



CIEEM



Defining and assessing human wellbeing

What the science says

Biodiversity Net Gain and People's Wellbeing / October 2021

www.cieem.net



CONTENTS

	Summary	3
1.	Biodiversity Net Gain and Wellbeing	4
2.	Scoping Study	4
3.	This Report	5
4.	Timeline	6
5.	How is Wellbeing Defined?	8
6.	What Methods Are Used to Assess wellbeing?	9
7.	Insights into Assessing Impacts on People's Wellbeing from Biodiversity Net Gain	12
8.	Appendix A: Project Team and Technical Advisory Panel	14 15
9.	Appendix B: Examples of Wellbeing Assessments	



Summary

Biodiversity Net Gain (BNG) could transform how we finance, design, build and operate development, with the UK's Good Practice Principles providing an approach that supports developers to generate long-term, measurable, and meaningful net benefits for biodiversity¹. But while we are making progress towards this goal, it is important to remain mindful of the connection between biodiversity and people's wellbeing.

The UK's BNG Good Practice Principles involve sharing the benefits fairly among stakeholders and achieving an overall gain in the services that ecosystems provide. However, the principles do not explicitly state that BNG should avoid detrimental impacts on people, in other words they lack the "do no harm" principle adopted internationally for sustainable development². Neither do they link BNG to wellbeing, for the social impacts of BNG to be considered in a holistic way that fully understands and addresses how people's wellbeing is affected by BNG within the wider context of sustainable development.

With funding from the Esmée Fairbairn Foundation, CIEEM, in collaboration with Balfour Beatty, the University of Oxford, and Wild Business Ltd, undertook a scoping study to determine whether, and, if so, how, wellbeing should be incorporated more directly into the UK's BNG Good Practice Principles. The aim of incorporating wellbeing into BNG good practice is for development projects to achieve BNG in ways that "do no harm" to people's wellbeing and, where possible, enhance wellbeing. This report describes how wellbeing is defined and assessed within the academic literature. It presents examples of wellbeing definitions and assessment methods, with the aim of drawing on the wealth of knowledge within academia for insights into how wellbeing might be applied to the development context of BNG.

Wellbeing definitions

We reviewed definitions of wellbeing within the scientific literature and summarised themes that we considered were most apparent, together with indicators often used to assess these themes. The themes and indicators are:

Wellbeing themes	Definition	Indicators
Material	Access to the material assets needed to live a good life	e.g. income and wealth, jobs and earnings, housing, food
Health	Quality and performance of people's physical and mental functioning	e.g. energy level, fitness, mental and physical health, nutritional balance
Functioning well	People's activities in their daily life and ability to undertake them	e.g. achievement, leisure, learning, role, recreation, creativity
Mental & emotional	People's feelings and thoughts about their quality of life	e.g. anxiety, autonomy, optimism, life satisfaction, pleasure, hope
Spiritual	People's sense of life-meaning and purpose	e.g. feelings of connectedness to nature, faith and belief
Relational	People's connections to others, the local community, to the wider world	e.g. family, community, partner relations, social support

¹ CIEEM, CIRIA, IEMA (2016) Biodiversity Net Gain Good Practice Principles for Development. UK

² The "do no harm" principle of sustainable development is to avoid or mitigate impacts that create or exacerbate poverty, or that undermine the resilience of people or communities. In recent years, international sustainable development has adopted a "do good" agenda of actively working to improve human livelihoods and wellbeing.

Wellbeing assessments

There are many methods to assess wellbeing within the scientific literature. Commonly applied methods include interviews, focus group discussions and questionnaires. Some are 'top-down' and already contain a set list of questions, for example the Public Health Surveillance Wellbeing Scale. Others are 'bottom-up' approaches whereby users can develop locally-specific wellbeing indicators based on local priorities, for example the Quality of Life Survey. Several wellbeing assessments are presented in detail in this report, with references for more information. Then drawing on the wealth of knowledge within the scientific literature on wellbeing, we give insights into how impacts on wellbeing from BNG might be assessed. While these are only insights, the aim is to prompt further discussion especially on how wellbeing can be better incorporated into existing social impact assessments for developments, and how the principle of proportionality can be applied.

1. Biodiversity Net Gain and Wellbeing

Biodiversity Net Gain (BNG) could transform how we finance, design, build and operate development, with the UK's Good Practice Principles providing an approach that supports developers to generate long-term, measurable, and meaningful net benefits for biodiversity³. But while we are making progress towards this goal, it is important to remain mindful of the connection between biodiversity and people's wellbeing.

BNG can benefit people directly, for example when communities enjoy high quality natural surroundings either by BNG being achieved within the development footprint or when a biodiversity offset increases people's access to, or views of, nature. Indirectly, BNG has a wider societal benefit through enhancing the natural environment for everyone, and people can benefit from simply knowing there has been a net gain of biodiversity from a development. But poorly designed BNG can be detrimental to people's wellbeing, restricting access to nature within a development site, for example, without adequate alternative provision.

International principles were published to address the social impacts of No Net Loss (NNL) and BNG in depth (Bull *et al*, 2018⁴). These 'People Principles' set an outcome for NNL/BNG projects to achieve, as follows:

"People perceive the components of their wellbeing affected by biodiversity losses and gains to be at least as good as a result of the development project and associated biodiversity NNL/NG activities, than if the development had not been implemented."

Wellbeing is defined as a positive physical, social, and mental state, and these international 'People Principles' for BNG focus on wellbeing related to biodiversity. Their application involves measuring change to people's wellbeing that is caused by losses and gains in biodiversity from a development and its BNG activities, and then making sure that this change is positive through an inclusive approach to planning BNG activities to support the wellbeing of affected people.

The UK's BNG Good Practice Principles involve sharing the benefits fairly among stakeholders and achieving an overall gain in the services that ecosystems provide⁵. However, the principles do not explicitly state that BNG should avoid detrimental impacts on people, in other words they lack the "do no harm" principle adopted internationally for sustainable development⁶. Neither do they explicitly link BNG to wellbeing or consider the social impacts of BNG in a holistic way that fully understands and addresses how people's wellbeing is affected by BNG within the wider context of sustainable development

2. Scoping Study

With funding from the Esmée Fairbairn Foundation, CIEEM, in collaboration with Balfour Beatty, the University of Oxford, and Wild Business Ltd, undertook a scoping study to determine whether, and, if so, how, wellbeing should be incorporated more directly into UK's BNG Good Practice Principles.

³ CIEEM, CIRIA, IEMA (2016) Biodiversity Net Gain Good Practice Principles for Development. UK

⁴ [ensuring_no_net_loss_-_bull_et_al_2018.pdf \(iucn.org\)](#)

⁵ [Biodiversity Net Gain: Good Practice Principles for Development | CIEEM](#)

⁶ The "do no harm" principle of sustainable development is to avoid or mitigate impacts that create or exacerbate poverty, or that undermine the resilience of people or communities. In recent years, international sustainable development has adopted a "do good" agenda of actively working to improve human livelihoods and wellbeing.

The scoping study involved desk-based reviews and consultations that included webinars, an on-line questionnaire, interviews and focus group discussions. The study commenced during Autumn 2020 and was completed in Spring 2021. The project team was supported by a Technical Advisory Panel, with expertise from industry, academia, and government, who provided advice and feedback throughout. The team and Technical Advisory Panel members are listed in Appendix A.

The study findings are documented in the following reports:

Defining and assessing human wellbeing: what the science says	A literature review of how wellbeing is defined assessed within the academic literature
How do governments define wellbeing?	A literature review of how wellbeing is defined by international and UK governments and key organisations
Accounting for wellbeing within planning applications	A desk-based review of whether planning authorities in England require consideration of a development's impacts on people's wellbeing as part of a planning application
Biodiversity Net Gain and Wellbeing: consultation responses	A report on responses to this study's consultations on whether, and, if so, how, wellbeing should be incorporated more directly into UK industry's BNG Good Practice Principles
Biodiversity Net Gain and Wellbeing: core messages and recommendations	A summary of the core messages from all of the evidence gathered by this scoping study, together with the recommendations.

3. This Report

This report is the first output from the BNG and Wellbeing Scoping Study. It describes how wellbeing is defined and assessed within the academic literature. It presents examples of wellbeing definitions and assessment methods, with the aim to draw on the wealth of knowledge within academia for insights into how wellbeing might be applied to the development context of BNG within the UK.

The next sections of this report are:

Section 4: Timeline

The concept of wellbeing has been studied at length by researchers from various disciplines including health, psychology, and environmental sciences. We present a timeline of scientific publications on wellbeing, demonstrating the extent of information and data available.

Section 5: How is wellbeing defined?

We discuss the definitions of wellbeing within the academia literature, especially those developed for the health, psychology, and environmental disciplines.

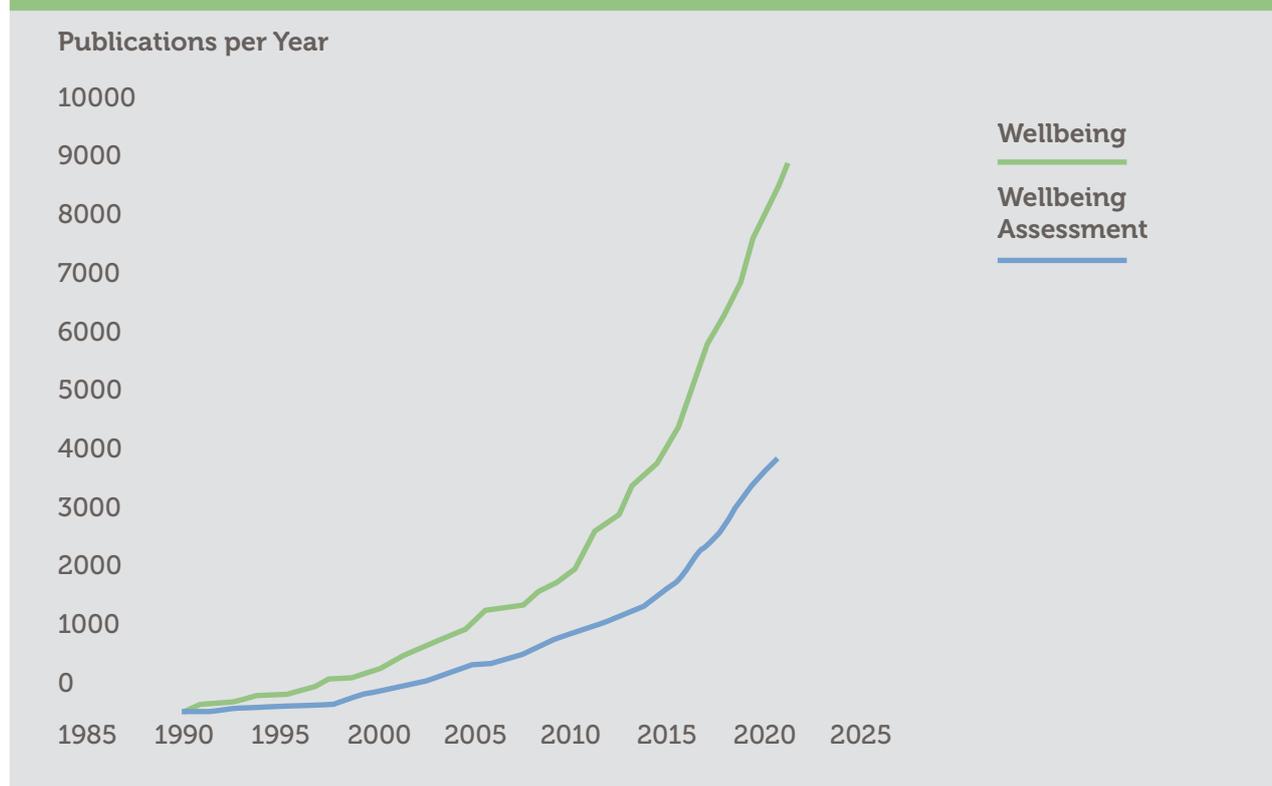
Section 6: How is wellbeing assessed?

We summarise research methods to assess and measure wellbeing, drawing out key points of relevance for impact assessments of development.

4. Timeline

The number of scientific publications on wellbeing has rapidly increased since 2000. While research on methods to assess wellbeing increased, there was a much sharper rise in research on the concept of wellbeing itself, especially from 2005 onwards (Figure 1). This illustrates the development of scientific knowledge on wellbeing over the last 20 years and the extent of knowledge now available for governments and industry to utilise.

Figure 1. Number of scientific publications on wellbeing since 1990⁷



Since 1990, most scientific publications on wellbeing have been within the psychology, health and environmental domains (Figure 2). As noted above, most of these studied the concept of wellbeing and this has resulted in the comprehensive understanding of wellbeing that underpins the definitions presented in Section 5. Around a third of publications focused on wellbeing assessments, and these either proposed new assessment methods or assessed the relevance of existing methods when applied to a specific context. These studies form the basis of the methods to assess wellbeing presented in Section 6.

⁷ Database: Web of Science

Figure 2. Publications on wellbeing and wellbeing assessments domain⁸

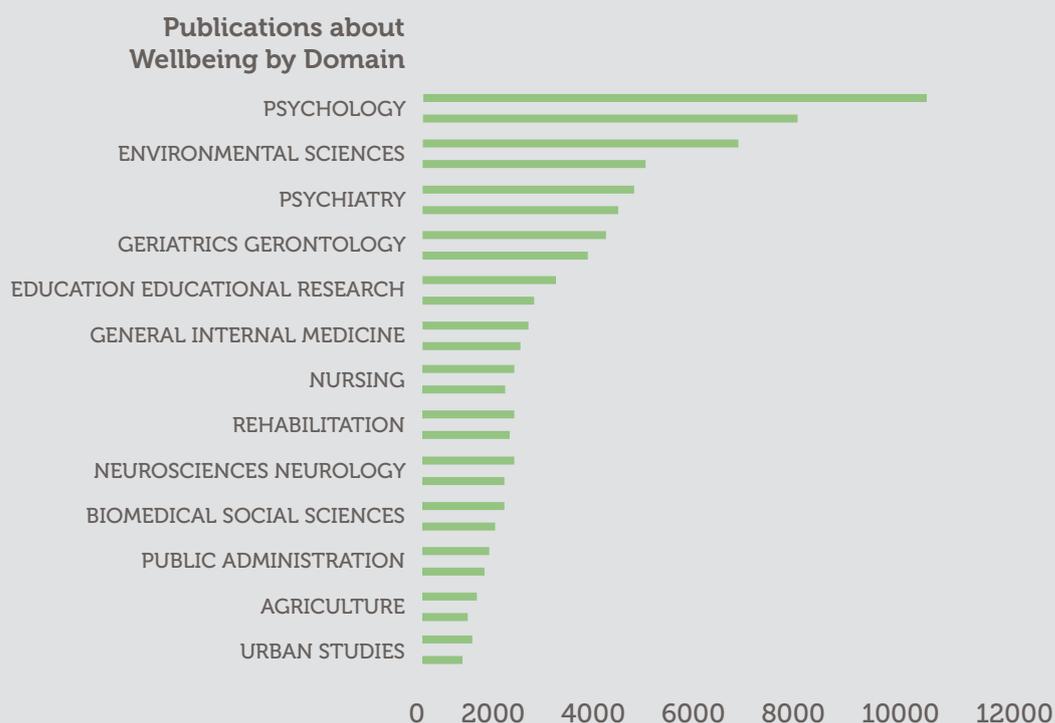
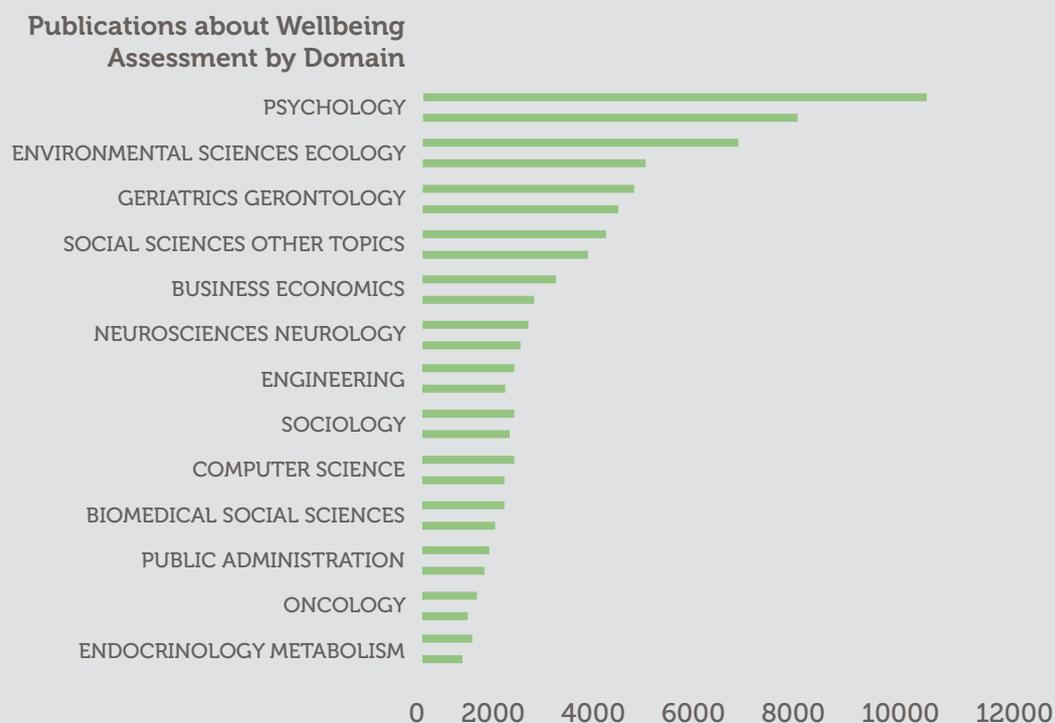


Figure 2. Publications on wellbeing and wellbeing assessments by domain



⁸ Database: Web of Science

4. How is wellbeing defined?

Definitions of wellbeing from the psychology, social and environmental domains can be broadly described as follows:

Psychology

In psychological studies, the definition of wellbeing comprises people's feelings and attitudes, as well as the undertaking of meaningful activities and self-actualisation (i.e. realising one's full potential; Adler & Seligman, 2016).

Social

Within social studies, wellbeing is defined as 'what a person has', 'what a person can do with what they have', and 'how they think about what they have and can do' (Gough & McGregor, 2007). Under this definition, in general, wellbeing goes up when a person's needs are met, when they are able to act meaningfully to pursue their goals, and when they enjoy a satisfactory quality of life. This definition has been translated into three components of wellbeing as: material, relational, and subjective wellbeing.

Environmental

In the environmental domain, the definition of wellbeing is similar to definitions in social studies, although it is closely linked with environmental components that underpin a person's wellbeing, e.g. the cultural and recreational value that people gain from nature. One example is from Breslow *et al* (2016) who described wellbeing as: a state of being with others and the environment, which arises when human needs are met, when individuals and communities can act meaningfully to pursue their goals, and when individuals and communities enjoy a satisfactory quality of life.

While each domain focuses on slightly different aspects of wellbeing, they all contain common themes. For this report, we have summarised the themes that we considered were most apparent within the literature, together with indicators often used to assess these themes. These are set out in Table 1. We also include specific examples of wellbeing definitions from the literature, which are listed in Table 2.

Table 1. Themes underpinning definitions of wellbeing from the literature

Wellbeing themes	Definition	Indicators
Material	Access to the material assets needed to live a good life	e.g. income and wealth, jobs and earnings, housing, food
Health	Quality and performance of people's physical and mental functioning	e.g. energy level, fitness, mental and physical health, nutritional balance
Functioning well	People's activities in their daily life and ability to undertake them	e.g. achievement, leisure, learning, role, recreation, creativity
Mental & emotional	People's feelings and thoughts about their quality of life	e.g. anxiety, autonomy, optimism, life satisfaction, pleasure, hope
Spiritual	People's sense of life-meaning and purpose	e.g. feelings of connectedness to nature, faith and belief
Relational	People's connections to others, the local community, to the wider world	e.g. family, community, partner relations, social support

Table 2. Examples of wellbeing definitions from published scientific literature

Field of study	Wellbeing Definition	Author(s)	Year	Domain
Psychology (and related)	People's positive evaluations of their lives, includes positive emotion, engagement, satisfaction, and meaning	Diener & Seligman	2004	Psychology
	Being at ease with oneself, having meaning and fulfilment, experiencing positive emotions, being resilient and belonging to a respectful community.	Campion & Nurse	2007	Psychiatry
	The combination of feeling good and functioning well.	Huppert	2009	Psychology/ Health
	A match between an individual's actual life and his or her ideal life.	Zou <i>et al.</i>	2013	Psychology/ Health
	The subjective psychological, physical and social experiences of individuals.	Caza & Wrzesniewski	2013	Psychology/ Health
Interdisciplinary social science	A combination of: "i. what a person has, ii. what a person can do with what they have, and iii. how they think about what they have and can do ... [It] can be conceived in terms of the interplay of i. the resources that a person is able to command; ii. what they are able to achieve with those resources, and in particular what needs and goals they are able to meet, and iii. the meaning that they give to the goals they achieve and the processes in which they engage."	Gough & McGregor	2007	Interdisciplinary Social Sciences
	The extent to which an individual is satisfied with his/her life, experiences a preponderance of positive affect, and possesses a healthy body and mind.	Giacalone & Promislo	2010	Business
	The satisfaction of individuals' preferences, as long as these are not immoral or illegal, ideally through market exchanges.	Schulz <i>et al.</i>	2017	Economics
	The underlying, intrinsically good, psychological and emotional state.	Clapham <i>et al.</i>	2018	Urban Studies
Environmental sciences/ecology	A state of being with others and the environment, which arises when human needs are met, when individuals and communities can act meaningfully to pursue their goals, and when individuals and communities enjoy a satisfactory quality of life.	Breslow <i>et al.</i>	2016	Environmental Sciences/ Ecology
	A state of life that is, overall, consistently believed to be good for a person or group of people, all things considered. It comprises the various activities and preferred end states that are believed to constitute a good form of life.	Wallace <i>et al.</i>	2020	Environmental Sciences/ Ecology

6. What methods are used to assess wellbeing?

6.1 Overview

There are many methods to assess wellbeing within the scientific literature. Here we summarise commonly applied methods to give an overview: this is a brief overview only with the aim of highlighting the methods that can be used to assess wellbeing. In Section 6.2 we present specific examples with references for more information. Applying these methods in practice should be undertaken by suitably qualified social professionals with full due diligence and careful planning given the sensitive nature of wellbeing.

In summary, commonly applied methods to assess wellbeing are:

Choose themes and associated indicators

A starting point to assess wellbeing can be to identify the themes of wellbeing (such as those listed in Table 1) that are most relevant for the assessment and people of the study area. The next step is to select indicators to represent each theme that are appropriate for the local context and on which it is practically possible to collect data. Objective indicators are normally quantitative, representing an external view of wellbeing that can be measured by external bodies, such as income, health, education, and accessibility to nature. Subjective indicators are more likely to be qualitative and represent internal perceptions of wellbeing such as sense of place or appreciation of aesthetic values. These are less easily fitted within the quantitative indices, and less easily combined into broad-scale aggregate values.

Choose interest groups

Often wellbeing assessments are based on groups of people with similar needs or priorities, for example dogwalkers, those with young families, elderly residents and nature-lovers. The selection of these interest groups is critical, as it is the framework for the wellbeing assessment. Selecting interest groups can be based on desk-based reviews of the study area and of communities living and working there, as well as insights from key informants.

Gain insights from key informants

Speaking with key informants can be helpful to understand the issues that are important to people's wellbeing in a study area. Their feedback can be used to refine the wellbeing themes and indicators being used for the assessment. Key informants can also help decide on the interest groups for the wellbeing assessment. When speaking with key informants, gathering views from a variety of informants is essential to obtain a balanced account and not one purely from a dominant perspective.

Host individual interviews

Interviews are an opportunity for individuals to voice their own needs and concerns about issues affecting their personal wellbeing and the wellbeing of their community. The interviews can include closed questions with quantitative elements (e.g. Likert scales that ask people to rate factors on a scale, for example from low to high), and open questions that enable deeper and more qualitative explorations of factors affecting wellbeing.

Host focus group discussions

These discussions are an efficient and useful way of obtaining a view on the group-level priorities and drivers of wellbeing. Focus groups can be interactive and include a range of methods for data-gathering, such as ranking or prioritising exercises. Alternatively, they can be open discussions with a facilitator guiding the group through the questions. Focus group discussions should be undertaken with representatives from different interest groups of the wellbeing assessment.

Conduct wellbeing questionnaires

Questionnaires can be in person, online or by post, and are used as an objective assessment that produces generalisable results from large sample sizes in an efficient manner. There now exists many wellbeing questionnaires and scales developed by researchers (see Appendix B for examples). However, while questionnaires generate useful information efficiently, it is important to place them in context: they do not enable more nuanced discussions on specific aspects of wellbeing. In this regard, questionnaires are best used in combination with other assessments.

6.2 Examples of wellbeing assessments

We present 14 wellbeing assessment methods that are examples of the many wellbeing assessments within the scientific literature. Table 3 provides a summary and Appendix B contains details of the assessment methods.

While these are only a few examples, they illustrate 'top-down' approaches i.e. those that already contain a set list of questions such as the Millennium Ecosystem Assessment and Organisation for Economic Co-operation and Development framework, and Public Health Surveillance Wellbeing Scale. Whereas others are 'bottom-up' approaches whereby users can develop locally-specific wellbeing indicators (and the associated questions) based on people's priorities and the local context, for example the Basic Necessities Survey and Quality of Life Survey.

Our examples also show assessments with a component of external validity (see methods 1 to 4 in Table 3), as well as wellbeing scales and questionnaires from psychology, health and interdisciplinary social sciences (methods 6 to 13 in Table 3). For example, the Oxford Happiness Questionnaire is a 29-item questionnaire that provides an in-depth assessment of mental wellbeing (i.e. one theme of wellbeing). In contrast, the Public Health Surveillance Wellbeing Scale is a 10-item scale that covers five different wellbeing themes.

The Subjective Wellbeing Indicators for Cultural Ecosystem Services Assessment is an example of how researchers

have used a structured wellbeing questionnaire to explore the relationship between wellbeing and ecosystem services. For example, it includes “I have made or strengthened bonds with others through visiting these [natural] sites”, providing a context-related indicator.

Table 6. Examples of Wellbeing Assessments within the Scientific Literature

Themes of Wellbeing													
	Wellbeing Assessment Method	Assessment Framework	Assessment Metrics	Assessment Tool	Originator	Year	Publication Domain	Material	Physical	Mental	Spiritual	Relational	Functioning
1	Voices of the Poor	Ö			Narayan <i>et al.</i>	2000	Interdisciplinary Social Sciences	Ö	Ö	Ö	Ö	Ö	Ö
2	Millennium Ecosystem Assessment	Ö			Reid <i>et al.</i>	2005	Environmental Sciences/ Ecology	Ö				Ö	Ö
3	OECD How's Life	Ö			OECD	2011	Interdisciplinary Social Sciences	Ö	Ö	Ö	Ö	Ö	Ö
4	WeD Framework, Resources and Needs Questionnaire & Quality of Life Survey	Ö	Ö	Ö	Gough & McGregor	2007	Interdisciplinary Social Sciences	Ö				Ö	Ö
5	Basic Necessities Survey			Ö	Davies	2007	Interdisciplinary Social Sciences	Ö					
6	Oxford Happiness Questionnaire	Ö	Ö	Ö	Hills & Argyle	2002	Psychology			Ö			
7	Social Production Function & SPF-IL Scale	Ö	Ö	Ö	Nieboer <i>et al.</i>	2005	Interdisciplinary Social Sciences		Ö	Ö		Ö	Ö
8	Warwick-Edinburgh Mental Wellbeing Scale	Ö	Ö	Ö	Tennant <i>et al.</i>	2007	Health			Ö			
9	Flourishing Scale	Ö	Ö	Ö	Diener <i>et al.</i>	2010	Interdisciplinary Social Sciences			Ö	Ö	Ö	
10	Questionnaire for Eudaimonic Wellbeing	Ö	Ö	Ö	Waterman <i>et al.</i>	2010	Psychology			Ö	Ö		
11	Public Health Surveillance Wellbeing Scale	Ö	Ö	Ö	Bann <i>et al.</i>	2012	Health		Ö	Ö	Ö	Ö	Ö
12	PERMA, PERMA-Profiler	Ö	Ö	Ö	Seligman; Butler & Kern	2012; 2016	Psychology/ Health			Ö	Ö		
13	Interpersonal, Community, Occupational, Physical, Psychological, and Economic (I COPPE) Scale	Ö	Ö	Ö	Prilleltensky <i>et al.</i>	2015	Psychology		Ö	Ö		Ö	Ö
14	Subjective Wellbeing Indicators for Cultural Ecosystem Services Assessment	Ö	Ö	Ö	Bryce <i>et al.</i>	2016	Environmental Sciences/ Ecology		Ö	Ö	Ö	Ö	Ö

5. Insights into assessing impacts on people's wellbeing from Biodiversity Net Gain

Sections 3 and 4 demonstrate the wealth of knowledge within the scientific literature on wellbeing, as well as the variety of assessment methods that exist. Here we provide insights into how wellbeing impacts from BNG might be assessed. These high-level insights only with the aim to provide a starting point for discussion.

Broadly speaking, some wellbeing themes are objective, such as the material and physical wellbeing themes, while others are subjective, including people's mental and spiritual wellbeing. When assessing wellbeing, distinguishing between themes that are externally valid and those that are internally valid is a useful starting point. Externally valid themes are generally comparable across places and times, such as income and health, and so are useful for decision-making by external bodies. Internally valid wellbeing themes are less comparable, including people's mental state when they experience natural surroundings. They are also likely to change over time and to vary between different interest groups and life stages. However, these less-tangible components of wellbeing are extremely important to people, and their inclusion within wellbeing assessments alongside more objective assessments is often critical.

Participatory approaches to wellbeing assessments can be essential to fully understand who the different interest groups potentially affected by BNG are and who might benefit and suffer from BNG activities. Given the variety of experiences and needs that different people have at different times, participatory approaches can understand wellbeing at the level of impact (for example, by interest group), which can be masked in situations when the wellbeing of a community as a whole is enhanced by BNG. In addition, disadvantaged and minority groups should be involved in the assessment of potential impacts on their wellbeing from BNG to capture their perspectives and needs.

Assessments of potential impacts on wellbeing from BNG should acknowledge all factors that affect wellbeing, for example a new housing estate or transport infrastructure project could have many positive and negative impacts on people's wellbeing. However, to assess the link between wellbeing and BNG, the focus is on people's relationship with nature. Understanding people's relationship with nature gives, in turn, a focus on people living and working locally to the development because people most commonly engage with green spaces that are nearby. When the site of the development and the area of the BNG activities are not in the same place, this local framing of the wellbeing assessment is a vital consideration.

A wellbeing assessment requires due diligence and careful planning, and to be undertaken by a suitably qualified social professional. Ideally, a wellbeing baseline and impact assessment with ongoing monitoring should be planned and undertaken by the social professional working closely with the ecologist undertaking the BNG assessment, design and implementation. This joined-up approach is more efficient, as it enables efficiencies when undertaking baseline surveys and the wellbeing and BNG assessments. It also enables early sight of possible conflicts as well as synergies, so that these can be acted on at an early stage of a scheme's planning and then throughout the design and construction stage. This is especially important to achieve genuine and locally meaningful net gains in biodiversity in ways that "does no harm" to people's wellbeing and, where possible, enhances wellbeing.

This joint working between social and ecological specialists is highlighted in the "Connecting people's wellbeing and biodiversity in impact assessment" (IAIA, 2021) advice note⁹. For example, the note recommends that scopes of works and budgets are set "to allow for collaboration among social and ecological specialists and to ensure that mitigation outcomes and implementation plans are aligned and mutually supportive".

A final point is to acknowledge the wealth of information on wellbeing within academia. For development projects, it is possible to use existing wellbeing assessments, especially from the fields of psychology and health where most have been developed. Several wellbeing assessments have been applied to real-world examples and show how to assess the relationship between people's wellbeing and nature, such as those in Table 7. There are two main considerations with regard to BNG:

⁹ [Fastips_23 Connecting people's wellbeing.pdf \(iaia.org\)](#)

Incorporate into existing social assessments

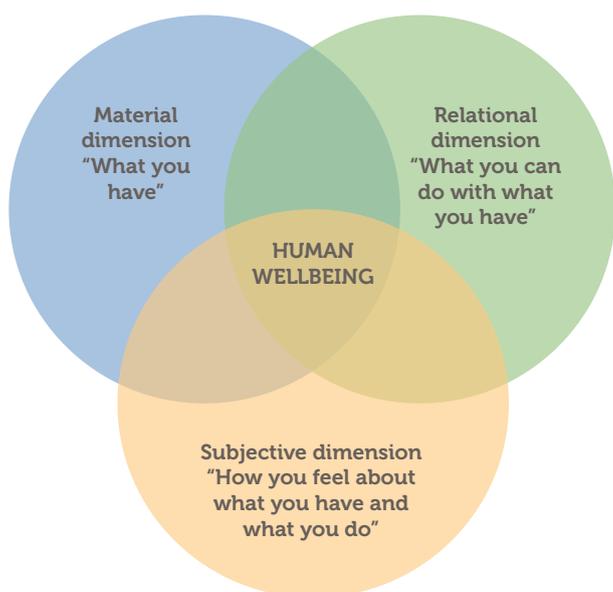
Developments are already subject to social impact assessments, such as Health Impact Assessments (HIA)¹⁰. Opportunities to amend these existing assessments to better incorporate wellbeing should be explored as the priority, rather than developing new and independent wellbeing assessments. For example, Green L. *et al* (2019¹¹) used HIAs to implement the sustainable development goals in practice, based on a case study in Wales. HIAs were applied to a proposed major electricity cable connection development in Wales, and the paper illustrates how HIAs can be used to consider and implement the Wellbeing Goals of the Welsh Government (Wellbeing of Future Generations (Wales) Act 2015). It also discusses how this can be extended to implement and address the Sustainable Development Goals at a local, regional and national level.

Proportionality

Environmental Impact Assessments (EIA) of developments are proportionate to the type and scale of the development and its impact. This principle of proportionality¹² should be considered for wellbeing assessments of BNG. Indeed, the first stage of the process of HIA is Screening to determine whether an HIA is needed, and a similar approach could be applied.

Table 7. Examples of wellbeing assessments applied in practice

A study assessed wellbeing of Northern Ireland’s fishing society using the WeD framework, i.e. material, relational, and subjective (Britton & Coulthard, 2013). Researchers used the WeD toolkits; they generated community profile through interviewing key informants, and assessed people’s resources, relationships, and life satisfaction together as a whole assessment through interview-administrated questionnaires with fishers.
A study led by the University of Oxford investigated wellbeing in conservation context across three sites in northern Cambodia. Researchers used a wellbeing framework that combines the VoP structure with the WeD perspective to provide conceptual guidance for measuring wellbeing, as shown in the figure below (Beauchamp <i>et al.</i> 2018). Survey methods including key informants, individual interview, and group discussions have been applied to collect wellbeing data.



Material
<ul style="list-style-type: none"> Secure and adequate livelihoods Enough food and food security Assets e.g. land, natural resources, livestock, housing
Health
<ul style="list-style-type: none"> Feeling strong and well Access to health services Having a healthy mental and physical environment
Social relationships
<ul style="list-style-type: none"> Good relations with family, community, and country Dignity e.e. not being a burden Ability to help others and fulfil social obligations
Security
<ul style="list-style-type: none"> Confidence in future and predicability Peace Personal physical security and safety
Freedom of choice and action
<ul style="list-style-type: none"> Sense of control and power Ability to pursue what you value doing and being, meet aspirations

¹⁰ A HIA is a process that identifies the health and wellbeing impacts (benefits and harms) of any plan or development project. [Health Impact Assessment in spatial planning. \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/711111/Health_Impact_Assessment_in_spatial_planning.pdf)

¹¹ [List of issues Impact Assessment and Project Appraisal \(tandfonline.com\)](https://www.tandfonline.com/journals/1111111)

¹² INSTITUTE OF ENVIRONMENTAL MANAGEMENT & ASSESSMENT. Perspectives upon Proportionate EIA. Thought pieces from UK IEMA, 2018

Appendix A: Project Team

Project Lead

Julia Baker, Balfour Beatty

Technical Advisory Panel

TAP Member	Organisation
Sally Hayns	Chartered Institute of Ecology and Environmental Management (CIEEM)
Kerry ten Kate	Independent Consultant
E.J. Milner-Gulland	University of Oxford
Joseph W. Bull	Wild Business Ltd; Durrell Institute of Conservation and Ecology (DICE)
Sarah Scott	Department for Environment, Food & Rural Affairs (DEFRA)

Research Team

TAP Member	Organisation	Leading on:
Hannah Williams	WSP	Requirements to consider development impacts on people's wellbeing within regional and local planning policies in England
Shuo Gao	University of Oxford	What the science says: defining and assessing wellbeing
Isobel Taylor	Wild Business Ltd	Consultation responses on whether and how BNG good practice should more directly incorporate wellbeing

Appendix B: Examples of Wellbeing Assessments

Oxford Happiness Questionnaire

The Oxford Happiness Questionnaire (OHQ) can be a helpful tool to chart the mental components of subjective wellbeing. The OHQ comprises 29 items related to feelings, satisfaction, and life evaluations, all of which are answered on a six-point Likert scale, where “1” represents being the least happy and “6” represents being the happiest (Box 1) (Hills & Argyle 2002). Respondents are asked to choose the right one for them in general or most of the time.

Box 1. Oxford Happiness Questionnaire

Below are a number of statements about happiness. Would you please indicate how much you agree or disagree with each by entering a number alongside it according to the following code: 1=strongly disagree; 2=moderately disagree; 3=slightly disagree; 4=slightly agree; 5=moderately agree; 6=strongly agree.

You will need to read the statements carefully because some are phrased positively and others negatively. Don't take too long over individual questions; there are no 'right' or 'wrong' answers and no trick questions. The first answer that comes into your head is probably the right one for you. If you find some of the questions difficult, please give the answer that is true for you in general or for most of the time.

- 1†. I don't feel particularly pleased with the way I am (-)
2. I am intensely interested in other people
- 3†. I feel that life is very rewarding
4. I have very warm feelings towards almost everyone
5. I rarely wake up feeling rested (-)
6. I am not particularly optimistic about the future (-)
7. I find most things amusing
8. I am always committed and involved
9. Life is good
10. I do not think that the world is a good place (-)
11. I laugh a lot
- 12†. I am well satisfied about everything in my life
- 13†. I don't think I look attractive (-)
14. There is a gap between what I would like to do and what I have done (-)
15. I am very happy
- 16†. I find beauty in some things
17. I always have a cheerful effect on others
- 18†. I can fit in everything I want to
19. I feel that I am not especially in control of my life (-)
20. I feel able to take anything on
- 21†. I feel fully mentally alert
22. I often experience joy and elation
23. I do not find it easy to make decisions (-)
24. I do not have a particular sense of meaning and purpose in my life (-)
25. I feel I have a great deal of energy
26. I usually have a good influence on events
27. I do not have fun with other people (-)
28. I don't feel particularly healthy (-)
- 29†. I do not have particularly happy memories of the past (-)

Notes. Items marked (-) should be scored in reverse. †Indicates components of the OHQ short scale. The sum of the item scores is an overall measure of happiness, with high scores indicating greater happiness.

The tool has been applied in diverse contexts. For example, a study conducted by Glyndwr University, Wales, used it to assess subjective wellbeing among a sample of 658 rural Church of England clergy (Brewster 2015). Brewster compared the current wellbeing levels of different groups and found clergy who embrace a liberal theology experience higher wellbeing levels than those who are more conservative.

Also, practitioners can modify the approach based on local information; for instance, a study published in 2018 to assess the impacts of access to infrastructure on human wellbeing in rural Nepal (Sapkota 2018). The research selected 25 questions out of the 29 in the OHQ and modified a few statements to match them with the local context.

Voices of the Poor

Narayan *et al.* (2000) developed the “Voices of the Poor” (VoP) work for the World Development Report 2000/2001 on the theme of poverty and development. The VoP framework was one of the earliest wellbeing models proposed by interdisciplinary social scientists. Researchers conducted and analysed field studies in close to 300 communities across 23 countries to develop the conceptual framework using local words and concepts. Its strength, therefore, is in its cross-cultural applicability.

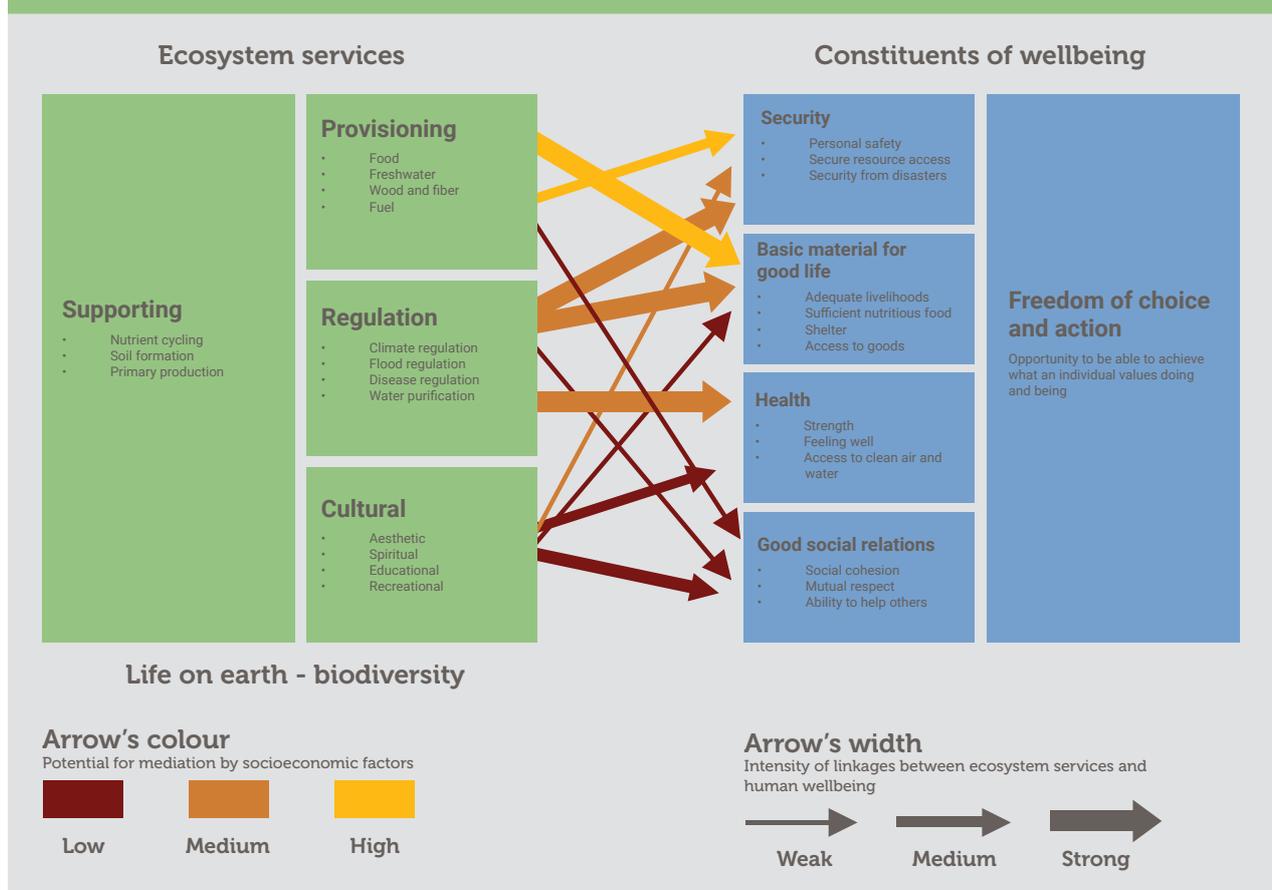
The VoP framework provides a useful checklist of components to consider when starting an assessment. It includes material wellbeing which means having enough: bodily wellbeing which includes being strong, well, and feeling good; social wellbeing, which includes caring for and settling children; and having self-respect, peace, good relations, security (including civil peace and personal physical security) and freedom of choice and action (Narayan *et al.* 2000). The VoP framework was drawn upon by the Millennium Ecosystem Assessment (Woodhouse *et al.* 2015).

Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment (‘MEA’) was called for by the United Nations Secretary-General in 2000 (Reid *et al.* 2005). The MEA is an international approach that provides a framework for assessing the consequences of ecosystem change for human wellbeing.

In the framework (Figure 2), components of wellbeing include security, basic material for good life, health, good social relations, and freedom of choice and action.

Figure 2. Links between ecosystem services and various constituents of human wellbeing (Adapted by Forslund *et al.* 2019 from Reid *et al.* 2005)



This wellbeing framework has been widely applied by studies in the environmental sciences and ecology domain. It is utilised with other survey methods to collect required wellbeing assessment data. For example, a study led by the Wildlife Conservation Society applied the MEA framework in a participatory study in Kenya to assess human wellbeing associated with marine ecosystem services (Abunge *et al.* 2013). They carried out focus group discussions with five different stakeholder groups connected to a small-scale Kenyan coastal fishery at Nyali beach. Local people were asked to discuss and list the main aspects of life that are required to live well in the community, which were then mapped onto the wellbeing dimensions in the assessment framework. Interviewers then asked people to evaluate the degree of accessibility of each wellbeing component in the livelihood group. Finally, respondents were asked to identify the past changes in the area, both positive and negative, that had enabled or disabled their capacity to achieve the wellbeing components.

Social Production Function Instrument for the Level of Well-being (SPF-IL Scale)

The SPF-IL scale is designed as a tool to measure the dimensions proposed by the social production function (SPF) theory (Ormel *et al.* 1999; Nieboer *et al.* 2005). The theory covers certain universal goals which need to be achieved by people in order to enhance their wellbeing, including affection, behavioural confirmation, status, comfort, and stimulation.

The designers of the SPF-IL Scale developed a full version and a 15-item version questionnaire. The overview of this instrument is shown in Table 3.

Table 3. Overview of the SPF -IL Scale (Nieboer *et al.* 2005)

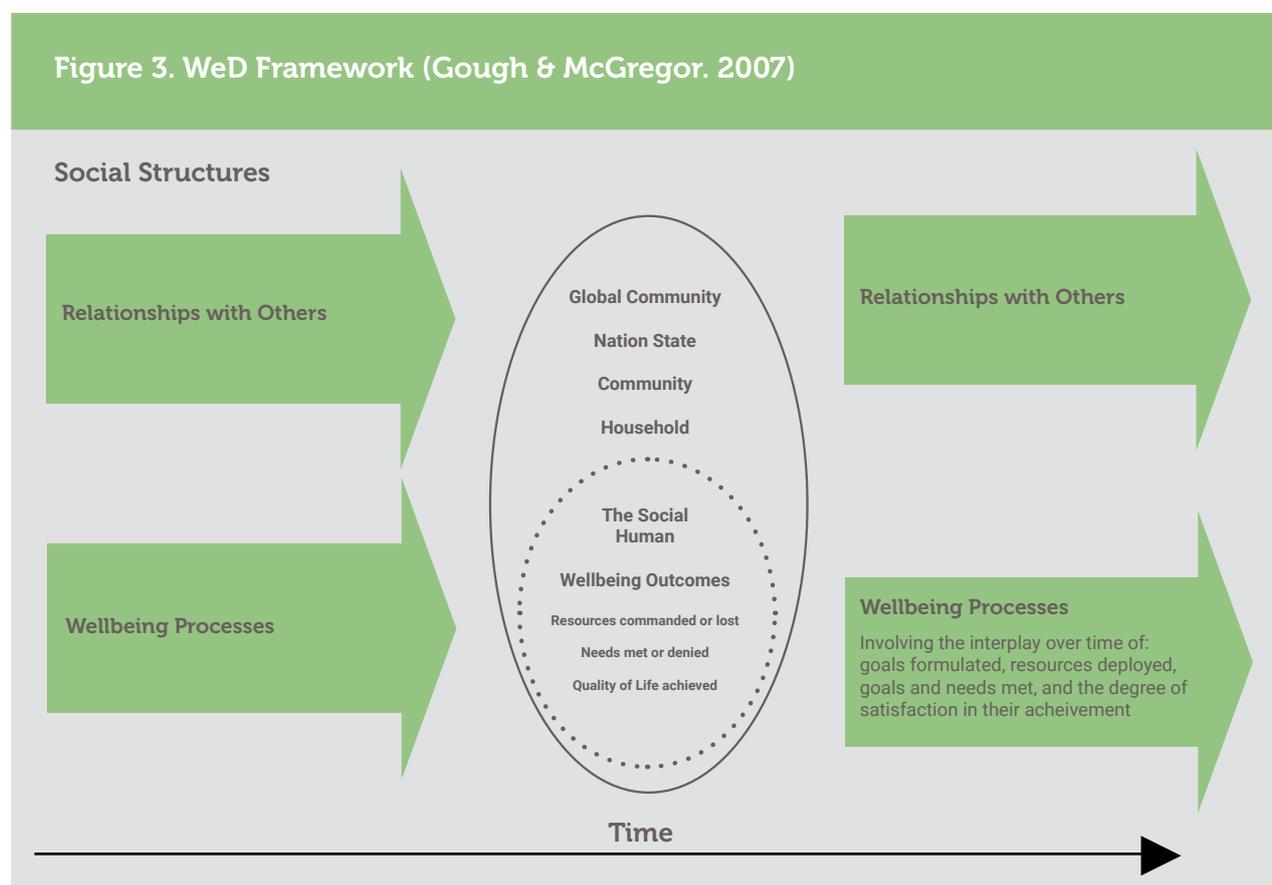
Goal	No. of items in full version	No. of items in 15-item version	Shorthand description of major aspects of the concept
Affection	18	3	The love one gets for who one is as a person, regardless of one's assets or actions
Behavioural confirmation	12	3	The feeling to have done "the right thing" in the eyes of relevant others
Status	12	3	Social approval given on the basis of the command over scarce resources relative to others (e.g. money and education)
Comfort	8	3	The absence of deleterious stimuli (i.e. physiological discomforts such as pain, thirst, hunger, or cold)
Stimulation	8	3	Activation which produces arousal, including mental and sensory stimulation and physical effort

This approach has been used for real-world assessment in many contexts, especially the 15-item version. For example, a study conducted by Erasmus University, The Netherlands measured the wellbeing of older adults admitted to the Vlietland hospital (Netherlands) in 2010 using the 15-item version of the SPF-IL instrument (Cramm *et al.* 2012). Another group from Erasmus University also applied the 15-item version to measure the wellbeing of the elderly who had long-term conditions and multiple complex needs (Vestjens *et al.* 2018).

WeD Framework, RANQ & QoL Survey

The UK Economic and Social Research Council-funded Research Group on Wellbeing in Developing Countries (WeD) developed the WeD Framework for wellbeing assessment (Figure 3).

Figure 3. WeD Framework (Gough & McGregor. 2007)



Based on the framework, the group created wellbeing assessment tools including the Resources and Needs Questionnaire (RANQ) and WeD Quality of Life (WeD-QoL) survey. RANQ was developed to assess household's access to resources and the need satisfactions they achieve, while WED-QoL is a measure of an individual's perceived quality of life.

RANQ is a household survey that establishes basic demographic information on the households and provides a baseline for the resource distribution and levels of needs satisfaction achieved for the households. Before RANQ was launched, it underwent intensive groundtruthing and piloting within four countries, Bangladesh, Ethiopia, Peru, and Thailand.

RANQ evaluates households' satisfaction of their human resources (occupations, education, and health), material resources (land and natural resources, housing utilities, etc.), social resources (kin and fictive connections, connections to the local community, to the wider world, to markets and government) and cultural resources (language, social identity, etc.)

The WeD-QoL survey measures the level of satisfaction people feel both regarding certain specific aspects of their lives and for their life as a whole. It relies upon self-evaluation, where people can state what they value, what they have experienced, and how satisfied they are with what they have, and what they can do and be.

Interviewers first take an exploratory phase to identify key elements for wellbeing or QoL and triangulate proper methods (e.g. semi-structured interviews, focus groups, etc.). Then they review the findings of the exploratory phase and develop a draft tool and a plan for its implementation, after which fieldworks are carried out to generate QoL data. Respondents need to be chosen to include people of different ages, wealth, occupation, ethnicity, and religion.

Basic Necessities Survey

The Basic Necessities Survey (BNS) approach assesses a household's material wellbeing without relying on theoretical frameworks, instead it captures the residents' material conditions and their perceptions of these conditions, both of which affect the quality of their lives.

Before the survey, the researchers develop a list of things, activities, and services that are considered as basic necessities. In the survey, people are asked three questions: (i) *"Which of these items do you think are basic necessities, things that everyone should be able to have and no one should have to go without?"* (ii) *"Which of these items does your household have?"* and (iii) *"Compared to other people in this x area (same as area sampled, do you think your household is poor or not poor?"*

The term "basic necessities" can be democratically defined as those that more than half of the people agree *"are basic necessities that everyone should be able to have and nobody should have to go without"*. Items are also designated as being more or less important depending upon the percentage of households who identified that item as a basic necessity. The survey was first extensively implemented by ActionAid Vietnam in the late 1990s and has been implemented by a range of researchers and development organisations since then.

Warwick-Edinburgh Mental Wellbeing Scale

The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) was designed by an expert panel based on literature, qualitative research, and psychometric testing. It monitors people's mental wellbeing, and evaluates mental health promotion initiatives (Tennant *et al.* 2007). It covers the items only related to mental wellbeing while the items relating to spirituality and purpose in life were not included.

Table 4. Warwick-Edinburgh Mental Wellbeing Scale (Source: Tennant *et al.* 2007)

Statements	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future	1	2	3	4	5
I've been feeling useful	1	2	3	4	5
I've been feeling relaxed	1	2	3	4	5
I've been feeling interested in other people	1	2	3	4	5
I've had energy to spare	1	2	3	4	5
I've been dealing with problems well	1	2	3	4	5
I've been thinking clearly	1	2	3	4	5
I've been feeling good about myself	1	2	3	4	5
I've been feeling close to other people	1	2	3	4	5
I've been feeling confident	1	2	3	4	5
I've been able to make up my own mind about things	1	2	3	4	5
I've been feeling loved	1	2	3	4	5
I've been interested in new things	1	2	3	4	5
I've been feeling cheerful	1	2	3	4	5

The 14-item scale (Table 4) appears to have some validity in application, and thus has been used widely in research. A study led by the University of Cambridge designed a trial to test the effects of the provision of mindfulness courses to university students; they employed the WEMWBS to measure the wellbeing of students at the University and calculated and compared the wellbeing scores in different periods (Galante *et al.* 2018).

Flourishing Scale

The flourishing scale (FS) assesses wellbeing with regard to psychological flourishing and feelings, complementing existing measures of subjective wellbeing in psychological studies. The FS is an 8-item summary measure of an individual's self-perceived success in the key areas including relationships, self-esteem, purpose, and optimism. Each item of the FS is answered on a 7-point scale where "1" represents "strong disagreement" and "7" represents "strong agreement". The FS yields an overview of respondents' mental, spiritual, and relational wellbeing outcome while it does not separately provide measures of dimensions of wellbeing. The full version FS scale is shown in Box 2.

Box 2. Flourishing Scale

Below are eight statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement.

7. Strongly agree 6. Agree 5. Slightly agree 4. Mixed or neither agree nor disagree 3. Slightly disagree 2. Disagree 1. Strongly disagree

- I lead a purposeful and meaningful life
- My social relationships are supportive and rewarding
- I am engaged and interested in my daily activities
- I actively contribute to the happiness and wellbeing of others
- I am competent and capable in the activities that are important to me
- I am a good person and live a good life
- I am optimistic about my future
- People respect me

Scoring: Add the responses, varying from 1 to 7, for all eight items. The possible range of scores is from 8 (lowest possible) to 56 (highest possible). A high score represents a person with many psychological resources and strengths.

Again, this simple tool has been widely applied. For example, a study lead by University of Canberra, Australia measured the wellbeing levels of 18 high school and college students at different times, finding their average wellbeing score at each time and so measuring change in wellbeing (Nielsen and Ma 2016).

Researchers can also modify the FS questionnaire depending upon their own assessment objectives: for instance, a study lead by University of Otago, New Zealand, conducted a 13-day daily diary study (Conner *et al.* 2018). The researchers assess 658 young adults' wellbeing using a modified daily FS by adding the word 'today' in each item and phrasing each statement in past tense ('Today, I led a purposeful and meaningful life'; 'Today, my social relationships were supportive and rewarding'; 'Today, I was engaged and interested in my daily activities.').

Questionnaire for Eudemonic Wellbeing

The Questionnaire for Eudemonic¹³ Wellbeing (QEWB, Box 3) is a 21-item scale developed to assess six aspects of eudemonic wellbeing: self-discovery, perceived development of one's best potentials, a sense of purpose and meaning, investment of significant effort in pursuit of excellence, intense involvement in activities and enjoyment of activities as personally expressive (Waterman *et al.* 2010).

¹³ Where 'eudemonic' means 'conducive to happiness'

Box 3. The Questionnaire for Eudemonic Wellbeing

This questionnaire contains a series of statements that refer to how you may feel things have been going in your life. Read each statement and decide the extent to which you agree or disagree with it. Try to respond to each statement according to your own feelings about how things are actually going, rather than how you might wish them to be.

Please use the following scale when responding to each statement.

Strongly Disagree 0 1 2 3 4 Strongly Agree

1. I find I get intensely involved in many of the things I do each day.
2. I believe I have discovered who I really am.
3. I think it would be ideal if things came easily to me in my life. (R)
4. My life is centered around a set of core beliefs that give meaning to my life.
5. It is more important that I really enjoy what I do than that other people are impressed by it.
6. I believe I know what my best potentials are and I try to develop them whenever possible.
7. Other people usually know better what would be good for me to do than I know myself. (R)
8. I feel best when I'm doing something worth investing a great deal of effort in.
9. I can say that I have found my purpose in life.
10. If I did not find what I was doing rewarding for me, I do not think I could continue doing it.
11. As yet, I've not figured out what to do with my life. (R)
12. I can't understand why some people want to work so hard on the things that they do. (R)
13. I believe it is important to know how what I'm doing fits with purposes worth pursuing.
14. I usually know what I should do because some actions just feel right to me.
15. When I engage in activities that involve my best potentials, I have this sense of really being alive.
16. I am confused about what my talents really are. (R)
17. I find a lot of the things I do are personally expressive for me.
18. It is important to me that I feel fulfilled by the activities that I engage in.
19. If something is really difficult, it probably isn't worth doing. (R)
20. I find it hard to get really invested in the things that I do. (R)
21. I believe I know what I was meant to do in life.

(R) Item is reverse scored.

This tool has also been implemented in many empirical studies. For instance, a study conducted by Canterbury Christ Church University studied whether gardening in allotments allows people to feel connected to nature and improves wellbeing. They thus applied the QEWB to measure the wellbeing of a group of gardeners in the UK (Webber *et al.* 2015).

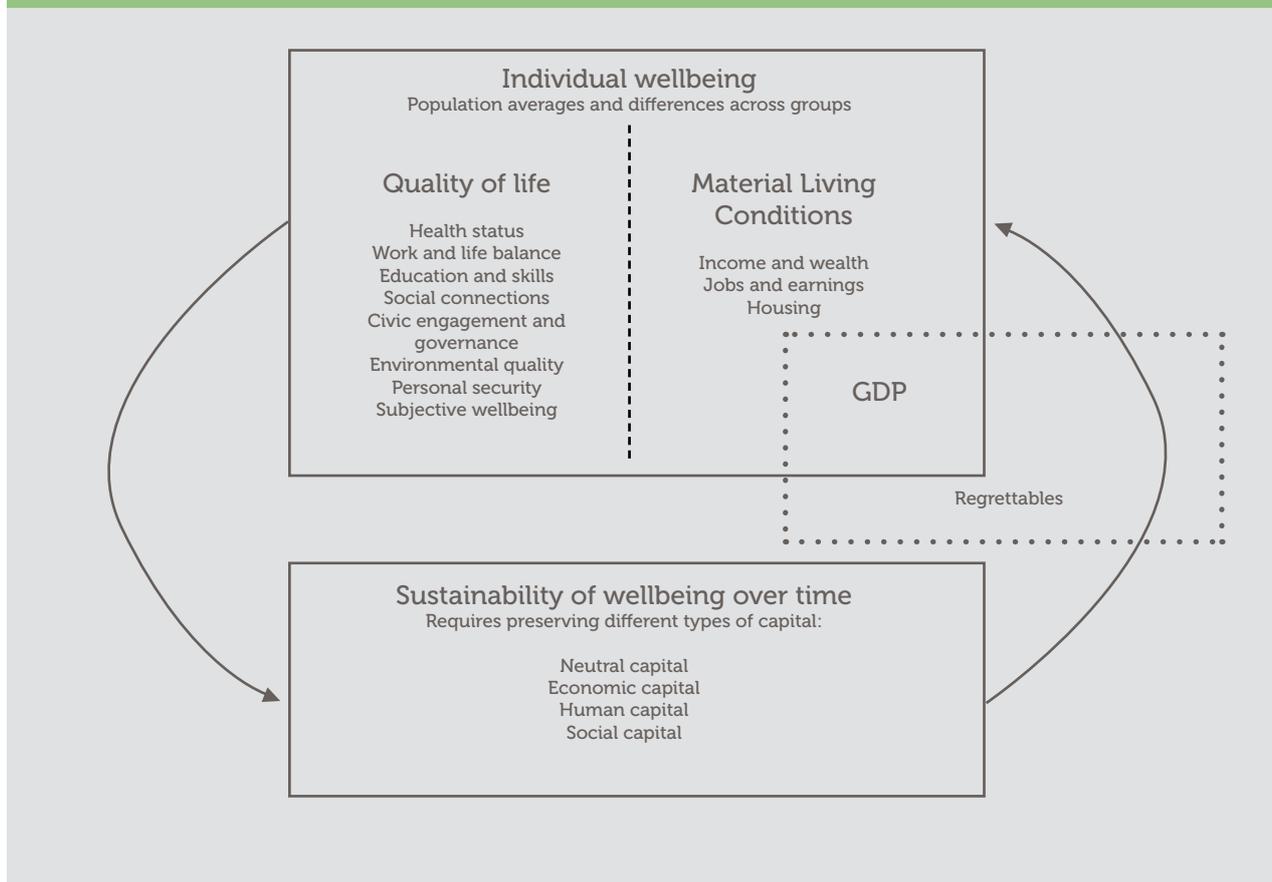
A study conducted by the London School of Economics also examined the effect of nature on children's and adolescents' wellbeing from 15 English secondary schools (Skianis 2013). To measure these students' wellbeing state, the researcher modified the QEWB to make it more suitable for non-adult respondents.

OECD How's Life

The Organisation for Economic Co-operation and Development (OECD) How's Life report proposed a different wellbeing framework (Figure 4) for measuring peoples' wellbeing and broader societal progress (OECD, 2011).

The framework considers the following dimensions of wellbeing: under quality of life: health status, work and life balance, education and skills, civic engagement and governance, social connections, environmental quality, personal security and subjective wellbeing; under material living conditions: income and wealth, jobs and earnings, and housing. The framework also proposed four key resources as measures to assess future wellbeing: the four types of “capital”.

Figure 4. OECD Wellbeing Conceptual Framework



Practitioners using this framework to assess wellbeing could select the most relevant components of this framework and translate them using locally-relevant indicators to measure people’s wellbeing.

A study led by University of Chile investigated the relationship between human wellbeing and ecosystem services in Río Cruces watershed, southern Chile (Delgado and Marín, 2016) using wellbeing indicators with local relevance. They selected the measures of housing, income, and jobs under the material conditions, and the measures of social connections, education, health status, and life satisfaction under quality of life.

Public Health Surveillance Wellbeing Scale

The Public Health Surveillance Wellbeing Scale (PHS-WB) was developed by a group of health scientists and workers from the Center for Disease Control and Prevention, US (Bann *et al.* 2012). The PHS-WB scale was designed to capture mental, physical, and social components of people’s wellbeing. It is a brief 10-item wellbeing scale which is extremely suitable in situations for which long surveys are impractical. The PHS-WB questionnaire is shown in Figure 7.

The profiler is a 23-item measure that assesses wellbeing across the 5 domains of the PERMA framework. Respondents are asked to complete the self-reported questionnaire with 15 main PERMA items (3 items per domain) and 8 filler items. The PERMA-Profiler Measure is shown in Figure 6.

Figure 6. PERMA-Profiler
The PERMA-Profiler Measure

#	Label	Question	Response Anchors
Block 1	A1	How much of the time do you feel you are making progress towards accomplishing your goals?	0 = never 10 = always
	E1	How often do you become absorbed in what you are doing?	
	P1	In general, how often do you feel joyful?	
	N1	In general, how often do you feel anxious?	
	A2	How often do you achieve the important goals you have set for yourself?	
Block 2	H1	In general, how would you say your health is?	0 = terrible 10 = excellent
Block 3	M1	In general, to what extent do you lead a purposeful and meaningful life?	0 = not at all 10 = completely
	R1	To what extent do you receive help and support from others when you need it?	
	M2	In general, to what extent do you feel that what you do in your life is valuable and worthwhile?	
	E2	In general, to what extent do you feel excited and interested in things?	
Lon	How lonely do you feel in your daily life?		
Block 4	H2	How satisfied are you with your current physical health?	0 = not at all 10 = completely
Block 5	P2	In general, how often do you feel positive?	0 = never 10 = always
	N2	In general, how often do you feel angry?	
	A3	How often are you able to handle your responsibilities?	
	N3	In general, how often do you feel sad?	
	E3	How often do you lose track of time while doing something you enjoy?	
Block 6	H3	Compared to others of your same age and sex, how is your health?	0 = terrible 10 = excellent
Block 7	R2	To what extent do you feel loved?	0 = not at all 10 = completely
	M3	To what extent do you generally feel you should have a sense of direction in your life?	
	R3	How satisfied are you with your personal relationships?	
	P3	In general, to what extent do you feel contented?	
Block 8	hap	Taking all things together, how happy would you say you are?	0 = not at all 10 = completely

The PERMA framework and the PERMA-profiler could be one of the most widely used approaches to the assessment of wellbeing. For example, a group of researchers from the Royal College of Music and Imperial College, London applied the PERMA-profiler to survey a sample of professional classical musicians and found musicians scored significantly higher than general population indicators on positive emotion, relationships and meaning (Ascenso *et al.* 2018).

Also, a group of scientists led by the University of Auckland, New Zealand used PERMA and the profiler as a guide to conduct qualitative wellbeing assessment drawing on semi-structured interviews with 48 older people in a region of the North Island of New Zealand (Waterworth *et al.* 2019). In 2020, a study led by the Indiana University, US, also employed the PERMA framework to investigate the wellbeing associated with snow-sport tourism among women (Mirehie and Gibson 2020).

Interpersonal, Community, Occupational, Physical, Psychological, & Economic Scale

The Interpersonal, Community, Occupational, Physical, Psychological, and Economic (I COPPE) scale was based on the theory that wellbeing includes life satisfaction across various domains: interpersonal, community, occupational, physical, psychological, economic, and overall. A group of scientists from the University of Miami, US, thus synthesise the multiple dimensions into the I COPPE instrument (Prilleltensky *et al.* 2015). The 21-item scale is demonstrated in Box 4.

Box 4. I COPPE Scale

All questions start with following stem: The top number ten represents the best your life can be. The bottom number zero represents the worst your life can be. When it comes to.....

Overall Wellbeing (OV WB): positive state of affairs, as perceived by individual respondents.

When it comes to the best possible life for you, on which number

OV WB PR: do you stand now?

OV WB PA: did you stand a year ago?

OV WB FU: do you think you will stand a year from now?

Interpersonal Wellbeing (IN WB): satisfaction with the quality of relationships with important people such as family, friends, and colleagues.

When it comes to relationships with important people in your life, on which number

IN WB PR: do you stand now?

IN WB PA: did you stand a year ago?

IN WB FU: do you think you will stand a year from now?

Community Wellbeing (CO WB): satisfaction with one's community.

When it comes to the community where you live, on which number

CO WB PR: do you stand now?

CO WB PA: did you stand a year ago?

CO WB FU: do you think you will stand a year from now?

Occupational Wellbeing (OC WB): satisfaction with one's job, vocation, or avocation.

When it comes to your main occupation (employed, self-employed, volunteer, stay at home), on which number

OC WB PR: do you stand now?

OC WB PA: did you stand a year ago?

OC WB FU: do you think you will stand a year from now?

Physical Wellbeing (PH WB): state of satisfaction with one's overall health and wellness.

When it comes to your physical health, on which number

PH WB PR: do you stand now?

PH WB PA: did you stand a year ago?

PH WB FU: do you think you will stand a year from now?

Psychological Wellbeing (PS WB): satisfaction with one's emotional life.

When it comes to your emotional and psychological wellbeing, on which number

PS WB PR: do you stand now?

PS WB PA: did you stand a year ago?

PS WB FU: do you think you will stand a year from now?

Economic Wellbeing (EC WB): satisfaction with one's financial situation.

When it comes to your economic situation, on which number

EC WB PR: do you stand now?

EC WB PA: did you stand a year ago?

EC WB FU: do you think you will stand a year from now?

Note. PR = Present; PA = Past; FU = Future.

The I COPPE tool has also been applied to assess wellbeing in diverse contexts. For instance, a study led by the Michigan State University, US, measured the wellbeing of adult employees at a university with the I COPPE scale in order to test an online universal intervention designed to promote wellbeing (Myers *et al.* 2017).

Another piece of work led by the University of Geneva, Switzerland, also used the instrument to measure subjective wellbeing among Serbian and Italian university students, examining how psychological distress symptoms mediate the association between alcohol use and subjective wellbeing (Piumatti *et al.* 2019).

Subjective Wellbeing Indicators for Cultural Ecosystem Services Assessment

This wellbeing assessment method was developed specifically for the context of cultural ecosystem services (Bryce *et al.* 2016). Researchers developed a framework with 3 dimensions, and 3 single items, and applied 14 indicators to measure the 6 themes, as demonstrated in Table 5.

This instrument has also been applied in research; for example, to elicit cultural ecosystem service value, a group of researchers led by the Scottish Association for Marine Science applied it to measure subjective wellbeing through online surveys with divers and sea anglers across the UK (Kenter *et al.* 2016).

Table 5. Subjective wellbeing indicators related to six dimensions (Bryce *et al.* 2016)

Factor	Dimension Theme	Indicator
1	Engagement and interaction with nature	1. Visiting these sites has made me learn more about nature
		2. Visiting these sites makes me feel more connected to nature
		3. I have felt touched by the beauty of these sites
		4. I feel like I can contribute to taking care of these sites
		5. These sites inspire me
2	Place identity	6. These sites feel almost like a part of me
		7. I feel a sense of belonging in these sites
		8. I miss these sites when I have been away from them for a long time
3	Therapeutic value	9. Visiting these sites clears my head
		10. Visiting these sites gives me a sense of freedom
		11. Visiting these sites leaves me feeling more healthy
Single Items	Spiritual value	12. At these sites I feel part of something that is greater than myself
	Social bonds	13. I have made or strengthened bonds with others through visiting these sites
	Memory/transformational value	14. I've had a lot of memorable experiences in these sites

References

- Abunge, C., Coulthard, S., & Daw, T. M. (2013). Connecting marine ecosystem services to human well-being: insights from participatory well-being assessment in Kenya. *Ambio*, 42(8), 1010-1021.
- Adler, A., & Seligman, M. E. (2016). Using wellbeing for public policy: Theory, measurement, and recommendations. *International journal of wellbeing*, 6(1), 1-35.
- Ascenso, S., Perkins, R., & Williamon, A. (2018). Resounding meaning: a PERMA wellbeing profile of classical musicians. *Frontiers in Psychology*, 9, 1895.
- Austin, A. (2020). *A Universal Declaration of Human Well-being*. Palgrave Macmillan.
- Ahuvia, A. (2008). If money doesn't make us happy, why do we act as if it does?. *Journal of economic psychology*, 29(4), 491-507.
- Breslow, S. J., Sojka, B., Barnea, R., Basurto, X., Carothers, C., Charnley, S., ... & Levin, P. S. (2016). Conceptualizing and operationalizing human wellbeing for ecosystem assessment and management. *Environmental Science & Policy*, 66, 250-259.
- Brewster, C. E. (2015). Churchmanship and personal happiness: A study among rural Anglican clergy. *Rural Theology*, 13(2), 124-134.
- Britton, E., & Coulthard, S. (2013). Assessing the social wellbeing of Northern Ireland's fishing society using a three-dimensional approach. *Marine Policy*, 37, 28-36.
- Brlak, E., Škoda, J., Marković, B., & Čerepinko, D. (2019). Understanding the Influence of Social Media on Individual's Quality of Life Perceptions. *European Journal of Behavioral Sciences*, 2(3), 1-9.
- Bryce, R., Irvine, K. N., Church, A., Fish, R., Ranger, S., & Kenter, J. O. (2016). Subjective well-being indicators for large-scale assessment of cultural ecosystem services. *Ecosystem Services*, 21, 258-269.
- Butler, J., & Kern, M. L. (2016). The PERMA-Profiler: A brief multidimensional measure of flourishing. *International Journal of Wellbeing*, 6(3).
- Campion, J., & Nurse, J. (2007). A dynamic model for wellbeing. *Australasian Psychiatry*, 15(1_suppl), S24-S28.
- Caza, B. B., & Wrzesniewski, A. (2013). How work shapes well-being. *The oxford handbook of happiness*, 693-710.
- Clapham, D., Foye, C., & Christian, J. (2018). The concept of subjective well-being in housing research. *Housing, Theory and Society*, 35(3), 261-280.
- Cramm, J. M., Hartgerink, J. M., De Vreede, P. L., Bakker, T. J., Steyerberg, E. W., Mackenbach, J. P., & Nieboer, A. P. (2012). The relationship between older adults' self-management abilities, well-being and depression. *European Journal of Ageing*, 9(4), 353-360.
- Crawford, T. N., & Ridner, S. L. (2018). Differences in well-being between sexual minority and heterosexual college students. *Journal of LGBT Youth*, 15(3), 243-255.
- Conner, T. S., DeYoung, C. G., & Silvia, P. J. (2018). Everyday creative activity as a path to flourishing. *The Journal of Positive Psychology*, 13(2), 181-189.
- Delgado, L. E., & Marín, V. H. (2016). Well-being and the use of ecosystem services by rural households of the Río Cruces watershed, southern Chile. *Ecosystem services*, 21, 81-91.
- Diener, E., & Seligman, M. E. (2004). Beyond money: Toward an economy of well-being. *Psychological science in the public interest*, 5(1), 1-31.
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social indicators research*, 97(2), 143-156.
- Diener, E., Oishi, S., & Tay, L. (2018). Advances in subjective well-being research. *Nature Human Behaviour*, 2(4), 253-260.
- Evers, K. E., Castle, P. H., Fernandez, A. C., Prochaska, J. O., Prochaska, J. M., & Paiva, A. L. (2015). The Functional Well-Being Scale: a measure of functioning loss due to well-being-related barriers. *Journal of health psychology*, 20(1), 113-120.

- Forslund, A., Renöfält, B. M., Barchiesi, S., Cross, K., Davidson, S., Farrell, T., ... & Smith, M. (2009). Securing water for ecosystems and human well-being: The importance of environmental flows. Swedish Water House Report, 24.
- Galante, J., Dufour, G., Vainre, M., Wagner, A. P., Stochl, J., Benton, A., ... & Jones, P. B. (2018). A mindfulness-based intervention to increase resilience to stress in university students (the Mindful Student Study): a pragmatic randomised controlled trial. *The Lancet Public Health*, 3(2), e72-e81.
- Giacalone, R. A., & Promislo, M. D. (2010). Unethical and unwell: Decrements in well-being and unethical activity at work. *Journal of Business Ethics*, 91(2), 275-297.
- Gough, I., & McGregor, J. A. (2007). *Wellbeing in developing countries: from theory to research*. Cambridge University Press.
- Griffiths, V. F., Bull, J. W., Baker, J., & Milner-Gulland, E. J. (2019). No net loss for people and biodiversity. *Conservation Biology*, 33(1), 76-87.
- Heshmati, S., Oravec, Z., Brick, T. R., & Roeser, R. W. (2020). Assessing psychological well-being in early adulthood: Empirical evidence for the structure of daily well-being via network analysis. *Applied Developmental Science*, 1-19.
- Huppert, F. A. (2009). Psychological well-being: Evidence regarding its causes and consequences. *Applied Psychology: Health and Well-Being*, 1(2), 137-164.
- Kinderman, P., Schwannauer, M., Pontin, E., & Tai, S. (2011). The development and validation of a general measure of well-being: the BBC well-being scale. *Quality of Life Research*, 20(7), 1035-1042.
- La Placa, V., McNaught, A., & Knight, A. (2013). Discourse on wellbeing in research and practice. *International Journal of Wellbeing*, 3(1), 116-125.
- Loveridge, R., Sallu, S. M., Pasha, I. J., & Marshall, A. R. (2020). Measuring human wellbeing: A protocol for selecting local indicators. *Environmental Science & Policy*, 114, 461-469.
- Milner-Gulland, E. J., McGregor, J. A., Agarwala, M., Atkinson, G., Bevan, P., Clements, T., ... & Wilkie, D. (2014). Accounting for the impact of conservation on human well-being. *Conservation Biology*, 28(5), 1160-1166.
- Mirehie, M., & Gibson, H. J. (2020). The relationship between female snow-sport tourists' travel behaviors and well-being. *Tourism Management Perspectives*, 33, 100613.
- Myers, N. D., Prilleltensky, I., Prilleltensky, O., McMahan, A., Dietz, S., & Rubenstein, C. L. (2017). Efficacy of the fun for wellness online intervention to promote multidimensional well-being: a randomized controlled trial. *Prevention Science*, 18(8), 984-994.
- Narayan, D., Chambers, R., Shah, M. K., & Petesch, P. (2000). *Voices of the Poor: Crying out for Change*. New York: Oxford University Press for the World Bank.
- Nieboer, A., Lindenberg, S., Boomsma, A., & Bruggen, A. C. V. (2005). Dimensions of well-being and their measurement: the SPF-IL scale. *Social Indicators Research*, 73(3), 313-353.
- Nielsen, T. W., & Ma, J. (2016). Investigating meaningful happiness and wellbeing in college students through a 'curriculum of giving' outdoor education program. *International Education Research*, 4, 1-13.
- Office for National Statistics (ONS). (2018). Personal well-being in the UK QMI. <https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/methodologies/personalwellbeingintheukqmi>
- Organisation for Economic Co-operation and Development (OECD). (2011). *How's life?: measuring well-being*. Paris: OECD.
- Ormel, J., Lindenberg, S., Steverink, N., & Verbrugge, L. M. (1999). Subjective well-being and social production functions. *Social indicators research*, 46(1), 61-90.
- Piumatti, G., Lietz, F., Aresi, G., & Bjegovic-Mikanovic, V. (2019). Alcohol use, psychological distress, and subjective well-being among young adult university students: A cross-national study between Serbia and Italy. *Journal of ethnicity in substance abuse*, 18(4), 511-529.
- Prilleltensky, I., Dietz, S., Prilleltensky, O., Myers, N. D., Rubenstein, C. L., Jin, Y., & McMahan, A. (2015). Assessing multidimensional well-being: Development and validation of the I COPPE scale. *Journal of Community Psychology*, 43(2), 199-226.
- Reid W.V., *et al.* (2005). *The Millennium Ecosystem Assessment: ecosystems and human well-being: synthesis*. World

Resources Institute, Washington, DC.

Ridner, S. L., Newton, K. S., Staten, R. R., Crawford, T. N., & Hall, L. A. (2016). Predictors of well-being among college students. *Journal of American college health*, 64(2), 116-124.

Sapkota, J. B. (2018). Access to infrastructure and human well-being: Evidence from rural Nepal. *Development in Practice*, 28(2), 182-194.

Schulz, C., Martin-Ortega, J., Glenk, K., & Ioris, A. A. (2017). The value base of water governance: a multi-disciplinary perspective. *Ecological Economics*, 131, 241-249.

Seligman, M. E. (2012). *Flourish: A visionary new understanding of happiness and well-being*. Simon and Schuster.
 Skianis, V. (2013). The influence of nature on secondary school students' subjective well-being in England and Greece (Doctoral dissertation, The London School of Economics and Political Science (LSE)).

Skianis, V. (2013). The influence of nature on secondary school students' subjective well-being in England and Greece (Doctoral dissertation, The London School of Economics and Political Science (LSE)).

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., ... & Stewart-Brown, S. (2007). The Warwick-Edinburgh mental well-being scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes*, 5(1), 1-13.

Vestjens, L., Cramm, J. M., Birnie, E., & Nieboer, A. P. (2018). Evaluating an integrated primary care approach to improve well-being among frail community-living older people: a theory-guided study protocol. *BMC geriatrics*, 18(1), 1-17.

Wallace, K. J., Kim, M. K., Rogers, A., & Jago, M. (2020). Classifying human wellbeing values for planning the conservation and use of natural resources. *Journal of Environmental Management*, 256, 109955.

Waterman, A. S., Schwartz, S. J., Zamboanga, B. L., Ravert, R. D., Williams, M. K., Bede Agocha, V., ... & Brent Donnellan, M. (2010). The Questionnaire for Eudaimonic Well-Being: Psychometric properties, demographic comparisons, and evidence of validity. *The Journal of Positive Psychology*, 5(1), 41-61.

Waterworth, S., Raphael, D., Gott, M., Arroll, B., Benipal, J., & Jarden, A. (2019). An exploration of how community-dwelling older adults enhance their well-being. *International journal of older people nursing*, 14(4), e12267.

Weber, J., Hinds, J. & Camic, P. M. (2015). Investigating the wellbeing of allotment gardeners: A mixed methodological study. *Ecopsychology*, 7 (1), 20-28.

Zou, C., Schimmack, U., & Gere, J. (2013). The validity of well-being measures: A multiple-indicator–multiple-rater model. *Psychological assessment*, 25(4), 1247.



Raising the profile of professional ecological and environmental management and promoting the highest standards of practice for the benefit of nature and society.



**Chartered
Institute of
Ecology and
Environmental
Management**

Chartered Institute of Ecology and Environmental Management

Grosvenor Court, Ampfield Hill, Ampfield, Romsey, SO51 9BD

t: 01962 868626

enquiries@cieem.net | www.cieem.net

Company Number: RC000861, Registered Charity Number (England and Wales): 1189915