutant which is then converted "into a useful product (sulphuric acid, both for sale and for use in the company's own processing plants)" (Banda and Bass 2014, 19). However, Simpere (2010, 19) claims that such positive reports about gas emissions are "discredited as soon as one arrives near the Mufulira site where the pollution is obvious. The air is heavy and leaves a metallic taste in one's mouth. The mine's chimneys are constantly spewing out smoke, day and night". With the conflicting statements above, it is difficult to state with a certainty the amount of greening actually occurring in the mines.

3.4 Taking Stock of the Current Scenario

In this section we critically discuss the state of the mining sector highlighting challenges and prospects. To set the background for the discussion, we present below a case of river pollution by a mining company (Box 1).

3.4.1 Economic Growth versus Environmental Protection

That the country has been quick in adopting multilateral environmental agreements has set Zambia on a good path for reaping the benefits of GE. However, despite this propensity to domesticate international conventions, politicians are seen as negatively interfering with the implementation of the international agreements. Laws and regulations can only foster a GE if there are mechanisms in place for ensuring compliance. Politicians have a tendency to favour economic growth over environmental protection. Fraser (2010, 15-16) makes this point very succinctly. He says:

> Zambian institutions were too weak to regulate their [mining companies'] behaviour, particularly in the context of an increased diversity of mining firms with different standards and expectations for relations with regulatory authorities. The state itself also developed political relationships with certain mining houses that resulted in health and safety, labour, immigration and environmental laws being ignored with impunity.

Even when responsible government agencies or the courts have taken appropriate measures to sanction erring companies or to prevent them from potentially environmentally harmful activities, all it takes is a politician to overrule any professionally arrived at decision. As Patson Zulu, then ECZ director said "You've got to have friends in government" (Simpere 2010, 11).

Box 1 below shows a case in which a mining company made profit at costs of polluting river of the surrounding community and was sued by the community. The case partly illustrates negative features seen as inherent with the mineral extraction industry. These features include "environmental pollution caused by mining waste, the contribution of

mining to biochemical processes, etc. and the asymmetries of power between mining firms and indigenous peoples" (Newton and Cantarello 2014, 268). The judge was categorical in stating how the mining companies put profits above the environment and the lives of people in surrounding communities that are affected by pollution.

Box 1: A Case of Konkola Copper Mines Pollution of Kafue River

Konkola Copper Mines (KCM), a subsidiary of the London-registered Vedanta Resources Plc, is Zambia's largest mining firm in terms of production output. Kafue River supplies 40% of the country's domestic water needs. It is also the most polluted river in Zambia. In 2006, KCM polluted the Kafue River through its tributary Mushishima River. In 2007, affected residents who suffered from stomach pains, diarrhoea, chest pains, and sight problems sued the company for polluting their water supply. In 2011, in what is seen as a landmark case against mining corporations in Zambia, the court ruled against the KCM, ordering the company to pay US$2 million to 2000 residents of Chingola town.

- "[T]he fact that Zambia was in dire need of foreign investment to improve the well-being of its people does not mean its people should be dehumanized by 'greed and crude capitalism' which put profit above human life." – Judge Phillip Musonda
- "In comparison with the EPPCA, the EMA provides for enhanced public participation in environmental management. It provides for an option for both ZEMA and members of the public to sue for damages following pollution and this is the provision that was used by Chingola residents".
- "We would like to encourage more of such vigilant actions from members of the public because environmental protection should not be a preserve of enforcement agencies alone. Effective environmental management in this country requires the active participation of all stakeholders including the general public" - Irene Chipili (ZEMA).

Source: Sibanda (2011) www.waterjournalistsafrica.wordpress.com

3.4.2 Weak Regulatory Framework and Capacity

According to Haglund (2010), both the ZEMA and the MSD face with capacity constraints which hamper their capacity to monitor and evaluate the activities of powerful and increasingly diverse mining sector. As Lindahl (2014, 25) points out, the MSD "is in need of increased technical and geo-scientific knowledge to adequately execute its sector authority when reviewing mining EIA´s". The shortage of competent human resource is worsened by the poaching of government trained engineers by the private mining firms that offer better remuneration (Haglund 2010).

Although there is law to regulate the extraction and processing of minerals, the law does not require EMPs during the exploration phase. This is despite the evidence that explorations in Zambia have had significant negative impacts on the environment. "Legislation specific to exploration and prospecting merely demands Environmental

Project Brief (EPB) which proposes rehabilitation plans" (ECZ 2008, 97). Needless to say, any mining-related activities need to be duly covered by adequate legislation as it is not likely any activity comes with its own environmental and health risks for animals and humans.

The legal framework also frustrates the work of regulatory authorities. The EPPCA, now EMA, allows the Ministry of Environment to override decisions made by ZEMA or MSD. Firms not happy with these bodies can appeal to the ministry as was the case in 2007 when KCM polluted the Kafue River. The ministry simply asked the company to drill some water boreholes in the surrounding communities (Haglund 2010, 96). The judgement in the above cited case in which the court ruled against KCM was historic in that sense. Even Judge Phillip Musonga agreed "with the plaintiff's pleadings that KCM was shielded from criminal prosecution by political connections and financial influence, which put them beyond the pale of criminal justice" (Sibanda 2011).

Despite the landmark ruling against KCM, there is room for skepticism about its effectiveness as deterrence to other would-be polluters. This is because the penalty does not seem sufficiently punitive to deter an industry in which pollution is so endemic. US$2 million may be negligible compared to the many times the companies may go scot-free or may find themselves treated with kid gloves by the Zambian government. The penalty might seem a better risk for the companies than investing in expensive greener technologies. This brings to question the credibility of the accounting involved in penalizing mines that pollute the environment. Does the ECZ, for example, have the capacity to cost the damage to the environment in order to put a price on the environmental externalities from the mines?

More recently, in early 2014, Harry Kalaba, a minister in the Ministry of Lands overturned ZEMA's rejection of Zambezi Resources Limited's application to start a mine in the Lower Zambezi National Park (Lusaka Times 2014). This seems to be a weakness in the EMA as it gives the minister too much power over ZEMA. The environmental agency is better suited at assessing Environmental Impact Statements on expected impacts on the environment and companies' outlined measures to offset the negative environmental effects of the mining ventures. In the event that the agency is overruled, it is better that a transparent process is put in place and the public and other stakeholders duly informed of the reasons underlying the decision to sidestep the agency.

In addition to the EMA and country regulatory policies and regulations, mines are also expected to abide by international standards for mines that include the Equator Principles, the World Bank Standards and OECD guidelines. These however offer no guarantees. An investigation of the European Investment Bank (EIB) loans shows how the bank is funding a 'mining scandal' through loans to Mopani Copper Mines (MCMs) whose majority shares owner is the Swiss company Glencore. The report concludes that the company goes against all the three pillars of a GE.

> The mining context in Zambia does not enable us to believe that the Mopani project is likely to support the country's development. The project is benefiting neither the Zambian state nor the local communities. The project has disastrous environmental impacts. The positive effects of the project that were announced have therefore not been forthcoming, and its social and environmental impacts have been negative. Even worse, in this Zambian context, this situation was foreseeable (Simpere 2010, 7).

What is most interesting about the report is that the Global North through the EIB does not show any good faith towards a GE in the global South. Although the guidelines are there for MCMs to abide by as loan conditions, they pay only leap service to compliance and the EIB turns a blind eye to the violations of its own conditions. This seems to point to continuity of business-as-usual whereby profit making is at the fore at the cost of local communities' well-being and degradation of the environment.

3.4.3 Stakeholder Participation

The KCM court case brings out another noteworthy aspect that should be part of GE, namely, social inclusiveness. Social inclusiveness is not only important to ensure local communities benefit equitably from the profits of mining ventures but also for them not to suffer gratuitous or negligent pollution from the mines. Not only did the residents of Chingola sue KCM, they sued the company together with ECZ and the local government authority. This shows lack of participation by the communities and also lack of trust and confidence in organizations that are supposed to be championing their well-being against the profit-motivated multinational mining firms.

According to Haglund (2010), Zambia has adopted the partnership approach following World Bank recommendations to abandon the command-and-control form of regulation. The partnership approach, however, only involves government agencies and mining firms. This seems to be a hands-off approach which leaves the mines with the responsibility to self-regulate and to self-report to ECZ and MSD. It is questionable to trust mining firms that they will have good faith in reporting their own failures to comply with the law and regulations. The questionable glowing performance MCMs gave about their capture of sulphur dioxide shows how the partnership approach may give leeway for mines to lay their way out of meeting set standards. This approach also leaves out the community from the consultative process. These are the stakeholders whose participation is bound to lend the consultative process any credibility to ensure green growth.

4. Conclusion

GE is not an entirely new concept; its tenets can be found in multilateral conventions and agreements at least going as far back as the Rio Earth Summit in 1992. Prior to that summit, writers had already sounded the bell on the ecological limits of the earth and that economic growth could not go on indefinitely. The financial crisis of 2007-2008 however brought to clear focus the inherent risks in the orthodox economic growth model. The United Nations, the OECD and the World Bank were jolted by the sheer scale of the crisis prompting them to rethink the economic model. Hence GE has been seen as a viable alternative model that would result into a more socially, economically, and environmentally resilient world.

This paper recognises that the debate about and implementation of GE has largely been in the Global North. The authors realise the need to assess the viability, desirability, potential and challenges for a GE in the South. Economies based on mineral extraction pose a special challenge for GE since mining is essentially destructive to the environment. For example, for every ton of copper ore there are two tons of wastes generated. We therefore look at Zambia's mining sector as a case study.

The paper shows that although there is reasonable legislation, policies, and regulations to provide a basis for greening the mining industry, there are significant lacunas that permit the largely foreign-owned mines to pollute the environment. This is especially due to the development agreements that favour the investors against the state, the local communities, and the environment. It is also shown how the favour of economic benefits over environmental protection hampers the working of government bodies such as the ECZ and the MSD tasked with regulating mining firms vis-à-vis environmental health, safety and sustainability. These bodies also lack institutional capacities to regulate an increasingly diverse and sophisticated sector. Moreover, the financial risks for the mines are not significant to deter polluters. For billion dollar annual revenue firms the fines for polluting are meagre. This implies that GE cannot be fully implemented in the absence of political will to hold accountable mines violating environmental laws.

The paper also argues that the Global North is a party to the poor environmental compliance of the mines. This is partly because the mines are largely owned by the North who, ideally, should insist on green mining standards that apply in the North. A case in point is the European Union, through the European Investment Bank, funding through loans some of the worst pollutants in Zambia's mining sector. Instead, however, the double standards seem to fuel the narrative that the South maybe used merely for profiteering irrespective of environmental damage.

We conclude that green economy can only take effect in the South with political will, effective institutions and capacity to enforce the institutions as well as equal standards by local governments and those of the North.

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