INDICATORS FOR SUSTAINABLE PROSPERITY? —CHALLENGES AND POTENTIALS FOR INDICATOR USE IN POLITICAL PROCESSES

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Abstract

The use of quantified indicators for the implementation and measurement of social progress is a well-established policy tool. However, any form of 'social progress' is inherently contested and a meaningful application of indicators in such contexts poses numerous challenges. In this paper we explore how indicators might be used to research and implement *sustainable prosperity*. We do this by reviewing key critiques of indicators and their political use (and misuse), drawing out lessons from previous indicator projects such as the *UN Sustainable Development Goals*, and *Taking Part*. We argue that because classic indicators rely on simplification and quantification, they struggle to do justice to objectives like sustainable prosperity which come with conflicting understandings and contain unquantifiable subjective elements. Indicators can only be a partial representation of sustainable prosperity, we find, and thus should not be understood as a way to measure it, but a way of articulating a particular set of political priorities. This way indicators can be a useful tool for constructing new understandings, holding powerful actors to account and enabling engagement with policy end goals.

1 Introduction

Indicators are widely perceived to be useful tools for researching and guiding various forms of societal progress, including sustainability (Singh et al., 2012), human rights (Merry, 2011) and wellbeing (Self and Randall, 2013). For example, the Compendium of Sustainability Indicator Initiatives lists 895 sustainability initiatives that either use or develop sustainability indicators (IISD, 2011). Likewise, many national and international sustainability plans have made indicators a key part of their implementation (Lyytimäk, 2012). A high profile case is the United Nations (UN) post-2015 development plan, Agenda 2030. Signed off by 193 countries, Agenda 2030 is centred on 17 'Sustainable Development Goals' with more than 200 indicators. The indicators are described as essential "to help with the measurement of progress", "ensure that no one is left behind", and "key to decision making" (UN, 2015, p. 12). In this paper we explore the extent to which such claims about the role of indicators are justified.

1.1 The Pros and Cons of Indicator Use

Indicators are central to many sustainability and other socio-cultural projects because they are a useful way to generate knowledge of, and communicate about, complex issues. Indicators break complex issues into more readily understood chunks of information thus allowing communication between experts and non-experts (Merry, 2011, Morse, 2016). Likewise, through selecting and measuring a finite set of quantified indicators that approximate the essential elements of a concept, experts can 'measure' an otherwise immeasurable entity (Turnhout et al., 2007). There is a long history of using indicators in this way in the biological sciences, particularly ecology (Bell and Morse, 2008) and indicators are applied similarly in sustainability research (for example, Mair et al., 2016)). In such cases, indicators can function as an analytical structure, mediating between the nuanced, complex, and difficult to interrogate concept of sustainability and the blunt analytical tools with which complex systems can be investigated. Additionally, indicators are necessary inputs for the investigation of complex concepts by other research tools such as models.

However, indicators have been widely critiqued. Indicators are reductionist analytical tools and their use risks oversimplification, particularly in highly complex and contested contexts (Morse and Bell, 2008; Merry, 2011) where their use can often hide the complexity and interrelations of the underlying system. This can be especially problematic because of how users interact with indicators. A selected set of indicators to measure a certain concept, such as sustainable prosperity, is often assumed to be objective and a complete description of the concept it measures. However, in reality the choice of particular indicators is often value-laden and incomplete (Merry, 2011, Porter, 1995). Additionally, indicators can be biased by the specific indicator construct (conceptualization of the indicator), the determination of the representative sample used to gather data or the choice of statistical methods for the data aggregation. Moreover, indicators help us to construct knowledge and guide decision making. Consequently, where they inadequately describe a contested concept, that concept may even become re-defined in terms of its indicators (Bell and Morse, 2008, Espeland and Sauder, 2007). This can lead to policies and strategies that focus on what is measurable rather than addressing less tangible or measurable issues. For example, the use of GDP as an indicator of societal progress has led to a reframing of societal progress as predominantly about increased productive capacity of the economy, creating a 'growth imperative' (Jackson, 2016).

In fact, GDP is a particularly pertinent example of the dangers of indicators. First it is an inadequate measure of societal progress because it misses important

factors that contribute to broader conceptions of progress (Prescott-Allen, 2001, Stiglitz et al., 2009, Anderson, 2014). Furthermore, GDP growth is strongly correlated with negative environmental impacts (Antal, 2014) and the extent to which it can solve social problems is questionable (Victor, 2007), at least in the case of developed countries. Such criticisms occasionally find an echo in political discourse. Robert Kennedy (1968) famously disparaged economic growth as a measure of progress:

> "*Gross National Product counts air pollution and cigarette advertising, and ambulances to clear our highways of carnage... Yet the gross national product not does not allow for the health of our children, the quality of their education or the joy of their play... it can tell us everything about America except why we are proud that we are Americans.*"

Likewise, Tony Blair (DETR, 1999) argued:

> "*there is a growing realisation that real progress cannot be measured by money alone...But in the past, governments have seemed to forget this. Success has been measured by economic growth - GDP - alone. We have failed to see how our economy, our environment and our society are all one. And that delivering the best possible quality of life for us all means more than concentrating solely on economic growth.*"

However, for all such misgivings and promises to change focus, policymakers have yet to move on from the use of GDP as a proxy measure of progress. We see this even in the SDGs, which have been widely praised as "holistic" and for moving the development away from GDP alone, but nonetheless have an entire goal (Goal 8) which not only aims to promote sustained economic growth (measured as GDP), but also conflates GDP growth with concerns about decent jobs. GDP growth continues to be the principal objective of most government policy (Victor, 2007), and there is little sign that this is changing.

1.2 Indicators for a Better Future?

As researchers and citizens, the authors of this paper are interested in how indicators may or may not be used to help imagine, explore and create a better future. Specifically, all the authors of this paper are engaged in work and research into 'sustainable prosperity'. Sustainability and prosperity are both ideas that have been widely used in plans for societal progress (the UN Global Goals, for example, use both). We understand sustainable prosperity as a good

future, *a world in which people everywhere have the capability to flourish as human beings whilst remaining within the ecological and resource constraints of a finite planet* (Jackson et al., 2016). However, sustainable prosperity remains a highly contested concept and, given that indicators can be problematic in the absence of a fully agreed definition, the use of indicators to flesh it out should be approached with care.

Therefore, in this paper we critically engage with indicators, particularly where they have been used in the context of contested and complex phenomena. Based on a review of the literature, we critique the use of indicators as they have been used for various socio-cultural projects, with a view to understanding how they may be used in our work on sustainable prosperity.

The rest of the paper is structured as follows. In the next section we describe sustainable prosperity as a contested concept. In section 3 we highlight that indicators of contested concepts are not neutral, but instead represent a particular perspective on an issue. We then demonstrate the difficulties this raises, illustrated in relation to the United Kingdom (UK), European Union (EU) and United Nations (UN) sustainable development indicator sets (see Appendix). In section 4 we elaborate on this, highlighting how indicators of contested concepts risk oversimplification as they struggle to deal with the complexity of moral and ethical problems. Finally, in section 5 we mount a qualified defence of indicators, arguing that although these two critiques should influence how we use indicators in contested systems, they do not altogether negate their usefulness.

2 Sustainable Prosperity

 'Sustainable Prosperity' is a highly contested concept. Both sustainability and prosperity relate to issues that are very subjective and politically sensitive. Therefore, sustainable prosperity may be more of an affective-cognitive construct (Davern et al., 2007) than a tightly defined analytical term. In other words, sustainable prosperity as a concept, and how it might be measured, is dependent on each person's world view. For example, the precise understanding of sustainable prosperity depends on how political and institutional contexts frame each person's perceptions.

Even the elements of sustainable prosperity that appear to relate to objective physical realities intersect with highly value-laden problems. For example, a

common theme in discussing sustainable prosperity is the presence of physical planetary limits and the impetus they provide for us to reduce environmental damage. While planetary limits are grounded in physical science (Rockström et al., 2009, Steffen et al., 2015) they are constructed in such a way as to keep the human economy in a relatively benign environment. For example, a biodiversity 'limit' assumes that we value today's biodiversity more than historic or future biodiversity and does not account for the idea that a new biodiversity could flourish under the conditions of a changed environment. Furthermore, the impact of planetary limits on our ability to live good lives is highly contested and subjective. We take the view that any understanding of sustainable prosperity must be cognizant of these physical limits, thus positioning sustainable prosperity as a 'strong' view of sustainability where natural capital and man-made capital are complements rather than substitutes (Daly et al., 1995). But of course this too is contentious. As the name 'strong' sustainability suggests, there is an alternative reading of the impact of planetary limits ('weak' sustainability) which views them as being of negligible importance in the construction of sustainable policies.

Other elements of sustainable prosperity (indicators) are also contested. For example, central to our understanding of sustainable prosperity is that it is a multi-dimensional concept about more than just the economic health of society. In our view, a prosperous society is one that is concerned not only with income and financial wealth, but also with the health and wellbeing of its citizens, with access to good quality education, and with their prospects for decent and rewarding work. Sustainable prosperity enables basic individual rights and freedoms but also goes beyond this and allows people to flourish. But what is flourishing? What are the capabilities that enable flourishing?

Likewise, for us, inter- and intra-generational justice and equity is a core element of sustainable prosperity, such issues can be measured by indicators such as the Gini coefficient or the more general 'poverty reduction'. Another element that could be important is civil engagement and democratic inclusiveness, and the autonomy to act, particularly at the community level (Böhmelt et al., 2015, Howard and Wheeler, 2015). In achieving sustainable prosperity, issues concerning finance and the economy are also likely to play an important role, as are issues around diversity of ownership, and investment models (Vickers and Lyon, 2014, Jackson and Victor, 2016).

The indicators we choose are influenced by the vision of prosperity that we have, and choosing the wrong indicator will lead to the 'wrong' prosperity. We explore this difficulty in the next section.

3 Indicators are limited interpretations, not objective descriptions.

Contested concepts defy the naive understanding of indicators as readily digestible representations of the essential components of a larger system. In this theory researchers construct new information or communicate about the system as a whole (Bell and Morse, 2008, Figure 1) by combining and interpreting multiple indicators of the system. Although this understanding is applicable in perfectly objective and well understood systems, contested concepts, conversely, are characterised by multiple and conflicting ideas about how any given system works. As a result, any given indicator set is only able to represent a subset of these understandings and the differences in these understandings result in different indicators (Meadows, 1998, Davis et al., 2015). Therefore, an indicator of a contested system should not be understood as a piece of information about a system, but a piece of information reflecting how an individual or group conceptualises that system (Figure 2).
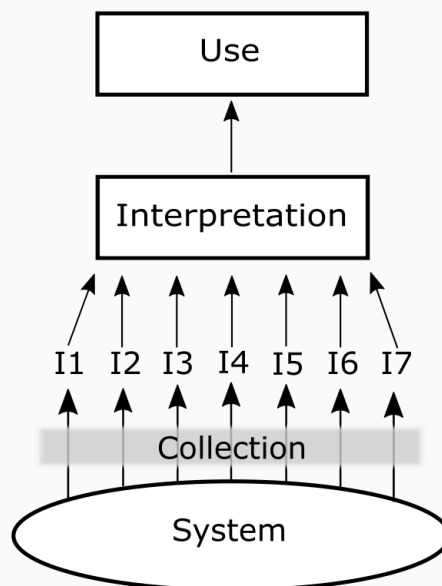

Figure 1: The naïve view of indicators (I), adapted from Bell and Morse (2008). 'I1 to I7 collect information (indicated by arrows) about the system.*
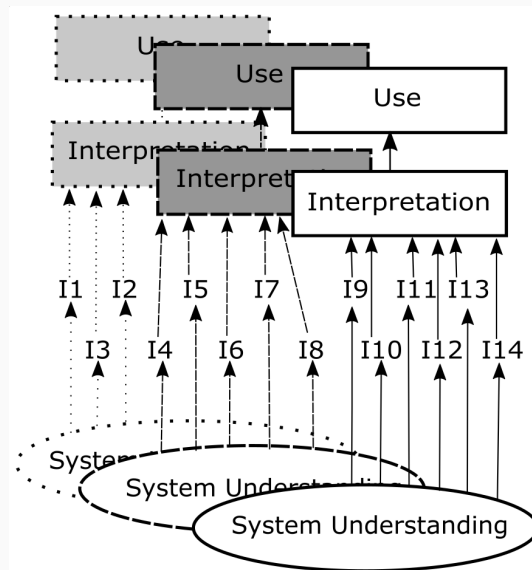
*Figure 2: **The concept of indicators as applied to highly contested and badly understood systems.** While there are multiple conflicting understandings of contested systems, a given indicator set can only represent one (or a small subset) of those understandings.*

3.1 Three different understandings of Sustainable Development

To illustrate how the ability to represent only a limited perspective creates difficulties for those who would use indicators in contested systems, we compare three indicator frameworks that aim to measure and implement sustainable development. The UK (Lofts and Macrory, 2015), EU (Eurostat, 2015) and United Nations (through the Sustainable Development Goals - SDGs) have each developed a set of sustainability indicators. Comparing these three indicator sets is instructive because they have substantial differences, despite all being focused on the same concept and being primarily designed for the same users (nation states).

It is not just that the processes leading to these sets of indicators could not agree on common statistical metrics – *they fundamentally could not agree on how to frame the indicator sets*. At the most basic level, each set contains a different number of indicators or targets (see Appendix):

- SDGs – 17 goals, 169 targets, 230 Indicators
- EU sustainable development indicators (SDIs) – 10 thematic areas (with headline indicator), 132 indicators
- UK SDIs – 3 thematic areas, 66 indicators

Looking deeper, there are only three indicators that use the same statistical measure across the three frameworks: 1) GDP per capita, 2) Greenhouse gas emissions, 3) Share of renewable energy. Likewise, there are only six further indicators that have a common outcome even if the statistical measure is not exactly the same: 1) Increase research and development, 2) Reduce air pollution (or the impact of air pollution), 3) Increase water efficiency, 4) Increase river quality, 5) Regulation of fishing, 6) Protection of forests. Some of these differences are understandable: it is natural that a national framework to measure progress towards sustainability may have different targets from an international framework (there is little reason for the UK to have a national target relating to rainforests, for example). However, many of the differences are less intuitive.

Several key aspects of the frameworks appear common in nature but offer very different indicator sets. For example, 'poverty' appears in all three indicator sets but with a number of different statistical measures. The UN's Global Goals' (SDGs) poverty indicators focus on the proportion of a national population suffering from various dimensions of poverty. Income and monetary aspects of poverty are captured through measures of people living below national and international poverty lines, while more social dimensions of poverty are captured by measuring the proportion of the population unable to access social protection systems and lacking access to basic services. In contrast, the UK's poverty SDIs focus predominantly on the proportion of children living in low income households, where income is defined both in absolute and relative terms.

Indicators both reflect and help construct theoretical perspectives and problem conceptualisations (Merry, 2011): the differences in the UK SDI and the SDG poverty indicators represent alternative understandings of poverty. The UK SDIs emerge from a conceptualisation of poverty as a primarily monetary problem, albeit with a role for societal norms around income. Further, the UK SDI theory of poverty sees households with children as the most at risk group (either because they are most likely to be affected, or likely to suffer the most). Conversely, the SDG poverty indicators emerge from a conceptualisation of poverty as problem that is broader than income alone (hence the inclusion of indicators on societal safety nets); they are based on a view of poverty as a problem for people of all ages (with indicators focused on a range of demographics); and they do not view societal norms as particularly important. Instead the SDGs focus on the absolute understanding of poverty and have no explicit indicators for relative poverty.

Beyond poverty, there are other examples of differences in the three indicator sets that reflect differences in theoretical understandings. For example, public health, where the SDGs and the EU SDIs focus on specific measurable health outcomes (such as maternal mortality, mental health, suicide rates or access to health care), the UK SDIs take a broader perspective that also encompasses more indirect influences on mental health, such as civic participation, whether people perceive that their neighbours can be trusted and if they have close relationships. In the main, these concepts are missing from the SDGs and EU SDIs. On the other hand, absent at the UK level are measures of trust in governance. The promotion of the rule of law, reduction in corruption, access to information, voter turnout and confidence in government are measured at both SDG and EU SDI levels (in different ways).

3.2 Indicators shape how we view the world

The differences in the three indicator sets may also drive outcomes that undermine each other. Indicators refocus attention on to the elements of a concept that they measure and away from the elements that they do not. In this way, indicators direct how their users think about and attempt to deal with the concept itself (Espeland and Sauder, 2007, Merry, 2011). For example, the UK SDIs include a measure of the origin of food consumed in the UK, while the EU SDIs include a measure of imports from developing countries by group of products. Therefore, at the UK level there is a target to reduce food imports while at the EU level there is a target to increase them (albeit from a specific set of countries). Likewise it seems reasonable to suggest that that the UK SDI poverty indicators will result in different policies and outcomes than the SDG poverty indicators. For example, if the UK reduced the coverage of its social protection systems but simultaneously increased the average income of households with children, poverty could get both worse (according to the SDG definition) and better (according to the UK SDI definition)!

4 Indicators struggle with unquantifiable, moral issues.

Indicators are further challenged by the difficulty of codifying, quantifying and linking important elements of contested concepts. The chief utility of indicators comes from their simplification of complex issues, making the ideas more

manageable. By definition, this requires losing information. Often, this information is the contextual and qualitative, discarded because it is hard to quantify or otherwise codify, rather than because it is unimportant (Porter, 1995). Moreover, indicator sets have typically been developed without explicit consideration of their ethical basis and the moral assumptions embedded in the choice and content of particular indexes. Fredericks (2014, p.6) argues that *'there is a widespread assumption in modern Western society that technical and ethical assessments are, and should be, completely separable'*. This needs to be rejected, in her view, on the grounds that *'developing indexes without explicit attention to ethics runs the risk of ineffective indexes, or even worse, indexes which drive people away from their vision of sustainability'* (Fredericks, 2014, p. 9). This crucial point about the ethical dimension of indicators can be made also in relation to values concerning aesthetic judgements, cultural goals and ultimate human ends.

4.1 Arts, Culture, and Ultimate Ends

Informative examples of the ways in which indicators struggle with messy and difficult to codify ideas and relationships are found in arts and culture indicator initiatives such as 'Taking Part'. This is not to say that arts and culture offer a unique challenge when it comes to the use of indicators, as economic indicators also have significant problems associated with their measurement and use however the Taking Part initiative offers a useful case to explore. Taking Part is perhaps the largest and most prominent attempt to provide data on the cultural sector in England. Research using Taking Part data claims to provide "robust evidence" (DCMS, 2014, p. 4) of links between certain kinds of cultural participation and subjective wellbeing (wellbeing as measured through how individuals describe their own feelings). However, establishing causal links between participation/engagement and other outcomes – such as increased wellbeing – proves difficult. Though quantitative analyses from the UK, as well as Canada, Italy and elsewhere, demonstrate a link between engagement in art and culture, and wellbeing, for many, "the challenges of disentangling confounding variables and establishing directions of causality remain" (Crossick and Kaszynska, 2016, p. 38).

Daly's Pyramid (Meadows, 1998; Figure 3), is a useful framework for understanding why connecting the Taking Part participation indicators to 'wellbeing' is difficult.
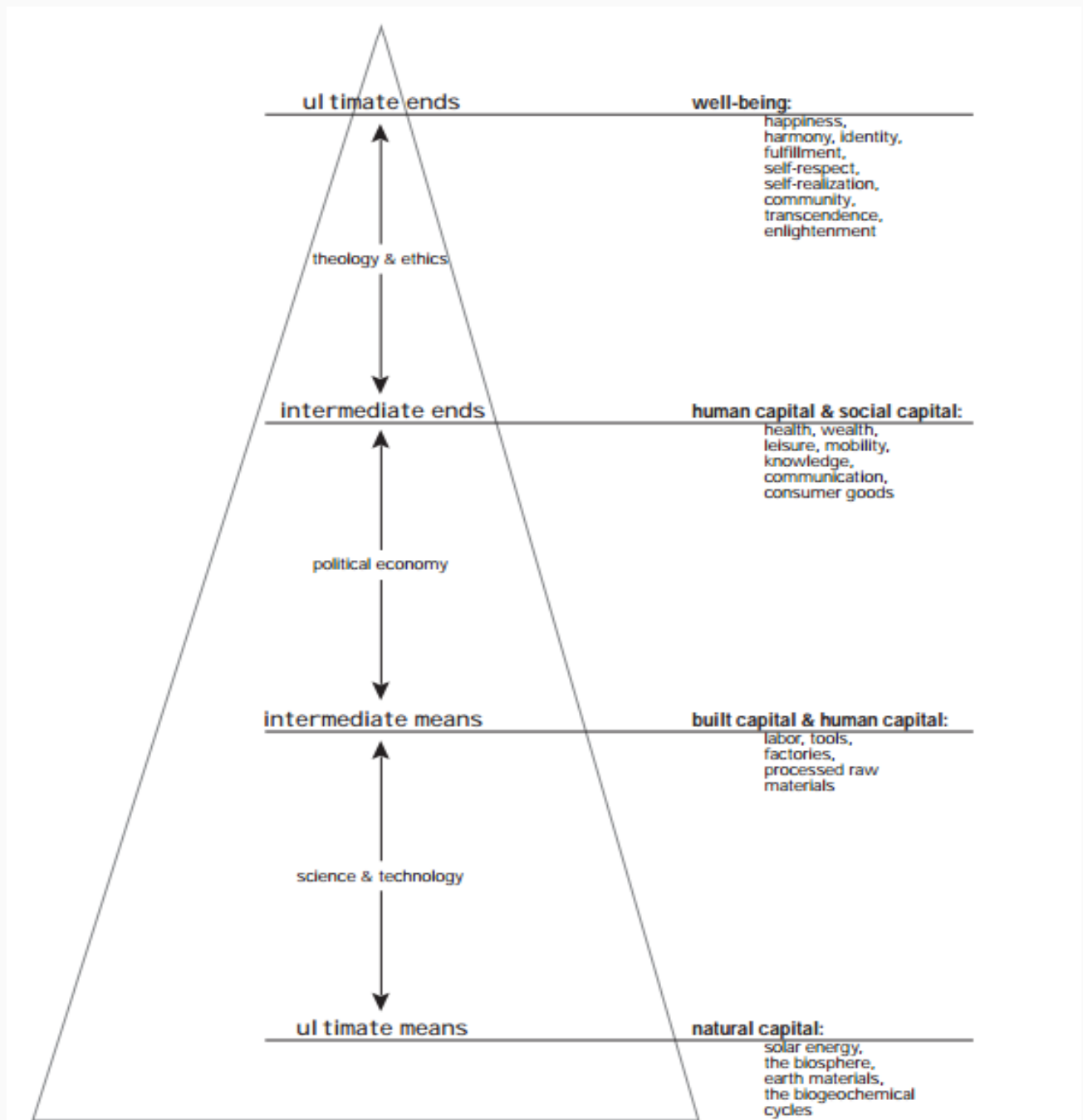
Figure 3. Daly's Pyramid, taken from Meadows (1998)

Daly's Pyramid frames indicators as falling into one of four categories: at the top of the pyramid are Ultimate Ends – happiness, wellbeing, flourishing. These are the things that we strive for, the high level concepts that together (arguably) constitute prosperity. At the base of the pyramid are the Ultimate Means – the fundamental earth systems without which we could not survive, let alone

prosper. In between the two are intermediate means (human labour, tools, processed raw materials etc.) which are used to produce intermediate ends (consumer goods, knowledge, services etc.). Intermediate ends are tools that are necessary to achieve our ultimate ends.

Taking Part measures intermediate ends, gathering information about participation and engagement in the arts, museums and galleries, archives, libraries, heritage, and sport. The survey includes data on frequency of participation. This is important as it draws a distinction between participation, a binary state whereby an individual participates or not, and engagement, which it suggests is related to the frequency of participation. Further questions aim to uncover drivers and barriers to participation. For example, respondents are asked about service provision in their area (e.g. new or closing facilities), and whether they have experienced a range of life events (such as moving house or illness) that could affect participation. It also captures socio-demographic data, including each respondent's education level, income, occupation, marital status and health. These data are released at 6 monthly intervals and provides headline figures on participation and engagement, broken down by, for example, age, ethnicity or region (DCMS, 2015).

However, 'wellbeing' is an ultimate end, not an intermediate end, and it is in connecting the two that problems arise. The data collected in Taking Part allows researchers to produce models that control for other factors (such as income) and provide a statistical evidence-base for claims about the positive impacts of cultural activity that, importantly, can speak to government objectives premised on public utility and notions of wellbeing (Walmsley, 2012). But, as Daly's Pyramid makes explicit, ultimate ends indicators are the outputs of ethical and theological frameworks. In other words, they emerge from a process of highly personal interpretation informed not only by quantifiable measures but by emotional and moral reasoning. As Walmsley (2012, p. 329) argues, many of the ways that culture and art influence wellbeing are personal and intrinsic, taking us *"into the incommensurable realms of spirituality and emotion"*.?

Complexity and immeasurability are not specific to wellbeing and the arts but also to other 'ultimate ends': happiness, harmony, community. How can psychological and personal growth, helping others or creating something new be measured? There may be some proxies for wider social benefits, such as health or education outcomes, but there is also a risk that inputs which are easier to measure, such as spending on health or education systems, do not capture the desired outcomes and, if captured as proxy indicators, become the desired outcomes in themselves. Rather than simply linking subjective wellbeing or

prosperity to cultural or community activity, an approach to understanding how human and social capital (the 'intermediate ends') promotes wellbeing (the 'ultimate ends') through the role of individual capabilities, using indicators such as the ability to exercise creativity, and imagination is needed.

As noted in the introduction of this paper, perhaps the clearest example of a proxy outcome becoming a desired outcome is GDP. GDP is properly understood as an intermediate means on Daly's pyramid: GDP measures the productive capacity of the economy, which we can use to produce intermediate ends and then ultimate ends. Viewed in this way it is unsurprising that increases in GDP often have a weak (or in some cases negative) relationship with ultimate ends such as happiness and health (REFS). GDP is a tool we can use to achieve our ultimate ends, but it will not always be an appropriate tool. But because GDP is much easier to measure than the quality of jobs (SDG 8) or how well the economy meets our needs (EU/UK SDIs), it has become the proverbial hammer and we view all our problems as nails.

Finally, it is worth noting here that the lack of clarity and difficulty of quantification is not confined to the moral aspects of ultimate ends. It takes, as Porter (1995, p. 41) puts it, an enormous amount of effort "*to arrange an unruly humanity into uncomfortable categories*". Consequently, arbitrary exclusion and subjective categorisation are apparent even in the more mundane aspects of intermediate and ultimate ends indicators. Efforts to produce indicators for cultural work, for instance, are hampered by unclear boundaries and distinctions that make even counting the number of cultural workers difficult. Taking a sectoral approach to these labour markets includes large numbers of individuals in non-'creative' roles while excluding cultural/creative workers in non-'creative' industries, while approaches that seek to utilise 'creative intensity' ultimately include consultancy and management roles that have little cultural output (Bakhshi, Freeman & Higgs, 2013; O'Brien & Oakley, 2015: 12-13).

4.2 Indicators that ignore essential elements risk undermining the concept they purport to measure.

These issues are particularly problematic because of the power of indicators to shape the thoughts and actions of researchers and decision makers: through indicator use, the more complex and qualitative aspects of ultimate ends risk being lost or ignored. As discussed in 3.2, indicators can come to redefine concepts by directing attention only to those dimensions captured by the

indicator (Merry, 2011). The act of measuring is not passive; rather, it shapes and defines what it is we are measuring, highlighting aspects to be important and, by omission, defining those aspects that are not important. As a result, indicators that ignore important elements of a concept may lead to policies that either overlook or actively conflict with the original concept as it is more broadly understood. In the arts, for example, Oakley et al. (2013, p. 24) point out that 'well-being-friendly' cultural policy may exacerbate current wellbeing inequalities, while also stemming the production of new work that can be viewed as "difficult, upsetting, challenging, or simply solitary".

Furthermore, there is a risk of concepts being redefined at all levels of society. Quantitative measures give the appearance of objectivity and neutrality: numbers often hide the complexity and value-laden nature of the judgements used in their construction (Porter, 1995). Where these constructions are very complex it is difficult for non-experts to challenge the indicator (Merry, 2011). Even where experts are willing to challenge the indicator, if the only dissenting voices have little political power it is easy for the indicator to remain neutral in appearance, and the concept to be re-defined (Espeland and Sauder, 2007).

Arts and culture once again provides a useful example of such risks. Neither art nor culture are included in the UK Office for National Statistics assessment of wellbeing, perhaps because they are too difficult to measure (Walmsley, 2012). Likewise there are no arts or culture based indicators under SDG goal 3 "Ensure healthy lives and *promote well-being* for all at all ages". Instead this goal opts for indicators that are based on much more easily quantified aspects of health such as maternal death rates and rates of new HIV infections. By ignoring arts and culture, wellbeing indicators may reduce actions that promote cultural and artistic dimensions of wellbeing; potentially leading to reduced wellbeing.

5 A Qualified Defence of Indicators

Despite the problems of indicators described in the above sections, we still believe that indicators have a useful, if limited, role to play in implementing sustainable prosperity. This section makes that case. The previous two sections critiqued the use of indicators in contested concepts on the grounds that they are only able to represent a small subset of understandings of that concept, and that they struggle to deal with messiness and complexity, often excluding

important elements on these grounds. Here we draw on these critiques and begin to outline how we see indicators being usefully applied going forwards.

5.1 Indicators can clarify political views and increase accountability.

While indicators remove contextual information and obscure the process through which this happens, they also force a clarity and rigour that exposes political priorities and beliefs. This is seen clearly in Agenda 2030. The 17 UN Global Goals for Sustainable Development (SGDs) often describe quite broad concepts that are accepted by a majority of global society and are apparently compatible with national sustainability initiatives. However, the SDG indicators reveal very specific perspectives on these problems some of which directly conflict with national perspectives. We have already discussed how indicators reveal very different conceptualisations of 'poverty' in the UK SDIs and the SDG indicators, but this is not the only example of this in Agenda 2030.

Goal 8 aims to "*promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all*", a statement broad enough that we can say with some confidence most people could agree with it. However, the SDG indicators have been criticised for failing to fully encapsulate the concept of decent work (Frey and MacNaughton, 2016). The SDGs do not, for example, include any measure of trade union coverage, working poverty rates or working time, all of which are 'main indicators' for decent work according to the International Labour Organisation (ILO, 2016). Moreover, there are no indicators on job satisfaction or fulfilment, reflecting a very different idea of 'decent work' than those for who such ideas are central (see Burchell et al., 2014 for examples). Indeed by conflating decent work with economic growth, and with only 3 of 16 indicators in Goal 8 (average earnings, work place fatalities and labour rights) attempting to measure it (even at a very superficial level), the conceptualisation of decent work at the policy level is shown to be contested at the very least.

This process of making a particular view explicit is, of course, the very same source of difficulty that we discussed in Section 3, here reframed as a strength. That indicators represent only a single perspective is a problem where they are interpreted as neutral fact, but a strength if indicators are understood as a clarification of the worldview. We must be clear here that indicators are no panacea, they do obscure those political judgements made in the construction of the indicator, but they also allow outsiders to see how concepts are being operationalised. So, instead of indicators necessarily re-conceptualising a

problem and enforcing a single narrow view, they can also create a platform for debate and critique of a concept.

In part this is related to the public nature of indicators (Porter, 1995). Examining the decision making processes of the European Union (EU) and the Millennium Challenge Corporation (MCC), Dutta (2015) finds that the use of indicators makes those parts of the MCC decision making process that use indicators relatively transparent because,

> *"external observers can more easily identify the mechanisms by which decisions are supposed to be made. Such legibility makes a contribution to accountability; where observers can easily discern how a decision was supposed to be made, they can more easily identify deviations in how the decision was actually made." (Dutta, 2015, p. 162)*

Similarly, Finnerty (2005), argues that the use of indicators in the Irish National Anti-Poverty Strategy (NAPS) allows the government to be held to account and has formed the basis for much of the critique of the program.

5.2. Indicators facilitate new understandings of complex systems.

While indicators may lead us to re-conceptualise issues in ways that somehow lessen or reduce our understanding of an issue, they can also facilitate a helpful re-conceptualisation of knowledge. For example, Porter (1995 p. 37) makes the case that the widespread use of quantified indicators helped to create the idea of society by reframing individual problems as societal:

> *"Indeed the concept of society was itself a part statistical construct. The regularities of crime and suicide announced in early investigations of 'moral statistics' could evidently not be attributed to the individual. So they became properties instead of 'society'…Similarly, people sometimes found themselves or people they met to be out of work before this had become a statistical phenomenon. The invention of crime rates in the 1830s and unemployment rates around 1900 hinted at a different sort of phenomenon, a condition of society involving collective responsibility rather than an unfortunate or reprehensible condition of individual persons"*

By reframing a concept in this way, indicators can help us to consider new options and ways of thinking. As a result, indicators are widely used as tools to highlight problems which then guide a more detailed and contextually-sensitive analysis. For instance, subjective wellbeing indicators show large spread but

relatively stable mean values. They also vary widely across geographical areas. Though the measures themselves do not explain underlying causes, they do highlight a potential problem to be explored further (Seaford, 2013).

The actual process of selecting indicators can also help understanding. This paper recognizes that there may be different views of definitions and configurations of indicators. By engaging in participatory processes, different views can be considered (Fraser et al., 2006, Bell and Morse, 2008) and space can be created for the voices of those who might otherwise be excluded. By understanding the contested nature of indicators, those indicators selected can be refined and the limitations of any research identified. Participatory processes for discussion, co-design and co-implementation of indicators became widely used in the wake of Local Agenda 21 in the 1990s, which gave considerable impetus to community-level initiatives for measuring and practising sustainable development (Warburton, 1998; Buckingham and Theobald, 2003). The basic claim made for such processes is that they can, by engaging local insights, expertise and everyday experience, make indicators both more accountable and accepted, and more reflective of local complexity and qualitative as well as quantitative change (Lawrence, 1998; MacGillivray, 1998; Walker et al, 2000; Chambers, 2008). Despite considerable problems of comparability, scaling and integration into national and international indicator sets (Chambers, 2008), participatory systems for indicator development can generate important insights and build up trust and cooperative capacity (MacGillivray, 1998; Walker et al, 2000).

Indicators also enable quantified forms of analysis that can enhance our understanding of highly complex systems. A key example, in our view, is the use of models to understand dynamic non-linear systems. Such systems are difficult to conceptualise and interrogate without models because multiple inter-linkages and feedback mechanisms can result in counter-intuitive and emergent behaviours (Sterman, 2000). Models can be viewed as tools that mediate between theory and reality. In contrast to indicators, system dynamics models show two-way interlinkages between components, including two-way links between intermediate and end goals, and give information about the underlying structure (causal links between components) of a system. In this view, models draw from both theories and the 'real' world but retain a level of autonomy (Morgan and Mary, 1999). Therefore, they facilitate learning by allowing users to test and refine the mental models (theories, value judgements and assumptions) that they inevitably bring to research (Sterman, 2000, Epstein, 2008, Meadows, 2008). By manipulating models we are able to see how the outputs of a model diverge

(or converge), from the theoretical predictions or 'real world' observations and explore why this is the case. Moreover, where models are sufficiently representative of some aspect of the real world they can be considered 'surrogate' worlds and we can make qualified inferences from our model world to the real world (Sugden, 2000, Mäki, 2009). Indicators are essential in this process because they provide the mechanism that allows the model world, theory and reality to be compared.

Reframing a concept may also be useful for more strategic reasons, particularly where we believe current concepts are inadequate. Indicators may be pursued by communities as a way to try and embed their conceptualisations within decision making processes (Hezri and Dovers, 2006). As discussed in the introduction, GDP is widely considered an inadequate measure of societal progress. Though GDP itself plays a role in creating an idea of societal progress that is inadequate, it is also true that GDP emerged from, and is reinforced by, an inadequate concept of societal progress that centres on material goods (see, for example, Blair, 1999 and Anderson, 2014). It has been suggested that rival indicators present a useful way to challenge GDP and reframe debates on societal progress in a broader way (Cassiers and Thiry, 2014). Indeed, the SDGs have been called transformative because they represent a much broader and more holistic view of societal progress (Hajer et al., 2015, WWF, 2016).

5.3 Looking forwards: Indicators for Sustainable Prosperity.

The preceding discussion leads us to take a view on the use of indicators in our sustainable prosperity work (and contested concepts more generally). To promote the use of indicators as tools of clarification and to correct the impression that they are objective, the choice of indicators and their conceptualization should be developed in participatory way, and explicitly linked to a narrative description of a specific sustainable prosperity vision. The literature on participatory indicator development emphasises deliberative construction of visions in conjunction with a variety of stakeholders and then identifying indicators that mean something in the context of that vision (e.g. Bell and Morse, 2008). Indeed, the most effective implementation of sustainability frameworks, such as Local Agenda 21, involved the co-creation of indicators by community groups and other local actors to ensure measures had resonance (see, for example, Barrutia and Echebarria, 2012).

For our own work we propose going slightly beyond this and co-creating multiple alternative, and possibly conflicting, visions of sustainable prosperity (within the understanding outlined in this paper) and then identifying multiple conflicting indicator sets that are meaningful and useful to the specific visions. By developing *intentionally conflicting indicator sets* explicitly tied to specific visions of sustainable prosperity we hope to emphasise the political nature of our indicators. Drawing on the notion that indicators increase levels of accountability and clarity, we hope that this process will also create a space in which we can critically engage with both the indicators and the visions they represent. The alternative indicator sets and visions will be explored using a variety of analytical techniques. This will include, but should not be limited to, different economic models.

6 Conclusion

The use of quantified indicators and targets, such as the Sustainable Development Goals, the EU Sustainable Development Indicators or the UK Sustainable Development Indicators, are now a well established policy tool. However, as shown in this paper there is little commonality in the exact statistical measure that these frameworks use. Indeed while the outcomes of these frameworks appear to have some commonality, at least at the broadest level, the measures used are more often against inputs to the system. While the geographic scale of these frameworks is important, and we acknowledge the place specific nature of measurement (indeed we have highlighted the vital aspect of very local measurement of cultural interventions for example), the variance in the measures of inputs in these three frameworks still surprised us.

The common measures across the three frameworks relate to action on climate change and economic growth. The GDP per capita indicator, while straightforward, dominates the political process and without a structured approach to dialogue around policy development it often drives outcomes which are counter to the other indicators included in the frameworks. As the SDGs develop further, and specific indicator targets are agreed, this wider issue of process and the importance of acknowledging the difference between input (means) and outcome (ends) measures should not be lost.

To develop and use indicators which might measure sustainable prosperity poses numerous challenges. For CUSP the process around the political use and misuse

(or disregard) of these indicators is as important as the indicators themselves and this is often not explored in their reporting. This should form an important part of the exploration of prosperity in practice. The limits of indicators, both in regard to what they can measure as well as their historic use to measure things that some perceive as either worthless or indeed driving incorrect behaviours, should also be acknowledged within CUSP's work.

Given the place of arts and culture within CUSP we need to acknowledge the implications of dialogue with this sector in the context of indicators and it will provide a useful case to explore the use of measures and indicators. For example, indicators of cultural consumption are important in understanding who is (and isn't) participating. However, these types of indicators need to be sensitive to amateur, vernacular and everyday kinds of activity outside funded, legitimated organisations as well as account for the aversion, or outright hostility, on the part of practitioners and arts organisations towards attempts to measure, evaluate and quantify their activity, and the perceived instrumentalisation of art and culture. Thinking about how to capture social capital in ways that provides a basis for comparison may also be important in understanding how it affects health, wellbeing and other markers of sustainable prosperity. If art and culture, alternative investment models or increasing community development through social enterprise, can promote a kind of sustainable prosperity then we must understand, as a matter of social justice and perhaps environmental necessity, how to make them accessible to all. Robust indicators can play an important part in developing these narratives.

Developing a multi-dimensional view of sustainable prosperity based on trans-disciplinary research and dialogue across sectors requires us to break down many barriers. There is a need for us to debate the meaning of 'modelling' and scenario testing alongside measurement and indicators. CUSP, as a team, will reflect on how we work in an interdisciplinary and transdisciplinary way, to explore these issues.

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APPENDIX

A1: UN Sustainable Development Goals

Note that the SDG Indicator list has 241 indicators however 9 are repeated under two or three categories and therefore the total number of indicators is 230.

Goal 1 | End poverty in all its forms everywhere
1. Proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
2. Proportion of population living below the national poverty line, by sex and age
3. Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
4. Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
5. Proportion of population living in households with access to basic services
6. Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure
7. Number of deaths, missing persons and persons affected by disaster per 100,000 people
8. Direct disaster economic loss in relation to global gross domestic product (GDP)
9. Number of countries with national and local disaster risk reduction strategies
10. Proportion of resources allocated by the government directly to poverty reduction programmes
11. Proportion of total government spending on essential services (education, health and social protection)
12. Proportion of government recurrent and capital spending to sectors that disproportionately benefit women, the poor and vulnerable groups

Goal 2 | End hunger, achieve food security and improved nutrition and promote sustainable agriculture
13. Prevalence of undernourishment
14. Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
15. Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age

16. Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)
17. Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
18. Average income of small-scale food producers, by sex and indigenous status
19. Proportion of agricultural area under productive and sustainable agriculture
20. Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities
21. Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction
22. The agriculture orientation index for government expenditures
23. Total official flows (official development assistance plus other official flows) to the agriculture sector
24. Producer Support Estimate
25. Agricultural export subsidies
26. Indicator of food price anomalies

Goal 3 | Ensure healthy lives and promote well-being for all at all ages
27. Maternal mortality ratio
28. Proportion of births attended by skilled health personnel
29. Under-five mortality rate
30. Neonatal mortality rate
31. Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations
32. Tuberculosis incidence per 1,000 population
33. Malaria incidence per 1,000 population
34. Hepatitis B incidence per 100,000 population
35. Number of people requiring interventions against neglected tropical diseases
36. Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease
37. Suicide mortality rate
38. Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders
39. Harmful use of alcohol, defined according to the national context as alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol
40. Death rate due to road traffic injuries
41. Proportion of women of reproductive age (aged 15-49 years) who have their need for family planning satisfied with modern methods
42. Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group
43. Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases,

non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)

44. Number of people covered by health insurance or a public health system per 1,000 population
45. Mortality rate attributed to household and ambient air pollution
46. Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)
47. Mortality rate attributed to unintentional poisoning
48. Age-standardized prevalence of current tobacco use among persons aged 15 years and older
49. Proportion of the population with access to affordable medicines and vaccines on a sustainable basis
50. Total net official development assistance to medical research and basic health sectors
51. Health worker density and distribution
52. International Health Regulations (IHR) capacity and health emergency preparedness

Goal 4 | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

53. Proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex
54. Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex
55. Participation rate in organized learning (one year before the official primary entry age), by sex
56. Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex
57. Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill
58. Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated
59. Percentage of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex
60. Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment
61. Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)

62. Volume of official development assistance flows for scholarships by sector and type of study
63. Proportion of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country

Goal 5 | Achieve gender equality and empower all women and girls

64. Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex
65. Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age
66. Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months, by age and place of occurrence
67. Proportion of women aged 20-24 years who were married or in a union before age 15 and before age 18
68. Proportion of girls and women aged 15-49 years who have undergone female genital mutilation/cutting, by age
69. Proportion of time spent on unpaid domestic and care work, by sex, age and location
70. Proportion of seats held by women in national parliaments and local governments
71. Proportion of women in managerial positions
72. Proportion of women aged 15-49 years who make their own informed decisions regarding sexual relations, contraceptive use and reproductive health care
73. Number of countries with laws and regulations that guarantee women aged 15-49 years access to sexual and reproductive health care, information and education
74. (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure
75. Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control
76. Proportion of individuals who own a mobile telephone, by sex
77. Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment

Goal 6 | Ensure availability and sustainable management of water and sanitation for all

78. Proportion of population using safely managed drinking water services
79. Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
80. Proportion of wastewater safely treated

81. Proportion of bodies of water with good ambient water quality

82. Change in water-use efficiency over time

83. Level of water stress: freshwater withdrawal as a proportion of available freshwater resources

84. Degree of integrated water resources management implementation (0-100)

85. Proportion of transboundary basin area with an operational arrangement for water cooperation

86. Change in the extent of water-related ecosystems over time

87. Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan

88. Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

Goal 7 | Ensure access to affordable, reliable, sustainable and modern energy for all

89. Proportion of population with access to electricity

90. Proportion of population with primary reliance on clean fuels and technology

91. Renewable energy share in the total final energy consumption

92. Energy intensity measured in terms of primary energy and GDP

93. Mobilized amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment

94. Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services

Goal 8 | Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

95. Annual growth rate of real GDP per capita

96. Annual growth rate of real GDP per employed person

97. Proportion of informal employment in non-agriculture employment, by sex

98. Material footprint, material footprint per capita, and material footprint per GDP

99. Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP

100. Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

101. Unemployment rate, by sex, age and persons with disabilities

102. Proportion of youth (aged 15-24 years) not in education, employment or training

103. Proportion and number of children aged 5-17 years engaged in child labour, by sex and age

104. Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status

105. Increase in national compliance of labour rights (freedom of association and collective bargaining) based on International Labour

Organization (ILO) textual sources and national legislation, by sex and migrant status
106. Tourism direct GDP as a proportion of total GDP and in growth rate
107. Number of jobs in tourism industries as a proportion of total jobs and growth rate of jobs, by sex
108. Number of commercial bank branches and automated teller machines (ATMs) per 100,000 adults
109. Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider
110. Aid for Trade commitments and disbursements
111. Total government spending in social protection and employment programmes as a proportion of the national budgets and GDP

Goal 9 | Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
112. Proportion of the rural population who live within 2 km of an all-season road
113. Passenger and freight volumes, by mode of transport
114. Manufacturing value added as a proportion of GDP and per capita
115. Manufacturing employment as a proportion of total employment
116. Proportion of small-scale industries in total industry value added
117. Proportion of small-scale industries with a loan or line of credit
118. CO2 emission per unit of value added
119. Research and development expenditure as a proportion of GDP
120. Researchers (in full-time equivalent) per million inhabitants
121. Total official international support (official development assistance plus other official flows) to infrastructure
122. Proportion of medium and high-tech industry value added in total value added
123. Proportion of population covered by a mobile network, by technology

Goal 10 | Reduce inequality within and among countries
124. Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population
125. Proportion of people living below 50 per cent of median income, by age, sex and persons with disabilities
126. Proportion of the population reporting having personally felt discriminated against or harassed within the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law
127. Labour share of GDP, comprising wages and social protection transfers
128. 10.5.1 Financial Soundness Indicators
129. Proportion of members and voting rights of developing countries in international organizations
130. Recruitment cost borne by employee as a proportion of yearly income earned in country of destination
131. Number of countries that have implemented well-managed migration policies

132. Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff

133. Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)

134. Remittance costs as a proportion of the amount remitted

Goal 11 | Make cities and human settlements inclusive, safe, resilient and sustainable

135. Proportion of urban population living in slums, informal settlements or inadequate housing

136. Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities

137. Ratio of land consumption rate to population growth rate

138. Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically

139. Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)

140. Number of deaths, missing persons and persons affected by disaster per 100,000 peoplea

141. Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services

142. Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

143. Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)

144. Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities

145. Proportion of persons victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months

146. Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city

147. Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030a

148. Number of countries with national and local disaster risk reduction strategies

149. Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials

Goal 12 | Ensure sustainable consumption and production patterns

150. Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies

151. Material footprint, material footprint per capita, and material footprint per GDP

152. Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP

153. Global food loss index

154. Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

155. Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment

156. National recycling rate, tons of material recycled

157. Number of companies publishing sustainability reports

158. Number of countries implementing sustainable public procurement policies and action plans

159. Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

160. Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies

161. Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools

162. Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels

Goal 13 | Take urgent action to combat climate change and its impacts

163. Number of countries with national and local disaster risk reduction strategies

164. Number of deaths, missing persons and persons affected by disaster per 100,000 people

165. Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)

166. Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
167. Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions
168. Mobilized amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment
169. Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities

Goal 14 | Conserve and sustainably use the oceans, seas and marine resources for sustainable development

170. Index of coastal eutrophication and floating plastic debris density
171. Proportion of national exclusive economic zones managed using ecosystem-based approaches
172. Average marine acidity (pH) measured at agreed suite of representative sampling stations
173. Proportion of fish stocks within biologically sustainable levels
174. Coverage of protected areas in relation to marine areas
175. Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing
176. Sustainable fisheries as a percentage of GDP in small island developing States, least developed countries and all countries
177. Proportion of total research budget allocated to research in the field of marine technology
178. Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries
179. Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources

Goal 15 | Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

180. Forest area as a proportion of total land area
181. Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
182. Progress towards sustainable forest management

183. Proportion of land that is degraded over total land area
184. Coverage by protected areas of important sites for mountain biodiversity
185. Mountain Green Cover Index
186. Red List Index
187. Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits
188. Proportion of traded wildlife that was poached or illicitly trafficked
189. Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species
190. Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020
191. Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems
192. Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems
193. Proportion of traded wildlife that was poached or illicitly trafficked

Goal 16 | Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

194. Number of victims of intentional homicide per 100,000 population, by sex and age
195. Conflict-related deaths per 100,000 population, by sex, age and cause
196. Proportion of population subjected to physical, psychological or sexual violence in the previous 12 months
197. Proportion of population that feel safe walking alone around the area they live
198. Proportion of children aged 1-17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month
199. Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation
200. Proportion of young women and men aged 18-29 years who experienced sexual violence by age 18
201. Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms
202. Unsentenced detainees as a proportion of overall prison population
203. Total value of inward and outward illicit financial flows (in current United States dollars)
204. Proportion of seized small arms and light weapons that are recorded and traced, in accordance with international standards and legal instruments
205. Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months

206. Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months
207. Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar)
208. Proportion of the population satisfied with their last experience of public services
209. Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions
210. Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group
211. Proportion of members and voting rights of developing countries in international organizations
212. Proportion of children under 5 years of age whose births have been registered with a civil authority, by age
213. Number of verified cases of killing, kidnapping, enforced disappearance, arbitrary detention and torture of journalists, associated media personnel, trade unionists and human rights advocates in the previous 12 months
214. Number of countries that adopt and implement constitutional, statutory and/or policy guarantees for public access to information
215. Existence of independent national human rights institutions in compliance with the Paris Principles
216. Proportion of population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law

Goal 17 | Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

217. Total government revenue as a proportion of GDP, by source
218. Proportion of domestic budget funded by domestic taxes
219. Net official development assistance, total and to least developed countries, as a proportion of the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee donors' gross national income (GNI)
220. Foreign direct investments (FDI), official development assistance and South-South Cooperation as a proportion of total domestic budget
221. Volume of remittances (in United States dollars) as a proportion of total GDP
222. Debt service as a proportion of exports of goods and services
223. Number of countries that adopt and implement investment promotion regimes for least developed countries
224. Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation
225. Fixed Internet broadband subscriptions per 100 inhabitants, by speed

226. Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies
227. Proportion of individuals using the Internet
228. Dollar value of financial and technical assistance (including through North-South, South-South and triangular cooperation) committed to developing countries
229. Worldwide weighted tariff-average
230. Developing countries' and least developed countries' share of global exports
231. Average tariffs faced by developing countries, least developed countries and small island developing States
232. Macroeconomic Dashboard
233. Number of countries with mechanisms in place to enhance policy coherence of sustainable development
234. Extent of use of country-owned results frameworks and planning tools by providers of development cooperation
235. Number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goals
236. Amount of United States dollars committed to public-private and civil society partnerships
237. Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics
238. Number of countries that have national statistical legislation that complies with the Fundamental Principles of Official Statistics
239. Number of countries with a national statistical plan that is fully funded and under implementation, by source of funding
240. Dollar value of all resources made available to strengthen statistical capacity in developing countries
241. Proportion of countries that (a) have conducted at least one population and housing census in the last 10 years; and (b) have achieved 100 per cent birth registration and 80 per cent death registration

A2: EU sustainable development indicators (SDIs)

Socioeconomic development
1. Real GDP per capita
2. Investment by institutional sectors
3. Dispersion of regional GDP per inhabitant
4. Net national income
5. Household saving rate
6. Real adjusted gross disposable income of households per capita
7. Labour productivity per hour worked
8. Total R&D expenditure
9. Real effective exchange rate - 37 trading partners
10. Turnover from innovation
11. Energy intensity of the economy
12. Eco-innovation index
13. Total employment rate
14. Employment rate by educational attainment level
15. Dispersion of regional employment rates, by sex
16. Total unemployment rate
17. Young people neither in employment nor in education and training (15-24 years) - % of the total population in the same age group
18. Nominal unit labour cost - 3 years % change

Sustainable consumption and production
19. Resource productivity
20. Generation of waste excluding major mineral wastes
21. Components of domestic material consumption
22. Domestic material consumption by material - 1 000 t
23. Municipal waste generation and treatment, by type of treatment method
24. Generation of hazardous waste by economic activity
25. Emissions of sulphur oxides (SOx) by source sector
26. Emissions of nitrogen oxides (NOx) by source sector
27. Emissions of non-methane volatile organic compounds (NMVOC) by source sector
28. Emissions of ammonia (NH3), by source sector
29. Electricity consumption by households
30. Final energy consumption by sector
31. Motorisation rate
32. Organisations and sites with eco-management and audit scheme (EMAS) registration
33. Ecolabel licenses
34. Area under agri-environmental commitment
35. Area under organic farming
36. Livestock density index
37. Number of persons in households

38. Final consumption expenditure of households, by consumption purpose

Social inclusion

39. People at risk of poverty or social exclusion
40. Persistent-at-risk-of-poverty rate
41. Relative median at-risk-of-poverty gap
42. Inequality of income distribution
43. Severely materially deprived people
44. People at risk of poverty after social transfers
45. People living in households with very low work intensity
46. In work at-risk-of-poverty rate
47. Long-term unemployment rate, by sex
48. Gender pay gap in unadjusted form
49. Early leavers from education and training
50. At-risk-of-poverty-rate, by highest level of education attained
51. At most lower secondary educational attainment by age
52. Lifelong learning
53. Low reading literacy performance of pupils
54. Individuals' level of computer skills
55. Individuals' level of internet skills
56. Tertiary educational attainment by sex, age group 30-34
57. Public expenditure on education

Demographic changes

58. Employment rate of older workers
59. Total fertility rate
60. Crude rate of net migration plus adjustment
61. Healthy life years and life expectancy at age 65, by sex
62. Crude rate of population change
63. Aggregate replacement ratio
64. General government gross debt
65. Duration of working life
66. Old-age-dependency ratio
67. Projected old-age dependency ratio
68. Population projections
69. Pension expenditure projections (baseline scenario)
70. Expenditure on care for elderly

Public health

71. Life expectancy and healthy life years
72. Death rate due to chronic diseases
73. Suicide death rate, by age group
74. Self-reported unmet needs for medical care due to being too expensive, by income quintile
75. People having a long-standing illness or health problem, by income quintile
76. Production of toxic chemicals, by toxicity class
77. Urban population exposure to air pollution by particulate matter
78. Urban population exposure to air pollution by ozone

79. Proportion of population living in households considering that they suffer from noise
80. Non-fatal accidents at work by sex

Climate and energy
81. Greenhouse gas emissions
82. Primary energy consumption
83. Greenhouse gas emissions by sector
84. Greenhouse gas emissions intensity of energy consumption
85. Energy dependence
86. Share of renewable energy in gross final energy consumption
87. Gross inland energy consumption by fuel type
88. Electricity generated from renewable sources
89. Share of renewable energy in fuel consumption of transport
90. Combined heat and power generation
91. Projections of greenhouse gas emissions
92. Global and European surface temperature deviation

Sustainable transport
93. Energy consumption of transport relative to GDP
94. Modal split of freight transport
95. Volume of freight transport relative to GDP
96. Modal split of passenger transport
97. Volume of passenger transport relative to GDP
98. Energy consumption of transport, by mode
99. Greenhouse gas emissions from transport
100. People killed in road accidents
101. Average CO2 emissions per kilometre from new passenger cars
102. Emissions of nitrogen oxides from transport
103. Emissions of particulate matter from transport
104. HICP – annual average indices for transport prices

Natural resources
105. Common bird index
106. Sufficiency of sites designated under the EU Habitats directive
107. Water exploitation index
108. Population connected to urban wastewater treatment with at least secondary treatment
109. Biochemical oxygen demand in rivers
110. Fishing fleet, total engine power
111. Artificial land cover
112. Forest increment and fellings
113. Nutrient balance on agricultural land
114. Deadwood

Global partnership
115. Official development assistance as share of gross national income
116. Imports from developing countries by income group
117. Imports from developing countries by group of products
118. Imports from least-developed countries by group of products

119. Aggregated measurement of support for agriculture
120. Financing for developing countries
121. Foreign direct investment in developing countries, by income group
122. Official development assistance, by income group
123. Untied official development assistance
124. Bilateral official development assistance, by category
125. CO2 emissions per inhabitant in the EU and in developing countries
126. Official Development Assistance per capita in donor and recipient countries
127. Population living on less than 1.90 USD per day
128. Population with sustainable access to an improved water source

Good governance

129. Citizens' confidence in EU institutions
130. Infringement cases
131. Transposition deficit of EU law
132. Voter turnout in national and EU parliamentary elections
133. Shares of environmental and labour taxes in total tax revenues from taxes and social contributions
134. Implicit tax rate on energy

A3: UK sustainable development indicators (SDIs)

Economy
1. GDP
2. GDP per head
3. Median income
4. Per cent of adults unemployed over 12 months
5. Children in relative low income households
6. Children in absolute low income households
7. Value of human capital stock
8. Value of human capital per head
9. Population estimates and projections
10. Household estimates and projections
11. Public sector net debt and public sector net borrowing as proportion of GDP
12. Percentage of eligible workers in a workplace pension scheme
13. Total non-financial assets net worth
14. Expenditure on R&D performed in UK business
15. Expenditure on R&D related to environmental protection expenditure
16. Value of environmental goods and services sector

Social
17. Healthy life expectancy at birth (males)
18. Healthy life expectancy at birth (females)
19. Proportion of people engaging in actions addressing issues of public concern
20. Proportion of people engaging in any volunteering activity
21. Proportion of people who have someone to rely on
22. The percentage of people who agree strongly that they felt they belonged to their neighbourhood
23. Proportion of adults from less advantaged groups in managerial or professional positions
24. Net additional dwellings
25. Mortality from deaths considered avoidable
26. Mortality from deaths considered preventable
27. Mortality from deaths considered amenable
28. Percentage of adults overweight or obese
29. Percentage of children (2-15) overweight or obese
30. Prevalence of smoking among adults
31. Proportion of urban trips under 5 miles taken by walking or cycling
32. Proportion of urban trips under 5 miles taken by public transport
33. Proportion of adults doing the recommended 150 minutes of physical activity each week
34. Average daily consumption of fruit and vegetables
35. Incidence of birth weight less than 2,500g in full term live births in England
36. Number of air pollution days classed as moderate or higher – rural

37.   Number of air pollution days classed as moderate or higher – urban
38.   Percentage of the population affected by noise
39.   Number of households in fuel poverty

Environment

40.   Greenhouse gas emitted within the UK
41.   Greenhouse gas emissions associated with UK consumption
42.   Raw material consumption – construction materials
43.   Raw material consumption – non-construction materials
44.   Breeding farmland birds
45.   Breeding woodland birds
46.   Breeding wetland birds
47.   Breeding seabirds
48.   Estimated direct actual abstractions from non-tidal surface waters and groundwaters
49.   Energy supply (CO2 emissions)
50.   Transport (CO2 emissions)
51.   Business (CO2 emissions)
52.   Residential (CO2 emissions)
53.   Other (CO2 emissions)
54.   Proportion of gross energy consumption from renewable sources
55.   Mean SAP rating of existing housing
56.   Mean SAP rating of new homes
57.   Proportion of household waste recycled
58.   Proportion of construction and demolition waste recovered
59.   Land use and development
60.   Origins of food consumer in the UK
61.   Proportion of rivers with biological quality classed as good or high
62.   Proportion of rivers which pass on chemical status
63.   Percentage of fish stocks harvested sustainably
64.   Percentage of UK species of European importance in favourable or improving conservation status
65.   Percentage of UK habitats of European importance in favourable or improving conservation status
66.   UK biodiversity impact overseas