

16. Human wellbeing in environmental management

Kelly Biedenweg and David J Trimbach

INTRODUCTION

Human wellbeing is directly linked to the health of the natural environment (Berkes et al., 2003; Liu et al., 2007; Biedenweg et al., 2017). Human physical health depends on fresh air and clean drinking water. Economic prosperity for many depends on the ability to extract natural resources, whilst socio-cultural cohesion often depends on access to healthy ecosystems. The field of environmental management was developed to manage these natural resources for their myriad human benefits, emphasizing the sustainable use of air, land, forests, minerals, water, fisheries and wildlife (Muralikrishna and Manickam, 2017). Yet, until recently, environmental managers have had limited, to no, expertise in understanding whether their programmes were truly addressing the human causes and consequences of environmental health. Rather, they have focused solely on monitoring and directly influencing biophysical processes. Contemporary approaches to environmental management have adopted a more progressive worldview that social systems are inextricably linked to ecosystems – that human systems both influence and are influenced by the natural environment (Collins et al., 2011). Without identifying and evaluating how human wellbeing is related to ecosystem health in each management context, therefore, environmental management strategies may not address critical pressures and desired outcomes.

The global conversation around integrating human wellbeing and environment management stems largely from the Millennium Ecosystem Assessment [MA], an effort by over 2,000 authors and reviewers to characterize and classify the status of the world's ecosystems (MA, 2005). In this framework, a healthy ecosystem was defined as one that contributes to a multi-dimensional conceptualization of human wellbeing that includes security, basic material for a good life, health, good social relations and freedom of choice and action. In illuminating this link, the authors set forth a global pathway to justify the integration of human wellbeing in environmental management.

Yet the conceptualization of human wellbeing is not singular (Alexandrova, 2014; Scott, 2012). Within economics, at least two traditions have developed their own conceptualizations: preference maximization perspectives consider wellbeing to be attained when humans meet their preferences whereas capabilities perspectives consider that having many opportunities available in a myriad of arrangements, whether they form part of ones preferences or not, is the core of wellbeing. Within psychology, at least three traditions hold unique definitions of human wellbeing: hedonists define it as regularly experiencing a happy mental state, subjectivists define it as having one's desires fulfilled, and eudaimonists as living in accordance with one's own nature. Furthermore, public health scientists consider human wellbeing through standard health metrics, such as obesity and depression rates, as well as access to clear air and drinking water. Since human wellbeing connects to the natural environment in so many ways, its integration in environmental management can be guided by many objectives and worldviews.

Almost 15 years since the publication of the MA, there has been substantive growth in the consideration of human wellbeing by environment managers. The theoretical and sometimes methodological foundation of the trend has differed based on the initial goals of integration (such as for environmental justice, for more effective environmental management strategies or for improving public health). This chapter describes dominant philosophical paradigms in these three trajectories, providing case studies in which human wellbeing has been integrated in environmental management for each pathway (Table 16.1). Our first case study focuses on Ecuador's *buen vivir*, which highlights the application of the capabilities approach to biological conservation. Our second case study illustrates an ecosystem services approach for collaborative ecosystem restoration of Puget Sound in Washington State (US). Our third case study emphasizes linking healthy human populations and healthy ecosystems as a response to the western Public Health and Environmental Management institutions. Through these case studies, we outline three dominant paradigms of human wellbeing integration into environment management and illustrate the power of wellbeing to inform more inclusive, equitable, and effective stewardship of the natural environment that recognizes and foregrounds the importance of people-place relationships to social-ecological wellbeing.

DEVELOPMENT AND TROPICAL CONSERVATION: THE CASE OF BUEN VIVIR

it [economics] treats nature as an infinite supply of physical resources to be used for human benefit, and as an infinite sink for the by-products of the consumption of these benefits. (Colby 1991, p. 195)

Table 16.1 Table summarizing case studies in this chapter

Case Study	Academic and Practitioner Tradition(s) for integration	Primary Conceptualization of Wellbeing
Ecuador's Buen Vivir	Environmental Conservation and Development	Capabilities
Environmental Restoration in the Puget Sound	Ecosystem Services and Social-ecological Systems	Subjective wellbeing and indicators of ecosystem services outcomes
South Australia Healthy Parks Healthy People	Public Health and Leisure Studies	Biophysical indicators of health

Development and biological conservation have a complex relationship (Sutcliffe, [2000] 1995; Soulé, 2013). Both invoke advancement, progress and gain; however, development emphasizes a coordinated change towards social improvement while biological conservation focuses on the protection of biodiversity. Although both share underlying motivations, the overemphasis on economic growth within development is often seen as running counter to environmental protection or management goals (Sutcliffe, 2000 [1995]). Meanwhile, certain forms of conservation have been found to exacerbate poverty and inequality (Brockington and Wilkie, 2015). These critiques are not new (Colby, 1989, 1991), but with the MA's publication (MA, 2005), human wellbeing, notably through the capabilities approach [CA], has emerged as integral to development-conservation convergence (Sen, 2003). Using Ecuador's *buen vivir* as a case study, we highlight the evolution and contemporary application of CA as a component of human wellbeing in international conservation and development.

Theories and Frameworks of Conservation and Development

Development is traditionally equated with modernization, which posits that modernity (or development) can be achieved through progressive stages from more traditional to more modern (Rostow, 1960). Modernity is achievable via economic growth, as observed through gross domestic product [GDP], gross national product [GNP], gross national income [GNI] or other economic measures (Dasgupta, 2001; Ghatak, 2018). Modernity via economic growth theoretically increases human wellbeing through poverty reduction; however, major critiques of modernization, specifically dependency and world systems theories [WST], challenge this view (Wallerstein, 1987; Roberts and Hite, 2000). While different, both theories recognize that the wealth and modernity of some countries (for example those in the Global North) is directly linked to the poverty and lack of development of others (for example those in the Global

South), often as a result of post-/neo-colonial ties and integration into the capitalist world economy (Wallerstein, 1987; Hoogvelt, 2001). Modernization's unevenness also impacts natural environments, as the environment is viewed 'as an infinite supply of physical resources to be used for human benefit, and as an infinite sink for the by-products of the consumption of these benefits' (Colby, 1991, p. 195).

Consumption leads to environmental degradation, which in turn leads to the need for conservation efforts. These include the dramatic increase in protected areas [PAs], exclusive areas designed to protect wildlife, habitats, landscapes and resources (Adams and Hutton, 2007). These high-conservation areas are designated as off limits to any human use, often displacing nearby communities from the only livelihoods and cultural practices they knew and/or increasing their negative interactions with dangerous and destructive wildlife. As with the paradigm of modernization, conservation through PAs was a strategy imported from countries in the Global North, leaving a perception of continued colonialism that undervalued individuals and local culture. This emphasis on PAs led to the people vs. parks debate: whether conservation efforts should prioritize landscapes and biodiversity, or human welfare and poverty reduction (Minteer and Miller, 2011). New approaches, including CA, sought to balance these objectives (Pieterse, 2010).

CA has become the dominant way of thinking about wellbeing in development. It conceptualizes human wellbeing as a set of functionings ('doings and beings' of human life), that provide people with capabilities or freedoms to make choices that enrich their lives (Sen, 2003, p. 4). CA's dominance is evidenced in the UN Development Program's Human Development Index (1990), Inequality-adjusted Human Development Index (2010) and annual Human Development Reports that integrate social and ecological measures. Development is defined in this documents as 'the enlargement of people's choices', reflecting a shift away from a growth-centred to a wellbeing-centred approach (Pieterse, 2010, p. 7).

CA's application within development has coincided with human wellbeing efforts within conservation (Table 16.2) (Basiago, 1999; Haque, 1999; Du Pisani, 2006; Blom et al., 2010). While different, these efforts have sought to better integrate environmental protection and human wellbeing, making CA increasingly more attractive to conservation. While limited in its application thus far, scholars have integrated CA into the study of environmental governance (Bockstael and Berkes, 2017) and sustainability (Peeters et al., 2015). These efforts envision CA's application as addressing economic poverty, individual empowerment and environment access/use, which in turn can achieve both conservation and development goals. One example of CA's contribution to conservation and development is Ecuador's *buen vivir*.

Table 16.2 Table summarizing conservation efforts that reflect human interactions or wellbeing

Conservation Effort	Brief Description
Protected areas [PAs]	Exclusive areas designed to protect wildlife, habitats, landscapes, and resources from human use or consumption
Agenda 21	Popularized the concept of sustainable development and foregrounds wellbeing
Integrated Conservation and Development Projects [ICDPs]	Development projects that offer alternative employment opportunities to local communities displaced or impacted by conservation activities
Payments and for environmental services [PES]	Programmes that offer incentives to land-users to protect or encourage the provision of environmental or ecological services (benefits derived from nature)
Reducing emissions from deforestation and forest degradation [REDD]	Programmes that offer incentives to reduce deforestation and improve sustainable forest management practices; includes links to carbon offsets and credits
Millennium Ecosystem Assessment [MA]	International assessment of the impacts of ecosystem change on human wellbeing and the actions necessary to enhance conservation and sustainability to contribute human wellbeing

Wellbeing-Centred Conservation and Development: Buen Vivir in Ecuador

Buen vivir is considered a post-growth development alternative that literally means ‘good life’, ‘good living’, and/or human wellbeing. Unlike other normative conceptualizations of human wellbeing, however, buen vivir emphasizes the importance of the social-ecological community and collective wellbeing (Gudynas, 2015). This human-natural inclusivity reflects buen vivir’s links to indigenous notions, including *sumak kawsay* (in Quechua – there is no exact translation into English or Spanish; however, it has been equated with good living, living well, and life of fullness or plenitude (Villalba 2013)), which captures a distinct worldview of wellbeing as achieved through material and non-material means, including social and ecological community relationships (Vanhulst and Beling, 2014; Gudynas, 2015). According to Gudynas (2015), a leading buen vivir scholar, there are three overlapping conceptualizations of buen vivir: (1) a broad critique of conventional development; (2) a narrowed critique of development that is post-capitalist and growth-critical; and (3) a comprehensive radical critique of all development paradigms and a set of plural indigenously-derived alternatives that is post-capitalist, post-socialist and non-western.

Buen vivir emerged as an alternative following decades of conventional development failures. These failures caused economic vulnerability, environmental degradation, land dispossession, increases in socio-economic inequality and conflict (Hollender, 2015). Buen Vivir recreated and reimagined development based on human-nature interrelationships and not economic growth (Osborne et al., 2014). Buen vivir's emphasis on the collective, community and/or social group helped reconcile some critiques of CA's overemphasis on the individual, specifically in reference to capabilities (Scarlato, 2013; Sikkema, 2018). Buen vivir is multi-dimensional, embodying a plurality of conceptualizations and applications that continue to evolve as a legal, policy and planning framework that reimagines development as human wellbeing-centred.

Under the leadership of President Rafael Correa (2007–2017), Ecuador adopted a new voter-approved constitution in 2008 that embeds buen vivir into Ecuador's legal, development and conservation landscape (Merino, 2016). Constitutionally, buen vivir is conceptualized as a set of rights and mechanisms to achieve or exercise those rights (Scarlato, 2013; Merino, 2016). Rights to water, food and nutrition, healthy environment, education, work, habitat or housing, cultural identity, recreation, and scientific benefits, among others, were included (Kauffman and Martin, 2014; Merino, 2016). Buen vivir is supported by other rights including indigenous rights and the rights of nature. The latter treats nature as an equal subject with formal rights, rather than an object to be used or exploited (Kauffman and Martin, 2014; Piertari, 2016). Buen vivir integrates citizen participation to inform Ecuador's Ministry of Planning and Development, national development plans (National Development Plan, 2009–2013) (Box 16.1) and overarching environmental governance model (Kauffman and Martin, 2014). Planning documents based on buen vivir have stressed: dismantling past neoliberal development efforts; decreasing consumption; prioritizing small-scale local production and food security; legally protecting the environment; respecting local knowledge, values, and culture; guaranteeing rights, justice, and civic participation; providing equitable environment access; and enlarging human capabilities (Scarlato, 2013; Villalba, 2013; Kauffman and Martin, 2014).

BOX 16.1 ENDOGENOUS STRATEGY FOR GOOD LIVING

The endogenous strategy for Good Living requires developing societal capabilities and opportunities through the creation of value to satisfy society's own needs, as expressed by internal demand. (Republic of Ecuador 2010, p. 110)

Highlighted by its expansion across South and Central America, *buen vivir* reimagines the development–conservation nexus as a human wellbeing-centred alternative. It blends indigenous and non-indigenous understandings of what constitutes an enriched life. As such, *buen vivir*, like conventional CA, further cements a conceptual turn for development beyond economic growth by emphasizing human–environment interdependence.

ECOSYSTEM SERVICES DRIVING ENVIRONMENTAL RESTORATION: THE PUGET SOUND

What makes ecological restoration uniquely valuable is its inherent capacity to provide people with the opportunity not only to repair ecological damage, but also to improve the human condition. (Gann and Lamb, 2006, p. 1)

In places with already degraded environments, support for ecosystem restoration has often been motivated by the value that healthy ecosystems contribute to human wellbeing. This framing of human wellbeing is encompassed in the concept of ecosystem services. Many environmental management agencies claim that a focus on ecosystem services will result in more relevant management plans and increased compliance with environmental management recommendations (Ban et al., 2013). In fact, influential agencies such as the US Environmental Protection Agency and the United Nations Environment Program have mission statements to protect and restore the natural environment with the explicit purpose of enhancing, or not hindering, human wellbeing and quality of life (US EPA, 2018; UNEP, n.d.). These dual goals lay the foundation for integrated ecosystem restoration processes (Gann and Lamb, 2006; Abelson et al., 2015). As such, the inclusion of human wellbeing in these contexts is less about creating more culturally just development, as with the *buen vivir* example, and more about effectively managing complex natural environments that are influenced by human actions (Gann and Lamb, 2006).

Theories and Frameworks in Ecosystem Service Integration

Since the 1990s, the field of ecological economics has driven the theoretical and methodological approaches for linking social and ecological goals in environmental management through ecosystem services (Daily, 1997). Dissatisfied with the ability of common metrics such as GDP to represent the invisible costs associated with degrading environments, ecological economists began to assess the value of environments according to their contribution to supporting, provisioning and regulating ecosystem services (Costanza et al., 1997). In conventional economics, acres of forest were not considered part of a country's GDP until they were harvested and the timber was sold. An

ecological economic assessment, however, attributes worth to the forest due to its ability to mitigate climate changes, regulate floods and purify water. These ecosystem services in turn provide a value to humans and thus enhance human wellbeing (MA, 2005). The ecosystem services perspective is clearly biased towards accounting for positive interactions between humans and the environment – highlighting the ways that natural processes contribute to human wellbeing (such as through provisioning drinking water), rather than the ways that the natural world can hurt humans (such as through dangerous wildlife interactions). The ecosystem services concept has received criticism for these biases, as well as its emphasis on placing value (usually monetary) on tangible items, when many of the things that contribute to human wellbeing are intangible and/or should not be monetized due to ethical considerations (Chan et al., 2012; Breslow et al., 2016).

While the ecosystem services concept developed, environmental planners and ecologists simultaneously explored causal, linear conceptual models of social and ecological interactions (Breslow et al., 2016). The most common of these is the Driver-Pressure-Stressor-Impact-Response [DPSIR] model. DPSIR identifies humans as negative actors on the natural environment and human wellbeing as an outcome of effective ecosystem protection, making the role of humans apparently passive in environmental management (Wolanski and Elliott, 2015; Yee et al., 2012). This linear pathway largely informed the framework presented in the MA (2005) and contrasts the more recent Social Ecological Systems [SES] framing.

SES is a framework for understanding environmental management that better incorporates human wellbeing as both a contributor to and beneficiary of healthy ecosystems. Originally developed to describe the factors affecting collective environmental management, the SES framework was refined throughout the early 2000s to better diagnose sustainable social-ecological systems (Partelow, 2018). SES researchers believe that ‘delineation between society and the environment [is] artificial and arbitrary’ (Guerrero et al., 2018, p. 1) and that the SES framework ‘recognizes the connections and feedbacks linking human and natural systems’ (Leslie et al., 2015, p. 5979). This inherent integration allows researchers and managers to more explicitly consider trade-offs and identify compromises between ecological and social components of a system (Ban et al., 2013, p. 194). In this framework, ecosystem services are perceived as a mediating construct linking biophysical attributes to human wellbeing and influencing how people interact with ecosystems (Collins et al., 2011).

Because of the importance of human wellbeing in justifying ecosystem recovery, many natural resource agencies have recently identified relevant indicators of human wellbeing as part of their ecosystem planning and monitoring programmes (Leisher et al., 2013; Biedenweg et al., 2017; Breslow et

al., 2016; Donatuto et al., 2011; Scott 2012). While such efforts often adopt existing national and international standards for economic (such as jobs) and physical (such as drinking water pollution) wellbeing, some, like the Puget Sound Partnership, have launched specific efforts to identify more holistic, regionally appropriate metrics of human wellbeing.

Ecosystem Services and Human Wellbeing Monitoring in the Puget Sound

The Puget Sound basin lies in the northwestern United States of America. With 213.43km of coastline and home to almost five million people, it is a large and diverse social-ecological system (Rice et al., 2015). The basin includes mountain ranges peaking at over 4,000 metres, high value Douglas Fir (*Pseudotsuga menziesii*) forests, agricultural valleys, large urban centres (including Seattle and Tacoma), over twenty federally recognized tribal nations, and productive coasts where shellfish, salmon and orca whales thrive. Yet this ecosystem is said to be 'dying the death of a thousand cuts' (Thompson and Scigliano, 2003, p. 104) due to rapid population growth and its correlative shoreline development, increase in impervious surfaces and diversity of extractive uses.

In 2008, a Washington state agency, the Puget Sound Partnership [Partnership], was created to coordinate ecosystem recovery efforts. The Partnership's mandate included six social and ecological goals: protect species and food webs; habitat; water quality; water quantity; human populations; and human quality of life. The mandate also required that the agency develop indicators (called Vital Signs) to monitor, communicate and highlight how restoration strategies met these goals (Figure 16.1). The first Vital Signs to be developed addressed biophysical attributes of the ecosystem, such as endangered Chinook salmon and Southern Resident Killer Whales (orcas), marine water quality and freshwater flows, and shoreline armouring and onsite sewage systems. These Vital Signs were easy to monitor because they had numeric metrics with target magnitudes to be reached by 2020. Yet even after four years of creating the Partnership, the agency still had not identified Vital Sign indicators that measured the goals of human health and wellbeing.

The Partnership's attention to strictly biophysical indicators stemmed from the prevailing DPSIR model that staff and partners held when conceptualizing the ecosystem. Since human wellbeing was considered a passive outcome of improving ecosystem services, most scientists and planners assumed that by monitoring the ecosystem component they were addressing the two social objectives. A handful of social-science trained staff and partners recognized that this framing limited the suite of restoration options the Partnership considered, and that the more comprehensive perspective of SESs would greatly benefit the conversation and restoration strategy development. They

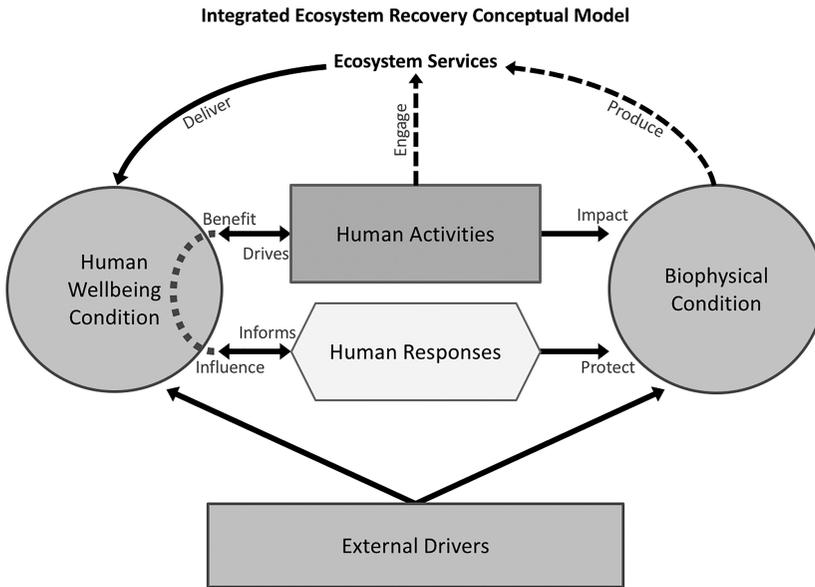


Source: Puget Sound Partnership (www.psp.wa.gov).

Figure 16.1 Vital signs wheel for monitoring biophysical and human wellbeing goals in Puget Sound restoration

created an Integrated Conceptual Model for Ecosystem Recovery that outlined and justified the myriad reasons for directly considering human wellbeing as an objective, rather than simply the outcome of biophysical restoration (Biedenweg et al., 2017) (Figure 16.2). This model mimicked ones published in the academic literature (such as Collins et al., 2011) but was specific to the region in its examples.

With this Puget Sound specific SES model as a foundation, it became clearer that the region needed explicit human wellbeing indicators to both guide creative strategy development that would mitigate existing pressures and to monitor the social impact of restoration activities. The lead author of



Source: Biedenweg et al. (2017).

Figure 16.2 Social ecological conceptual model of Puget Sound restoration

this chapter implemented a participatory research process with Partnership staff to develop these indicators (Biedenweg, 2016). The process resulted in the adoption of eight new human health and quality of life Vital Signs: Air Quality, Drinking Water, Local Foods, Outdoor Activity, Cultural Wellbeing, Economic Vitality, Sense of Place and Good Governance (Stiles et al., 2015). Due to the structure of the Vital Sign reporting system, the indicators for each of these were measured with quantitative metrics. This made sense for Air Quality and Drinking Water, which both have set federal standards for maximum acceptable contamination levels. However, quantitative indicators of the more qualitative attributes of human wellbeing, such as Sense of Place, could inadequately capture the status of these Vital Signs. That said, the ability to represent the trends of these diverse attributes of human wellbeing as related to Puget Sound ecosystem restoration received substantial support from the community and policymakers. Managers now had ways to communicate the importance of restoration strategies that better align with what residents care about. They were able to make better strategic decisions that incorporate

considerations of social and ecological trade-offs. And their evaluation of ecosystem restoration strategies could address the remaining two of the six state mandated goals: human health and human wellbeing.

PUBLIC HEALTH AND GREEN SPACES: HEALTHY PARKS, HEALTHY PEOPLE INITIATIVES

Research and teaching in environmental health have centred on hazardous effects of environmental exposures...However, some kinds of environmental exposures may have positive effects. (Frumkin, 2001, p. 234)

The World Health Organization in 1950 defined health as ‘a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity’ (National Academies of Sciences, 2001, p. 11). When this definition was developed, the subfield of environmental health did not yet exist. This changed in the late 1900s, after the publication Rachel Carson’s *Silent Spring* in 1962 and the Cuyahoga River fire of 1969 in the USA stimulated recognition that human actions were negatively impacting natural environments, and the degraded environment in turn affected human health. Sweeping international policies arose to regulate human actions, especially in reference to drinking water and air quality (National Academies of Sciences, 2001). In the USA, the regulation and enforcement of these policies was placed in environmental protection agencies that were dominated by natural scientists who had limited understanding of the motivations for human behaviours (Kotchian, 1997). While public health agencies focused on epidemiology and medical practices, environmental protection agencies regulated human interactions with nature to protect ecological health. A recent paradigm shift, however, has linked environmental and public health agencies to embrace public interaction with healthy natural environments as a ‘treatment’ that would both enhance human wellbeing and motivate environmental protection (Hartig et al., 2014; Frumkin et al., 2017).

Frameworks of Public and Environmental Health

Public health as an institution did not formally exist in the USA and England until the late nineteenth century, when federal, and eventually state agencies, focused on communicable disease vaccinations, provision of water and sewer services, food protection legislation, and housing reform (Kotchian, 1997; Institute of Medicine, 1988). These early years of public health focused on protecting people from negative interactions with the environment, perceiving it as a source of infectious disease, extreme weather, and geological events that sicken and kill people (Hartig et al., 2014). Environmental health emerged as

a subfield of public health in the late twentieth century specifically to protect ‘against environmental factors that may adversely impact human health or the ecological balances essential to long term human health and environmental quality, whether in the natural or human-made environment’ (Gordon, 1993, p. 28). According to Frumkin (2001), these efforts demonstrate a framework of public health that prioritized healing an ailing body over enabling the conditions for humans to thrive in the first place (Frumkin, 2001).

In the twenty-first century, however, there was an exponential increase in the number of peer-reviewed publications devoted to identifying, measuring, and understanding the positive links between human health and the natural environment (Hartig et al., 2014). This growing interest in re-uniting public and environmental health was attributed to various factors, including an ‘epidemiologic transition to chronic, lifestyle-related diseases as the major causes of mortality’ that identified biopsychosocial factors as more predictive than biomedical factors (Hartig et al., 2014, p. 209). For example, sedentary, urban lifestyles increasingly removed people from natural opportunities for physical activity, leading to obesity.

The growing knowledge of public health benefits associated with contact with the natural environment have been summarized in a handful of review papers (Maller et al., 2005; Bowler et al., 2010; Hartig et al., 2014; Kuo, 2015; Seymour, 2016; and see Gittins et al., Chapter 13 this volume) and agency efforts (for example, the US Environmental Protection Agency’s *EnviroAtlas*). Contact with the natural environment can reduce stress, anxiety, depression, aggression, ADHD, blood pressure, obesity, diabetes, and mortality; and improve sleep, happiness, postoperative recovery, birth outcomes, congestive heart failure, child development, and pain control, among many other factors (Frumkin et al., 2017). While this new ‘environment-positive’ paradigm in public health has identified correlative relationships between outdoor exposure and health indicators, scientists are not sure of the mechanisms by which nature benefits these health outcomes, nor the magnitude and dosage of outdoor contact required. Moreover, scientists and public health officials are not sure how to guarantee that people will adopt proposed nature-based interventions (Frumkin et al., 2017). Nevertheless, public health professionals ultimately believe that achieving the benefits of outdoor engagement depends on people adopting new behaviours. One of these is simply to spend time in outdoor parks.

Healthy Parks, Healthy People, South Australia

Healthy Parks, Healthy People [HPHP] programmes aim to meet the diversity of government priorities (such as tourism, health costs, climate change impacts, and childhood development) through investment in park accessibility,

use and the communication of health benefits associated with outdoor activity. Unlike the Puget Sound Partnership example, where the coordinating agency had a mandate to reverse and prevent environmental degradation, the HPHP programme in South Australia is a joint strategy between the Ministries of Health and Sustainability, Environment and Conservation as a ‘nature-based approach for population health’ (Government of South Australia, 2016). This initiative found its philosophical home in the outdoor recreation and leisure literature as compared to the social-ecological system literature of the Partnership and the development literature of *buen vivir*. Proponents of the approach referenced that contact with nature reduces diabetes, heart disease, mental health issues, obesity and vitamin D deficiencies, among other public health outcomes (Government of South Australia, 2016; Maller et al., 2005; Schmalz et al., 2013). They also identified the multiple benefits of partnering two types of agencies: those tasked with conserving the natural environment (parks) and those with ensuring public health (health).

Initially developed in 1999 by Australia’s Parks Victoria, the HPHP programme focused on building collaborative efforts between parks and health agencies, researching the benefits of nature contact in parks and sharing information through numerous publications and international congresses (Romagosa et al., 2015). Although it was initiated by an environmental protection agency, the dominant language in HPHP programmes was associated with individual and community health benefits. In its 2016 framework, the South Australia HPHP initiative defined its priorities as promoting physical activity in nature, increasing understanding of the natural environment’s contribution to aboriginal health and wellbeing, mitigating potential human impacts of climate change, encouraging nature benefits on childhood development, investing in green infrastructure in urban settings and contributing to biodiversity conservation (Government of South Australia, 2016) (Box 16.2).

BOX 16.2 SEVEN PILLARS OF HEALTHY PARKS, HEALTHY PEOPLE IN SOUTH AUSTRALIA

- Promoting Physical Activity in Nature
- Mental Health Benefits and Contact with Nature
- Promoting the cultural value of Country for Aboriginal health and wellbeing
- Community health and wellbeing in a changing climate
- Childhood development in nature
- Green infrastructure in urban settings
- Biodiversity, conservation, and human health

The designers of HPHP acknowledged that public health concerns required integrated strategies to address the multifaceted causes of chronic disease plaguing industrialized countries (Senior and Townsend, 2005; Maller et al., 2005). In their perspective, national and state-supported nature-based efforts were the primary option to tackle the diverse factors influencing public health: sedentary lifestyles, aging populations, declining social capital and increased gaps in access to resources across socio-economic groups. The national and state-sponsored aspect was crucial, as coordinated approaches in public management agencies had historically been rare, a pattern not unique to Australia.

The Australian initiative started a wave of similar efforts globally, including Healthy By Nature in Canada (2006); Healthy Parks, Healthy People US (2010); and Health and Protected Areas in Spain (2013) (Romagosa et al., 2015). The National Park System in the USA identified guiding design principles to ensure national parks contributed to human health (Schmalz et al., 2013; Thomsen et al., 2013). These included committing to increased accessibility, healthy food and beverage services and investing in internal programmes to improve the public health of agency workers themselves. While these programmes continued to grow and expand, their supporters also noted the dearth of research specific to parks and protected areas (as opposed to nature in general) needed to justify government investment and improve the relevancy of services (Romagosa et al., 2015; Lemieux et al., 2015). Australian researchers continued to study diverse connections between humans and parks, with a specific focus on social capital (Senior and Townsend, 2005) and mental health (Government of South Australia, 2017). Meanwhile, some doctors already prescribed time in nature to patients based on educational and marketing outreach of these HPHP programmes (Seltenrich, 2015).

Similar to the conservation and development paradigm shift, the efforts to design and market natural spaces for human health changed the debate from 'parks vs. people' to 'parks and people'. By creating and promoting spaces that supported human wellbeing, both the natural environment and the human environment could be restored and protected. Moreover, the linking of these prior distinct outcomes through a singular mechanism created the opportunity for collaboration across government institutions, promoting greater efficiency and creativity in addressing public concerns.

CONCLUSION

As with the conceptualizations of human wellbeing, the motivations and methods for integrating wellbeing with environmental management are highly diverse. But a trend is clear. Governments, scientists and non-profit organizations are acting on a progressive worldview that social systems are inextricably

a part of natural ecosystems. As such, any contribution to one will require an action or reaction to the other.

In this chapter we have explored how the patterns for integrating human and ecological goals in environmental management vary based on the philosophical foundation initiating the effort. In the tropics, the combination of human wellbeing and conservation objectives has been largely driven by an international development narrative around environmental justice and conventional alternatives, including capabilities (such as *buen vivir*). In western countries, the linking of healthy human populations and healthy ecosystems is a response to the segregated Public Health and Environmental Management institutions. At times, the initiatives are driven by a more efficient way to restore environments and obtain public support for their management (such as in the Puget Sound). Other times, the initiatives are more driven by getting people to use green spaces for leisure (such as Healthy Parks Healthy People initiatives). Both are responses to the inefficiencies of a singular perspective, adopting a more collaborative approach to public policy. Interestingly, the integration of human wellbeing and environmental management in all three case studies was initiated by the environment-focused field. And although each of these examples derives from unique theoretical and practical frameworks, they all landed on the justification that such a focus would establish healthier social and ecological systems. We foresee the continuation of this integration as validating and enhancing our understanding of multi-dimensional human wellbeing while re-connecting the field of environmental management to its social roots.

REFERENCES

- Abelson, A., B.S. Halpern, D.C. Reed, R.J. Orth, G.A. Kendrick, M.W. Beck, J. Belmaker, G. Krause, G.J. Edgar, L. Airoidi, E. Brokovich, R. France, N. Shashar, A. de Blaeij, N. Stambler, P. Salameh, M. Shechter and P.A. Nelson (2016), 'Upgrading marine ecosystem restoration using ecological-social concepts', *BioScience*, **66** (2), 156–163.
- Adams, W.M. and J. Hutton (2007), 'People, parks and poverty: Political ecology and biodiversity conservation', *Conservation and Society*, **5** (2), 147–183.
- Alexandrova, A. (2014), 'Well-being', in N. Cartwright and E. Montuschi (eds), *Philosophy of Social Science: A New Introduction*, Oxford, UK: Oxford University Press, pp. 9–30.
- Ban, N.C., M. Mills, J. Tam, C. Hicks, S. Klain, N. Stoeckl, M. Bottrill, J. Levine, R. Pressey, T. Satterfield and K. Chan (2013), 'A social-ecological approach to conservation planning: Embedding social considerations', *Frontiers in Ecology and the Environment*, **11** (4), 194–202.
- Basiago, A.D. (1999), 'Economic, social, and environmental sustainability in development theory and urban planning practice', *The Environmentalist*, **19**, 145–161.

- Berkes, F., J. Colding and C. Folke (2003), *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*, Cambridge, UK: Cambridge University Press.
- Biedenweg, K. (2016), 'A comparative study of human well-being indicators across three Puget Sound regions', *Society & Natural Resources*, **30** (3), 362–376.
- Biedenweg, K., H. Harguth and K. Stiles (2017), 'The science and politics of human wellbeing: A case study of co-creating indicators for Puget Sound restoration', *Ecology and Society*, **22** (3), 11.
- Blom, B., T. Sunderland and D. Murdiyarso (2010), 'Getting REDD to work locally: Lessons learned from integrated conservation and development projects', *Environmental Science & Policy*, **13**, 164–172.
- Bockstael, E. and F. Berkes (2017), 'Using the capability approach to analyze contemporary environmental governance challenges in coastal Brazil', *International Journal of the Commons*, **11** (2), 799–822.
- Bowler, D., L.M. Buyung-Ali, T.M. Knight and A.S. Pullin (2010), 'A systematic review of evidence for the added benefits to health of exposure to natural environments', *BioMed Central Public Health*, **10**, 456.
- Breslow, S.J., B. Sojka, R. Barnea, X. Basurto, C. Carothers, S. Charnley, S. Coulthard, N. Dosak, J. Donatuto, C. Garcia-Quijano, C.C. Hicks, A. Levine, M.B. Mascia, K. Norman, M. Poe, T. Satterfield, K. St. Martin and P. Levin (2016), 'Conceptualizing and operationalizing human wellbeing for ecosystem assessment and management', *Environmental Science & Policy*, **66**, 250–259.
- Brockington, D. and D. Wilkie (2015), 'Protected areas and poverty, Philosophical Transactions of the Royal Society of London', *Series B, Biological Sciences*, **370**, 1681.
- Chan, K., T. Satterfield and J. Goldstein (2012), 'Rethinking ecosystem services to better address and navigate cultural values', *Ecological Economics*, **74**, 8–18.
- Colby, M.E. (1989), 'The evolution of paradigms of environmental management in development', discussion paper produced for The World Bank, Strategic Planning and Review Department, Washington DC.
- Colby, M.E. (1991), 'Environmental management in development: The evolution of paradigms', *Ecological Economics*, **3** (3), 193–213.
- Collins, S.L., S.R. Carpenter, S.M. Swinton, D.E. Orenstein, D.L. Childers, T.L. Gragson, N.B. Grimm, J.M. Grove, S.L. Harlan, J.P. Kaye, A.K. Knapp, G.P. Kofinas, J.J. Magnuson, W.H. McDowell, J.M. Melack, L.A. Ogden, G.P. Robertson, M.D. Smith and A.C. Whitmer (2011), 'An integrated conceptual framework for long-term social-ecological research', *Frontiers in Ecology and the Environment*, **9** (6), 351–357.
- Costanza, R., R. d'Arge, R. de Groot et al. (1997), 'The value of the world's ecosystem services and natural capital', *Nature*, **387**, 253–260. <https://doi.org/10.1038/387253a0>.
- Daily, G. (1997), *Nature's Services: Societal Dependence on Natural Ecosystems*, Washington, DC: Island Press.
- Dasgupta, P. (2001), *Human Well-Being and the Natural Environment*, Oxford, UK: Oxford University Press.
- Donatuto, J.L., T.A. Satterfield and R. Gregory (2011), 'Poisoning the body to nourish the soul: Prioritizing health risks and impacts in a Native American community', *Health, Risk and Society*, **13** (2):103–127.
- Du Pisani, J.A. (2006), 'Sustainable development – historical roots of the concept', *Environmental Sciences*, **3** (2), 83–96.

- Frumkin, H. (2001), 'Beyond toxicity: Human health and the natural environment', *American Journal of Preventative Medicine*, **20** (3), 234–240.
- Frumkin, H., G.N. Bratman, S.J. Breslow, B. Cochran, P.H. Kahn Jr., J.J. Lawler, P.S. Levin, P.S. Tandon, U. Varanasi, K.L. Wolf and S.A. Wood (2017), 'Nature contact and human health: A research agenda', *Environmental Health Perspectives*, **125** (7), 075001-1.
- Gann, G.D. and D. Lamb (2006), *Ecological Restoration: A Mean of Conserving Biodiversity and Sustaining Livelihoods*, Tucson, Arizona: Society for Ecological Restoration International.
- Ghatak, M. (2018), 'Measures of development – concepts, causality, and context', in P. Ray, R. Sarkar and A. Sen (eds), *Economics, Management and Sustainability*, Singapore: Springer Nature, pp. 3–11.
- Gordon, L.J. (1993), 'The future of environmental health, part 1', *Journal of Environmental Health*, **55**, 28–32.
- Government of South Australia (2016), Healthy Parks Healthy People South Australia (2016–2021): Making contact with nature, second nature. State of South Australia.
- Government of South Australia (2017), Connecting Nature and Parks to Mental Health Promotion and Mental Illness Prevention Strategies in South Australia. Discussion Paper prepared for by the Department for Health and Ageing and the Department of Environment, Water and Natural Resources, accessed 5 March 2021 at https://www.environment.sa.gov.au/files/sharedassets/public/park_management/healthy-parks-healthy-people-discussion-paper-gen.pdf.
- Gudynas, E. (2015), 'Buen vivir', in G. D'Alisa, F. Demaria and G. Kallis (eds), *Degrowth: A Vocabulary for a New Era*, New York: Routledge, pp. 201–204.
- Guerrero, A.M., N.J. Bennett, K.A. Wilson, N. Carter, D. Gill, M. Mills, C.D. Ives, M.J. Selinske, C. Larrosa, S. Bekessy, F.A. Januchowski-Hartley, H. Travers, C.A. Wyborn and A. Nuno (2018), 'Achieving the promise of integration in social-ecological research: A review and prospectus', *Ecology and Society*, **23** (3), art. 38.
- Haque, M.S. (1999), 'The fate of sustainable development under neo-liberal regimes in developing countries', *International Political Science Review*, **20** (2), 197–218.
- Hartig, T., R. Mitchell, S. de Vries and H. Frumkin (2014), 'Nature and health', *Annual Review of Public Health*, **35**, 207–228.
- Hollender, R. (2015), 'Post-growth in the Global South: The emergence of alternatives to development in Latin America', *Socialism and Democracy*, **29** (1), 73–101.
- Hoogvelt, A. (2001), *Globalization and the Postcolonial World: The New Political Economy of Development*, 2nd edition, Baltimore, MD: The John Hopkins University Press.
- Institute of Medicine (1988), *The Future of Public Health*, Washington, DC: The National Academies Press. <https://doi.org/10.17226/1091>.
- Kauffman, C.M. and P.L. Martin (2014), 'Scaling up buen vivir: Globalizing local environmental governance from Ecuador', *Global Environmental Politics*, **14** (1), 40–58.
- Kotchian, S. (1997), 'Perspectives on the place of environmental health and protection in public health and public health agencies', *Annual Review of Public Health*, **18**, 245–259.
- Kuo, M. (2015), 'How might contact with nature promote human health? Promising mechanisms and a possible central pathway', *Frontiers in Psychology*, **6**, 1093.

- Leisher, C., L.H. Samberg, P. Van Beukering and M. Sanjayan (2013), 'Focal areas for measuring the human well-being impacts of a conservation initiation', *Sustainability*, **5**, 997–1010.
- Lemieux, C.J., S.T. Doherty, P.F.J. Eagles, J. Gould, G.T. Hvenegaard, E. Nisbet et al. (2015), *Healthy Outside–Healthy Inside: The Human Health and Well-Being Benefits of Alberta's Protected Areas – Towards a Benefits-Based Management Agenda*, Ottawa, Canada: CCEA Secretariat. Available at: ccea.org.
- Leslie, H.M., X. Basurto, M. Nenadovic, L. Sievanen, K.C. Cavanaugh, J.J. Cota-Nieto, B.E. Erisman, E. Finkbeiner, G. Hinojosa-Arango, M. Moreno-Báez, S. Nagavarapu, S.M.W. Reddy, A. Sánchez-Rodríguez, K. Siegel, J.J. Ulibarria-Valenzuela, A.H. Weaver and O. Aburto-Oropeza (2015), 'Operationalizing the social-ecological systems framework to assess sustainability', *PNAS*, **11** (19), 5979–5984.
- Liu, J., T. Dietz, S.R. Carpenter, M. Alberti, C. Folke, E. Moran, A.N. Pell, P. Deadman, T. Kratz, J. Lubchenco, E. Ostrom, Z. Ouyang, W. Provencher, C.L. Redman, S.H. Schneider and W.W. Taylor (2007), 'Complexity of coupled human and natural systems', *Science*, **317**, 1513–1516.
- Maller, C., M. Townsend, A. Pryor, P. Brown and L. St Leger (2005), 'Healthy nature healthy people: 'Contact with nature' as an upstream health promotion intervention for populations', *Health Promotion International*, **21** (1), 45–54.
- Merino, R. (2016), 'An alternative to "alternative development"?: Buen vivir in human development in Andean countries', *Oxford Development Studies*, **44** (3), 271–286.
- Millennium Ecosystem Assessment (MA) (2005), *Ecosystems and Human Well-being: General Report*, Washington, DC: Island Press.
- Minteer, B.A. and T.R. Miller (2011), 'The new conservation debate: Ethical foundations, strategic trade-offs, and policy opportunities', *Biological Conservation*, **144**, 945–947.
- Muralikrishna, I.V. and V. Manickam (2017), *Environmental Management: Science and Engineering for Industry*, Oxford, UK: Butterworth-Heinemann.
- National Academies of Sciences (2001), *Rebuilding the Unity of Health and the Environment: A New Vision of Environmental Health for the 21st Century*, National Academies Press (US).
- Osborne, T., L. Bellante and N. vonHedemann (2014), 'Indigenous peoples and REDD+: A critical perspective', Cusco, Peru: report produced for Indigenous Peoples' Biocultural Climate Change Assessment Initiative.
- Partelow, S. (2018), 'A review of the social-ecological systems framework: Applications, methods, modifications, and challenges', *Ecology and Society*, **23** (4), 36.
- Peeters, W., J. Dirix and S. Sterckx (2015), 'The capabilities approach and environmental sustainability: The case for functioning constraints', *Environmental Values*, **24** (63), 367–389.
- Piertari, K. (2016), 'Ecuador's constitutional rights of nature: Implementation, impacts, and lessons learned', *Willamette Environmental Law Journal*, **5**, 37–94.
- Pieterse, J.N. (2010), *Development Theory: Deconstructions/Reconstructions*, Los Angeles, CA: Sage.
- Republic of Ecuador (2010), National Plan for Good Living 2009–2013, accessed 25 September 2019 at <http://www.planificacion.gob.ec/wp-content/uploads/downloads/2016/03/Plan-Nacional-Buen-Vivir-2009-2013-Ingles.pdf>.
- Rice, J., J. Baker, K. Biedenweg, P. Christie, T. Francis, J. Gaydos, P. MacCready, C. Milesi, C. Simenstad, A. Snover and K. Symer (eds) (2015), Puget Sound Fact Book, version 3.1 (p. 124). Tacoma, WA: Encyclopedia of Puget Sound, University of Washington Puget Sound Institute.

- Roberts, J.T. and A. Hite (2000), 'Introduction', in J.T. Roberts and A. Hite (eds), *From Modernization to Globalization*, Malden, MA: Blackwell Publishers, pp. 1–24.
- Romagosa, F., P.F.J. Eagles and C.J. Lemieux (2015), 'From the inside out to the outside in: Exploring the role of parks and protected areas of providers of human health and well-being', *Journal of Outdoor Recreation and Tourism*, **10**, 70–77.
- Rostow, W.W. (1960), 'The stages of economic growth: A non-communist manifesto', reprinted in J.T. Roberts and A. Hite (eds) (2000), *From Modernization to Globalization*, Malden, MA: Blackwell Publishers.
- Scarlato, M. (2013), 'Social enterprise, capabilities and development paradigms: Lessons from Ecuador', *Journal of Development Studies*, **43** (9), 1270–1283.
- Schmalz, D., J. Hallo, S. Griffin, M. Kisch and M. Arce. (2013), 'Development of a Healthy Parks Healthy People strategic action plan for Hot Springs National Park', *Park Science*, **30** (2), 37–43.
- Scott, K. (2012), *Measuring Wellbeing: Towards Sustainability?* New York, NY: Routledge Press.
- Seltenrich, N. (2015), 'Just what the doctor ordered: Using parks to improve children's health', *Environmental Health Perspectives*, **123** (10), A255–A259.
- Sen, A. (2003), 'Development as capability expansion', in S. Fukuda-Parr, A.K. Shiva Kumar and A. Sen (eds), *Readings in Human Development*, Oxford, UK: Oxford University Press, pp. 3–16.
- Senior, J. and M. Townsend (2005), 'Healthy Parks, Healthy People and other social capital initiatives of Parks Victoria, Australia', in Ted Trzyna (ed.), *The Urban Imperative*, Sacramento, CA: California Institute of Public Affairs, pp. 111–121.
- Seymour, V. (2016), 'The human–nature relationship and its impact on health: A critical review', *Frontiers in Public Health*, **4**, 260.
- Sikkema, S.W. (2018), 'The capability approach as an account of minimal well-being that does justice to indigenous peoples', thesis, Utrecht University, 13 August.
- Soulé, M. (2013), 'The new conservation', *Conservation Biology*, **27** (5), 895–897.
- Stiles, K., K. Biedenweg, K. Wellman, L. Kintner and D. Ward (2015), Human wellbeing vital signs and indicators for Puget Sound recovery: A technical memorandum to the Puget Sound Partnership, Tacoma, WA: Puget Sound Partnership.
- Sutcliffe, B. ([2000] 1995), 'Development after ecology', in J. Timmons Roberts and A. Hite (eds), *From Modernization to Globalization: Perspectives on Development and Social Science*, Oxford: Blackwell Publishers, pp. 328–339.
- Thompson, T. and E. Scigliano (2003), *Puget Sound: Sea Between the Mountains*, Portland, OR: Graphic Arts Books.
- Thomsen, J.M., R.B. Powell and D. Allen. (2013), 'Park health resources: Benefits, values, and implications', *Park Science*, **30** (2), 30–36.
- United National Environment Programme (UNEP) (n.d.), accessed September 2019 at <https://www.unenvironment.org/about-un-environment>.
- US EPA (2018), Our mission and what we do, accessed 10 June 2020 at <https://www.epa.gov/aboutepa/our-mission-and-what-we-do>.
- Vanhulst, J. and A.E. Beling (2014), 'Buen vivir: Emergent discourse within or beyond sustainable development', *Ecological Economics*, **101**, 54–63.
- Villalba, U. (2013), 'Buen vivir vs development: A paradigm shift in the Andes?', *Third World Quarterly*, **34** (8), 1427–1442.
- Wallerstein, I. (1987), *The Capitalist World-Economy*, Cambridge, UK: Cambridge University Press.
- Wolanski, E. and M. Elliott (2015), *Estuarine Ecohydrology: An Introduction*, Amsterdam: Elsevier.

Yee, S.H., P. Bradley, W.S. Fisher, S.D. Perreault, J. Quackenboss, E.D. Johnson, J. Bousquin and P.A. Murphy (2012), 'Integrating human health and environmental health into the DPSIR framework: A tool to identify research opportunities for sustainable and healthy communities', *EcoHealth*, **9**, 411–426.