

Poorer without It? The Neglected Role of the Natural Environment in Poverty and Wellbeing

Judith Schleicher,^{1,2*} Marije Schaafsma,³ Neil D. Burgess,¹ Chris Sandbrook,^{1,2} Fiona Danks,¹ Chris Cowie⁴ and Bhaskar Vira²

¹*UN Environment World Conservation Monitoring Centre, Cambridge, UK*

²*Department of Geography, University of Cambridge, Cambridge, UK*

³*Geography and Environment, University of Southampton, Southampton, UK*

⁴*Department of Philosophy, University of Cambridge, Cambridge, UK*

ABSTRACT

The relationship between sustainable development's prime goal, human wellbeing, and the natural environment has been narrowly conceived. This paper focuses on the possibility and the implications of treating the natural environment as a 'constituent', or internal element, of the concepts of wellbeing and poverty, as opposed to a 'determinant', or instrumental, external factor. Our review of philosophical accounts and conceptual frameworks of wellbeing and poverty suggests that treating the environment as a constituent element is philosophically sound, conceptually robust and empirically grounded. We argue that failing to consider these missing environmental aspects can result in an incomplete capturing of the multiple dimensions of wellbeing and poverty, and their underlying drivers. This broader framing of the environment–wellbeing relationship has the potential to inform a new generation of individual level wellbeing and poverty indicators, creating measures of multidimensional poverty that reflect the broadened scope ambitiously articulated in the Sustainable Development Goals. Copyright © 2017 The Authors. Sustainable Development published by ERP Environment and John Wiley & Sons Ltd

Received 13 February 2017; revised 20 April 2017; accepted 5 May 2017

Keywords: sustainable development; natural environment; multidimensional poverty; human wellbeing; ecosystem services; nature

Introduction

THE PURSUIT OF HUMAN WELLBEING IS ONE OF THE PRIMARY GOALS FOR SOCIETY AND SUSTAINABLE DEVELOPMENT (HELNE AND Hirvilammi, 2015). Consequently, wellbeing is a main focus of public policies and interventions that are high on the international development agenda, as articulated through the adoption of the Sustainable Development Goals (SDGs) in September 2015. The SDGs, which represent more comprehensive

*Correspondence to: Judith Schleicher, Department of Geography, University of Cambridge, Cambridge, UK.
E-mail: judith.schleicher@geog.cam.ac.uk

ambitions than the Millennium Development Goals, arguably promote better integration of the environmental, economic and social pillars of sustainable development (Le Blanc, 2015). As such, the first SDG aims to eradicate poverty in all its forms and explicitly mentions the need to provide equal access to, and control over, natural resources to all, and to reduce the exposure of the poor to climatic and environmental hazards. This goal highlights the growing recognition that a holistic understanding of poverty, in all its dimensions, requires an appreciation of the importance of nature and ecosystem services (ES). There has been a parallel emphasis within the environmental policy community on understanding the multifaceted links between people's livelihoods and the natural environment (Mebratu, 1998; WCED, 1987), more recently often expressed in the form of ES (Díaz *et al.*, 2015a; MA, 2005; TEEB, 2010).

In recent years, the importance and complexity of the links between the natural environment and human wellbeing have been increasingly stressed in the development, environment and sustainability literatures (Daw *et al.*, 2016; Helne and Hirvilammi, 2015; Hopwood *et al.*, 2005; Mace, 2014). However, the percolation of these ideas into international development policy circles and the incorporation of environmental aspects into mainstream poverty alleviation strategies have been more limited for various reasons (Bojö *et al.*, 2004; Nunan *et al.*, 2012; Vira, 2015). This has implications for the development of effective policies and interventions for society and the environment. Failing to consider environmental aspects of, and links with, human wellbeing and poverty may have led to an incomplete capturing of wellbeing and poverty, and their underlying drivers and mechanisms. Consequently, the identification of the poor, and an understanding of what makes them poor, risks being incomplete, thereby posing a challenge to addressing poverty adequately in development and poverty alleviation strategies. Furthermore, in some instances, mainstream development projects put forward in the name of poverty alleviation and development may result in environmental degradation, and have negative impacts on poverty (e.g. Shrivastava and Kothari, 2012). The trade-offs involved, and potential for synergies, in meeting development and conservation goals have been extensively debated in the literature (e.g. Adams *et al.*, 2004). Damage to natural ecosystems from development projects can undermine people's livelihood bases, cultural identity and sense of belonging, and can thereby exacerbate human deprivations (Anguelovski and Martinez Alier, 2014). Recent work has reiterated the need for interdisciplinary approaches and better integration of the insights gained from environmental, sustainability and poverty literatures to further understand the synergies and trade-offs between these agendas (Agarwala *et al.*, 2014; Milner-Gulland *et al.*, 2014; Helne and Hirvilammi, 2015) and to develop better-informed development policies.

At least three main issues may have hindered this integration. First, the natural environment, human wellbeing and poverty are understood and referred to in many different ways, without a consensus on how to define these concepts¹ (Milner-Gulland *et al.*, 2014; Ruggeri-Laderchi *et al.*, 2003). This is in part because these concepts are experienced and conceived in diverse ways by different people (e.g. Misurelli and Heffernan, 2011). In addition, the concepts themselves and the approaches for measuring them are evolving. While initially unidimensional (monetary) approaches dominated poverty indicators (Ruggeri-Laderchi *et al.*, 2003), wellbeing and poverty are now widely conceived as multidimensional (Alkire, 2007). Second, the main framing of the environment–wellbeing relationship in the global North has evolved, from an initial focus on environmental protection and biodiversity conservation as independent goals from the pursuit of human wellbeing and poverty alleviation, to seeing the environment as an input to wellbeing (MA, 2005; Mace, 2014). Third, the empirical relationships between the environment and wellbeing are not yet well understood. Discussions continue over the precise pathways through which ecosystem functions and different components of biodiversity affect human wellbeing. Indeed, synergies, trade-offs and independent relationships have been found between types of ES and different aspects of wellbeing (Bennett *et al.*, 2015; Howe *et al.*, 2014; Suich *et al.*, 2015).

Behind these empirical assessments lie conceptual differences in how human wellbeing and the natural environment are seen to relate to one another. To advance our understanding of the environment–wellbeing

¹Without going into the definitional subtleties entailed in these different terms, here we refer to (1) human wellbeing as a multidimensional concept that aims to capture diverse ideas about what a good life is, (2) poverty as multidimensional deprivations or disadvantages that prevent people from attaining a certain level of wellbeing and (3) the natural environment as a multidimensional concept of the non-human physical environment, landscapes and ecosystems, including the living and non-living components; we exclude the human-built environment from this definition, but include human-modified and non-human-modified systems, as well as both inhabited and uninhabited places. We further recognize that physical and socio-cultural environments intersect, and these intersections vary across philosophies and cultures (Dunlap and Catton, 1983).

relationship, here we draw attention to the distinction between accounts that treat the natural environment as a 'determinant' of human wellbeing and poverty, and those that treat the environment as a 'constituent' element of these concepts (Dasgupta, 2001). Much of the ES literature has treated ES and the natural environment as a determinant, instrumental factor or external driver, which can influence human wellbeing in both positive and negative ways (MA, 2005; TEEB, 2010). However, alternative wellbeing accounts may conceive of the natural environment as being a 'constituent' aspect of the concept of human wellbeing itself (Dasgupta, 2001). In these accounts, the natural environment is understood as internal to, or part of, how human wellbeing and poverty are defined. This can be as a sub-component or as a stand-alone component or dimension that is a constituent of the concepts of wellbeing and poverty (Smith *et al.*, 2013; Stiglitz *et al.*, 2009; Summers *et al.*, 2012).

In this paper, we focus on the choice and implications of treating the natural environment as a 'constituent' and/or a 'determinant' of wellbeing and poverty. This conceptual distinction has not been addressed in existing reviews of frameworks that link the natural environment and wellbeing or poverty (Agarwala *et al.*, 2014; Fisher *et al.*, 2013; King *et al.*, 2014). More specifically, we aim to address the question of whether there is a philosophical and conceptual basis for treating the natural environment as a constituent of wellbeing and poverty. This leads to important questions about how wellbeing and poverty accounts should treat the natural environment, what the conceptual basis for such a treatment might be and what, specifically, such an extended wellbeing account would include. Following Dolan and Metcalfe (2012), we suggest that such a wellbeing account should be theoretically rigorous (grounded in philosophical theories), policy relevant (socially and politically acceptable and understood) and empirically robust (practically measurable). In the subsequent sections of this paper, we will therefore in turn (1) discuss philosophical, political and practical considerations influencing the choice over whether to treat the natural environment as a constituent or determinant of wellbeing and poverty, (2) review key existing conceptual frameworks of wellbeing and poverty, and how they incorporate the environment, and (3) discuss the practical implications of this expanded understanding of the relationship between the natural environment and wellbeing for policy and future research.

Wellbeing Accounts and Conceptual Frameworks

Whether the natural environment is considered to be a determinant or a constituent element of the concepts of wellbeing and poverty is dependent on individual and societal values, beliefs, attitudes and worldviews. Large bodies of literature have gone into discussing these relationships, providing perspectives from psychology, political science, environmental philosophy, ethics and anthropology, among others (e.g. Callicott, 1984; Langton, 2007; O'Neil, 1992). In this section we will highlight some key aspects in this discussion. We will first consider the treatment of the natural environment in contemporary philosophical theories. Second, we will draw on a number of alternative philosophical approaches and worldviews, which address the role of the environment beyond its determinant contribution to wellbeing. Third, we will discuss political and practical issues associated with the implementation of these conceptual ideas, emphasizing the need to be conscious of power dynamics and political economy considerations in the choice of wellbeing indices and measures.

Contemporary Philosophical Accounts of Wellbeing and the Natural Environment

The philosophical account of wellbeing that underpins one's values, beliefs and worldview has important implications for the role of the natural environment in human wellbeing, and is therefore worth exploring further. In contemporary analytical philosophy, a person's wellbeing is most commonly understood as what is good for that person (Crisp, 2015) and it is one of the fundamental topics in moral philosophy. The three main broad philosophical theories of human wellbeing, initially highlighted by Parfit (1984), are particularly relevant in this respect. This 'tripartite' division includes (1) hedonism, (2) desire fulfilment or satisfaction and (3) objective list theories.

To understand the positioning of the environment in these theories, we first briefly summarize their key principles. Hedonism conceives of wellbeing in terms of the balance of an individual's pleasures and pains. Therefore, hedonistic theories contend that one's life goes well to the extent that one experiences a surplus of

pleasure over pain. What constitutes pleasure and pain is up to the individual, be it contentment or joy, and is often thought of as sensations characterized by their intensity and duration (Bentham, 1789).

For desire satisfaction theories, which are widely adopted in mainstream development studies (Dolan *et al.*, 2006), a person's wellbeing depends on the satisfaction of one's desires, preferences or wants (Griffin, 1986; see Schulz, 2015, for a discussion of the distinction between these), rather than on experiencing net pleasure. Consequently, from this point of view wellbeing is a matter of attaining one's desires, with the detailed content of the desire(s) being determined by the possessor.

According to 'objective lists' theories (e.g. Nussbaum, 1992; Sen, 1985), wellbeing consists in obtaining a set of 'objective' goods, which in combination constitute wellbeing. These theories therefore contend that a list of certain goods can be defined that are widely regarded as good for people and are worthwhile pursuits, such as good health, education, friendships and material comforts. A person's wellbeing depends on meeting certain items on the list, independent of what the person thinks or feels about them – in contrast to hedonistic and desire satisfaction accounts, which are based on personal experience or preferences.

The tripartite division has important implications for whether the natural environment can be considered as a constituent or a determinant of wellbeing. Although maximizing net pleasure and meeting one's desires may be contingent on, and influenced by, other factors, such as good health and the quality of the surrounding natural environment, these influencing factors remain external to the core account of wellbeing in hedonistic and desire satisfaction theories. For objective list theories, however, the natural environment can be listed as an objective good that is a constituent element and helps define the concept of wellbeing in these philosophical accounts. The environment therefore plays a determinant role in hedonistic and desire satisfaction perspectives, while for objective lists theories it can be conceived as both a constituent and determinant of wellbeing.

Alternative Approaches to a Determinant Role of the Environment

Besides the mainstream contemporary philosophical theories, there are alternative views to a purely determinant role for the natural environment in relation to wellbeing. One possible avenue emerges from adopting a virtue-ethical tradition within moral philosophy. Hill, for instance, argues that 'a person's attitude toward nature may be importantly connected with virtues or human excellences' (1983, p. 221). This opens up the possibility that an appropriate attitude toward the natural environment may be constitutive of the good life. Indeed, Hill seems to take this possibility seriously when he writes that 'a proper valuing of natural environments is *essential* to a broader human virtue that we might call "appreciation of the good"' (2006, p. 331).

Furthermore, the environmental ethics literature has long debated the instrumental and intrinsic (or final) values of nature. Theories that value nature only for its instrumental value and contribution to human wellbeing tend to have a different view of the relationship between people and the environment than those that also acknowledge the intrinsic value of nature: the standpoint that nature has value in itself, even without people (Craig *et al.*, 1993; Hedlund-de Witt, 2012; Trainor, 2006). Instrumental values are more often associated with anthropocentric worldviews, whilst intrinsic values tend to be associated with more holistic perspectives, such as biocentric (putting living individuals central) and ecocentric (putting ecosystems central, including non-living components; e.g. deep ecology) worldviews. These worldviews in turn influence how wellbeing is understood (Hedlund-de Witt *et al.*, 2014) and what societal changes are perceived necessary (Hopwood *et al.*, 2005).

In anthropocentric approaches (particularly those with a more individualistic ethic), relationships between humans, the environment and/or other beings are assessed according to their impact on individuals (Deneulin, 2014). Alternative anthropocentric approaches recognize that interpersonal relationships are constitutive of human life, and focus more on the social context that inextricably links people, and on collective aspects of wellbeing (e.g. Cloutier and Pfeiffer, 2015). Others have extended this thinking to emphasize the importance of relationships with the natural environment (Deneulin, 2014), including recognizing the interconnectedness between wellbeing and healthy ecosystems (Helne and Hirvilammi, 2015). Chan *et al.* (2016) consider the relationship between people and nature to give rise to another category of the value of nature, namely relational values. The sense of relational embeddedness in the environment captures something that is fundamentally constitutive of the human condition (Larson *et al.*, 2013).

Similarly, some worldviews adopt more holistic approaches to understanding and characterizing relationships between humans, and between humans and the environment. The Southern African concept of Ubuntu, for example, refers to humanness or humanity towards others, and hence has a more explicit emphasis on relational values, collective wellbeing and the connectedness between human beings (Le Grange, 2012). While most contemporary anthropocentric discussions of wellbeing are based on a distinct self, Buddhist philosophy contends that there is no such thing as a self or a person with a distinct identity through time. Instead, the self is nothing but 'a causally related series of impermanent mental and physical elements or aggregates' (Gowans, 2003, p. 6). The concept of selflessness lies at the very heart of Buddhist enlightenment. Such approaches extend the notion of wellbeing to other beings, at times implicitly treating the natural environment as a constituent element of the non-self-regarding concept of wellbeing. Similarly, in certain Amazonian and Central African traditions, humans and other beings are perceived as being intrinsically interconnected, as humans can change into animals and *vice versa*. In the Andean indigenous traditions, the Inca deity of Pachamama, meaning Mother Earth or World Mother, is the fertility goddess presiding over planting and agricultural harvest. La Pachamama symbolizes the interconnectedness of humans with nature. In 2008, Ecuador famously became the first country in the world to recognize the rights of nature explicitly in its constitution (Gudynas, 2009), suggesting that these environmental worldviews can be converted into practical ways of operationalizing collective and society-wide perspectives on wellbeing. Such worldviews may include all aspects of the natural environment as constituent elements of wellbeing. These worldviews are also compatible with the theoretical position that defines wellbeing in relation to objective lists, albeit based on principles and value systems that are often very culturally specific and locally defined.

Practical and Political Considerations

There are various interrelated practical and political considerations that may influence the choice of the philosophical account one adopts in a particular context, and its positioning of the natural environment *vis-à-vis* human wellbeing and poverty. This choice can depend on the specific purpose for which wellbeing and poverty are being conceptualized. For example, if the objective is to identify and understand the factors leading to poverty or wellbeing, a conceptual framework might focus on capturing all the components that constitute wellbeing or poverty, and all the external factors that influence them. If the aim is to measure poverty or wellbeing, considerations associated with the ease of measurement and data availability are likely to influence how wellbeing and poverty are defined and measured.

Similarly, if comparisons across people and places are to be conducted, such as cross-country or cross-regional comparisons, ensuring that meaningful and comparable data are available or can be collected has to be taken into account. Consequently, the components that are included in a wellbeing or poverty framework may be shaped by data constraints. Indeed, data availability has repeatedly been referred to by parties when making a case for or against specific indicators proposed to track the progress of the SDGs (UN, 2015a). A comparative perspective is also important for meeting donor demands and complying with international treaties and targets, such as the SDGs (UN, 2015b).

Furthermore, it is important to recognize the role that politics and power dynamics play in how the natural environment, wellbeing and poverty are experienced, defined and measured. The social context influences an individual's experience of wellbeing, including the complex set of formal and informal institutions that mediate the differential access to, and rights over, the environment people have (Leach *et al.*, 1999). Far from being neutral, the above mentioned technical and practical decisions are embedded within unequal distributions of power that influence the choice of conceptual framework, the measures adopted and the indicators being monitored. It is therefore necessary to consider the political economy of knowledge in environment and development policy communities that underpins these choices. Who has a say in these decisions, in whose interests are they being taken and for what purpose? What does the choice of particular indicator reveal, and what does it occlude? How might certain indicators privilege the interests of particular actors over those of others? For example, in the field of avoided carbon emissions from forestry activities, it has been argued that the process for measuring, reporting and verifying avoided emissions creates conditions in which particular types of land management practice are favoured and others disfavoured, in ways that suit the interest of international consultants and national elites over those of local actors (Leach and Scoones, 2013). We highlight these political considerations to signal the need to be cognisant of these

wider knowledge–policy contexts. The choice of specific wellbeing frameworks will inevitably involve compromises necessary due to the associated technical and practical challenges, and the interrelated power dynamics that shape the context for which measures are being developed.

Review of Wellbeing and Poverty Frameworks

We now turn to our second objective, to review key human wellbeing and poverty frameworks that are relevant to characterize the role of the natural environment in relation to wellbeing and poverty. Based on the discussion and expert judgement of the author team, and informed by relevant recent review papers (Agarwala *et al.*, 2014; Fisher *et al.*, 2013; King *et al.*, 2014), we selected what we considered the most influential wellbeing and poverty conceptual frameworks (as detailed in Table 1) that have been used in environmental and development literatures, or adopted in relevant international policy circles. We decided to include conceptual frameworks that deal with human wellbeing or poverty without an explicit focus on the natural environment, but are particularly relevant to this debate. We excluded conceptual frameworks that only cover the natural environment without making explicit links to human wellbeing or poverty (e.g. Rounsevell *et al.*, 2010). In contrast to previous studies (Agarwala *et al.*, 2014; Fisher *et al.*, 2013), our review was restricted to conceptual frameworks and did not interrogate entire bodies of literature or communities of practice (e.g. political ecology), concepts (e.g. vulnerability, resilience) and indices that have been constructed for the measurement of poverty or wellbeing (e.g. Happy Planet Index). We compared the resulting 12 conceptual frameworks (see Table 1) against a list of evaluation criteria. These criteria were chosen and refined through a deliberative process during a series of discussion meetings within the multidisciplinary author team, and were informed by previous comparisons of wellbeing and/or poverty frameworks (Agarwala *et al.*, 2014; Fisher *et al.*, 2013; Nunan, 2015; Ruggeri-Laderchi *et al.*, 2003). In addition, the lists of frameworks and criteria were discussed and scrutinized during a workshop, organized to discuss these issues and attended by 13 experts. This provided some external validation of our choices. The final list included criteria on definitions, philosophical accounts, the wellbeing–environment relationship and the purpose of the conceptual frameworks. These were judged most relevant to the comparison of the different frameworks concerning the wellbeing–environment relationship.

Table 1 captures the main findings of the review and summarizes our comparison of key frameworks. The review once again establishes the large variety of conceptual approaches for wellbeing and poverty, and of the understanding of environment–wellbeing relationships. With regards to defining the concepts, it is noteworthy that two of the reviewed frameworks do not provide an explicit definition of wellbeing or poverty. Even more frameworks (six) do not define the concepts of the natural environment, ES or nature. Furthermore, six of the frameworks do not specify in detail which philosophical account underpins their work. Finally, two of the frameworks do not make explicit whether the natural environment is treated as a constituent or determinant of the notion of wellbeing or poverty.

The objective list theory is the most widely adopted philosophical account among the reviewed frameworks, but the constituent dimensions of wellbeing (i.e. the items on that list) vary. Its widespread use may be because the objective list theory lends itself to breaking wellbeing and poverty down into constituent components, and hence can facilitate the development of indicators to measure these concepts. Only one framework, the income-based approach (Ravallion, 1996), adheres to the desire satisfaction theory. In addition, some conceptual frameworks adopt a mixture of philosophical accounts spanning objective lists and subjective notions of wellbeing (Scoones, 1998; Gough and McGregor, 2007; Stiglitz *et al.*, 2009). Moreover, not all of the frameworks are explicit about the philosophical underpinning of the subjective notion of wellbeing adopted (Table 1).

With regards to the positioning of the environment as either a constituent or determinant, the majority of frameworks that mention an environment–wellbeing relationship treat the environment as a determinant of wellbeing (six out of nine). This is despite the fact that the objective list theory, which could accommodate environment as a constituent aspect of wellbeing, is the most widely adopted philosophical account among the reviewed frameworks. Among the three frameworks that treat the environment as a constituent, only the Sarkozy Commission (Stiglitz *et al.*, 2009) explicitly attributes to the environment as a whole the status of being a distinct

	Sen's capability approach	Nussbaum's capability approach	Income-based approach	Basic needs
Definition of wellbeing, poverty or related concepts	Poverty as a deprivation of basic capabilities; capabilities are substantive freedoms to choose a life one has reason to value (i.e. perform functionings, which are doings or beings that one values). Capabilities are a set of achievable functionings.	Poverty as a deprivation of basic capabilities; capabilities are substantive freedoms to choose a life one has reason to value (i.e. perform functionings, which are doings or beings that one values). Capabilities are a set of achievable functionings.	Measured as people living below a certain monetary income line. Income/expenditure as sufficiently correlated with other dimensions of poverty.	Basic needs as goals that must be achieved if any individual is to achieve any other goal, i.e. preconditions for participation in social life.
Wellbeing account ¹	Objective list.	Objective list.	Desire theory.	Objective list.
Definition of nature, environment, ES or related concepts	Not explicit. The environment is mentioned as a resource, and environmental issues as resource allocation and social responsibility or environmental ethics problems.	Animals, plants and the world of nature.	n.a.	n.a.
Distinction made between environment, nature and/or ES?	Not explicit.	Not explicit.	n.a.	n.a.
Environment-wellbeing relationship ²	Determinant.	Sub-component and dimension.	Determinant.	Excluded.
Description of the environment-wellbeing relationship	Environment is listed as one of the factors that can affect income, and conditions that can affect the use of income to generate wellbeing outcomes.	'Other species' as one of the 10 dimensions: being able to live with concern for and in relation to animals, plants and the world of nature.	Natural resources as a potential input to production.	n.a.
Stated purpose of framework	Broaden thinking of what is meant by wellbeing/capabilities and development; highlights multidimensional nature of wellbeing; considers the opportunities that people have to choose a life one has reason to value.	Identify capabilities as central requirements of a life with dignity – and has a legal/political focus on justice, as items that governments must provide.	Measuring poverty headcount.	Focus development strategies on satisfaction of some elementary needs of the whole population, particularly in education and health.
Main references	Sen, 1999	Nussbaum, 2000	Ravallion, 1996	Streeten <i>et al.</i> , 1981

(Continue)

	Sustainable Livelihoods Approach	3D Wellbeing/WeD framework	Quality of life (QOL)	Voices of the Poor
Definition of wellbeing, poverty or related concepts	Adopts Sen's capability approach and refers to Chambers' (e.g. 1997) notion of wellbeing; this can allow people to define the sustainable livelihood outcome criteria important to them, such as self-esteem, security, happiness, material concerns, stress, vulnerability, power and exclusion.	Wellbeing as an individually defined and achieved but socially constructed, constituted within political and cultural context, concepts with three dimensions; material, relational and subjective; aiming towards human progress.	No explicit definition of QOL, but operationalized as being constituted of several 'domains':	Wellbeing/illbeing seen as good and bad life that can be described in five or 10 dimensions, while recognizing their individual and location-specific nature.
Wellbeing account ¹	Objective list and subjective notions (not explicit which).	Objective list and subjective/self-evaluative notion.	Not explicit; but seems to imply objective list.	Not explicit; but seems to imply objective list.
Definition of nature, environment, ES or related concepts	Not explicit; but refers to natural capital as natural resource stocks (e.g. soil, water, air, genetic resources) and environmental services (e.g. pollution sinks) giving rise to resource flows and services for livelihoods.	Not explicit.	Not explicit.	Not explicit.
Distinction made between environment, nature and/or ES?	Not explicit.	Not explicit.	Not explicit.	Not explicit.
Environment-wellbeing relationship ²	Not explicit; but seems to imply determinant.	Sub-component or dimension.	Excluded.	Determinant (and possibly sub-component).
Description of the environment-wellbeing relationship	Natural capital seen as a livelihood resource that interacts with institutional processes and livelihood strategies in a given context to lead to wellbeing outcomes; people may also define their own wellbeing dimensions.	Environmental quality as material indicator.	n.a.	Different environmental aspects mentioned under the different dimensions of wellbeing/illbeing (e.g. water quality, environment hazards & vulnerability), but not explicit if these are determinants or sub-components of these dimensions.
Stated purpose of framework	Provide 'a holistic and integrated view of the processes by which people achieve (or fail to achieve) sustainable livelihoods' (Scoones, 1998, p. 13).	Understanding of how poverty is created and reproduced through interaction of the three dimensions.	Propose a specific number and scope of domains of QOL; determine if headings of QOL in literature can be grouped into seven domains; determine the empirical relationship between domains and to other measures of QOL.	Understand what constitutes wellbeing/illbeing for poor people around the world, identify common dimensions of wellbeing/illbeing and cross-cutting problems that keep people trapped in poverty; explore the priorities of the poor.
Main references	Chambers and Conway, 1991; Scoones, 1998	Gough and McGregor, 2007; McGregor and Sumner, 2010;	Cummins, 1996; Schmidt and Bullinger, 2007	Narayan <i>et al.</i> , 1999, 2000

(Continue)

	Duraiappah's framework	Sarkozy Commission	Millennium Ecosystem Assessment	IPBES Conceptual Framework
Definition of wellbeing, poverty or related concepts	No explicit definition of wellbeing, but comprising 10 key constituents and/or determinants that are closely linked to ecosystems.	Wellbeing or quality of life seen as multidimensional comprising nine dimensions, including material living standard, health, education, political voice and governance, social connections and relationships; environment (present & future) and insecurity.	Wellbeing has multiple, situation-dependent constituents, including basic material, freedom and choice, health, good social relations and security; how experienced reflects geography, culture and ecological circumstances; poverty is at the opposite end of a continuum.	Good quality of life includes wellbeing and refers to a fulfilled life, which is a context-dependent, multidimensional state of groups and individuals includes material, immaterial and spiritual components; e.g. livelihood security, health, cultural identity and freedom of choice and action.
Wellbeing account ¹	Not explicit.	Objective list & subjective notion.	Not explicit.	Not explicit.
Definition of nature, environment, ES or related concepts	The natural environment defined as ecosystems; adopts the ecosystem and ES definition of MA; ecosystem refers to a spatially explicit part of the Earth, including people and all other organisms and the abiotic environment.	Not explicit.	'Ecosystem services are the benefits people obtain from ecosystems' (MA, 2003, p. 3). It includes provisioning, regulating, cultural and supporting services.	Nature refers to the natural world, emphasizing the diversity of organisms, the interactions among them and with their environment; includes biodiversity, ecosystems, 'Mother Earth' and 'systems of life'.
Distinction made between environment, nature and/or ES?	Natural environment = ecosystem; no explicit definition of nature.	Not explicit.	No explicit definitions; differentiates between ES and biodiversity.	No explicit definition; differentiates between 'nature' and 'nature's benefits to people'.
Environment-wellbeing relationship ²	Determinant (and possibly sub-component).	Dimension.	Determinant (and possibly sub-component).	Not explicit, possibly all.
Description of the environment-wellbeing relationship	ES influence wellbeing (determinant); the wellbeing component 'Being able to continue using natural elements found in ecosystems for traditional cultural and spiritual practices' could imply 'sub-component'.	At the national level, the environment is seen as one dimension of wellbeing/quality of life in a list of nine dimensions.	ES influence wellbeing (determinant), but potentially also a sub-component of health (e.g. access to clean air and water), although ES might be replaceable (i.e. determinant).	Context-dependent as 'different societies espousing different views of their relationships with nature'.

(Continue)

	Duraiappah's framework	Sarkozy Commission	Millennium Ecosystem Assessment	IPBES Conceptual Framework
Stated purpose of framework	Demonstrate the poor's dependence on ES for their wellbeing; identify barriers and drivers that prevent the poor from using ES; identify policy response options; ensure policy coherence among policy frameworks at local to international levels.	Aims to 'identify the limits of GDP as an indicator of economic performance and social progress' (Stiglitz <i>et al.</i> , 2009: 7); to consider what additional information may be required for developing more relevant social progress indicators.	Provide a framework for the MA, which aims to make available an integrated assessment of impacts of ecosystem change for wellbeing and evaluate options to enhance ecosystem conservation and their benefits to meet human needs.	Provide a tool for 'shared working understanding across different disciplines, knowledge systems and stakeholders' (UNEP, 2014, p. 39) and basic common ground for coordinated action to achieve IPBES' goal of 'strengthening the science-policy interface for biodiversity and [ES] for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development' (Díaz <i>et al.</i> , 2015a, p. 3).
Main references	UNEP, 2003; Duraiappah, 2004	Stiglitz <i>et al.</i> , 2009	MA, 2003, 2005	UNEP, 2014; Díaz <i>et al.</i> , 2015a, b

Table 1. Comparison table of key conceptual frameworks of wellbeing and/or poverty

¹Wellbeing accounts: hedonism, desire satisfaction, objective lists and others.

²Different forms of the environment-wellbeing relationship: the environment is (a) excluded from the framework or has no relationship with wellbeing or is (b) a determinant (i.e. the source is unimportant), (c) a sub-component or (d) a dimension of wellbeing.

dimension of poverty. Nussbaum's (2000) version of the Capability Approach includes aspects of the environment as a dimension of wellbeing, namely 'other species; being able to live with concern for and in relation to the natural environment'. Furthermore, the Wellbeing in Developing Countries framework (Gough and McGregor, 2007) also allows for the environment to be a constituent element, but does not specify whether it would be a distinct dimension or part of another dimension of wellbeing and poverty. In addition, three of the frameworks that treat the environment as a determinant of wellbeing (i.e. Duraiappah, 2004; MA, 2003; Narayan *et al.*, 2000) could also allow for certain aspects of the environment to be treated as a constituent element of wellbeing and poverty, within their existing dimensions of wellbeing.

Discussion and Practical Implications

Approaches to Considering the Natural Environment as a Constituent of Wellbeing

Our review suggests that, although most existing conceptual frameworks treat the natural environment as a determinant factor of wellbeing and poverty, a few regard it as a constituent element; a position that also has grounding in the philosophical literature. While the frameworks we reviewed have a predominant anthropocentric focus, our earlier discussion highlights that alternative, more holistic accounts have scope to treat the environment as constituent of wellbeing and poverty. This shows that there is a conceptual basis to develop broader human wellbeing frameworks that include aspects of the natural environment as constituent of wellbeing and poverty.

This raises the question of whether such an extended account of human wellbeing, inclusive of the natural environment as both a determinant and a constituent element of wellbeing, should be developed, and in which contexts. Although a review of all available empirical studies is beyond the scope of this paper, there are empirical examples that demonstrate that in some cultures human wellbeing definitions include environmental aspects as constitutive (e.g. Walker, 2011). Several of the reviewed frameworks adopted an objective list theory, which, in principle, is compatible with the role of the environment as a constituent element, and could incorporate some of these wider worldviews and beliefs. As we have seen, some objective lists in the literature do in fact include ES and the environment in their definitions of wellbeing. However, if the items on the objective list (i.e. the components of what constitutes wellbeing) are determined top down without sufficient consideration of the context to which the list is applied, the approach may be perceived as paternalistic (Deneulin, 2002). This might appear to override personal thoughts and feelings and can be seen to impose external perceptions of what matters to wellbeing. While the objective list can be determined within particular cultural, religious and historical contexts, some accounts instead claim to be based on transcendental or global values (Nussbaum, 1999). These can be challenged on the grounds of cultural relativism. As they do not emerge from all of the societies that they are applied to, they might lack social legitimacy. Therefore, in assessing wellbeing and poverty in any particular setting, it is important to consider the prevalent worldviews and cultural context that influence which aspects of the natural environment matter (and for whom) (Deneulin and McGregor, 2010). Including the environment as a constituent of wellbeing and poverty has political and distributional implications and presents further conceptual as well as practical challenges, as we have elaborated in this paper. However, ignoring the environment in wellbeing and poverty assessments, in contexts where the environment is important for people's wellbeing, could lead to considerable misidentification of poor people, and undermine their own understanding of the conditions and processes that contribute to their poverty.

What might be plausible methodological approaches to determine if the environment should be a constituent of wellbeing in an objective list, in a specific context? At least three methods suggest themselves for such analysis, as they have been used for similar purposes. The standard methodology in moral philosophy is 'reflective equilibrium': the weighing of general moral principles, specific moral judgments and any additional relevant information (e.g. Daniels, 1979; Rawls, 1971). Nussbaum applies this to construct her list of the constitutive components of a life of minimal dignity (Nussbaum, 2000). An alternative approach would be to understand practical reasoning through iterative questioning about what is perceived to be constitutive of wellbeing and poverty. Alkire's methodology for identifying basic or fundamental constituents of wellbeing is a specific kind of practical reasoning (Alkire, 2002).

The fundamental or non-derivative reasons that people cite for their actions are identified via (actual or hypothetical) iterated questioning of the motives for which they act. These fundamental reasons (e.g. to stay alive, to have fun, to help their children) are taken as a guide to their fundamental values. An 'objective list' consists in the capabilities to realize these values.

Both of the above methodologies – reflective equilibrium and iterative questioning – begin with the evaluative judgments of individuals (whether those of the investigator, or those whose wellbeing is at issue). An alternative process is via public reason, or participation in broadly democratic discussion. Constituents of wellbeing are identified as those features that survive this process. This is the approach that, in outline, Sen (1999) comes closest to endorsing for determining the components of wellbeing.

Policy Relevance and Empirical Implications

Beyond the evaluative impact of identifying who is poor, treating the natural environment as a constituent element also has further implications for informing, designing and targeting policies to address poverty. It could facilitate the mainstreaming of the environment into other policy areas of the sustainable development pillars and goals, as doing so would be a required element of policy objectives to reduce poverty. However, mainstreaming the natural environment into poverty agendas may be met with opposition. It may be perceived as detrimental to other development and wellbeing considerations, for example (1) if environmental agendas are perceived to be dominating other aspects of poverty reduction (e.g. social equality) or (2) among those who might benefit from ongoing environmental exploitation. Including the natural environment in measures of wellbeing and poverty therefore has important political implications regarding whose perceptions and interests influence decision making.

Our review has highlighted that some of the conceptual frameworks of wellbeing and poverty are not explicit about their underpinning philosophical principles, or of the definitions of key concepts, including human wellbeing, poverty and the natural environment. In this respect, policy and practice could benefit from greater clarity in our conceptual engagement with poverty and wellbeing. However, it is also worth recognizing that, in certain circumstances, not providing explicit definitions and boundaries to concepts can be a strategic (political) decision (Montana, 2017). It may be expedient to circumvent difficult conversations about epistemic differences, and a lack of conceptual clarity might help forge consensus where there may be widely differing positions in relation to a particular issue (e.g. Hulme, 2009).

Our analysis also has practical implications for the measurement of wellbeing and poverty. In cases where the environment is considered a constituent element of wellbeing or poverty, this will require a careful appraisal of ways to empirically measure these relationships. This would include critically evaluating (1) whether existing environmental data can be integrated with data on other aspects of wellbeing and poverty (including data derived from remote sensing and machine-based learning; e.g. Jean *et al.*, 2016) and (2) whether and how the natural environment would be incorporated into the relevant survey tools that have been designed for the assessment of multidimensional poverty at household level. While considering questions of aggregation, further decisions need to be made about which aspects of the natural environment are treated as constituents, and which are determinants, to avoid the risk of double counting.

Future Directions: Exploring Constituent Aspects of the Natural Environment

This final section discusses some aspects of the natural environment that might feature as constitutive dimensions in wellbeing and poverty accounts, and how these might be included. One likely fruitful direction is related to considerations of 'cultural ES'. While the instrumental value of provisioning ES may already be captured by objective lists, there may be scope for a better recognition of cultural values, going beyond aesthetics and including concepts of sense of place, belonging and rootedness. Work on cultural ES focuses on the relations between people and places, including the environment. Examples include links to ancestors, gods and spirits that are associated with particular places and features of the natural environment. These links define the spiritual and religious life of certain groups, and memories and connections with particular places. These are part of the collective heritage of societies, and the sense of solace, contentment and fulfilment that is enjoyed by people who feel at 'home' in their natural environment, but uprooted and displaced when translocated to other places (Baviskar, 1995). Be it for

cultural, recreational or other reasons, having access to green and natural spaces might therefore be an important constitutive element of wellbeing for some people (Cloutier and Pfeiffer, 2015).

Another avenue is the ways in which exposure to nature creates a sense of physical (in)security, which may be fundamentally constitutive of the individual or collective self. Natural hazards are usually beyond the control of individuals, and greater attention to vulnerability, insecurity and adaptive capacity may be a useful starting point in defining an environment-related dimension of poverty (Sumner and Mallett, 2013). The perpetual sense of environmental insecurity due to exposure to the forces of nature, and the adaptive measures that human societies might adopt in response to such perennial danger, are themselves constitutive of a contemporary 'risk society' (Slovic, 2010). These shape the human experience in important ways. For those who are exposed to environmental vulnerability, inclusion of this dimension might be a very important aspect of their own perceptions of wellbeing. However, it is worth recognizing that this dimension of the environment might be important for very particular groups of people, in particular places, but less applicable in other contexts.

Among the existing philosophical approaches and frameworks we have reviewed here, the Capabilities Approach (Sen, 1999) and other objective list theories offer one avenue for developing wellbeing concepts that are inclusive of the environment as a constituent factor. This would complement the existing ways in which the Capabilities Approach currently addresses the environment. For instance, both Nussbaum (2000) and Alkire (2002) put forward itemized objective lists based on the Capabilities Approach, which refer explicitly to the natural environment. Alkire (2002) includes the beauty of the environment, alluding mainly to aesthetic considerations that enhance wellbeing. Nussbaum's list of central capabilities includes the capability to engage with the natural environment and other species. However, some debate exists around whether this emphasizes the instrumental value of nature for determining human flourishing (Deneulin, 2014) or covers various people–nature relationships as a constituent aspect of wellbeing (Walker, 2011). It is worth exploring further to expand how the environment features in wellbeing accounts within the Capabilities Approach.

Conclusion

The relationships between the natural environment and human wellbeing and poverty are complex and multifaceted. This paper explores whether the natural environment should be included in multidimensional accounts of poverty and wellbeing. In particular, we have drawn on philosophical accounts and conceptual frameworks to elaborate on both the rationale for, and the implications of, treating the natural environment as a 'constituent' element as opposed to a 'determinant' of wellbeing and poverty concepts. We argue that focussing only on the determinant role of the environment misses the opportunity for a more fundamental consideration of the natural environment as a constituent of wellbeing and poverty. Neglecting these environmental dimensions risks missing some critical elements of how some people understand and experience poverty and wellbeing. We therefore argue for developing an expanded account of wellbeing and poverty that allows for including environmental dimensions, which are currently missing from existing approaches.

Operationalizing these ideas will require more detailed engagement with the specificities of people and places to determine what aspects of the environment are most relevant and for whom, while being cognisant of the potential political and distributional implications for different groups of people. We suggest that this should involve talking to people whose wellbeing is at issue, about their understanding and experience of wellbeing and poverty, to give them a voice in the discussion and to ensure that any expanded account of wellbeing and poverty is grounded in local realities, rather than being externally defined. At the same time, in the context of the SDGs and public policies more broadly, engaging directly with national statistics offices and other relevant organizations is important to determine national priorities, identify relevant national datasets and monitoring systems (Schoenaker *et al.*, 2015), and determine where new data collection efforts are needed to better reflect the diverse ways in which the environment contributes to wellbeing and poverty.

Developing such an expanded approach has the potential to inform a new generation of individual level wellbeing and poverty indicators, creating measures of multidimensional poverty that reflect the broadened scope of the SDGs. It would provide national governments with an option to include the natural environment when reporting

on progress against one core focus of the SDGs, on eradicating poverty in all its forms (SDG 1). To facilitate this process, we suggest to (1) determine whether and what specific aspects of the environment are constitutive of wellbeing and poverty in different contexts, including the environmental aspects we have outlined, namely cultural ES, access to natural spaces, and resilience and vulnerability to natural hazards, (2) develop qualitative and quantitative indicators that capture these environmental dimensions, (3) develop methods for integrating spatially explicit environmental data with other datasets into multidimensional indices of poverty and wellbeing and (4) identify what relevant environmental data already exist at national, regional and global levels among the multitude of existing monitoring systems, to ease reporting at country and global scales. These are important considerations if the aspirations that have been articulated in the SDGs are to be taken seriously. This broader consideration of the environment in shaping wellbeing and poverty is a step towards a more holistic assessment of our collective progress towards these ambitious global goals and the potential for a more sustainable development.

Acknowledgments

We thank workshop participants, Simon Beard and two anonymous reviewers for their comments on an earlier draft of this paper, and the Political Ecology Research Group in the Department of Geography at the University of Cambridge for useful feedback on a presentation of this work. We further thank colleagues at Oxford Poverty and Human Development Initiative for their discussion of early ideas that fed into this research. This work, 'Ecosystem services as a missing dimension of poverty' (NE/M00760X/1), was funded with support from the Ecosystem Services for Poverty Alleviation (ESPA) programme. The ESPA programme is funded by the Department for International Development (DFID), the Economic and Social Research Council (ESRC) and the Natural Environment Research Council (NERC).

References

- Adams WM, Aveling R, Brockington D, Dickson B, Elliott J, Hutton J, Dilys R, Vira B, Wolmer W 2004. Biodiversity conservation and the eradication of poverty. *Science* 306: 1146–1149.
- Agarwala M et al. 2014. Assessing the relationship between human well-being and ecosystem services: a review of frameworks. *Conservation and Society* 12(4): 437.
- Alkire S 2002. *Valuing Freedom*, Oxford University Press: Oxford.
- Alkire S 2007. The missing dimensions of poverty data: introduction to the special issue. *Oxford Development Studies* 35(4): 347–359.
- Anguelovski I, Martinez Alier J 2014. The 'Environmentalism of the Poor' revisited: territory and place in disconnected global struggles. *Ecological Economics* 102: 167–176.
- Baviskar A 1995. *In the Belly of the River: Tribal Conflicts over Development in the Narmada Valley*, Oxford University Press: Delhi.
- Bennett EM et al. 2015. Linking biodiversity, ecosystem services, and human well-being: three challenges for designing research for sustainability. *Current Opinion in Environmental Sustainability* 14: 76–85.
- Bentham J 1789. *An Introduction to the Principles of Morals*, Athlone: London.
- Bojő J, Green K, Kishore S, Pilapitiya S, Reddy RC 2004. *Environment in Poverty Reduction Strategies and Poverty Reduction Support Credits*, World Bank Environment Department Paper 102. World Bank: Washington, DC.
- Callicott JB 1984. Non-anthropocentric value theory and environmental ethics. *American Philosophical Quarterly* 21(4): 299–309.
- Chambers R 1997. Responsible well-being: a personal agenda for development. *World Development* 25(11): 1743–1754.
- Chambers R., Conway G. 1991. *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*. IDS Discussion Paper 296. Institute of Development Studies: Brighton.
- Chan KM et al. 2016. Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences* 113(6): 1462–1465.
- Cloutier S, Pfeiffer D 2015. Sustainability through happiness: a framework for sustainable development. *Sustainable Development* 23: 317–327.
- Craig PP, Glasser H, Kempton W 1993. Ethics and values in environmental policy: the said and the UNCED. *Environmental Values* 2(2): 137–157.
- Crisp R 2015. Well-being. In Zalta EN (ed.). *The Stanford Encyclopaedia of Philosophy*, <http://plato.stanford.edu/archives/sum2015/entries/well-being/> [12 September 2016].
- Cummins RA 1996. The domains of life satisfaction: an attempt to order chaos. *Social Indicators Research* 38(3): 303–328.
- Daniels N 1979. Wide reflective equilibrium and theory acceptance in ethics. *Journal of Philosophy* 76(5): 256–282.
- Dasgupta P 2001. Constituents and determinants of well-being. In Dasgupta P (ed.). *Human Well-Being and the Natural Environment*, Oxford University Press: Oxford.

- Daw T et al. 2016. Elasticity in ecosystem services: exploring the variable relationship between ecosystems and human well-being. *Ecology and Society* 21(2): 11.
- Deneulin S 2002. Perfectionism, paternalism and liberalism in Sen and Nussbaum's capability approach. *Review of Political Economy* 14(4): 497–518.
- Deneulin S 2014. *Wellbeing, Justice and Development Ethics*, Routledge: Abington; 37.
- Deneulin S, McGregor JA 2010. The capability approach and the politics of a social conception of wellbeing. *European Journal of Social Theory* 13(4): 501–519.
- Díaz S et al. 2015a. The IPBES Conceptual Framework – connecting nature and people. *Current Opinion in Environmental Sustainability* 14: 1–16.
- Díaz S, Demissew S, Joly C, Lonsdale WM, Larigauderie A 2015b. A Rosetta Stone for nature's benefits to people. *PLoS Biology* 13(1): e1002040.
- Dolan P, Metcalfe R 2012. Measuring subjective wellbeing: recommendations on measures for use by national governments. *Journal of Social Policy* 41(2): 409–427.
- Dolan P, Peasgood T, White M 2006. *Review of Research on the Influences on Personal Well-Being and Application to Policy Making*, DEFRA: London.
- Dunlap RE, Catton WR 1983. What environmental sociologists have in common (whether concerned with 'built' or 'natural' environments). *Sociological Inquiry* 53: 113–135.
- Duraiappah AK 2004. *Exploring the Links: Human Well-Being, Poverty and Ecosystem Services*, United Nations Environment Programme (UNEP)–International Institute for Sustainable Development (IISD): Nairobi and Winnipeg.
- Fisher JA et al. 2013. Strengthening conceptual foundations: analysing frameworks for ecosystem services and poverty alleviation research. *Global Environmental Change* 23(5): 1098–1111.
- Gough I, McGregor JA (Eds) 2007. *Wellbeing in Developing Countries: from Theory to Research*, Cambridge University Press: Cambridge.
- Gowans CW 2003. *Buddhist Well-Being*, Fordham University: New York.
- Griffin J 1986. *Well-Being: Its Meaning, Measurement, and Moral Importance*, Clarendon: Oxford.
- Gudynas E 2009. La ecología política del giro biocéntrico en la nueva Constitución de Ecuador [The political ecology of the biocentric turn in Ecuador's new constitution]. *Revista de Estudios Sociales* 32: 34–47.
- Hedlund-de Witt A 2012. Exploring worldviews and their relationships to sustainable lifestyles: towards a new conceptual and methodological approach. *Ecological Economics* 84: 74–83.
- Hedlund-de Witt A, de Boer J, Boersema JJ 2014. Exploring inner and outer worlds: a quantitative study of worldviews, environmental attitudes, and sustainable lifestyles. *Journal of Environmental Psychology* 37: 40–54.
- Helne T, Hirvilammi T 2015. Wellbeing and sustainability: a relational approach. *Sustainable Development* 23: 167–175.
- Hill T Jr 1983. Ideals of human excellence and preserving natural environments. *Environmental Ethics* 5(3): 211–224.
- Hill T Jr 2006. Finding value in nature. *Environmental Values* 15(3): 331–341.
- Hopwood B, Mellor M, O'Brien G 2005. Sustainable development: mapping different approaches. *Sustainable Development* 13: 38–52.
- Howe C, Suich H, Vira B, Mace G 2014. Creating win–wins from trade-offs? Ecosystem services for human well-being: a meta-analysis of ecosystem service trade-offs and synergies in the real world. *Global Environmental Change* 28: 263–275.
- Hulme M 2009. *Why we Disagree about Climate Change*, Cambridge University Press: Cambridge.
- Jean N, Burke M, Xie M, Davis WM, Lobell DB, Ermon S 2016. Combining satellite imagery and machine learning to predict poverty. *Science* 353(6301): 790–794.
- King MF, Renó VF, Novo EM 2014. The concept, dimensions and methods of assessment of human well-being within a socioecological context: a literature review. *Social Indicators Research* 116(3): 681–698.
- Langton R 2007. Objective and unconditioned value. *Philosophical Review* 116(2): 157–185.
- Larson S, De Freitas DM, Hicks CC 2013. Sense of place as a determinant of people's attitudes towards the environment: Implications for natural resources management and planning in the Great Barrier Reef, Australia. *Journal of Environmental Management* 117: 226–234.
- Leach M, Mearns R, Scoones I 1999. Environmental entitlements: dynamics and institutions in community-based natural resource management. *World Development* 27(2): 225–247.
- Leach M, Scoones I 2013. Carbon forestry in West Africa: the politics of models, measures and verification processes. *Global Environmental Change* 23(5): 957–967.
- Le Blanc D 2015. Towards integration at last? The sustainable development goals as a network of targets. *Sustainable Development* 23: 176–187.
- Le Grange L 2012. *Ubuntu, ukama and the healing of nature, self and society*. *Educational Philosophy and Theory* 44: 56–67.
- Mace GM 2014. Whose conservation? *Science* 345: 1558–1560.
- McGregor JA, Sumner A 2010. Beyond business as usual: what might 3-D wellbeing contribute to MDG momentum? *IDS Bulletin* 41(1): 104–112.
- Mebratu D 1998. Sustainability and sustainable development: historical and conceptual review. *Environmental Impact Assessment Review* 18: 493–520.
- Millennium Ecosystem Assessment (MA) 2003. *Ecosystems and Human Well-Being: a Framework for Assessment*, Island: Washington, DC.
- Millennium Ecosystem Assessment (MA) 2005. *Ecosystems and Human Well-Being*. Vol. 5, Island: Washington, DC.
- Milner-Gulland EJ et al. 2014. Accounting for the impact of conservation on human well-being. *Conservation Biology* 28(5): 1160–1166.
- Misturelli F, Heffernan C 2011. The language of poverty: an exploration of the narratives of the poor. *Sustainable Development* 19: 206–222.
- Montana J 2017. *The Constitution of Expert Authority: the Organisation of Knowledge Practices for Biodiversity in IPBES*. PhD Thesis., University of Cambridge: Cambridge; 103.
- Narayan D, Chambers R, Shah M, Petesch P 1999. *Global Synthesis: Consultation with the Poor*, World Bank Publications: Washington, DC.
- Narayan D, Chambers R, Shah M, Petesch P 2000. *Crying Out for Change: Voices of the Poor*, World Bank Publications: Washington, DC.
- Nunan F 2015. *Understanding Poverty and the Environment: Analytical Frameworks and Approaches*, Routledge: London.

- Nunan F, Campbell A, Foster E 2012. Environmental mainstreaming: the organisational challenges of policy integration. *Public Administration and Development* 32: 262–277.
- Nussbaum MC 1992. Human functioning and social justice in defence of Aristotelian essentialism. *Political Theory* 20(2): 202–246.
- Nussbaum MC 1999. In Defence of Universal Values. Occasional Paper Series 16:OP:1, University of Notre Dame: Paris.
- Nussbaum MC 2000. *Women and Human Development: the Capabilities Approach*, Cambridge University Press: Cambridge.
- O'Neil J 1992. The varieties of intrinsic value. *The Monist* 75(2): 119–137.
- Parfit D 1984. *Reasons and Persons*, Oxford University Press: Oxford; x–543.
- Ravallion M 1996. *Issues in Measuring and Modelling Poverty*, World Bank Publications: Washington, DC.
- Rawls J 1971. *A Theory of Justice*, Harvard University Press: Boston, MA.
- Rounsevell MDA, Dawson TP, Harrison PA 2010. A conceptual framework to assess the effects of environmental change on ecosystem services. *Biodiversity and Conservation* 19(10): 2823–2842.
- Ruggeri-Laderchi C, Saith R, Stewart F 2003. Does it matter that we do not agree on the definition of poverty? A comparison of four approaches. *Oxford Development Studies* 31: 243–274.
- Schmidt S, Bullinger M 2007. Cross-cultural quality of life assessment approaches and experiences from the health care field. In Gough I, McGregor JA (eds.). *Wellbeing in Developing Countries: from Theory to Research*, Cambridge University Press: Cambridge; 219–241.
- Schoenaker N, Hoekstra R, Smits JP 2015. Comparison of measurement systems for sustainable development at the national level. *Sustainable Development* 23: 285–300.
- Schulz AW 2015. Preferences vs. desires: debating the fundamental structure of cognitive states. *Economics and Philosophy* 31: 239–257.
- Scoones I 1998. *Sustainable Rural Livelihoods: a Framework for Analysis*. IDS Working Paper 72, Brighton: Institute for Development Studies.
- Sen A 1985. Well-being, agency and freedom: the Dewey lectures 1984. *Journal of Philosophy* 82: 169–221.
- Sen A 1999. *Development as Freedom*, 1st edn., New York: Oxford University Press.
- Shrivastava A, Kothari A 2012. *Churning the Earth: the Making of Global India*, Penguin: New Delhi.
- Slovic P 2010. *The Feeling of Risk: New Perspectives on Risk on Risk Perception*, Earthscan: Oxford.
- Smith LM, Case JL, Smith HM, Harwell LC, Summers JK 2013. Relating ecosystem services to domains of human well-being: foundation for a US index. *Ecological Indicators* 28: 79–90.
- Stiglitz J, Sen AK, Fitoussi JP 2009. The Measurement of Economic Performance and Social Progress Revisited: Reflections and Overview. In OFCE Working Paper 2009–33, Centre de recherche en Economie de Sciences Po: Paris.
- Streeten P, Burki SJ, Haq U, Hicks N, Stewart F 1981. *First Things First: Meeting Basic Human Needs in the Developing Countries*, Oxford University Press: New York.
- Suich H, Howe C, Mace G 2015. Ecosystem services and poverty alleviation: a review of the empirical links. *Ecosystem Services* 12: 137–147.
- Summers JK, Smith LM, Case JL, Linthurst RA 2012. A review of the elements of human well-being with an emphasis on the contribution of ecosystem services. *Ambio* 41(4): 327–340.
- Sumner A, Mallett R 2013. Capturing multidimensionality: what does a human wellbeing conceptual framework add to the analysis of vulnerability? *Social Indicators Research* 113(2): 671–690.
- TEEB 2010. In Kumar P (ed.). *The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations*, Earthscan: London.
- Trainor SF 2006. Realms of values: conflicting natural resource values and incommensurability. *Environmental Value* 15: 3–29.
- UN 2015a. Anchoring a Global Multidimensional Poverty Index (MPI) within the SDGs. High-Level Side Event at UN Summit for the Adoption of the Post-2015 Development Agenda. <http://webtv.un.org/watch/anchoring-a-universal-multidimensional-poverty-index-within-the-sustainable-development-goals/4514028059001#full-text> [16 June 2017].
- UN 2015b. *Transforming Our World: the 2030 Agenda for Sustainable Development*, United Nations.
- United Nations Environment Programme (UNEP) 2003. *Poverty and Ecosystems: A Conceptual Framework: A Synthesis*, UNEP/GC.22/INF/30/Rev.1. UNEP: Nairobi.
- United Nations Environment Programme (UNEP) 2014. *Report of the Second Session of the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, IPBES/2/17. UNEP.
- Vira B 2015. Taking natural limits seriously: implications for development studies and the environment. *Development and Change* 46(4): 762–776.
- Walker LA 2011. *Defending Nussbaum's 'Other Species' Capability: Why Having Meaningful Relationships with Nature is Necessary for Living a Dignified Human Life*. MA Thesis, Paper 1161, Lehigh University: Bethlehem, PA.
- WCED 1987. *Our Common Future*, Oxford University Press: Oxford.