THE SCOTTISH DOUGHNUT

A safe and just operating space for Scotland

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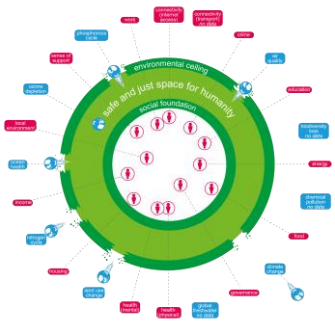

The world faces twin challenges: delivering a decent standard of living for everyone, while living within our environmental limits. These two interwoven concerns are depicted by Oxfam's Doughnut model. It allows people to visualize a space between planetary boundaries (the outer edge of the Doughnut) and a social foundation (the inner edge), where it is environmentally and socially safe and just for humanity to exist. It is where we must aim to reach.

Building on previous work undertaken by the Stockholm Resilience Centre and former Oxfam Senior Researcher, Kate Raworth, the Scottish Doughnut suggests areas of life, or domains, which might constitute a social foundation below which no one in Scotland should fall. It also begins the process of identifying which planetary boundaries might be useful for incorporation into a national Scottish analysis.

The report then provides a snapshot of Scotland's current situation by assessing performance against these suggested domains and indicators.

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LIST OF ABBREVIATIONS

AURN	Automatic Urban and Rural Network (UK)
BSAS	British Social Attitudes Survey
CFCs	chlorofluorocarbons
CSE	Centre for Sustainable Energy
EHRC	Equality and Human Rights Commission
HBAI (AHC)	households below average income (after housing costs)
HKI	Humankind Index for Scotland, Oxfam
HLE	healthy life expectancy
ILO	International Labour Organization
JRF	Joseph Rowntree Foundation
MDGs	Millennium Development Goals
MIS	minimum income standard
NPI	New Policy Institute
ODS	ozone-depleting substances
ONS	Office of National Statistics
PSE:UK	Poverty and Social Exclusion:UK
SDGs	Sustainable Development Goals
SEI	Stockholm Environmental Institute
SCJS	Scottish Crime and Justice Survey
SCOTPHO	Scottish Public Health Observatory
ScRS	Scottish Recreation Survey
SEPA	Scottish Environmental Protection Agency
SIMD	Scottish Index of Multiple Deprivation
SNH	Scottish Natural Heritage
SRC	Stockholm Resilience Centre
SSAS	Scottish Social Attitudes Survey
UNEP	United Nations Environment Programme
UKLHS	UK Longitudinal Household Survey
UKTAG	UK Technical Advisory Group
WEMWBS	Warwick Edinburgh Mental Wellbeing Scale
WERS	Workplace Employment Relations Study
WHO	World Health Organization

EXECUTIVE SUMMARY

BACKGROUND

We live on a fragile planet which is under increased human stress, to the extent that we are transgressing several of the planetary boundaries as mapped out by the Stockholm Resilience Centre (SRC).[1]

We share this planet with over seven billion fellow human beings, too many of whom face extraordinary challenges in building a life free of poverty, indignity, powerlessness and fear. While a small number of people are using the most resources, simultaneously too many are unable to lead lives in which they can flourish and live with dignity.

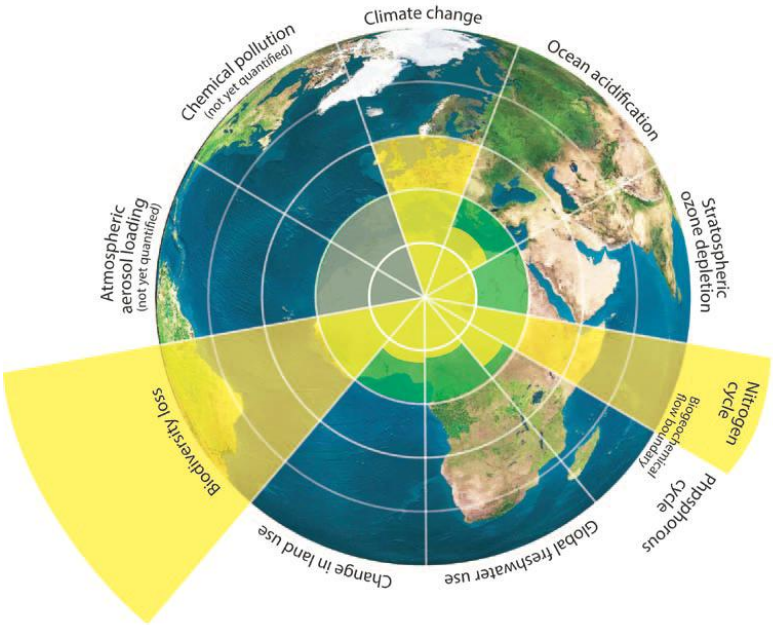
The Oxfam Doughnut brings these dynamics together visually to demonstrate that just as beyond the environmental ceiling lies unacceptable environmental stress, below what we might describe as a 'social foundation' lies unacceptable human deprivation in various manifestations (and those presented here are illustrative only).

This discussion paper outlines Oxfam's Doughnut concept and details the results produced when applying the concept to Scotland. The Doughnut highlights the main social and environmental issues that we face today, and where possible shows how Scotland performs in relation to these.[2]

The environmental elements of the Doughnut flow largely from the work of a team of leading Earth system scientists including Johan Rockström, the SRC and the Stockholm Environmental Institute (SEI).

In 2009, Rockström and others published a paper entitled *Planetary boundaries – the safe operating space for humanity*, which highlighted the risk of crossing critical thresholds in the Earth's biophysical processes.[3] They sought to identify *planetary boundaries,* or tipping points, within these processes beyond which vital Earth systems would become unpredictable and/or unsafe. In 2013, the SRC and SEI sought to develop a methodology to downscale this approach to a national level using Sweden as an example.[4]

Figure 1: Planetary boundaries

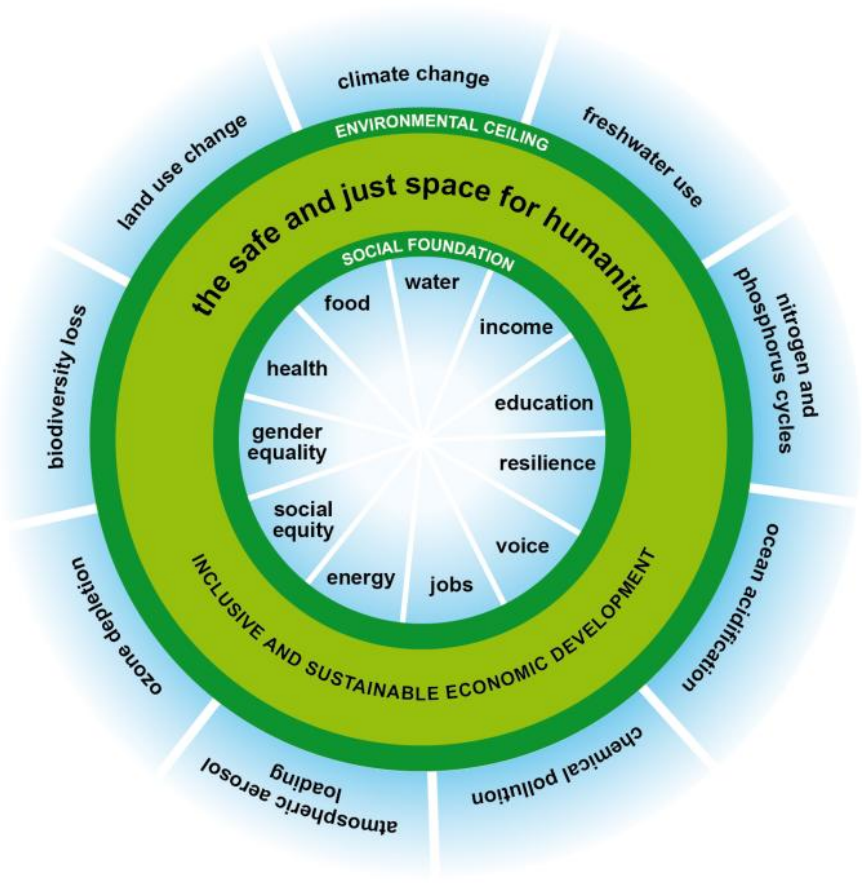


***Source**: Stockholm Resilience Centre and Stockholm Environmental Institute.*

Changes within these processes, driven by human activity, are already causing adverse and severe impacts on weather systems, our ability to produce food and the availability of fresh water. These processes can be seen in Figure 1, which also shows where these planetary boundaries have already been breached. Thus the outer ring represents an environmental ceiling beyond which Earth systems may become irreversibly unstable.

In 2012, Oxfam published a paper authored by former Senior Researcher, Kate Raworth which sought to combine this environmental ceiling with a *social foundation* below which it is *unjust* for people to fall.[5] This combination of environmental ceiling (outer ring) and social foundation (inner ring) is presented diagrammatically in what has become known as the Doughnut (see Figure 2). The social foundation includes domains relating to access to food, income, energy and security. The area between the outer and inner rings therefore represents a *safe* and *just* space within which to exist. Sections 1 and 2 of this report provide further details of this concept and approach.[6]

Figure 2: Oxfam's Global Doughnut



***Source**: K. Raworth (2012)*

The Doughnut demonstrates, in one diagram, performance against a wide range of social and environmental indicators. This allows for a more comprehensive understanding of the impacts of our approaches to socio-economic development and highlights the areas in which we are failing both current and future generations, in Scotland, the UK and around the world.

The concept has gained traction internationally as a growing number of academics, governments and NGOs are developing their own national analyses, while the UN has shown an interest in using the framework to feed into the Sustainable Development Goals. Oxfam is setting up studies similar to the Scottish one in South Africa and Brazil, as well as across the UK.

THE SCOTTISH DOUGHNUT REPORT

The Scottish Doughnut provides a snapshot of our current situation by assessing performance across a wide range of indicators. While the original Doughnut developed by Kate Raworth suggested possible social foundation domains and indicators, it was recognized that these may need to be adapted for national contexts. We have therefore selected domains that we think fit the Scottish context. However, these selections remain open for debate and revision. In sections 3 to 5 of this report, the rationale behind the choice of social domains, indicators and thresholds is given, along with the results. The selection processes for domains and results regarding the *environmental ceiling* are detailed in sections 6 to 8. These follow, where possible, the work of SRC and SEI, but take a different approach when necessary. Section 9 summarizes findings and highlights some conclusions.

It should be noted that the results provide a description of where Scotland is now and do not capture either historical contribution or the direction of travel within each domain.

RESULTS

The picture painted by the Scottish Doughnut is stark. Scotland's impact upon planetary boundaries is far beyond what its population size can justify. Efforts are being made to turn this around through, for example, work to reach world-leading carbon reduction targets as laid out in Climate Change (Scotland) Act 2009. However, the fact remains that Scotland significantly outstrips proposed boundaries in nearly all of the environmental domains identified (Figure 3, Table 1). At the same time inequalities in the distribution of Scotland's great wealth causes deprivation across many indicators as people find themselves lacking work, unable to afford to heat their homes, and forced to visit food banks or simply go without enough food (Figure 4, Table 2). Thus Oxfam's Scottish Doughnut demonstrates that our current economic model is, in many ways, both environmentally unsafe and socially unjust.

This will be the cause of little surprise among those engaged in the various socio-economic and environmental policy fields covered. For several decades debates around sustainable development have exposed the environmental damage caused by economic development based upon an ever growing and individualized consumption of resources. At the same time a mounting body of literature such as Poverty and Social Exclusion: UK's *(PSE:UK) Impoverishment of the UK* report; the Joseph Rowntree Foundation's (JRF) *Minimum Income Standard;* Oxfam's *Humankind Index* for Scotland; and the work of the Resolution Foundation demonstrate the human costs of our current socio-economic model and the over-reliance on economic growth, as measured by Gross Domestic Product, in assessing our collective prosperity. This work challenges both the effectiveness and acceptability of current economic models and suggests alternative ways to view progress.

Whilst seeking to add to that developing narrative this paper does not go into the policy analysis required to systematically challenge these failures.[7] Instead, through the presentation of the data within the Doughnut, it provides a valuable visual representation of Scotland's performance while substantiating the need for significant change in the way we produce, consume and distribute resources if we are to develop an environmentally and socially *safe* and *just* space within which to exist. It is hoped that by bringing social and environmental considerations together, a broader dialogue can be initiated between those working for social and environmental justice; two inter-linked areas of policy and practice.

It is therefore hoped that this report can feed into ongoing policy debates and help spark new ones. The wealthy nations of the world are the winners in our current socio-economic models while the poor, both globally and within wealthy nations, pay the price. The Doughnut presents the facts which make that clear.

However, the environmental and social realities outlined in the Doughnut are not set in stone.

Choices can be made to develop a more environmentally sustainable future. Debates surrounding potential solutions are ongoing and are focussed on changes to industrial and agricultural production, consumption patterns, and broader mechanisms to tackle resource demand. We now require the political will to implement policies designed to shape such decisions and tackle the detrimental impacts created by our production and consumption patterns.

Nor are the social failures described inevitable. The failures highlighted here, are the result of the way we currently organize our society. They are the result of successive governments' policy choices surrounding how we use the tax system and public spending, as well as how we regulate and deliver services, and provide support for our citizens. A more equal distribution of the wealth created could deliver a social foundation where all citizens could enjoy what we define as a minimum acceptable standard for all.

We make no claim to have uncovered the definitive *safe* and *just operating space* for our society. However, the Doughnut does provide an aim, or set of objectives, which – if delivered – would make for a much more sustainable society which is organized in a way that delivers a quality of life for all, without compromising the ability of others either here or abroad, now or in the future, to an equally acceptable quality of life.

We hope the Scottish Doughnut can add weight to challenges to the dominant socio-economic narrative and help develop the political will required to create paths to a more sustainable and just society.

Figure 3: Environmental ceiling – Scotland 2014

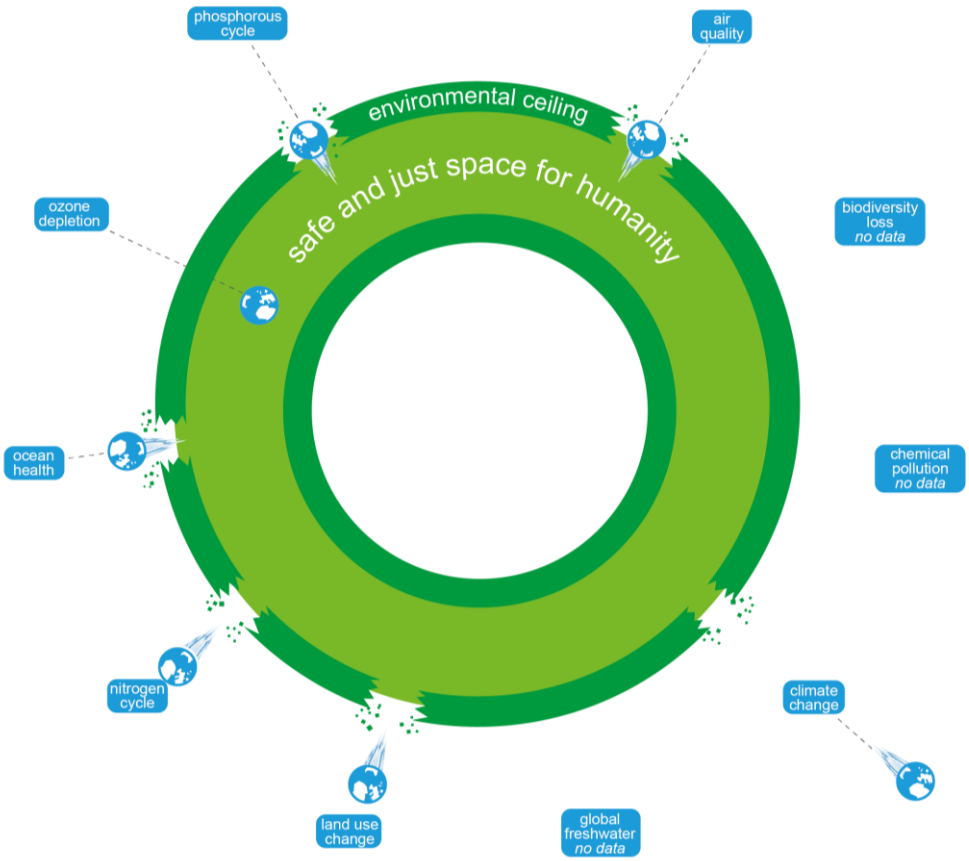


Table 1: Environmental ceiling results – Scotland 2014

Domain	Indicator	Scottish boundary (based on population)	Result
Air quality	Particulate concentration (PM10)	Alternative Scottish boundary: World Health Organization (WHO) recommend limit of 20μgm^3 annual mean.	**12% of roadside sites in Scotland failed to meet WHO recommended upper limits**
Biodiversity loss	No data		
Chemical pollution	No data		
Climate change	Consumption of CO_2 ($MtCO_2$)	Stockholm Resilience Centre (SRC)-based Scottish boundary: 10.4 $MtCO_2$/year	**60.25 $MtCO_2$/year** **Exceeded boundary by 479%**
Global fresh water	No data		
Land-use change	Consumption of land-use change (ha).	United Nations Environment Programme (UNEP)-based per capita UK boundary: 0.2 ha/capita	**0.7 ha/capita** **Exceeded boundary by 250%**
Nitrogen cycle	Imports of manufactured nitrogen (MtN)	SRC-based Scottish boundary: 0.0266 MtN/year	**0.125 MtN/year** **Exceeded boundary by 317%**
Ocean health	% of fish stocks harvested sustainably by Scottish vessels	Alternative Scottish boundary: 100% of fishing classified as sustainably harvested	**53% of Scottish fish harvested unsustainably**
Ozone depletion	Ozone-depleting Substances (ODS)	Alternative UK boundary: Consumptive use of ODS	**Zero emissions of ODS** **Boundary not exceeded**
Phosphorous cycle	Phosphorous loads in Scottish rivers	Alternative Scottish boundary: *poor/bad* loads of phosphorous in rivers.	**4% of Scottish river testing sites classified as having *poor* or *bad* loads**

Figure 4: Social foundation – Scotland 2014

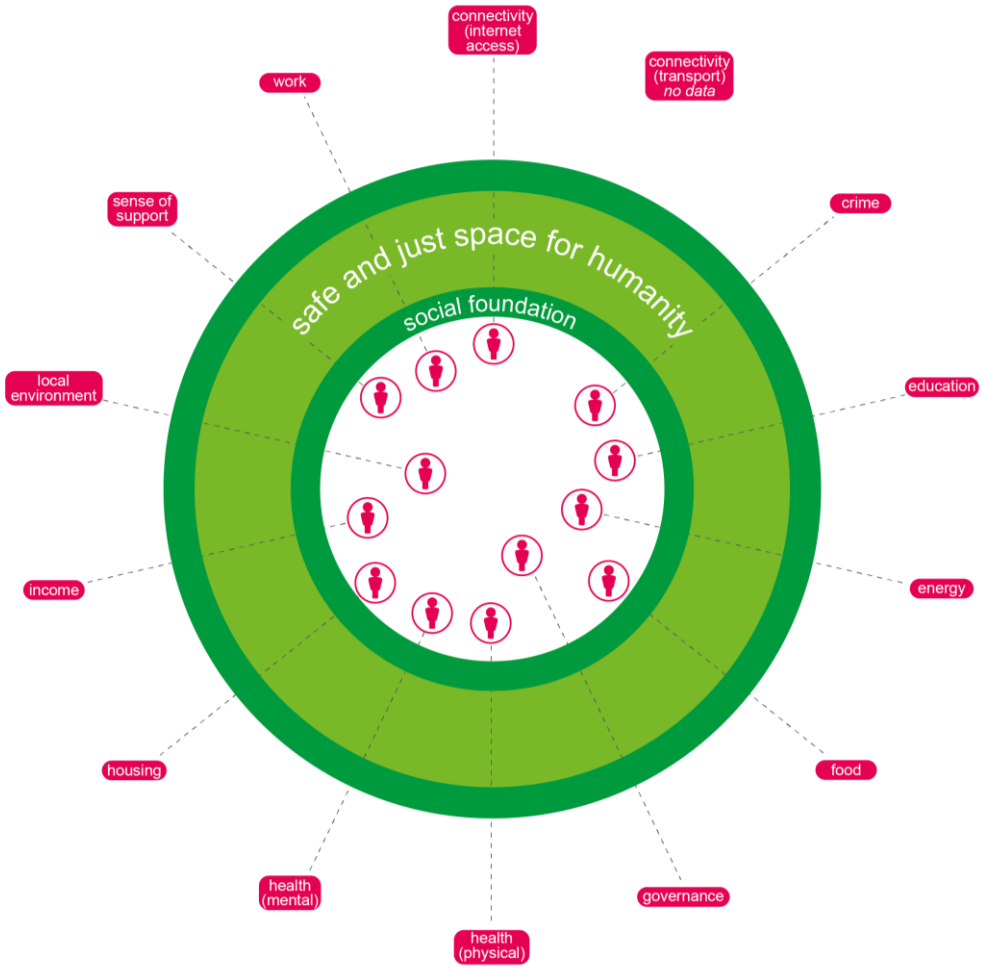


Table 2: Social foundation results – Scotland 2014

Domain	Sub-domain	Indicator	Result
Connectivity	Internet access	People who have no internet connection due to barriers such as affordability and complexity	**10% of households lack an internet connection due to barriers**
	Transport	No indicator identified	
Crime		Risk of victimization	**17% of adults were victims of crime within the past 12 months (women 16%, men 18%)**
Education		Adults lacking any formal qualifications	**21% of adult population lack any formal qualification. (women 22%, men 21%)**

Energy		Fuel poverty – 10% or more of income required to be spent on all energy	**46% of households are in fuel poverty**
Food		Poverty and Social Exclusion:UK (PSE:UK)-defined adequate diet	**5% of people cannot afford an adequate diet (UK data)**
Governance		Sense of personal political efficacy	**60% of people feel they *have no say in what the government does***
Health	Physical	Years of healthy life expectancy (HLE)	**Men in the most deprived areas in Scotland have 16% less than the average number of years of HLE (women 15%)**
	Mental	Anxiety or depression	**15% of adults recently experienced some level of anxiety or depression (women 17%, men 13%)**
Housing		Overcrowding	**3% of households are overcrowded**
Income		Households below 60% average income – after housing costs (HBAI-AHC)	**19% of households in relative poverty**
Local environment		Access to the natural environment once per week	**58% of people access the natural environment *less than* once per week**
Sense of support		Support from family, friends and others	**8% of people have little or no support in times of need**
Work		People lacking satisfying work	**20% of people lack satisfying work**

1 INTRODUCTION

Scotland and the UK face multiple and interlocking social challenges: deep inequalities in wealth[8] and power; rising levels of in-work poverty; and growing stigmatization of people living in poverty. Alongside these we are witnessing environmental challenges on many fronts, not least the disproportionate size of our contribution to global climate change, notwithstanding efforts to reduce emissions and a welcome increased focus on renewable forms of energy.

Gains from growth in the economy have not been shared equitably enough.[9] One in five of the Scottish population live in relative income poverty,[10] and according to the High Pay Commission inequality is heading towards levels last seen in Victorian times.[11] Only 12p in every £1 of UK gross domestic product (GDP) goes to wages in the bottom half of the labour market.[12] If the national minimum wage had risen in line with directors' pay it would stand at £19 per hour rather than the current level of £6.30 (set to increase to £6.50 by October 2014).[13] The richest three families in Scotland now own more wealth than the poorest 20% of the population.[14]

Such poverty and inequalities are created by a complex web of root causes, with structural economic changes being a major driver. Over the last four decades economic change has been marked by the continued decline of skilled and semi-skilled jobs, and the relative growth of low-skilled, service-sector jobs leading to increasingly insecure work.[15] Such shifts have contributed to the maintenance or deepening of disparities in areas such as education, income and life expectancy.

At the same time, at a Scottish level we contribute significantly to the pressures brought to bear on the planet's bio-physical capacities. A set of 10 critical planetary processes have now been identified by the Stockholm Resilience Centre (SRC) and Stockholm Environmental Institute (SEI) as vital for the continued safe functioning of our planet; these include climate change, fresh water use, ocean acidification and biodiversity.[16] The initial report from the team of Earth system scientists in 2009 led by Johan Rockström put forward safe operating boundaries, *planetary boundaries*, for some of these processes and argued that two (biodiversity loss and nitrogen cycle) have already been breached, while for another (climate change) a tipping point is dangerously close.[17] As is demonstrated below, Scotland adds to many such pressures on a scale well beyond what its population size might justify.

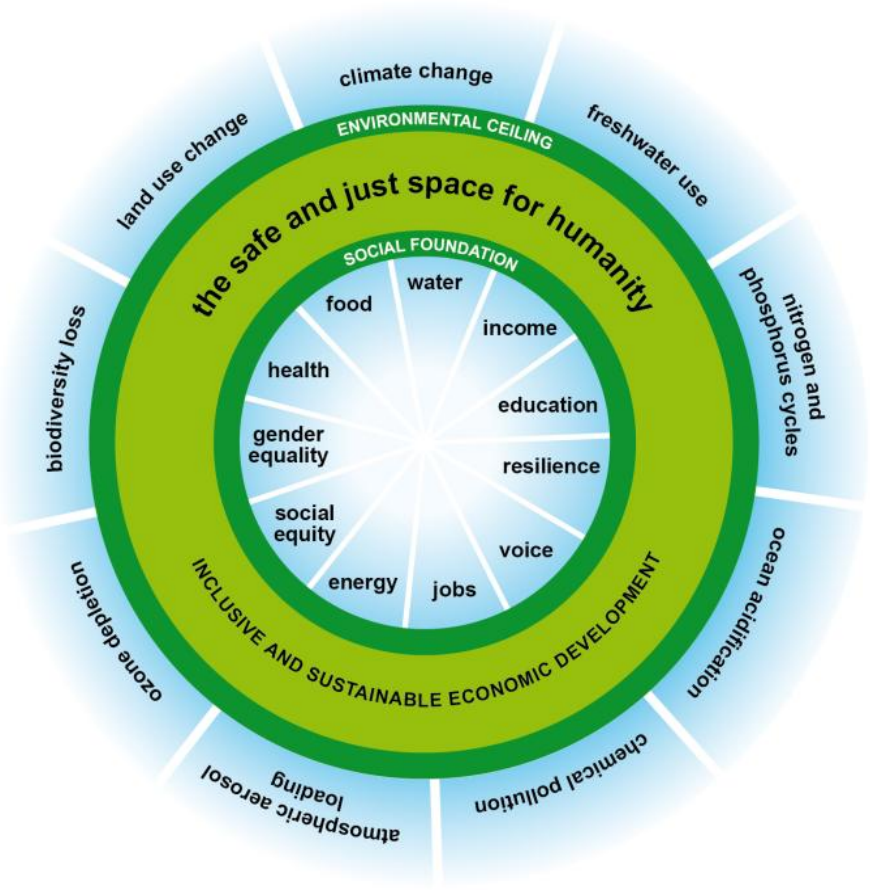
Methods and patterns of production and consumption are the drivers behind these changes, from our energy consumption to our food production. These will have long-term and, in some instances, irreversible negative impacts which may limit our ability to live safely on this planet as extreme weather events become both more common and more severe, while fresh water and food supplies come under growing pressure.[18]

Therefore we need to look to a model of sustainable economic development that tackles inequalities in the distribution of resources, *and* lives within environmental limits in production and consumption. Our economy needs to deliver a decent standard of living for all while respecting planetary boundaries.

It is within this context that Oxfam seeks to display visually the current state of play in relation to planetary boundaries and socio-economic standards.

These two interwoven concerns are depicted in the Oxfam Doughnut which allows people to visualize a space between planetary boundaries (the outer edge) and a social foundation (the inner edge) – see Figure 5. This space is where it is suggested it is environmentally and socially *safe* and *just* for humanity to exist.

Figure 5: Oxfam's Global Doughnut



***Source**: K. Raworth (2012)*

This paper is an initial step in the development of this snapshot assessment for Scotland. Another covering the UK will follow later in 2014. It should be noted, however, that the results provide a description of where Scotland is at present and do not capture historical developments or the direction of travel within each domain.

First, the paper suggests domains – or the areas of life – that might constitute a *social foundation*, below which no one in Scotland should fall. In suggesting potential domains, the paper draws on existing research regarding what people in Scotland and the UK deem to be important outcomes in today's society. A variety of sources, including many covering consensus-based notions of minimum standards, along with discussions with subject experts, have been used to identify these domains. The paper also goes on to suggest possible indicators and thresholds that might be used to assess Scotland's performance in relation to such a social foundation.

Second, the paper begins the process of identifying which of the planetary boundaries put forward by Johan Rockström and the SRC/SEI might be useful for incorporation into a national Scottish analysis. These have been suggested following an assessment as to whether they can be meaningfully measured at a national level.

The methodology also leans heavily on SRC's work downscaling the global planetary boundaries to apply at a national level for Sweden.[19] As with the social foundation the paper goes onto suggest indicators and, where possible, thresholds for the selected domains.

Further discussions will be required to test whether these social and environmental domains are indeed the most relevant for Scotland and to investigate the most informative indicators and thresholds that can be usefully employed.

The assessment makes no claim to be definitive in either its social or environmental aspects. However, it is a starting point from which to engage experts and activists from intrinsically related but often segregated fields; to raise awareness of the issues among a wider audience; and to focus minds on creating new perspectives and more radical policy debates aimed at delivering a truly sustainable economic model.

2 THE 'DOUGHNUT' CONCEPT: A 'SAFE' AND 'JUST' OPERATING SPACE FOR HUMANITY

This section gives a brief overview of how the Doughnut concept has been developed and what it is intended to achieve.

The paper produced by Johan Rockström and others in 2009, *Planetary boundaries – the safe operating space for humanity,*[20] highlighted the risk of crossing critical thresholds in nine of the Earth's biophysical processes (this was later updated to 10). These *planetary boundaries* represent their estimate of where a *safe operating space* is within each of those processes.

Building on this, in February 2012 Oxfam published a discussion paper by Kate Raworth entitled *A safe and just space for humanity: can we live within the Doughnut?*[21] This paper added a social dimension to the planetary boundaries concept, highlighting global poverty and injustice and proposing a *safe* and *just* space for humanity. This space – which has become known as the Oxfam *Doughnut* – offers a powerful visualisation of where our economy needs to deliver change.

Oxfam's Doughnut has gained strong international interest and traction as an approach to understanding global development paths informed by both social and environmental factors. The UN has shown interest in using it to feed into the post-2015 Sustainable Development Goals (SDGs) and a growing number of academics, NGOs, think tanks and governments are proposing to collect data on planetary boundaries and social foundations in their own countries, creating a national 'Doughnut analysis' for each. In this context, this paper is a contribution to the development of a Scottish Doughnut.

The appeal of such a visualisation is strong: nations rarely bring together such diverse information about their environmental impacts and socio-economic conditions in such an integrated and visually understandable way. Doing so will help highlight questions such as:

- What has been the impact of Scotland's economic model in terms of tackling poverty?
- How do we equitably manage our national natural resources and economic growth when taking account of planetary boundaries?
- What is Scotland's 'natural resource budget' and are we living beyond it?
- How can we ensure food, water, energy and jobs for all in the future without degrading the resources on which our global and national wellbeing depends?

The Doughnut is a useful representation of what *just* and *sustainable* development might look like. It brings into one image, and hence a single conceptual framework, the concerns of environmental sustainability and social justice, which are too often portrayed as competing, rather than inter-related, aims. In short it acts as a barometer, measuring the sustainability of our development. In this sense there are obvious links to the Scottish Government's National Performance Framework, which is being reviewed[22] and placed on a statutory basis.[23] We hope some of the concerns inherent within the Scottish Doughnut can be incorporated into the revised National Performance Framework.

Rather than aiming to provide answers, the value of the Doughnut lies in provoking public discussion and opening up new questions. Oxfam hopes that mapping out the extent to which Scotland lies within the Doughnut – or is operating above or below the boundaries and social foundation – is a first step. Subsequent steps will be required to implement change across the whole range of policy areas in order to change the shape of that map. Oxfam would welcome collaborative working partnerships to progress this agenda.

The Doughnut has three main components, namely: domains, indicators and thresholds:

- The domains are the broad areas we wish to explore. For example, biodiversity loss and land-use change within the planetary boundaries, and adequate income, food and shelter within the social foundation.
- Within those domains we have selected indicators to measure our current state. For several of the environmental domains we have leaned heavily on the work of SRC and SEI, while for others we have developed alternative approaches.
- We also propose thresholds for the social domains, based upon analysis of the extensive body of evidence in the Appendix, and build up a picture of what a social foundation might look like. Together these data sets are used to indicate an environmentally and socially *safe* and *just* space.

The methodologies for selecting the range of domains for this study have been shaped fundamentally by the main objective, namely to inform and shape public policy debate. Therefore the domains used within the Scottish Doughnut were chosen because they are relevant to such debate in Scotland. An explanation of the rationale for selecting domains is laid out below (and in the Appendix), along with the reasons for choosing each indicator and threshold.

However, it should be noted that this study is not an exercise in expert, scientific analysis. It is instead a suggestion, based on extensive policy research, for a set of criteria that will enable us to demonstrate the impact of Scotland's economic model on social and environmental developments both nationally and globally. The project will remain organic recognizing that there will be other, very valid, criteria that might also be considered.

3 METHODOLOGY FOR DEVELOPING A SOCIAL FOUNDATION

This section explains the thinking behind the selection of the domains for the social foundation and explains some of the limitations of the project and the data. More detailed discussion on how the domains were selected can be found in the Appendix.

In selecting the range of domains, indicators and thresholds to incorporate into a social foundation our efforts were shaped by Oxfam's understanding of poverty as being much wider than income alone. Oxfam's work around the world and in the UK shows that understanding poverty needs to be underpinned by examination of power, politics and relationships.[24]

Thus our social foundation must encompass a range of areas – including social, economic and political.

Domains

The 11 domains of the original social foundation in Oxfam's Global Doughnut (i.e. water, income, education, resilience, voice, jobs, energy, social equity, gender equality, health and food) were drawn from governments' submissions to the Rio+20 conference on the replacement of the Millennium Development Goals (MDGs) post-2015.[25] The selection criterion was that a minimum of 50 percent of the submissions from government included the priority area. Relevant indicators and data were then obtained from global databases and reports.[26] The indicators focus on deprivation thresholds (such as the percentage of people below the poverty line) rather than nationwide outcomes (such as GDP per capita).

In applying the Doughnut concept at the national level, a number of key questions needed to be asked:

- What are the most relevant domains for each country and how do we agree what is relevant?
- How should the indicators and thresholds within these domains be selected?
- How many domains would be useful and practicable?
- Are there sufficient data sets for the selected metrics?

A workshop attended by representatives from civil society and academic institutions from a range of countries hosted by Oxfam in November 2012 explored these questions further. The workshop concluded that while the original global domains related to the MDGs remain important, they do not address human rights very comprehensively. Nor did they address issues such as housing or personal security.

Other domains put forward for consideration included:[27]

- Housing and land
- Safety and security
- Communication and mobility
- Access to finance and information
- Governance

- Community and citizenship (to replace Voice)
- Water and sanitation could possibly be separated into two domains

The workshop further concluded that a core set of around 12 social domains were needed for comparison, and that these should be proposed by Oxfam given its 70 years' experience of development around the world (and over 15 years working with some of the poorest communities in the UK).

This Scottish Doughnut report is built on the premise that domains, thresholds and indicators for the national social foundations should reflect as much as possible the reality of life in that country, and should be derived from public dialogue, discussion and participation. This echoes the view of the Scottish and UK public that minimum living standards should reflect contemporary aspirations.[28] However, rather than undertaking a dedicated consultation of the sort that informed Oxfam Scotland's Humankind Index, which is precluded by resource constraints, this report analyses existing research and literature, much of which is based upon participatory methods, and distils the findings into proposed domains for Scotland and for the forthcoming UK Doughnut.

The main sources used for this report include:

- *The Impoverishment of the UK* (Poverty and Social Exclusion: UK (PSE:UK) led by the University of Bristol)
- *Monitoring Poverty and Social Exclusion* (Joseph Rowntree Foundation (JRF) and the New Policy Institute (NPI)
- The Minimum Income Standard (MIS) (University of Loughborough and JRF)
- The Office of National Statistics (ONS) Wellbeing Consultation
- The Equalities Measurement Framework (The Equalities and Human Rights Commission)
- The Oxfam Humankind Index for Scotland (HKI) (Oxfam)

Much of the literature reviewed was based upon research into what people felt to be important aspects of their lives or life in general. For example, the HKI engaged with 3,000 people in Scotland to establish their priorities while the PSE:UK report was built upon a survey which sampled 12,100 people in 5,200 UK households. This was added to by analysis of more theoretical literature. Finally, we spoke to a series of experts with knowledge of aspects of poverty and social exclusion. The full range of the literature review can be found in the Appendix.

Based on the review of government input into Rio+20, the Oxfam workshop, the literature review, and discussions with stakeholders and experts we have suggested a range of 12 domains that reflect people's priorities in modern Scotland and the rest of Britain.

The domains selected through this methodology, for use within both the Scottish and UK Doughnut reports, are:

- Connectivity
- Crime
- Education
- Energy
- Food
- Governance
- Health
- Housing
- Income
- Local environment
- Sense of support
- Work

Further discussions on the selection of these domains will follow this paper. At a later point a dedicated consultation may be undertaken.

Indicators and thresholds: challenges and limitations

Indicators and thresholds have been suggested in order to assess the experiences of Scotland's population within each proposed domain. However, the setting of thresholds beyond which it is *unjust* for people to fall clearly presents some difficulties.

For example, in relation to income poverty the usual metric used is the 60% of median household income figure (HBAI). There are, of course, practical policy rationales for using such a threshold based on relative income: it is well understood, comparable across countries and time, simple and recognizable, and linked to existing government targets. However, it is also rather arbitrary. It implies that people one point below the threshold are *poor*, while those one point above are not. Moreover, it is only a relative measure and does not measure income adequacy. Similarly, as it measures income alone, it does not reflect the different financial *stocks* and resources or support people have to help them cope. Nor does it necessarily account for varying need among different groups – for example, pensioners have different requirements to households with young children. The task of selecting indicators and thresholds does therefore create a range of challenges. Section 5 explores these challenges and explains our approach to each selection.

It is important to acknowledge these challenges, as well as the threshold limitations. These have been the subject of a great deal of debate among academics, practitioners and policy makers for many years. Our objective here is not to ignore them, nor necessarily overcome them, but to explore and use the best available solutions in order to create a national *Doughnut* that can act as a barometer of Scotland's socio-economic model, and highlight the winners and losers it creates.

Disaggregating the findings

The experience and prevalence of poverty varies along many lines:

- Oxfam's experience leads to the view that poverty is a gendered issue. Incidences, experiences and routes into and out of poverty vary according to gender.
- Additionally, there is a clear need to consider the causes and consequences of economic inequality across all social domains.
- The work Oxfam does in communities around the UK shows us that relative circumstances matter: they shape how people participate in society. For example, even when subsistence needs are taken care of, how much you have relative to others has a profound impact in areas such as life expectancy.[29]
- Moreover, in terms of mental health, recent reports show that anxiety and the prevalence of mental illness are twice as high in the lowest-income communities as they are generally.[30, 31]

For these reasons it was agreed that, as different groups experience social exclusion differently, some level of data disaggregation would be required. However, resource constraints limited this, and disaggregation across gender and levels of deprivation within the chosen domains is therefore presented only where possible.

It is important to acknowledge that there are other distinctive experiences of poverty requiring tailored solutions across other social groups, defined in terms of ethnicity, age, physical and mental abilities, and in sub-national geographic areas. Disaggregation is therefore highlighted here as an area requiring further research.

4 SOCIAL FOUNDATION RESULTS

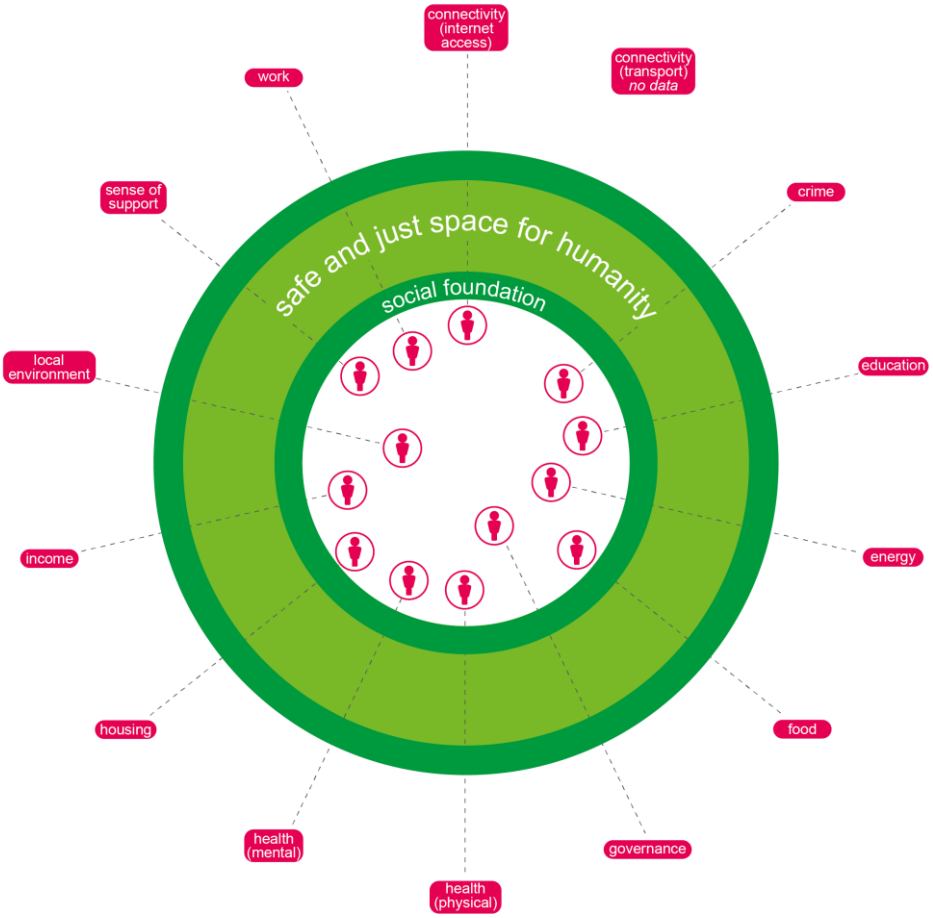
***This section details suggested domains of the social foundation along with indicators and thresholds where identified. Figure 6 shows the results while Table 3 gives an overview of the domains, indicators and thresholds. Section 5 explains the rationale for these choices and explores some of the data issues*.**

Table 3: Social foundation results – Scotland 2014

Domain	Sub domain	Indicator	Result
Connectivity	Internet access	People who have no internet connection due to barriers such as affordability and complexity	**10% of households lack an internet connection due to barriers**
	Transport	No indicator identified	
Crime		Risk of victimization	**17% of adults were victims of crime within the past 12 months (women 16%, men 18%)**
Education		Adults lacking any formal qualifications	**21% of adult population lack any formal qualification (women 22%, men 21%)**
Energy		Fuel poverty – 10% or more of income required to be spent on all energy	**46% of households are in fuel poverty**
Food		PSE:UK-defined adequate diet	**5% of people cannot afford an adequate diet (UK data)**
Governance		Sense of personal political efficacy	**60% of people feel they *have no say in what the government does***
Health	Physical	Years of healthy life expectancy (HLE)	**Men in the most deprived**

			areas in Scotland have 16% less than the average number of years of HLE (women 15%)
	Mental	Anxiety or depression	**15% of adults experienced some level of recent anxiety or depression (women 17%, men 13%)**
Housing		Overcrowding	**3% of households are overcrowded**
Income		Households below 60% average income – after housing costs (HBAI-AHC)	**19% of households in relative poverty**
Local environment		Access to the natural environment once per week	**58% of people access the natural environment less than once per week**
Sense of support		Support from family, friends and others	**8% of people say they have little or no support in times of need**
Work		People lacking satisfying work	**20% of people lack satisfying work**

Figure 6: Social foundation – Scotland 2014



5 RATIONALE FOR SOCIAL FOUNDATION RESULTS

This section explains the rationale behind the choices for each domain, indicator and threshold, along with the methods used to derive the results.

5.1 CONNECTIVITY

Comprising sub-domains of *Internet access* and *Transport*

5.1.1 Internet access

10 percent of households lack an internet connection due to barriers (Scotland 2013).

Domain

A recent report from the Carnegie Trust[32] along with ONS data[33] provide evidence that internet access is related to educational achievement, job prospects, contact with family and friends, democratic and civic participation, along with access to public and private goods and services, advice, information and knowledge. As an enabler it is therefore relevant to many aspects of the social foundation within this report.

In terms of a social norm, around 75 percent of those surveyed for the latest PSE:UK report stated that children need a computer and internet access at home for homework.[34] The Carnegie Trust report argues that as the capacities of the internet increase, so will the inequalities and exclusions for those who have no access '*…to such an extent that [the] lack will be both the symptom and cause of poverty'.*

We therefore propose to include *internet access* as a sub-domain within the social foundation under *connectivity*.

Indicator

The indicator chosen is the percentage of households without an internet connection who are prevented from having one due to barriers such as cost, availability and perceived complexity. While beyond this figure there are a number of households who have no internet connection, many state they do not want one. Some of that portion will see no reason to go online because they are unaware of its capacities. Additionally, many chose to remain offline for reasons such as a distrust of the technology involved.[35] This may also clearly be a barrier. However, we have chosen not to include this portion as at least some will be making an informed choice and we have as yet been unable to identify data to distinguish this group.

Threshold

Households without an internet connection due to barriers (such as lack of skills or access/equipment costs) rather than personal choice.

Result

10 percent of households lack internet access due to barriers (Scotland 2013, Q1).

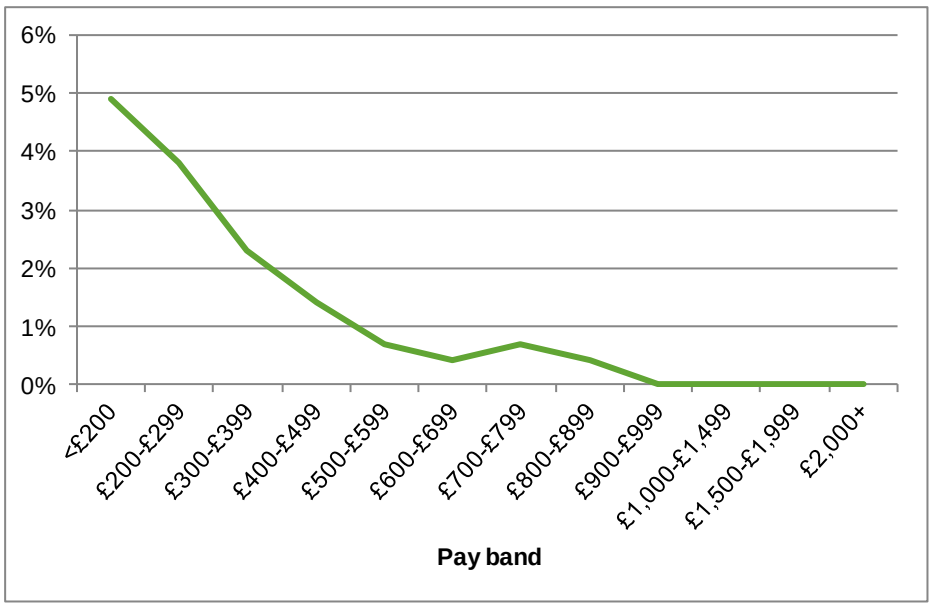
Method:

- 24 percent of households do not have internet access in Scotland.[36]
- 59 percent of those did not have it because they *did not need it*. [37] (Based on GB data on reasons for not having access).
- The remaining 41 percent cited reasons such as access and equipment costs along with lack of computer skills.

Therefore 41 percent of the 24 percent of households did not have an internet connection due to barriers – 10 percent of all households in Scotland.

The data used for the results in this section are household-based and we have no direct gender breakdown. However, GB data on a slightly different, and therefore not directly comparable, metric suggests women are less likely than men to have *ever accessed* the internet; 15 percent of women report never having used the internet compared to 11 percent of men.[38] Similarly, those in the lowest income groups across GB are most likely to have never accessed the internet (Figure 7).

Figure 7: Percentage of those who have never used the internet by gross weekly pay (GB Q1 2014, working age in paid employment)



Source: *ONS, Internet Access Quarterly Update (May 2014) Table 6b.*

5.1.2 Transport

Domain

The other arm of connectivity is transport. Since at least 2003, transport has been widely understood to play a central role in social exclusion and people's experiences of poverty.[39] Accessible transport, both in terms of availability and price, was identified as significant factor in the work undertaken for the HKI and clearly impacts upon various aspects of life such as people's access to the labour market, goods and services (including health services) and heavily shapes the ability to form and maintain social networks.[40]

Indicator

However, measurement of it is complex. Dr Karen Lucas, a research associate at the Transport Studies Unit at Oxford University, talks of person and context-specific experiences of transport-

related exclusion, noting that while income and place are drivers for such exclusion, the impact varies across different socially excluded groups even within the same context.[41]

She also notes the lack of available data:

> *There is a general consensus amongst those with an interest in seeing this agenda more widely promoted that better social evaluation and appraisal tools are needed at every level of governance. Metrics are needed to establish the minimum level and standards of public transport which are necessary for social inclusion given certain distances, densities, levels of services, etc. and local targets set to achieve these within given timeframes.*[42]

Indeed the most commonly used indictor in relation to public transport depends upon self-reported satisfaction levels. These levels have seen an increase in recent years with around 90 percent of bus passengers now being satisfied with their journey.[43] However, in the decade to 2012 public transport costs across the UK rose by around 90 percent.[44] Therefore, reported satisfaction levels do not seem to capture the impacts of rising prices and perhaps have little to add to our understanding of the experiences of low-income groups.

Other data sets look at journey times to specified services and work.[45] However, the collection and presentation methodologies of these are not easily applied to the Doughnut approach and would require restructuring before being useful for this project. Even with such restructuring it is not clear that these data sets would be helpful in exploring the links between transport and social exclusion.

Given these complexities, the difficulties in tracking down data that focus on links with social exclusion, and the conflicting findings on satisfaction and rising costs, we have opted to omit a transport indictor for the time being.

5.2 CRIME

17 percent of adults were victims of crime within the past 12 months (Scotland 2012–13).

Domain

Feelings of personal security have been raised across many of the surveys assessed for this project, including the Humankind Index and EHRC's Equality Monitoring Framework, and during the Oxfam Doughnut workshop. It was also identified in the initial scoping based on government submissions to Rio+20.

Indicator

The range of indicators that could be used include fear of crime, police-reported crime rates and risk of victimization.

Fear of crime can be significantly shaped by political or media portrayal of certain groups, for example young people or immigrants.[46] Changes in these figures may therefore be more reflective of a shifting political and media context rather than any real variation in the risk of victimization. This may be particularly true when comparing data over time. We have therefore rejected this indicator, but acknowledge that fear of crime acts to constrain people's opportunities in other respects.

Police-reported crime rates also reflect factors beyond the mere incidence of crime. They are shaped by various factors, such as how likely any person, or any group of people, are to report a crime. In turn this can be shaped by factors such as whether a person believes they, or the crime experienced, will be taken seriously. Additionally, they may reflect the resources put into

tackling general or specific crime. Again, therefore, these are not the best indicators to assess the risk of victimization.

The Scottish Crime and Justice Survey (SCJS), however, does collect information on people's experiences of crime through a continuous and representative survey of households in Scotland.[47] It records crime as reported via the survey and therefore includes crime that may not be reported to the police. Because of its focus on victims' experience of crime rather than prosecutions or police-reported crime, it avoids some of the pitfalls outlined above. It has also measured crime consistently since 1993 (Notifiable Offences List[48]). The data sets also have the advantage of being broken down by a variety of factors including gender and area of deprivation.

The SCJS has some of its own limitations, for example, it records only crime where there has been an identifiable household victim and therefore omits crime where only the police have been involved, such as drug possession, or crime against businesses. However, as we are looking here at how safe people are these issues are not central for the aims of this paper. We have therefore selected this as an indicator.

Threshold

The threshold we have chosen is having been a victim of SCJS crime over the previous 12 months. While it may be unrealistic to hope to reach a point where no one experiences such crime, it is useful in giving a snapshot in time and capable of showing the direction, and extent, of any change.

Result

17 percent of adults Scotland reported being victims of crime within the past 12 months (2012–13).[49]

This compared to 19 percent in 2012–13 in England and Wales.[50] The data show those in the poorest areas are more likely to be victims of crime, and that males are at higher risk (Table 4).

Table 4: Percentage of adults reporting having been victims of SCJS crime in previous 12 months, 2012–13 (Scotland)

All adults	**16.9%**
Men	18.2%
Women	15.8%
20% most deprived SIMD output areas	21%
80% least deprived SIMD output areas	16%

Source: *Scottish Crime and Justice Survey (2014) Table 3.1.*

5.3 EDUCATION

21 percent of adults have no formal qualifications (Scotland 2012).

Women = 22 percent Men = 21 percent

Domain

The domain of education was clearly identified through the analysis of responses to Rio+20, the literature review, the Oxfam workshop and discussion with stakeholders. It is viewed as being fundamental in its own right as well as in relation to many of the other domains which together form the social foundation.

Indicator

The only point of contention is which indicator is the most appropriate. Enrolment in primary or secondary schools is used in countries in the economic south. As this is almost universal in Scotland we have looked for something more relevant. As with other indicators, the mere quantity of education is not seen as sufficient and we have sought indicators of quality and achievement. The main metric used in this field is *educational qualification*.

This relates to either the number of, or highest, educational qualifications attained; or to the number of working age adults at any one time who have no formal qualifications. The latter is comparable across GB and Europe.

Due to the stark nature of the *'no formal qualifications'* metric, as well as its standardization across GB and comparability across Europe, we have chosen this as an indicator. It also comes with its own threshold. However, it should be noted that we have chosen to measure all adults over 16 years old, rather than only the working-age population. This means those of pensionable age are also included in our analysis, as we felt that education is in itself of value to people rather than merely relevant during their working lives.

Threshold

Proportion of adults found to have no formal qualifications.

Result

21 percent of adults in Scotland in 2012 had no qualifications at all.[51] Women = 22 percent Men = 21 percent.

The equivalent figure for England and Wales was 23 percent.[52]

In terms of gender, data show a roughly similar picture for males and females. However, UK data shows that older cohorts of women are more likely to lack any formal qualifications than males or their younger female counterparts.[53] The correlation between qualifications and earning capacity, and therefore poverty, can be seen in Figure 8 which shows that of those *working-age adults* in households earning £6,000–£8,000 per year, 30 percent have no qualifications, while of those earning over £40,000, only 3 percent have no qualifications.

Figure 8: Percentage of each household income bracket (net) composed of those with no qualifications (working age, 2012 Scotland)

***Source**: Scottish Household Survey 2012, Table 7.2.*

5.4 ENERGY

47 percent of households are in fuel poverty (Scotland 2013).

Domain

Access to energy for heating, lighting and cooking was seen as fundamental in the participatory research projects reviewed. Inadequate heating is linked to respiratory and cardiac illness, early mortality and other detriments.[54] The inclusion of energy is therefore essential.

Indicator

Affordable warmth is a term often used in relation to energy, but is inadequate for our purposes as it does not necessarily relate to cooking and lighting. Therefore *fuel poverty* is the indicator used here.

Since Brenda Boardman's work in the 1990s[55] the term *fuel poverty* has been used to define a situation whereby a household would need to spend 10 percent or more of its income on all energy costs while maintaining a *standard heating regime.*[56]

While changes are being introduced in England following the 2012 Hills Review into the definition of fuel poverty,[57] Scotland, Wales and Northern Ireland continue to use the traditional definition. However, while rejecting some of the premises of the Hills review, the Scottish Government is also undertaking a review of the definitions it uses both for fuel poverty and for *standard heating regimes*.

As part of the Doughnut's value is comparing performance across the UK, there is a need to apply a consistent definition. Therefore during this period of changing definitions we will continue to apply the traditional definition as laid out above.

Threshold

Proportion of households that meet the traditional definition of fuel poverty, i.e. those that would need to spend 10 percent or more of their household income on all energy costs while maintaining a standard heating regime.

Result

47 percent (1.1m) of Scottish households are in fuel poverty (2013).[58]

We depend upon the estimates made by the Centre for Sustainable Energy (CSE) which include the impact of price rises up to October 2013. This gives a total of 1.1m households in fuel poverty in Scotland as a whole under the traditional definition. While this is significantly in excess of the Scottish Government figure of 647,000, it is broadly similar to the estimate of 900,000 from Scotland's leading fuel poverty charity, Energy Action Scotland. Of these estimates the CSE relies upon the most up-to-date information on fuel costs and so is used here.

As Table 5 below demonstrates, the CSE estimates that Scotland has by far the highest rates of fuel poverty in the UK, with double the rate experienced in England. An exploration of the reasons behind such divergence is beyond the scope of this report. However, variables such as house condition, weather, relative energy prices and a larger portion of houses in Scotland being off the main gas network play a part. For further discussion regarding fuel poverty see the National Energy Agency/Energy Action Scotland UK Fuel Poverty Monitor 2013–14.[59]

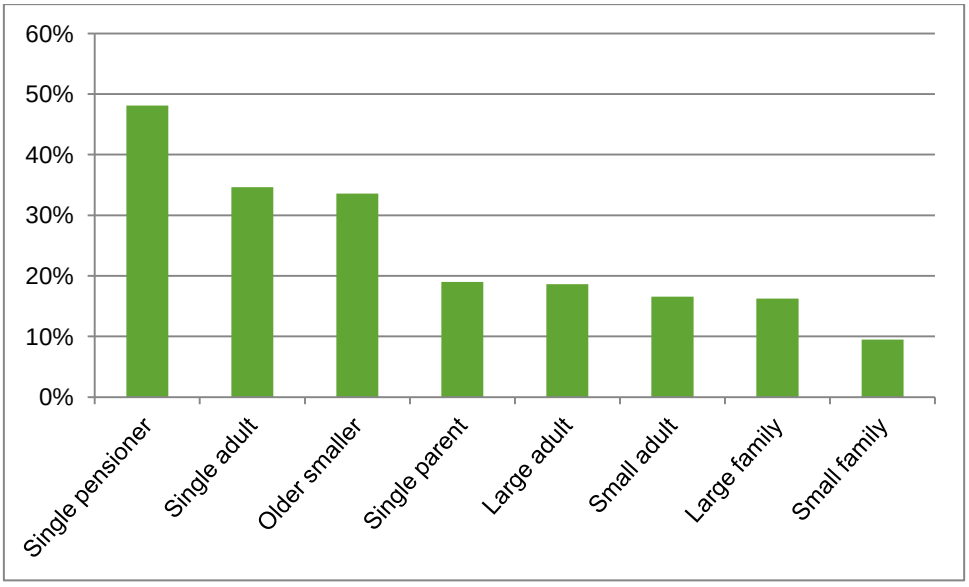
Table 5: Fuel poverty rates

	2010	2013	% rate (based on 2012 household numbers)
England	3,535,932	5,109,312	23%
Scotland	751,940	1,111,161	47%
Wales	331,983	520,500	40%
Great Britain	4,619,855	6,740,973	26%

Source: *CSE Nowcast.*

We have been unable to source data specifically on gender given that the experience of fuel poverty is likely to be shared by household occupants. The CSE data used to give the results in this section are not broken down within Scotland for household types. However, Scottish Government figures show the variation in incidence of fuel poverty across household types and that pensioners and single adults are at greatest risk (Figure 9). This follows the same pattern as the CSE UK data except that in the CSE results, lone parents have a higher than average risk of being in fuel poverty.

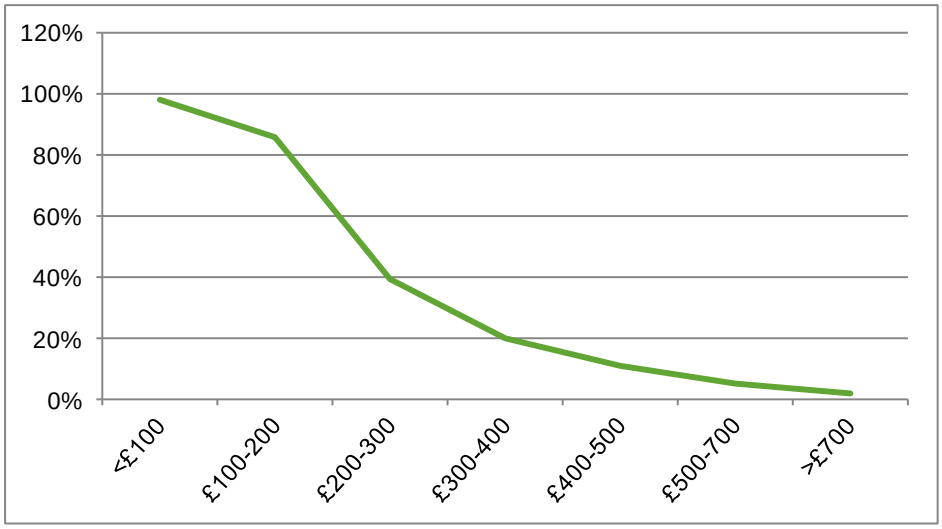
Figure 9: Percentage in fuel poverty by household type (Scotland 2012)



Source: *Scottish House Conditions Survey 2012, Key findings, Table 33.*[60]

Figure 10 demonstrates the fundamental role that income plays as fuel poverty is heavily concentrated among the lowest income groups, with almost all households with a weekly income of less than £100 being fuel poor and the highest earning category having a risk of around 2 percent.

Figure 10: Percentage in fuel poverty by household income (Scotland 2012)



Source: *Scottish House Conditions Survey 2012, Key Findings Table 33.*

5.5 FOOD

5 percent of people in Scotland cannot afford to feed themselves properly (2012).

Domain

Access to food is clearly a fundamental part of life and therefore integral to the social foundation; it was also identified through the analysis of the responses to Rio+20, the Oxfam workshop, and secondary sources. It is also clear that access to food is increasingly challenging for people in the UK, with 20 million meals being distributed across the UK by the three largest food aid providers in 2013–14.[61] In Scotland, the Trussell Trust distributed food parcels to 71,428 people in the same period. This represents a fivefold increase on the previous year.[62] Similar increases have been reported by other food aid providers.[63]

Indicator

Perhaps the best measure we have of what is acceptable in terms of food in the UK today comes from the PSE:UK report, *The Impoverishment of the UK* (2013). The report identifies what people think are reasonable standards to expect across a variety of social policy areas and assesses who is falling below these standards. The findings show broad agreement on what it means to be able to feed oneself properly: two meals per day for adults, three meals per day for children. This should include fresh fruit and vegetables every day, along with meat, fish or a vegetarian equivalent every other day.

Threshold

Proportion of people whose food intake falls below the minimally acceptable diet defined above.

Result

5.2 percent of people (children and adults) cannot afford to feed themselves properly (Scotland 2012).[64]

Method

Extrapolated data based on responses to the PSE survey show that in 2012, 274,285 people - 5.2% of the Scottish population - did not feed themselves adequately by this definition because they could not afford it.

This compares to 6.3% at UK level.[65] As yet we have no breakdown by gender but hope to be able to update this in the near future as data becomes available.

5.6 GOVERNANCE

60 percent of people feel they have no say over what government does (Scotland 2012).

Domain

Based upon government submissions to the Rio+20 process, *Voice* was proposed by Kate Raworth (2012) as a domain in the original global Doughnut. This was focussed upon measuring freedom of political expression and participation. *Citizenship* and *Community* were suggested as alternatives during the Oxfam workshop in November 2012, alongside the inclusion of *Governance*. We propose here to draw out a common element of all these domains that seeks to assess the impact citizens can have on their political systems and the decisions made within them. For the sake of consistent terminology we have labelled this domain *Governance*.

Indicator

Within the *Governance* domain lie a variety of potential indicators, voter turnout being the most commonly used. However, the mere incidence of voting does not necessarily reflect its effectiveness. The impacts that people have – or feel they can have – within a political system is of more interest. While this may be indirectly measurable through voter turnout, more direct measures do exist. The British Social Attitudes Survey (BSAS) has collected detailed data on this over the past 30 years, providing a range of indicators. Two areas of interest here are referred to as *system efficacy* and *personal political efficacy.*[66]

Both are measures of how people feel about the political system and their role within it. System efficacy refers to how responsive the political system is and is assessed through responses to statements such as '*parties are only interested in votes'* or '*MPs quickly lose touch'*. This shows how people feel about whether a political system is able or willing to respond to their needs.

Personal political efficacy refers to people's feelings regarding their *own* level of influence in shaping political decisions and how they are governed. This is assessed through responses to statements such as '*people like me have no say in what government does',* and others listed in Table 6.

It is difficult to choose between these as one is about how responsive the system can be and the other is about how empowered individuals feel within it. However, given the original focus on expression and participation we have chosen personal political efficacy here as this reflects an individual's feelings about their own ability to shape decisions.

Threshold

Individuals who agree with the statement '*people like me have no say in what government does'*.

Result

60 percent of people in Scotland feel that people like them have no say over what government does (Scotland 2012).

In 2012, 60 percent of adults in Scotland *agreed* or *strongly agreed* with the statement '*people like me have no say in what government does*'. That is, they felt they had no influence over how they are governed or the policies that impact upon them. It is this statistic we propose to use to measure personal political efficacy. It should be noted that the indicator is moving in a positive direction as the proportion agreeing with the statement is falling.

This is almost identical to the GB result of 59 percent. As yet we have no breakdown of this figure by gender or income groups. However, a useful proxy for income exists based on GB data on educational qualification. Feelings of disempowerment are clearly greater among those with lower educational qualifications – 71 percent of those with no qualifications report feeling that they have no say, compared to 39 percent with a degree (see Table 7). The Scottish Social Attitudes Survey (SSAS) also shows that people in deprived areas feel much less able to influence decisions regarding their *local* areas than those in less-deprived communities. Around 50 percent of people in Scotland's most deprived 20 percent of areas felt unable to influence local decisions compared to 30 percent in the 20 percent least deprived areas.[67]

Table 6: Personal political efficacy (Scotland)

% agree	1986	1994	2003	2012	Change 1986–2012
People like me have no say in what government does	73	64	66	60	-13
Politics is too complicated to understand	74	80	59	58	-16
Voting is the only way to have any say	n/a	73	67	55	-8

Source: *BSAS (2013).*

Table 7: Engagement in politics by educational qualification

All	**59%**
Educational qualification	
Degree	39%
Higher education below degree/A-level	54%
O level or equivalent/CSE	68%
No qualification	71%

Source: *BSAS (2013).*

5.7 HEALTH

Comprising sub-domains of Physical health and Mental health

5.7.1 Physical health

Men in the most deprived areas in Scotland have 16 percent less than the average number of years of healthy life expectancy. Women in those areas have 15 percent less than the average number of years of healthy life expectancy.

Domain

Physical health and wellbeing are among the most crucial indicators of a decent social foundation. As a respondent to the Humankind Index said: "Without good health you cannot work and help your family and community. Without health you cannot be positive or achieve your dreams."[68]

Indicator

The relationship between poverty, ill-health and early mortality is well documented.[69] Yet early mortality remains a crude indicator. Illness can severely curtail quality of life at any point, though most commonly in the years immediately preceding death. A preferable measure is therefore one that encompasses both illness and mortality, giving an indication of quality of life as well as quantity. This is known as healthy life expectancy (HLE). It is an estimate of how long the average person might be expected to live in a healthy state and combines statistical prediction of life expectancy with self-reported health status. Data for this are routinely collected across the UK by ONS and Scottish Public Health Observatory (SCOTPHO) and are also collected across the EU, allowing for international comparison.[70]

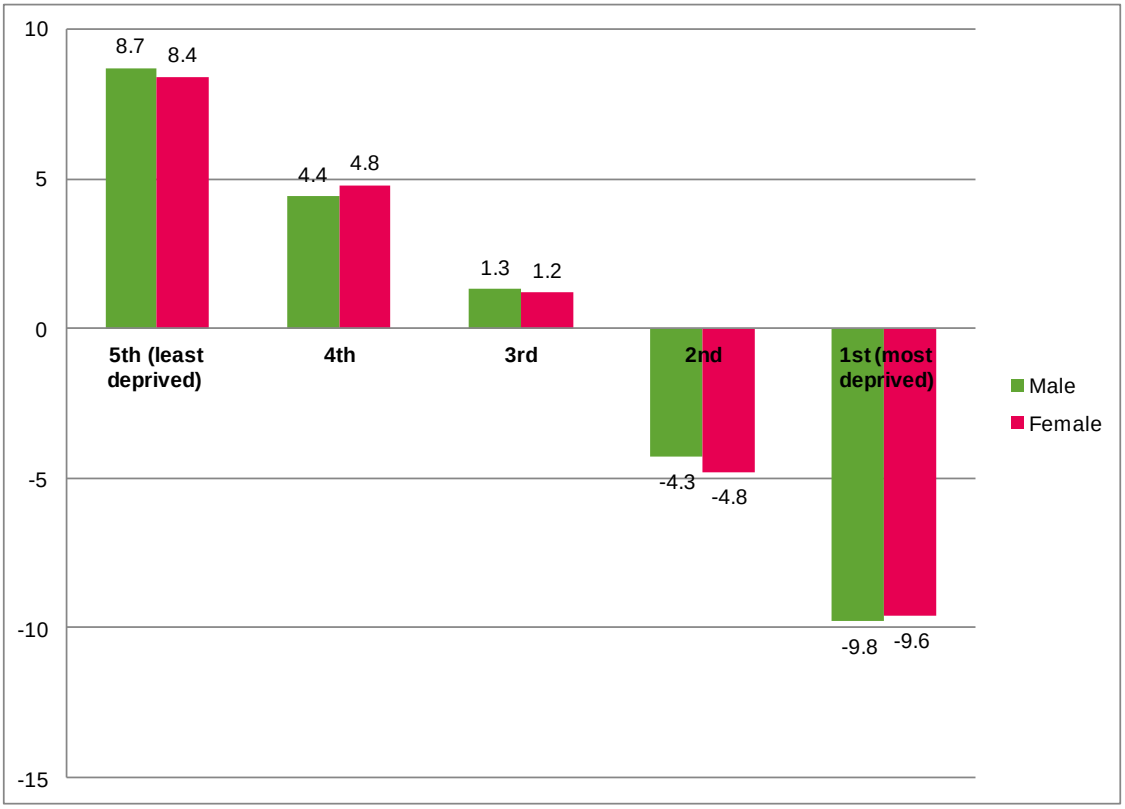
In Scotland, data are available for HLE broken down by quintiles of deprivation, based on the Scottish Index of Multiple Deprivation (SIMD).

The SIMD measures deprivation across a wide range of areas including housing, income and education. These are geographically based indictors which group output areas into deciles or quintiles ranging from *most deprived* to *least deprived.*[71]

Threshold

The problem for the purposes of the Doughnut is how to establish what a minimum acceptable HLE might be. One approach would be for an end to the correlation between deprivation and lower HLE – so there is no socio-economic gradient in this aspect of health. This would mean that HLE would be consistent at a population level across Scotland between areas as measured by the SIMD. Figure 11 shows the differences between the Scottish average HLE (59.8 years for men, and 62.1 years for women), and the average HLE within geographic areas as defined by the SIMD. It is these disparities that are relevant for the Doughnut. The most deprived areas in Scotland see males with 9.8 years less HLE than their average male counterparts, and females with 9.6 years less than average.[72]

Figure 11: Number of years above or below average healthy life expectancy by deprivation quintiles (Scotland 2009–10)



***Source**: Based on SCOTPHO data.*[73]

The problem is how to capture these disparities in a way that is useful for the Doughnut. We have therefore chosen to express the indicator as a percentage: calculated from the difference between the Scottish average for years of HLE (male and female) and the most deprived quintile, thus capturing disparities correlated to deprivation. The threshold is therefore the average number of years of HLE.

Result

Men in the most deprived areas in Scotland (the most deprived quintile) have 16.4% less than the Scottish male average number of years of healthy life expectancy.[74]

Women in the most deprived areas in Scotland (the most deprived quintile) have 15.5% less than the Scottish female average number of years of healthy life expectancy.

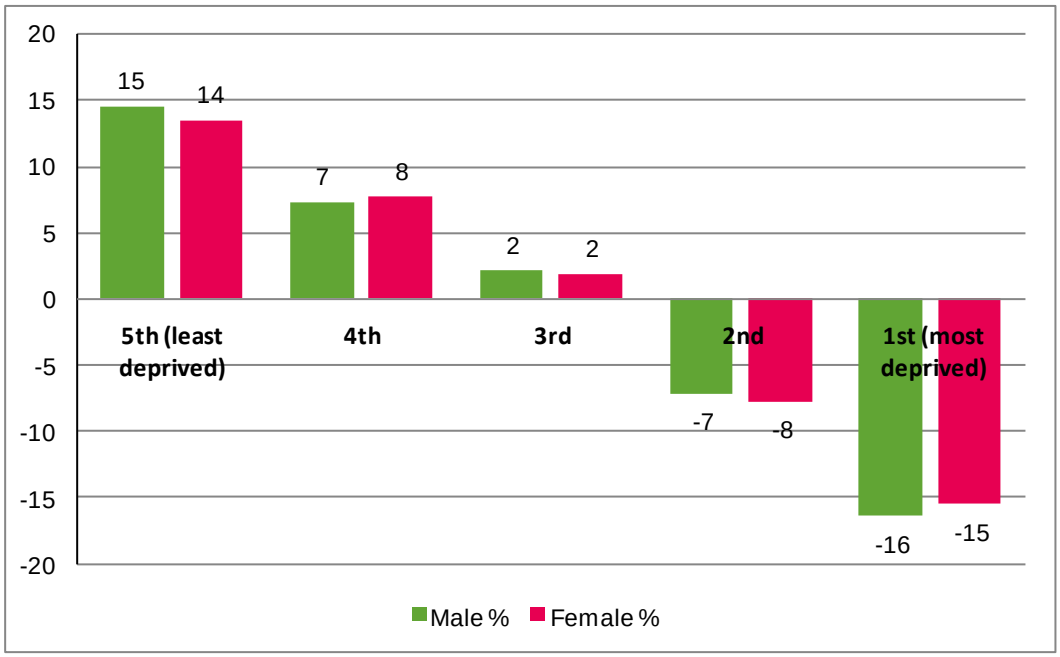
For the purposes of the Doughnut image, we have used the male result of 16% as this fully highlights the extent of health disparities related to deprivation.

Method

- Male HLE in most deprived quintile is 9.8 years below Scottish male average of 59.8 years (9.8/59.8*100 = 16.39 percent)
- Female HLE in most deprived quintile is 9.6 years below Scottish female average of 62.1 years (9.6/62.1*100 = 15.46 percent)

Figure 12 shows this disparity as a percentage of Scottish averages.

Figure 12: Number of HLE years compared as percentage of Scottish average by SIMD (0 = Scottish averages, 2009–10)



***Source**: Based on SCOTPHO data.*

There is a wide range of literature exploring the links between deprivation and HLE and possible policy responses. However, this discussion is beyond the scope of this project.

5.7.2 Mental health

15 percent of adults recently experienced some level of anxiety or depression. Women = 17 percent: Men = 13 percent (Scotland 2012).

Domain

Mental health is a significant policy area that is *crucial to the overall wellbeing of individuals, societies and countries.*[75] Mental health in some form was mentioned in much of the literature reviewed for this project including Oxfam's Humankind Index, the EHRC's Equality Monitoring Framework and the ONS Wellbeing Consultation. It was also prominent in submissions to Rio+20. Therefore it is included here as a sub-set of the *Health* domain.

Indicator

Mental health is a complex area of health policy, especially given that mental health problems can be both a significant cause of physical health problems and a consequence of them.[76] The three most commonly used indicators of mental illness are: prescriptions for, or self-reported experiences of, anxiety and or depression (since anxiety and depression are the most common forms of mental illness); hospitalization for mental health problems (chronic underfunding and an emphasis on care in the community mean that only severe problems are hospitalized); and rates of suicide (which are decreasing, but far faster for those who are wealthy than those who are poor).[77] The disadvantage of using any of these as a headline indicator is that they indicate disease rather than wellbeing. Mental wellbeing is crucial to health and is not merely the absence of significant mental illness.

In 2006, NHS Scotland funded the development of the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) based on responses to 14 questions, covering psychological functioning (autonomy, competence, self-acceptance, personal growth) and interpersonal relationships.[78] It is used in Scotland and Northern Ireland[79] to measure subjective mental wellbeing and has

recently been adopted by ONS for use in England and Wales.[80] While this would be a better indicator to measure wellbeing, as opposed to self-reported anxiety or depression, there appears to be insufficient data available as yet across the UK to allow for comparison between Scotland and the UK as a whole.[81] It is also problematic for use within the Doughnut as it is specifically recommended that a cut-off point is not established to differentiate wellbeing or illness. Such data issues may be overcome in the future.

In the meantime, however, we rely upon data on self-reported anxiety or depression.

There is concern that self-reported health data are unreliable and do not accurately reflect conditions due to underreporting. We have, however, found no suitable alternative and must therefore accept the data limitations if we are to include mental health as a domain.

Threshold

In terms of a cut-off point we have chosen one based on the General Heath Questionnaire 12 (GHQ12). The GHQ12 asks respondents twelve questions regarding how they have felt recently (over the past few weeks) and is designed to identify mild to moderate mental illness. A high score (four or more) indicates that respondents were experiencing, or had recently experienced, some level of anxiety or depression.[82]

Result

15 percent of adults in Scotland reported having recently experienced some level of anxiety or depression (2012).[83]

Women = 17 percent: Men = 13 percent (2012).

At a UK level this is 19 percent for all adults with women reporting 21 percent and men 16 percent.[84]

Scottish data shows a clear link between deprivation and poor mental health. The prevalence of mental health problems among people living in the most deprived areas is almost three times that for those in the least deprived areas.[85] Deprivation is described as the most important factor behind the inequalities experienced between the mental health factors considered here (i.e. GHQ12, anxiety and depression).[86]

5.8 HOUSING

3 percent of households are overcrowded (Scotland 2011–12).

Domain

Housing, while lacking as an issue in many of the submissions to Rio+20, was clearly identified through the Oxfam workshop, the consultation for the Oxfam Humankind Index, secondary sources and discussions with stakeholders as being fundamental in its own right and in relation to so many other domains of the social foundation.

Indicator

There are a range of housing indicators that might be considered for this project, including housing quality, affordability, overcrowding and homelessness. Indicators of housing quality tend to be basic, or not comparable across areas of the UK, while some issues such as dampness are to a degree dealt with by the fuel poverty indicator within the domain of *Energy*. Affordability is in part dealt with in the domain of *Income*.

Homelessness is the most basic of measures and, as recent reports show, is increasing in England and Wales.[87] The Scottish situation diverges from the English and Welsh both in terms

of policies and homelessness trends, which have been declining in recent years.[88] However, data suitable for the purposes of the Doughnut are difficult to establish as rough sleeping, hidden homelessness, applications to be considered homeless, and numbers in temporary accommodation are measured in a variety of ways and over different time periods.

We have therefore focussed on overcrowding as figures for this are available and comparable across the UK. We would prefer to combine this with some measure of homelessness, but have as yet to uncover or develop a suitable method for doing so.

Overcrowding here is measured by an *occupancy rating* based upon the *bedroom standard* which requires a set amount of bedrooms according to the number, age, gender and relationship of the occupants.[89]

Threshold

The lack of one or more bedrooms for the number, age and gender of inhabitants living in the property.

Result

3 percent (65,000) of households in Scotland were overcrowded in 2011–12 (see Table 8).

Table 8: Overcrowding in UK 2011–12

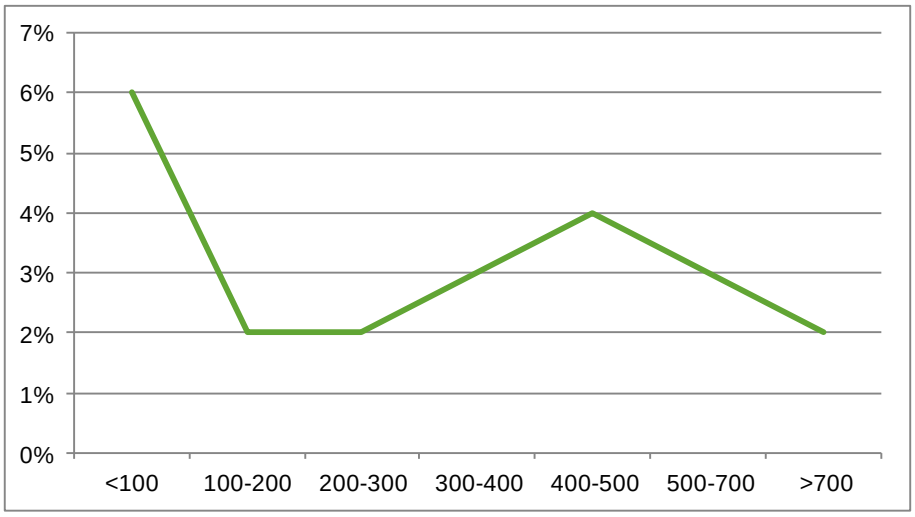
Scotland[90]	3%	65,000
England and Wales[91]	3%	643,000
Northern Ireland[92]	2%	15,000
UK	**2.8%**	**732,000**

Data assessing the correlation between income and overcrowding shows that those with a weekly income under £100 are twice as likely (6 percent) to live in overcrowded homes (Figure 13). However, beyond that income group the picture is mixed. Differentials can be seen in the nature of tenure with around 6 percent of households in Scotland who are renting being overcrowded compared to just over 2 percent of owner occupiers.[93]

While we have no statistics on any link between ethnicity and overcrowding in Scotland, data from England suggest a link, with over 12 percent of the black and minority ethnic (BME) population in England experiencing overcrowding compared to around 2 percent of the white population.[94]

We have been unable to source any gender-related data.

Figure 13: Percentage overcrowding in Scotland, based on weekly income (2012)



***Source**: SHS (2012) Table 48.*

5.9 INCOME

19 percent of households in relative poverty (Scotland 2010–11 – 2012–13)

Domain

Monetary income is vital in a developed market economy where access to various aspects of life is largely determined by financial resources (either directly or indirectly). This was clearly identified as fundamental through the Oxfam workshop, secondary sources and discussions with stakeholders.

Indicator

The statistic most commonly used in relation to income poverty is a relative measure set at 60 percent below the median household income (HBAI). This is usually calculated after housing costs have been deducted to allow for a truer assessment of disposable income (HBAI, AHC). While Oxfam believes that relative poverty must remain at the core of any poverty measurement,[95] a range of complexities arises in using this as an indicator for the purposes of this project. The main concern is that, while it shows income inequality, it is not a measure of income adequacy.

For income adequacy a better measure is the Minimum Income Standard (MIS) from the Joseph Rowntree Foundation (JRF) and the Centre for Research in Social Policy at Loughborough University.[96]

The MIS is defined as *"… the income that people need in order to reach a minimum socially acceptable standard of living in the UK today, based upon what members of the public think. It is calculated by specifying baskets of goods and services [including housing costs] required by different types of household in order to meet these needs and to participate in society."*[97]

However, the MIS only relates to a limited number of household types and does not include those with more than one unrelated adult. Thus around 25 percent of households are not tracked using this metric. Because of this, JRF notes that it cannot be used to show the risk of falling below MIS across the whole population. Rather it shows that risk among specific household types.

Therefore, despite its limitations, the HBAI metric is more comprehensive, longer term, comparable over time and countries, and forms the basis of many government targets. As such it is the preferred metric for this project. The HBAI results used here are based upon three-year averages as they smooth out annual variations.

Threshold

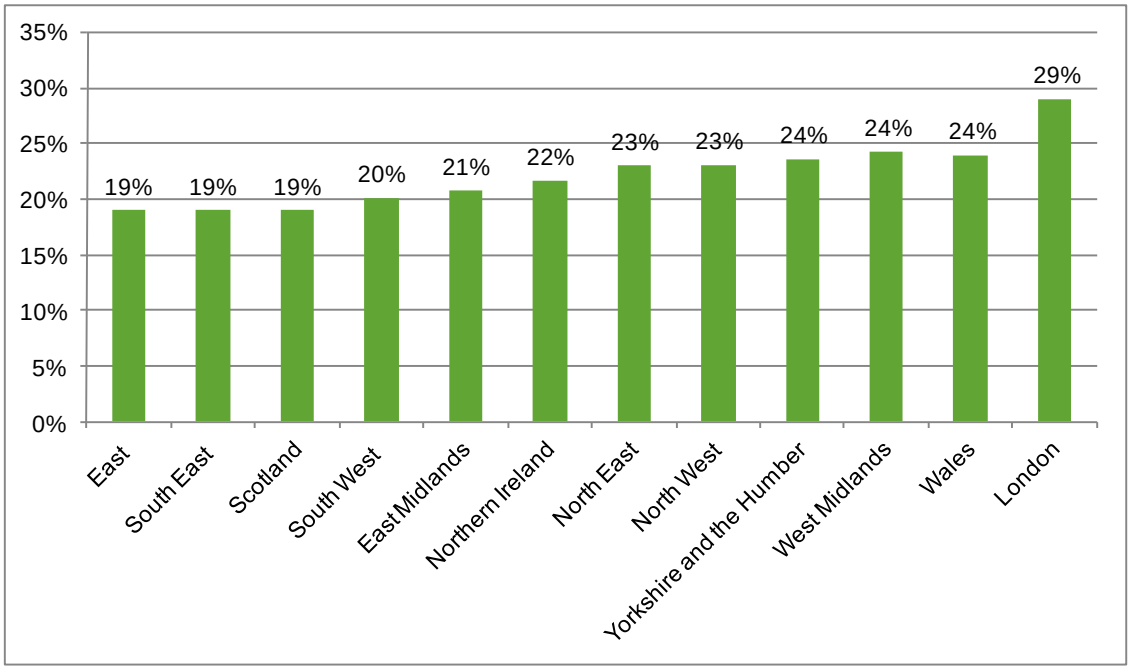
Proportion of households with income falling below 60 percent of HBAI AHC.

Result

19 percent of people in Scotland live in households whose income is below 60 percent of median income (HBAI, AHC, three-year average 2010–11 – 2012–13).[98]

The average level of poverty across the UK based on the HBAI three-year average is 22 percent. Thus Scotland compares *relatively* well on this metric of income having the equal lowest incidence across the UK (Figure 14). However, this clearly masks disparities within Scotland.

Figure 14: Percentage in relative poverty (60 percent below HBAI AHC, three-year average for 2010–11 – 2012–13)



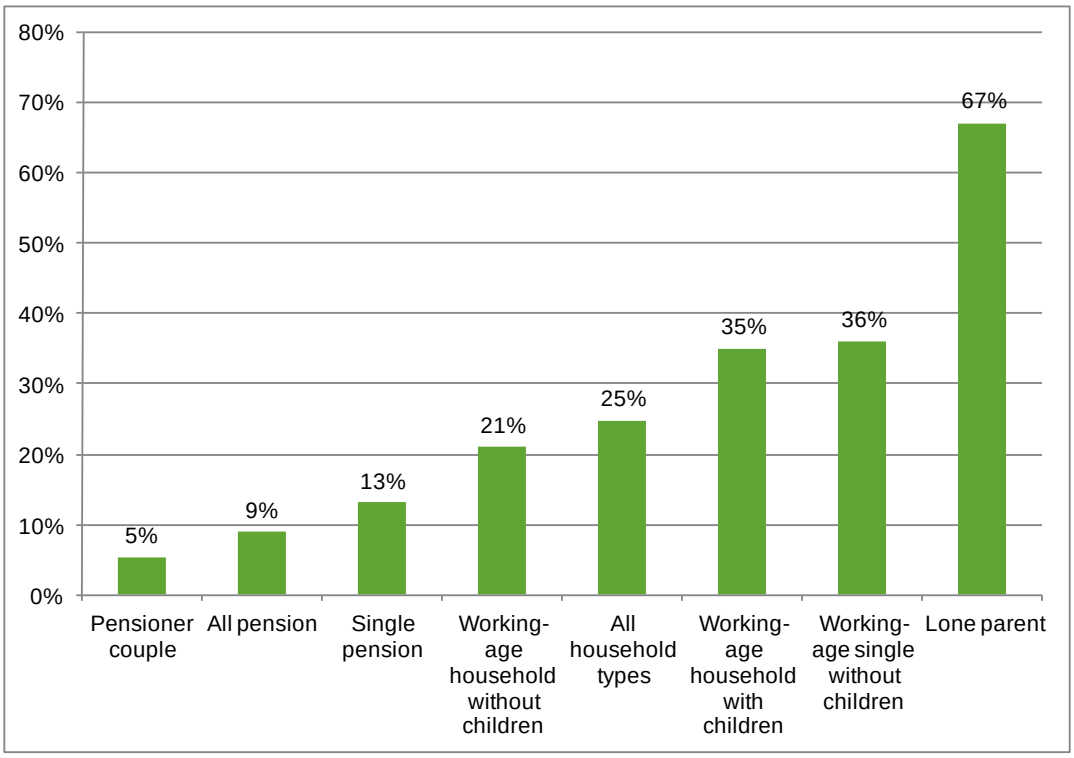
***Source**: HBAI July 2014 Table 3.19ts.*

Additionally, 21 percent of households in Scotland fell below the MIS in 2011–12, compared to around 25 percent at UK level.[99]

The two main data sets used here for measuring poverty, HBAI and MIS, tell a similar story: that lone parents, single working-age households and couples with children are most likely to be in relative poverty (Figure 15). Being a lone parent is clearly related to gender (over 90 percent of lone parents are women[100]) and carries the highest risk on both measures. Gender differences using HBAI data at UK level can be seen among single-adult households. Single female pensioners are more likely than single male pensioners to be in relative poverty (17 percent versus 15 percent), while single working-age males are more likely than their female counterparts to be in poverty (29 percent versus 25 percent).[101]

However, both data sets are based upon household measurements of income. Therefore, neither analyses how women and men might benefit differently from the distribution of the benefits of such income within a couple household. Any inequalities which may exist within couple households are therefore masked and not able to be drawn out in this report.

Figure 15: Percentage of individuals below MIS by household type (UK 2012)



***Source**: Padley & Hirsch (2014) Table 1 and Figure 2.*

5.10 NATURAL ENVIRONMENT

58 percent of people access the natural environment less than once a week (Scotland 2011–12).

Domain

This domain has been chosen due to a growing body of evidence showing the positive impact on people of being outside in a natural environment.[102] It also builds on work done by Oxfam for its Humankind Index for Scotland.

The definition of *accessing the natural environment* used here is:

'… visits to both urban and countryside open spaces, for example, to woodland, parks, farmland, paths and beaches and for a range of purposes…' [103]

Indicator

Frequency of access was chosen as an indicator as it relates to various factors such as proximity, transport/access, safety and perceptions. The more accessible and safe the natural environment is, and the greater people's perceptions are that it is a *'good'* thing to visit it, the more frequently people will access it.

The data used here is from Scottish Natural Heritage's (SNH) annual Scottish Recreation Survey (ScRS).[104]

Threshold

Accessing the natural environment at least once a week.

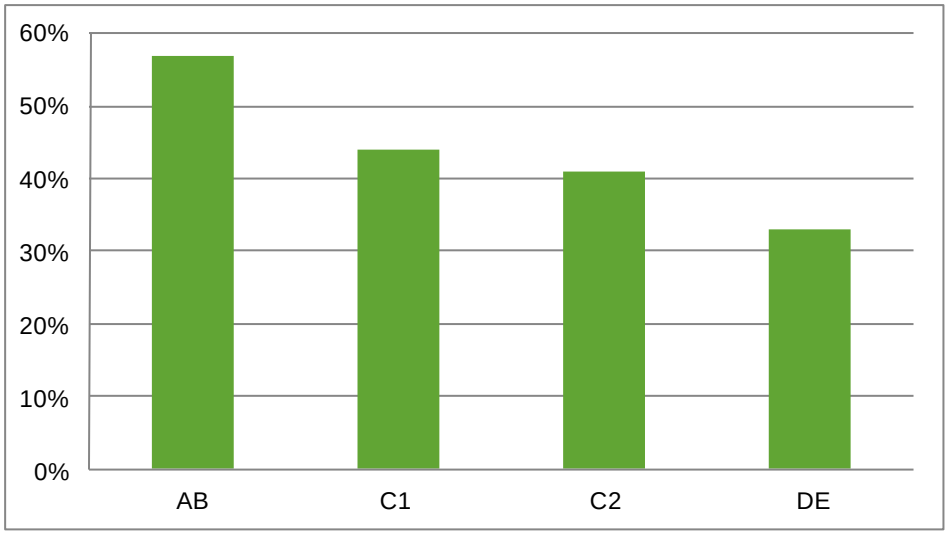
Result

58 percent of people in Scotland access the natural environment less than once a week (2011–12).[105]

Considerable variation is apparent according to socio-economic groupings (Figure 16).[106] Those living in the most deprived areas and the unemployed were least likely to visit (Table 9). There was also a slight variation according to gender, with 44 percent of men accessing the natural environment at least once per week compared to 41 percent women. [107]

There was a 4 percent decline in those visiting a least once per week between 2011 and 2012, while the long-term trend was largely stable.[108]

Figure 16: Percentage of each grouping that accessed the natural environment at least once per week, according to socio-economic group (Scotland 2012)



Source: *SNH Scottish Recreation Survey (2012) Table 1.*

Table 9: Percentage of adults living in Scotland who visit outdoor spaces for leisure or recreation at least once per week (2012)

All adults	42%
Age 16–54	45
55 and over	38
SIMD classification	
Bottom 10%	30
Others	44
Residency	
Urban	39
Rural	52
Working status	
In employment	45
Not in employment	39

Source: *Reproduced from SNH Official Statistics.*

5.11 SENSE OF SUPPORT

8 percent of people in Scotland have little or no support from family, friends or others in times of need (2012).

Domain

> *"There is evidence from other studies of a 'buffering' effect of having positive social support in the face of shocks such as divorce, ill-health, bereavement, or losing your job. Having positive and strong social support has also been associated with better psychological and physical health as well as positive health and other behaviours."* (McFall)[109]

The level of support that people can access is widely accepted as having a major impact on their resilience to shock and their mental and physical wellbeing. It is posited in some form in all of the works analysed in the Appendix and is included as a domain here due to this wider role and its potential to reflect the changing nature of relationships and levels of connections between people.

Indicator

A range of indicators are used in the various surveys that explore aspects of social support, including community support and participation, support from family and friends, and engagement with society more widely. What is central for this paper is what support people can call upon in times of need. As McFall highlights above, both practical and emotional support is relevant in helping people through difficult times or events.

We have therefore used data from the PSE:UK survey of people's perceptions of the quality of support they could depend upon from family, friends or other sources in times of need: such as being ill, loss of work, bereavement or dealing with relationship problems.[110]

This indicator is based upon seven questions asked by the PSE:UK survey covering a range of situations. People were asked to describe the level of support they could access in specific situations as 'a lot', 'some', 'not much' or 'none at all'.[111] The situations included 'relationship problems', 'serious personal crisis' and 'a lift in an emergency' (see below). To make the data compatible with the format of the Doughnut we have compiled the responses to each question to calculate an overall mean score for each level of support.

Threshold

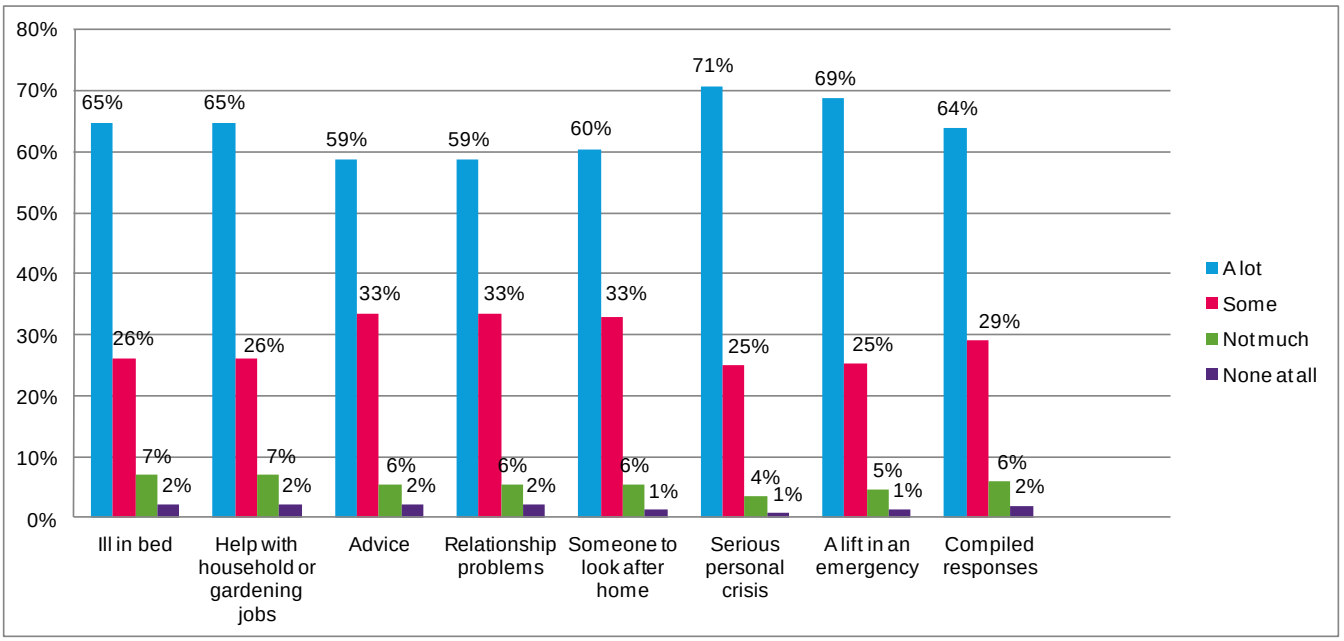
Individuals who have little or no access to support from family and friends in times of need.

Result

8 percent of people in Scotland have little or no support from family, friends or others in times of need (Scotland 2012).

The final set of columns in Figure 17 compile the responses to the seven questions to give an overall mean of 8 percent of people reporting having little or no access to support in times of need (the final two categories combined).

Figure 17: Level of social support (%) respondents reported being able to depend upon in each situation (Scotland 2012)



Source: *PSE:UK.*

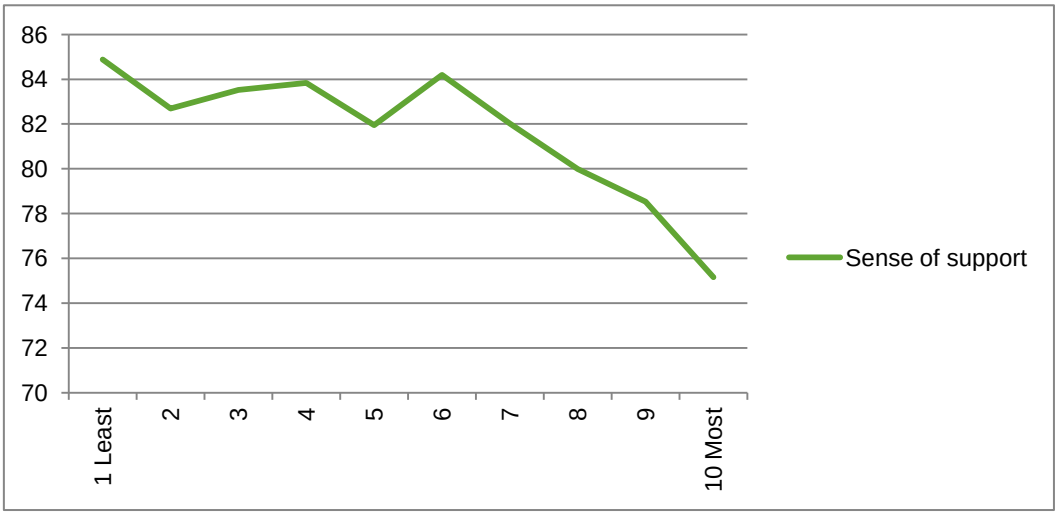
Scottish data broken down by gender are as yet unavailable. However, at a UK level the results do not vary for men and women.

The figures below are based on UK data which demonstrate the correlation between deprivation and sense of support. The left-hand axis on both figures is based on an index developed by PSE:UK. The index combines people's responses across the seven questions and applies a score from 0–100, with the upper scores indicating greater levels of perceived support. The x-axis on the figures shows deprivation by household incomes (Figure 18) and by deprivation on a neighbourhood basis (Figure 19). It is clear in these figures that sense of support increases with household income and declines in deprived areas.

Figure 18: Sense of support by household income deciles (UK 2012)

Source*: Based on figures from PSE:UK*

Figure 19: Sense of support by neighbourhood deprivation (IMD, UK 2012)



***Source**: Based on figures from PSE:UK.*

5.12 WORK

20 percent of people in Scotland lack satisfying work.

Domain

As well as providing some level of income there is significant evidence that work is central to people's physical, emotional and mental health, and should therefore be included. The quality of work – not just remuneration– impacts on people's ability to maintain good mental health, engage in non-work activities in the community and family, and so on. This is made clear by the Oxfam Humankind Index which identifies satisfying, secure, suitable work that pays an adequate income as important to the people of Scotland.

Indicator

The mere fact of work may not, in itself, necessarily have a positive impact. If wages and job security are low, hours insufficient and other, more qualitative factors, such as influence, representation, personal development and meaningfulness of work are lacking, then negative impacts may ensue.

Therefore, in terms of developing an indicator with a threshold below which no-one should fall, the *quality* of work is considered alongside the quantity of jobs. However, indicators for *quality work* are limited.

A TUC index measuring work *quality* relates only to hours and pay. A more advanced tool from the International Labour Organization (ILO) on *decent work* is being developed which will cover a wide variety of indicators relevant to each country. However, at the time of writing this tool was not available.

Additionally, there are ample data on wages, under-employment and the growth of in-work poverty. However, as wages are included under the domain of *Income,* it was felt unnecessary to make this the main focus here; it was also felt to be insufficient as an indicator of quality.

We have therefore focused on self-reported *satisfaction* levels. This has the advantage of capturing how people feel about their pay and hours alongside more qualitative factors. The data are collected through two sources – the UK Longitudinal Household Survey (UKLHS) which is updated regularly, and the Workplace Employment Relations Study (WERS) which

relates to influence, representation, pay and relations at work. Further work is required to drill down into the methodologies for each of these studies in order to select the most appropriate one. For the moment we use the UKLHS as the presentation of the data easily allows for a threshold to be identified.

There are difficulties in using this data as reported satisfaction may reflect harsh economic times as people become more easily satisfied with the mere fact of a job rather than its quality. Additionally, we have been unable to source UKLHS satisfaction data for Scotland. However, UKLHS, as used by the ONS is currently the best fit for this project, at least until the ILO tool has been developed. Thus we apply UK satisfaction rates to Scottish data on employment levels.

Alongside the numbers of those reporting dissatisfaction with their work we also have to consider those who are unemployed. We have therefore added Scottish data on those actively seeking employment to those reporting dissatisfaction at work, as they too lack satisfying work. Taken together these groups are termed the *economically active.*[112]

Threshold

Proportion of working-age adults who are economically active without satisfying work.

Result

20 percent (0.55m) of economically active adults lack satisfying work. (Based partially on UK data on self-reported satisfaction 2013–14).

Method

- 14.3 percent of employed people in the UK are *somewhat, mostly or completely dissatisfied* with their work[113]
- = 0.37m in work in Scotland who are '… *dissatisfied'* (14.3 percent of 2.59m in work[114])
- + 0.18m unemployed who are actively seeking work[115]
- = 0.55m lacking satisfying work

Denominator

Economically active (employed + unemployed but seeking work) = 2.8m

Percentage lacking satisfying work

- 0.55/2.8m*100 = 19.6 percent of economically active lacking somewhat satisfying work.

The UK result for this calculation is 21 percent, with the slight difference explained solely by a lower unemployment rate in Scotland (at the time of writing) as satisfaction data used derives from the overall UK result.

Unfortunately we do not have the data on work satisfaction broken down by gender. However, British Social Attitudes Survey (BSAS) data suggest that men are more likely than women to report being dissatisfied.[116] Combined with higher male unemployment rates this is likely to mean that men are more likely to lack satisfying work. Of course the work that we are talking about here is paid work in the market place. It does not take into account the broader understanding of work which encompasses unpaid care and housework etc. and the gender inequalities within these.

6 METHODOLOGY FOR DEVELOPING AN ENVIRONMENTAL CEILING

This section details our current proposals for the Scottish and UK domains of an environmental ceiling along with indicators and thresholds where these have been identified. Several of these cannot as yet be separated into Scottish and UK results due to data limitations, these are highlighted below. We have identified nine domains from the ten proposed by the Stockholm Resilience Centre (SRC), which can be applied in some form to Scotland or the UK. However, it should be noted that we have changed the terminology from *planetary boundaries* to *environmental ceiling*. We have done this in order to include a wider range of environmental domains than if we focussed only on those for which planetary boundaries have been recommended, and for which we have national data sets. Thus we look at national impacts in some areas, such as chemical pollution, where no planetary boundary has been proposed or where there is no method for measuring proximity to any such boundary. Where we have used metrics in relation to planetary boundaries these are based mainly upon the work of SRC who note their efforts are a '*…first attempt to develop scientifically grounded approaches that attribute the contributions of individuals to global environmental problems…*' [117]

Thus the methodologies used for developing the environmental domains vary and are explained in Section 8. We view these domains as organic and envisage them developing further over time through discussions with stakeholders. We again stress this report is not an exercise in rigorous scientific analysis, but rather a starting point to consider and present the major environmental concerns, and to combine these with social data sets in order to inform and stimulate policy debate.

The domains selected fit into four broad categories

First, for three domains we have used data that show Scotland's impact upon planetary boundaries based upon national-level consumption of the Earth's resources. This has been made possible by the work of SRC in downscaling proposals for planetary boundaries to a per capita level. We have treated the domains of *Climate change*, *Nitrogen cycle* and *Land-use change (UK)* in this way. It should be noted, however, that this approach does not take into account the relative impacts of a nation's consumption over time. Thus the historical contribution of countries to climate change, or 'climate debt', for example is not assessed. Nor does it take account of who is *specifically* responsible for breaches of environmental limits – although we know a strong and increasing body of evidence shows powerful companies and wealthy individuals are disproportionally responsible for environmental impact.[118] For a fuller discussion of the limitations of this methodology see SRC (2013).

Second, in three domains where this approach has not been possible due to lack of data or difficulties in relating national circumstances to global effects, we have sought to develop alternative measures showing impacts within Scotland or GB. We have taken this approach for the domains of *Phosphorous cycle*, *Chemical pollution* and *Biodiversity loss*. However, it should be noted that while we have sourced data for the latter two domains at a GB level, we have as yet been unable to source comparable Scottish data. Therefore, only the domain of *Phosphorous cycle* has been included here and the other two domains are omitted for the time being.

Third, we have developed alternatives for two domains. We have dropped *Ocean acidification* because the main driver of ocean acidification is the rising level of carbon dioxide which is dealt with in the domain of *Climate change.* Therefore, we have focussed upon *Ocean harvesting* as an alternative indicator of ocean health. The impact of *Atmospheric aerosol loading* is most apparent in local and regional weather systems, in particular in high population zones where biomass is used as a major fuel source. Global impacts are not well understood and no planetary boundary has been set. We have therefore selected one of the wide range of particulate pollutants associated with aerosol loading, PM10s. We have chosen this because of proven localized health impacts and use the term *Air quality* for this domain.

Additionally, we have inserted data on *Stratospheric ozone depletion* which is potentially problematic as there has been no boundary proposed. However, as Scotland currently neither produces nor consumes ozone depleting substances it is relatively simple to show current impact.

Finally, we have omitted one domain altogether. *Global fresh water use* was omitted for a range of reasons including data availability and doubts around the causal links between Scottish consumption of national supply and global impact.

7 ENVIRONMENTAL CEILING RESULTS

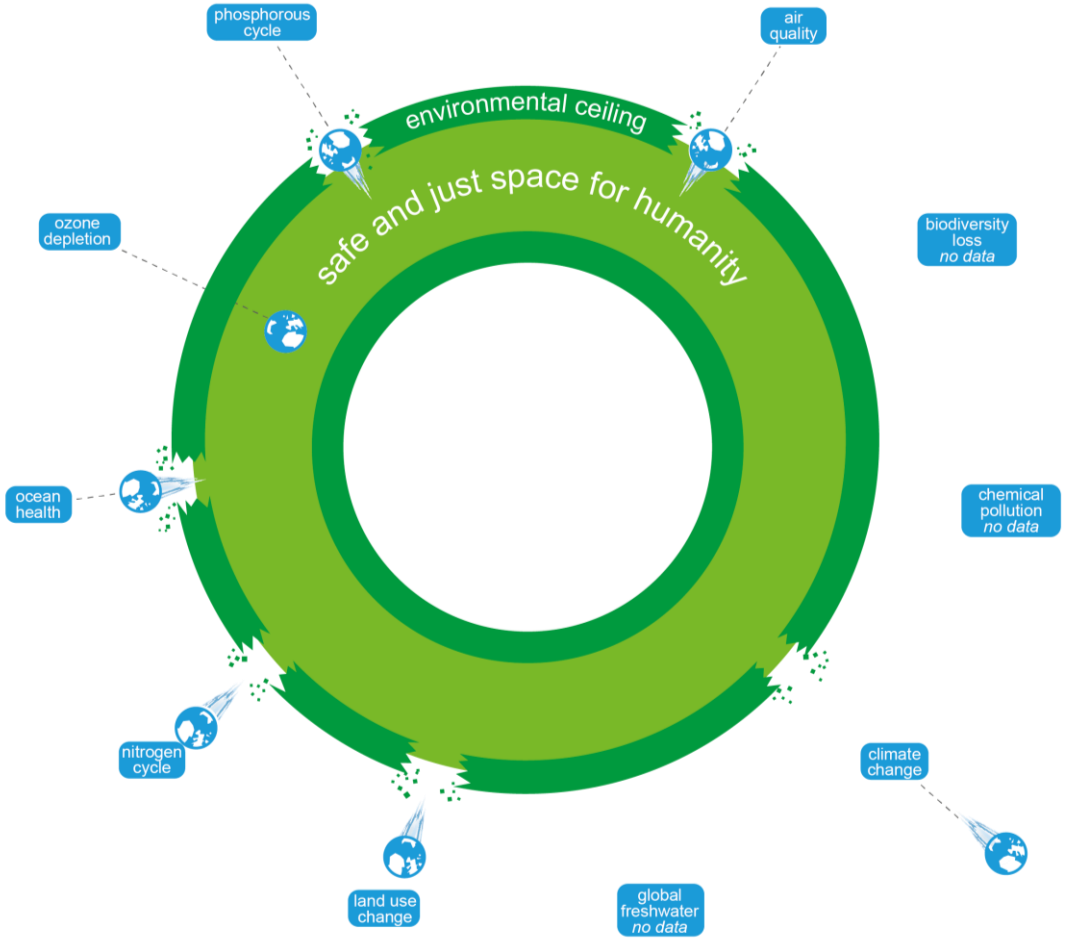
Figure 20 presents headline results while Table 10 gives an overview of the choices made. Section 8 gives the rationale behind these choices and explores some of the issues that arise surrounding the measurement of Scotland's performance in these areas.

Table 10: Environmental ceiling results

Domain	Indicator	Scottish boundary (based on population)	Result
Air quality	Particulate concentration (PM10)	Alternative Scottish boundary: World Health Organization (WHO) recommend limit of 20μgm^3 annual mean.	**12% of roadside sites in Scotland failed to meet WHO recommended upper limits**
Biodiversity loss	No data		
Chemical pollution	No data		
Climate change	Consumption of CO_2 ($MtCO_2$)	Stockholm Resilience Centre (SRC)-based Scottish boundary: 10.4 $MtCO_2$/year	60.25 $MtCO_2$/year **Exceeded boundary by 479%**
Global fresh water use	No data		
Land-use change	Consumption of land-use change (ha)	United Nations Environment Programme (UNEP)-based per capita UK boundary: 0.2 ha/capita.	0.7 ha/capita **Exceeded boundary by 250%**

Nitrogen cycle	Imports of manufactured nitrogen (MtN)	SRC-based Scottish boundary: 0.0266 MtN/year	0.125 MtN/year **Exceeded boundary by 317%**
Ocean health	% of fish stocks harvested sustainably by Scottish vessels	Alternative Scottish boundary: 100% of fishing classified as sustainably harvested	**53% of Scottish fish harvested unsustainably**
Ozone depletion	Ozone depleting substances (ODS)	Alternative UK boundary: consumptive use of ODS	**Zero emissions of ODS** **Boundary not exceeded**
Phosphorous cycle	Phosphorous loads in Scottish rivers	Alternative Scottish boundary: *poor/bad* loads of phosphorous in rivers	**4% of Scottish river testing sites classified as having *poor* or *bad* loads**

Figure 20: Environmental ceiling – Scotland 2014



8 RATIONALE FOR SELECTION OF ENVIRONMENTAL DATA

This section explains the process behind the development of each domain, indicator and threshold, and the method for working out the results.

8.1 AIR QUALITY

12 percent of roadside testing sites breached the WHO recommended upper limit for an annual mean PM10 level of 20 μgm^3 (Scotland 2013).

Domain

Atmospheric aerosol loading is included in SRC's planetary boundaries due to the impact upon the Earth's climate and on human health. It occurs when particulate pollutants are given off into the atmosphere through both naturally occurring processes and through human activity such as the burning of coal, forests and crops, or the diesel fumes and dust thrown up by vehicles. The SRC points out that particulate pollution can already be seen to have impacted upon local climates and weather systems in highly polluted areas. It also highlights that inhalation of polluted air causes the premature deaths of around 800,000 people per year globally.[119]

Indicator

The impact of aerosol loading on weather systems is significant. However, a method for understanding or measuring its impacts has, as yet, proven elusive. The SRC/SEI report points out that, *"Complexity in terms of the variety of particles, sources, impacts, and spatial and temporal distribution make it currently impossible to discuss a critical boundary for the Earth as a whole."*[120]

The absence of a planetary boundary has led us to explore an alternative indicator of national relevance.

Alternative domain- particulate pollution

> *"The air we breathe can be contaminated by emissions from motor vehicles, industry, heating and commercial sources (outdoor), as well as tobacco smoke and household fuels (indoor)… In the WHO European Region alone, exposure to particulate matter (PM) decreases the life expectancy of every person by an average of almost 1 year…" (World Health Organization)*[121]

Particulate matter in the atmosphere (in the form of PM10s) is associated with respiratory tract health problems, cancer, damage to lung tissue, asthma and heart attacks. The elderly, children and people with chronic lung disease, influenza or asthma are particularly sensitive to particulate air pollution. Therefore, while levels are not serious enough to disturb weather patterns in Scotland, they may pose a significant, if localized, risk to health and it is this risk we focus on.

Major sources of PM10s are diesel fumes and dust thrown up by traffic, and there are regularly collected, long-term and accurate data available. The UK Automatic Urban and Rural Network (AURN) monitors air quality in sites in rural and urban areas across Scotland.[122] The average

number of days per site with 'moderate' or higher PM10s was considered as an indicator. However, because of changes in methodology it was considered more useful to use annual mean concentrations for PM10s as the indicator. The highest levels tend to be found at roadside/kerbside sites and it these that we focus on here.

Boundary

The WHO-recommended safe limit for PM10s is an annual mean of 20 μgm^3. WHO states that "*…by reducing particulate matter (PM10) pollution from 70 to 20 micrograms per cubic metre, we can cut air quality related deaths by around 15 percent*."[123] It should be noted though that WHO does not suggest that this is a safe level, merely an aspirational one. Indeed the Scottish government target is a more stringent 18 μgm^3. However, in order to for the data to be comparable with the Doughnut produced for the UK and elsewhere we use the WHO boundary.

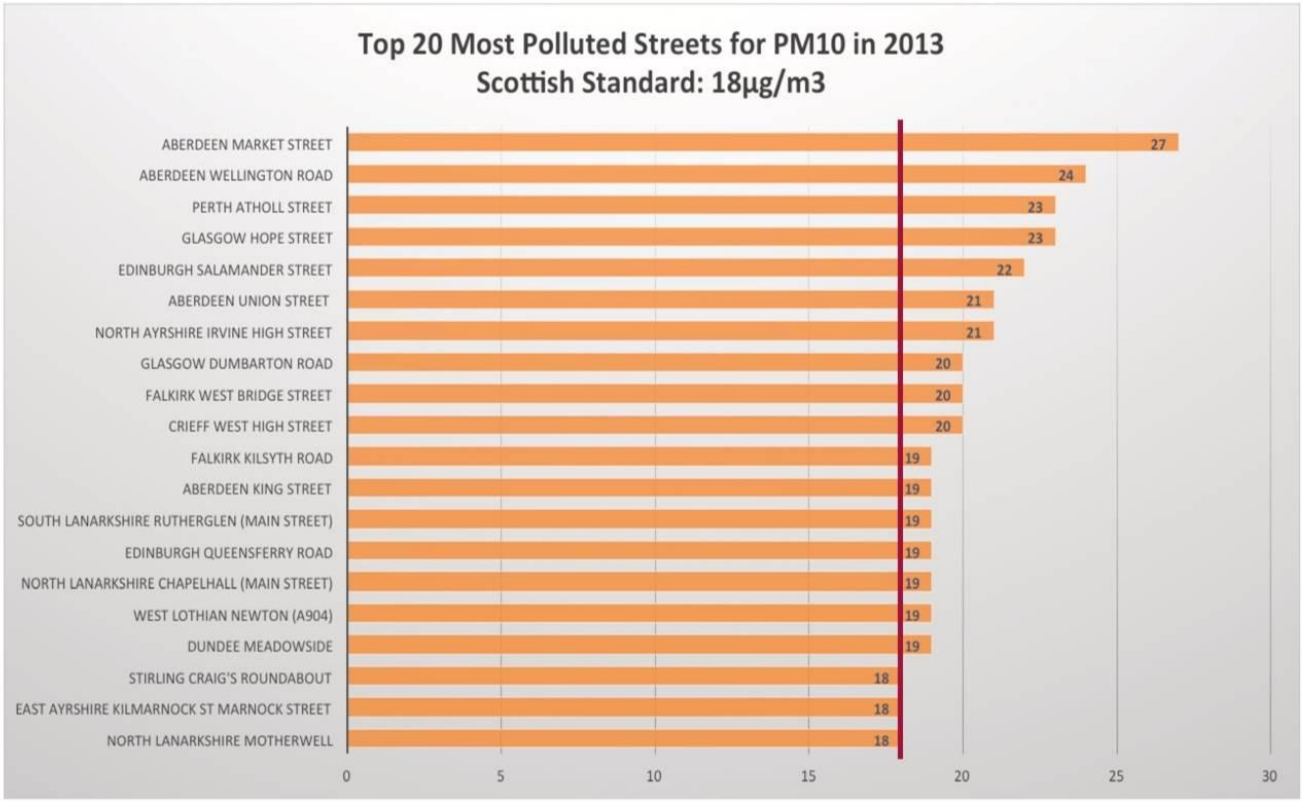
Result

12 percent of roadside testing sites in breached the WHO-recommended upper limit of an annual mean of 20 μgm^3 (Scotland 2013).[124]

Data from Friends of the Earth Scotland show the 20 μgm^3 limit was breached in seven (12 percent) of the 58 AURN sites in Scotland (Figure 21).

Data also show that in 2012 the annual mean PM10 concentration across all Scottish roadside test sites was 16 μgm^3 which is 20 percent lower than the maximum recommended by WHO of 20 μgm^3. [125] The urban background value was 13μgm^3. In 1998 these figures were 33μgm^3 and 26μgm^3 respectively. In total, 17 sites failed to reach the more stringent Scottish Government standard in 2013.[126]

Figure 21: PM10 level (Scotland 2013)



Annual averages on Scotland's 20 most polluted streets for PM10 (µg/m3). Note that the Scottish Standard is 18 µg/m3. This limit was supposed to be achieved at the end of 2010. Analysis of Scottish Government data by Friends of the Earth Scotland/Sunday Herald

***Source**: Reproduced from Friends of the Earth Scotland*

8.2 BIODIVERSITY LOSS

No Scottish data

Domain

> *"Biodiversity refers to the variety of life. The conservation and enhancement of our rich and varied natural heritage of plants and animals, habitats and ecosystems, is essential to the quality of our lives and for a sustainable future." (Natural Scotland)*[127]

Biodiversity loss is important nationally and globally as it increases*…the risks of abrupt and irreversible changes to ecosystems.*[128] Beyond that, it clearly has intrinsic value.

Indicator

Data covering many species and habitats provide a wide range of potential indicators. It was initially important to consider basing the indicator on other biodiversity indicators such as those used within Scottish Natural Heritage's (SNH) assessments of biodiversity and natural assets.[129] There are extensive and long-term data on a range of animals, plants, habitats and sites across Scotland and the UK. Following searches of such data a single indicator index was selected; the UK Farmland Bird Index. Birds tend to be at, or near to, the top of the food chain, so bird health is seen by scientists as providing a good indicator of the health of other animals, plants and a wide range of habitats. The Farmland Birds Index was chosen in particular because of the severe decline in that category which was most apparent from the 1970s and 1980s. It also reflects to some degree changes in farmland management system and use of pesticides and fertilizers.

However, data ranging from the 1970s in England that show a decline of around 51 percent in the Farmland Birds Index from 1970–2012 is not directly applicable to Scotland.[130] Data for the Farmland Birds Index in Scotland was not recorded in sufficient quantities until 1994. While some data does exist from which population declines in farmland birds in Scotland from the 1970s to the 1990s can be inferred,[131] we have as yet been unable to combine this with post-1994 data to make an overall assessment of the decline since 1970. We remain open to suggestions on how to overcome these data issues.

8.3 CHEMICAL POLLUTION

No Scottish data

Domain

Chemical pollution includes radioactive compounds, organic compounds and heavy metals such as mercury or lead generated by industrial processes and waste production. Of particular concern for the planetary boundary are persistent pollutants that have the potential to build up in the environment and bio-accumulate, creating lethal and non-lethal impacts such as reduced fertility, genetic damage and severe damage to ecosystems. Because there are so many manufactured chemicals and their effects may be manifest at very low levels (requiring expensive and specialist techniques to measure), producing a useful index is a major challenge and there is, as yet, no suggested planetary boundary proposed by SRC.

Indicators

The absence of a planetary boundary has led us once again to consider national impacts.

Several indicators were considered for this domain. They included pesticides within the food chain and organochlorine pesticides (OCPS), poly-brominated diphenyl-ethers (BDEs) and polychlorinated biphenyls (PCBs). The Basel Convention[132] was also considered, as was a recent report from the European Environment Agency on the use of neonicotinoid pesticides posing a risk to honey bees. Monitoring for the suite of persistent organic pollutants (POPs) controlled under the Stockholm Convention was also an option. However, since most of these chemicals were outlawed in Scotland and the UK many years ago, recording their continuing decline in concentration might lead to complacency about new risks.[133]

Given the current absence of any comprehensive index this is clearly one area that needs revisiting in the future.

In the meantime, an appropriate and useful proxy indicator is the percentage of total river length of *good* chemical quality. Chemical river quality in England was historically measured using the General Quality Assessment (GQA) Scheme. Previously this constituted three indicators: dissolved oxygen, biochemical oxygen demand (BOD) and ammoniacal nitrogen. The BOD indicator was dropped at the majority of sites from 2008. Hence this index does not directly measure POPs, but it will still correlate with their presence.

In 2009, 80 percent of English rivers were considered of good chemical quality, leaving 20 percent to fail this standard. [134]

The Scottish Environmental Protection Agency (SEPA) is responsible for collection of Scottish data but we have as yet been unable to source comparable data from SEPA and therefore have chosen not to include this domain within the Doughnut for Scotland at this point.

8.4 CLIMATE CHANGE

Planetary boundary exceeded by 479 percent (Scotland 2010).

Domain

Climate change is highly relevant to Scotland due both to our contribution to it and its well-documented impact nationally and globally.

Indicator

Man-made climate change is driven by greenhouse gas (GHG) emissions. The 'million tonnes' of carbon dioxide equivalent ($MtC0_2e$) is one of the best composite measures of greenhouse gas emissions as this includes a range of greenhouse gases. While this was considered as an indicator, SRC's proposed planetary boundary is based on a measure of CO_2 alone and so, for comparability, we have chosen to use $MtCO_2$. Carbon has by far the largest and most important impact on climate change so it is considered a suitable indicator for use here.

There are two methods for measuring our consumption of CO_2. Emissions can be measured on either a territorial or consumptive (footprint) basis. Territorial emissions are those relating only to the CO_2 produced within Scotland. Consumptive emissions take a broader approach and include estimates of CO_2 embedded in our imports of goods and services.

There are difficulties in accurately estimating consumptive emissions and it should be noted that results tend to be more dated than territorial data due to a more complex methodology.

However, in order to compare Scotland's impact upon the planetary boundary it is vital that consumptive emissions are used and we have opted for this as an indicator.

Boundary

The planetary boundary proposed by SRC is two tonnes CO_2/year/capita on a consumptive basis.[135]

Results

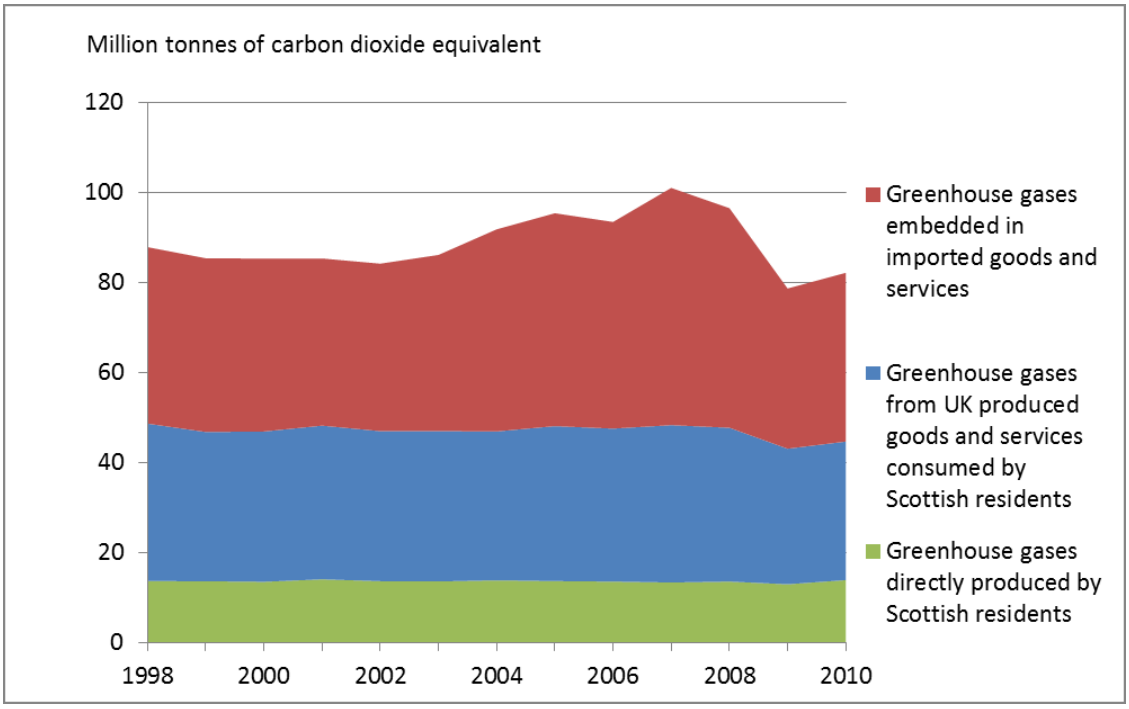
Boundary exceeded by 479 percent (Scotland 2010).

Method

- Scotland's boundary = 10.4 $MtCO_2$/year (based on 2tCO_2/year/capita x 5.22m population in 2010)
- Actual emissions = 60.25 $MtCO_2$/year (2010)[136]
- Exceedance = 49.85 $MtCO_2$/year
- Percentage exceedance: 49.85/10.4*100 = 479 percent

Figure 22 shows GHG emissions by source, territorial and imports. It should be noted that the total tonnage shown is higher than that used in the calculation above as it includes all GHG and measures $MtCO_2e$.

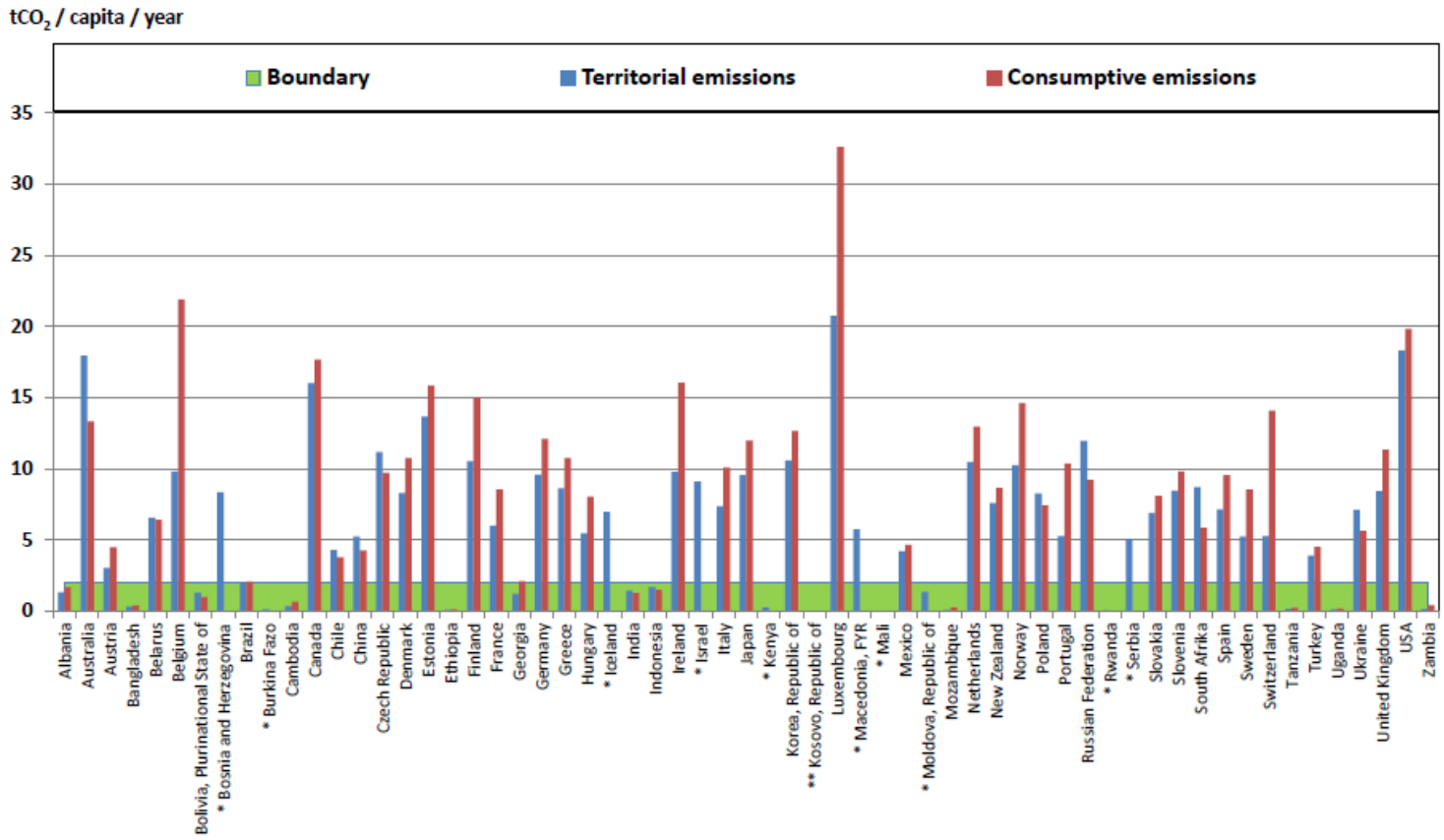
Figure 22: GHG emissions associated with Scottish consumption 1998–2010



***Source**: Reproduced from Government of Scotland.*[137]

Figure 23 demonstrates each country's relative per capita performance as calculated by the SRC.

Figure 23: Carbon emissions (selected nations 2008)



Source: *Reproduced from Stockholm Resilience Centre.*

8.5 GLOBAL FRESH WATER

No Scottish data

Domain

The Stockholm Resilience Centre argues that humans are now the main driving force behind hydrological cycles. The disruption of these cycles is seen in impacts on river flows, groundwater supply, soil moisture and vapour feedback. Fresh water is becoming increasingly scarce and water stress is becoming more common across the globe. This stress is driven not only by climate change but also by human use of fresh water supplies.

Indicator

Global fresh water is contained mainly in groundwater, and to a much lesser degree on the surface and in the air. The original planetary boundary on fresh water use was set as a result of observations that when the use of locally available renewable fresh water went beyond 40 percent, critical thresholds were crossed.

SRC calculates that 40 percent of the world's renewable fresh water amounts to 4,000km^3 per year. This gives a per capita/year figure of 585m^3. However, they caution against applying this

figure on a territorial basis as it takes no account of local availability of water, nor the demand for it.

An alternative approach is to apply the 40 percent boundary to a nation's renewable water resource and measure national performance against this. However, while this may be useful in showing water use in relation to national resources, it gives no indication of the impact of national use on planetary boundaries. Unlike CO_2, reducing territorial use of water in Scotland will have little impact elsewhere.

SRC has proposed using a consumptive-based indicator and relating that to national per capita use. This consumptive figure, also known as *virtual water*, measures water embedded in imports of goods and services from across the globe.[138] Unfortunately, they have been unable to calculate this for the UK due to a lack of data. Estimates do exist of the UK's virtual water consumption but, at present, there is no such estimate for Scotland. Moreover, the methodologies used for calculating these differ from SRC's and are not therefore comparable, nor are they suitable for inclusion in the Doughnut. It is beyond the scope of this paper to construct a methodology which would allow for a comparison. Therefore this domain is omitted from both the Scottish and UK Doughnuts for the time being.

For further discussion of the UK's consumption of virtual water see WWF's UK Water Footprint work.[139]

8.6 LAND-USE CHANGE

Planetary boundary exceeded by 250 percent (UK 2014).

Domain

> *"Humanity may be reaching a point where further agricultural land expansion at a global scale may seriously threaten biodiversity and undermine regulatory capacities of the Earth System.*" (J. Rockström *et al*).

The planetary boundary on *Land-use change* was based upon setting a maximum of 15 percent of ice-free land to be converted to cropland. The rationale behind this was that the conversion of forest and savannah and other ecosystems for agricultural purposes had negative impacts upon habitats and biodiversity, carbon storage, climate systems and hydrological processes.

So while agricultural expansion may, in the short term, allow for greater food production (although possibly on increasingly marginal land), in the longer term its continuation will impact negatively on Earth systems and therefore on stability and global bio-productivity.

Indicator

There are no data sets available for Scotland alone, therefore we rely upon an assessment of UK-related data.

SRC identifies two methods for downscaling the 15 percent boundary to a national scale.[140] One method involves limiting the conversion of nationally available land to crop land to 15 percent. However, the usefulness of this method is doubtful as *"… food and agricultural commodities are internationally traded to such a large extent, a better comparison would be consumptive use of global land".* [141]

A per capita boundary has therefore been calculated by SRC by simply dividing the safe amount of ice-free land by global population. This results in a boundary of 0.3ha per capita which can then be compared to actual national consumptive use of land – that is the amount of land use embedded in national consumption of goods and services, including imports.

However, this boundary has been criticized for various reasons. A major criticism from the United Nations Environmental Programme (UNEP) is that it takes no account of the expansion of settlement and infrastructure and the resultant decrease in available land for agriculture.[142] Taking this and a range of other factors into account, including predicted population growth, UNEP suggest a safer limit would be 0.2ha per capita by 2020.

For the purposes of this report another issue with the national results shown by SRC is that they have not published the methodology used to produce them. Therefore, while SRC results show the UK transgressing the 0.3ha boundary by around 10 percent[143] we have no way of updating this figure, or comparing it with other methodologies that show results for the UK ranging from 0.7ha[144] to 1.6ha[145] per capita. The latter methodologies differ from each other due to the higher estimate calculating all consumptive land use, including forestry and industrial use. Another issue with using any of the data referenced here is that they are not due to be updated. Finally, none of the above data sets can be applied to Scotland on its own.

There are then several methodological issues with using and comparing data sets for this section. It has been pointed out before in several reports that data on land use is seriously lacking and this is perhaps a central finding of this section.[146] Therefore, an agreed methodology on determining what a safe limit may be, and how consumptive land use is measured, is urgently required.

However, what is equally clear is that the UK's consumptive use of land outstrips any of the possible safe limits presented here.

Therefore, as land use is so fundamental to so many of the planetary boundaries, we have chosen to use the data we have available and include interim results on the UK's performance in this area.

It is clear that Scotland's per capita consumptive land use may differ from the UK's, not least because of population density. However, we have no data that break down consumptive use by constituent countries and are therefore forced to rely upon UK data.

Result

Planetary boundary exceeded by 250 percent (UK 2014).

Method

- Boundary = 0.2ha per capita
- Actual UK consumption = 0.7ha per capita.[147]
- Exceedance = 0.5ha
- 0.5/0.2*100 = 250 percent

Arguments could be made for using any of the range of data discussed above. Here we opt for UNEP's proposed safe limit which recommends stabilizing land-use change at 0.2ha per capita by 2020. We choose this mainly as we are convinced of their arguments regarding predicted population growth and the expansion of land being converted for settlement and infrastructure, limiting what is left for conversion for agricultural purposes. We compare this limit against results showing a UK consumptive use of 0.7ha per capita. We opt for this figure as its methodology is published and therefore preferable to SRC's result; also it is not currently clear to the authors that the upper figure of 1.6ha per capita is suitable, as this also measures the consumption of goods and services which flow from forestry – which in itself may not equate to the conversion of forests. We remain open to suggestions regarding data selection and use.

8.7 NITROGEN CYCLE

Planetary boundary exceeded by 317 percent (Scotland 2012).

Domain

Nitrogen was included as a planetary boundary because disruption of the nitrogen cycle results in pollution of waterways and coastal zones, causing eutrophication. Eutrophication is an ecosystem response to the addition of substances such as nitrogen and phosphorus to waterways. The most obvious impact of this can be seen in the growth of algal blooms and other lower level organisms. This in turn leads to the deprivation of nutrients, oxygen and light for higher level organisms.

Nitrogen also leads to increased soil acidity. In Scotland, following several years of improvement, the proportion of sensitive habitats where critical loads of nitrogen are exceeded has recently increased from 45 percent to 48 percent between the periods 2008–10 and 2009–11, returning to roughly the level seen in 2001–03.[148]

The disruption of the nitrogen cycle therefore impacts on bio-productivity and drives biodiversity loss both locally and globally.

Indicator

The nitrogen cycle is disrupted through additional nitrogen being manufactured and used for fertilizers. The manufacture of nitrogen occurs in only a few countries. Scotland and the UK import all the nitrogen they use. Nitrogen imports within fertilizer are recorded at a UK level but data on use is also available for Scotland. In this instance we have no data measuring nitrogen embedded in imports of other goods and services, so the indicator is based only on territorial consumption of fertilizers. The data therefore represent a significant underestimate but are internationally comparable and the best currently available.

Boundary

SRC has proposed a boundary of 5kg N/capita/year.[149] For Scotland as a whole this gives a boundary of 0.0265 MtN/year.

Result

Planetary boundary exceeded by 317 percent (Scotland 2012).

Method

- Scotland's boundary 0.0265 MtN/year
- Actual use = 0.125 MtN/capita/year (2012)[150]
- Exceedance = 0.0985 MtN/year
- % exceedance: 0.0985/0.0265*100 = 317%

8.8 OCEAN HEALTH

Ocean acidification is the term used to describe the ongoing decrease in ocean pH caused by rising CO_2 emissions. It is included in SRC's planetary boundaries. The oceans currently absorb approximately half the CO_2 produced by the burning of fossil fuels.[151] Ocean pH has already decreased by 30 percent and it is predicted to fall further at a rate that has not been experienced for over 400,000 years. Such a change in ocean chemistry is likely to have a large and negative impact on ocean life. However, although this is clearly important, the driver for

ocean acidification is CO_2 which is covered within the climate change domain and therefore not included here.

Alternative domain – Ocean harvesting

53 percent of fish stocks are harvested unsustainably (Scotland 2013).

Domain

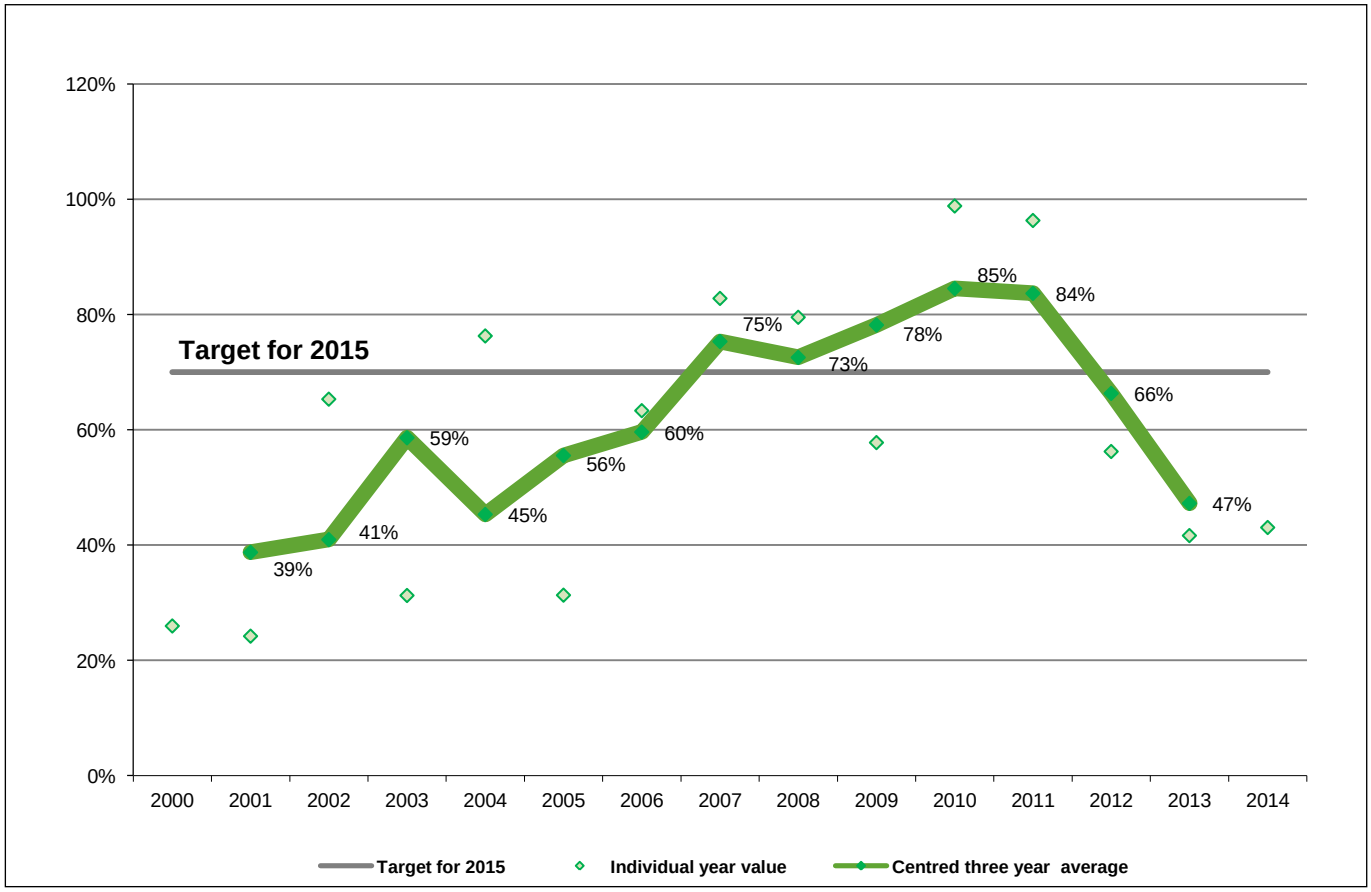
Instead of *Ocean acidification* we suggest *Ocean harvesting* of fish stocks as an alternative measure of ocean health and sustainability. This fits with the overall aim of the Doughnut in that it measures the impact of our patterns of consumption and resource management upon the bio-productivity of the marine environment, and on the general diversity and sustainability of marine ecosystems.

Indicator

The traditional definition of *sustainable harvesting* is that it does not cause a decline in stock numbers, or in fish size, over time. Unsustainable harvesting is caused by overfishing which reduces the reproductive capacity of the stock through heavy fishing of the adult population (recruitment overfishing), or in harvesting fish at younger ages (growth overfishing).

Marine Scotland produces annual data on the 13 main commercial fish stocks fished by Scottish vessels for which there are reliable data. Figure 24 shows the proportion of stocks where the total allowable catch for Scottish vessels fishing Scottish commercial stock has been set in accordance with scientific advice to ensure these are harvested sustainably and at full reproductive capacity.

Figure 24: Percentage of key fish stocks where the total allowable catch limit is consistent with scientific advice (Scotland 2001–13)



***Source**: Scottish Government/Marine Scotland.*[152]

Boundary

The boundary proposed here is 100 percent of the 13 monitored Scottish fish stocks to be classified as being sustainably harvested and at full reproductive capacity. The Scottish Government target for 2015, shown in the figure above, is 70 percent.

Result

53 percent of Scottish fish stocks are harvested unsustainably (2013).[153]

As seen in Figure 24, until 2010 there was a long-term increase in the numbers of stocks being sustainably harvested. However, in recent years this has declined dramatically, with over half failing to meet the criteria. The Scottish Government points to an international dispute over the mackerel catch as the reason behind this reversal.

8.9 OZONE DEPLETION

Zero emissions of ozone depleting substances

Domain

The severe depletion of Antarctic ozone, known as the *ozone hole,* was first observed in the 1980s and linked to the production of chlorofluorocarbons (CFCs) and other ozone depleting substances (ODS). There are a variety of negative impacts that flow from this, including global warming and harm to human health.[154]

Indicator

We have chosen here the territorial consumptive use of ODS – which includes substances embedded in imports – as the most relevant indicator. The production of CFCs and other ODS was regulated under a 1987 international agreement and the Montreal Protocol has now been ratified by more than 180 nations. In Scotland and the rest of the UK, hydrofluorocarbons (HFCs) are now used as a substitute for CFCs. HFCs do not contribute to ozone depletion and data show that the UK, and indeed the EU, neither produces nor consumes ODS.

Results

Zero emissions of ozone depleting substances[155]

Such success in turning around Scotland and the UK's contribution to stratospheric ozone depletion demonstrates the potential for public policy to tackle the damaging effects of consumption and production. This current situation however does not imply that historic use of ODS in Scotland no longer has a negative impact.

8.10 PHOSPHOROUS CYCLE

4 percent of Scottish river testing sites have poor or bad loads of phosphorus (Scotland 2013).

Domain

The phosphorous cycle was included in the original planetary boundaries paper …*to reflect the risk of a global oceanic anoxic event that would trigger a mass extinction of marine life.*[156]

Increased levels of phosphorus in both salt and fresh water can lead to a series of negative impacts through eutrophication. Phosphorus is added to the environment through fertilisers, manure, detergent and some pesticides.

Indicator

While there was a planetary boundary proposed of 11Mt of annual inflow of reactive phosphorus into oceans, SRC has, as yet, been unable to downscale this to a national level. The causal links between national use and impact on ocean inflow are scientifically uncertain. Additionally, there are insufficient data available.

It was therefore decided to explore an alternative indicator for this project focussed on national impacts. The levels of phosphorus loads in Scottish rivers were selected as this addresses the most serious short-term environmental impact of phosphorus – localized eutrophication. Although phosphorus supplies may be limited and non-renewable in the long-term, this indicator is better established than total phosphorus use. However, data that are comparable across the UK are limited. Therefore, we rely here upon data and recommendations from the UK Technical Advisory Group (UKTAG) on the Water Framework Directive.[157] We accept these are not as yet definitive, as they still need to be approved by ministers, and that categorization in Scotland and the rest of the UK may eventually differ. This indicator may therefore need to be revised.

Boundary

We propose a boundary of *poor* or *bad* phosphorus loads in Scottish rivers.

Result

4 percent of river testing sites are classified as having *poor* or *bad* loads of phosphorus *(Scotland 2013).*[158]

9 CONCLUSIONS

The facts presented in the Scottish Doughnut paint a stark picture.

Almost one-fifth of households in Scotland are living in relative poverty, with close to half of households unable to heat their homes adequately. Too many people are going hungry, living in overcrowded housing, experiencing poor health, anxiety and depression, with little access to social support networks. All of these societal failures are intricately linked to the long term and systemic issue of poverty – they create it, sustain it and flow from it.

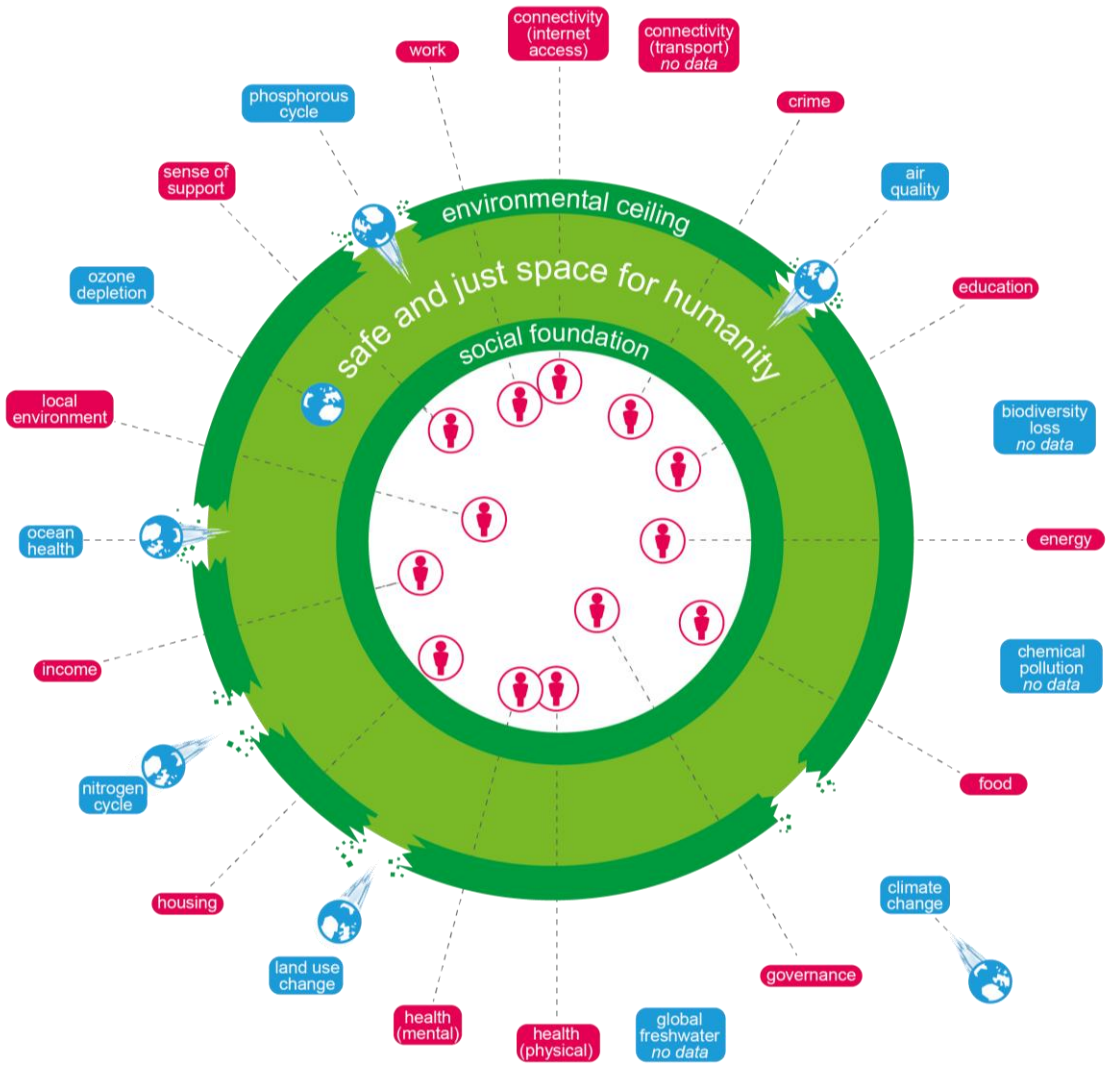
Not only does the Doughnut highlight the degradation of people's life experiences, it also shines a light upon the degradation of our local and global ecosystems.

In all but one of the environmental indicators used, Scotland fails to stay within safe limits. In the three planetary boundaries that can be downscaled to a Scottish or UK level – climate change, nitrogen use and land-use change (UK) – we not only fail, but fail spectacularly. While carbon emissions have been moving in the right direction, boosted by ambitious emission reduction targets, we still see recommended safe limits breached by over 470 percent, and land-use change and nitrogen cycles breached by over 250 percent. Analysis of the other domains selected for the environmental ceiling show WHO-recommended air quality levels being breached in 12 percent of road testing sites, and over half of fish stocks being unsustainably harvested.

Thus Scotland's environment is degraded by our methods and patterns of production and consumption. Moreover, our activities degrade the environment globally, as changing Earth systems undermine the bio-productivity of ecosystems, creating global food and water stresses. These are the statements of fact presented within the Scottish Doughnut.

This report does not go into the reasons behind these failures. However, it does highlight the immense inequalities experienced by our citizens across all social domains. Moreover, the environmental section tells a story not of scarcity but of a society over-consuming its share of the world's resources.

Figure 25: Oxfam's Scottish Doughnut



However, neither the environmental nor social realities outlined are set in stone.

The environmental facts presented do not imply an inevitable and impending Malthusian doom. We can choose to develop a more sustainable future. Debates surrounding potential solutions are ongoing and focussed on changes to industrial and agricultural production, consumption patterns, and broader mechanisms to tackle resource demand. What is required is the political will to implement policies designed to shape such decisions and tackle the detrimental impact created by existing production and consumption patterns.

Nor are the social failures described inevitable. The failures we highlight are the result of the way we currently organise our society. They are the result of successive Governments' policy choices surrounding how we use the tax system and public spending, as well as how we regulate and deliver services and provide support for our citizens. A more equal distribution of the wealth created could deliver a social foundation where all citizens could enjoy what we define as a minimum acceptable standard for all.

The Scottish Doughnut makes no claim to have uncovered the definitive *safe* and *just operating space* for our society. Debates will continue regarding what is a *just* quality of life for people to expect in particular, but we have based the *social foundation* upon the extensive participatory research cited. The setting of an environmental ceiling, or *safe space,* focuses as closely as possible on the priorities identified by the Earth system scientists of the Stockholm Resilience Centre, but remains open to change.

What the Doughnut provides however is an aim, or set of objectives, which would make for a much more sustainable society organized in a way that delivers an improved quality of life for all, without compromising the ability of others here or abroad, now or in the future, to an equally acceptable quality of life.

We hope the Scottish Doughnut can add to challenges to the dominant socio-economic narrative and help develop the political will required to create paths to a more sustainable and just society.

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- Stockholm Resilience Centre http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html
- The Literacy Trust http://www.literacytrust.org.uk/adult_literacy/illiterate_adults_in_england
- The Poverty Site http://www.poverty.org.uk/59/index.shtml
- Trussell Trust http://www.trusselltrust.org/foodbank-projects
- UK Air (Defra) http://uk-air.defra.gov.uk/networks/
- UK Ocean Acidification Research Programme (2013). http://www.oceanacidification.org.uk/
- WHO http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/data-and-statistics
- WHO (2013) http://www.who.int/mediacentre/factsheets/fs313/en/
- WWF infographic on UK virtual water http://www.theguardian.com/environment/interactive/2008/aug/19/water?guni=Article:in%20body%20link

APPENDIX: LITERATURE REVIEW FOR SOCIAL FOUNDATION

The social domains, indicators and thresholds in the main report have been chosen following analysis of a wide range of literature covering similar ground. Many of these reports were based on participatory research methods seeking to find out what people in the UK felt about what should be seen as acceptable standards of living. This literature review outlines some of these reports.

Resources used

In order to offer some suggestions as to what the domains of the UK's social foundation might encompass, several existing projects and sets of evidence were consulted:

1. **The Poverty and Social Exclusion:UK project (led by the University of Bristol)**
2. **The Minimum Income Standard (University of Loughborough and the Joseph Rowntree Foundation)**
3. **The Office of National Statistics wellbeing consultation**
4. **The Equalities and Human Rights Commission's Equalities Measurement Framework**
5. **Oxfam's Humankind Index for Scotland**

These offer insight into what people say is necessary to live with dignity in the UK and what people need to have their social needs met.

1. The Poverty and Social Exclusion:UK project (led by the University of Bristol)

This follows similar surveys in 1983, 1990, 1999, and Northern Ireland in 2002–03 seeking to highlight what the public think is an acceptable standard of living in the UK.

In 2012 1,400 respondents to a survey were given a list of 76 items (comprising 46 for adults and 30 for children) and asked to choose between what they thought was 'necessary and which all people... should not have to go without' and items which they felt were 'desirable, but... not necessary'.[159] This list was derived from focus group discussions (based on a hypothetical typical family). It found considerable agreement between groups (across gender, ethnicity, occupation, income level, education, political persuasion, housing tenure and family type) in all of the surveys.

Items agreed as 'necessary' by more than 75 percent of adults in the research were: [160]

- Heating to warm living areas of the home
- A damp-free home
- Two meals a day for adults
- Ability to repair or replace broken electrical goods
- Ability to to weddings, funerals and other such occasions
- Ability to visit family and friends in hospital

- Access to a telephone
- Access to a washing machine
- All recommended dental work
- A warm waterproof coat (children and adults)
- Ability to take part in celebrations on special occasions
- Fresh fruit and vegetables every day
- Meat, fish or equivalent every other day
- New, properly fitting shoes for children
- Garden or outdoor space for children to play safely
- Suitable books for children
- A suitable place for children to do homework
- Indoor games for children
- Toddler/nursery group once a week

These factors have been used to inform the suggested domains below.

2. The minimum income standard (University of Loughborough and the Joseph Rowntree Foundation

Academics at Loughborough University and their colleagues from other institutions have created a minimum income standard (MIS) based on what people say is necessary to realise an acceptable standard of living in Britain today. It combines expert views with the perspectives of ordinary people.[161]

The MIS is defined as 'having what you need in order to have the opportunities and choices necessary to participate in society'.[162] It is the standard to which we should 'aspire for everyone to meet... [it is] rooted in social consensus about the goods and services that everyone in modern Britain should be able to afford'.[163] The MIS is about identifying the minimum – but it goes beyond simple subsistence needs (food, warmth and shelter) to include the possessions and activities necessary to be able participate in society with dignity. It does, however, exclude those items which are seen as aspirational, and so delineates between needs and wants.[164] [165] In a way it is the income needed to access the modern equivalent of Adam Smith's 'linen shirt'. When circumstances change, items deemed necessary change: in the recession people specified lower budgets for eating out and buying presents.[166]

MIS draws on two methodological approaches – the family budget unit approach which brings together guidance, expert opinion and statistics (such as consumption data); and consensual budget standards, which elevate the views of people representing different family or household types, recognizing that they are the people best placed to construct a budget for respective household types. It prioritizes discussion to achieve 'informed negotiation and agreement about what constitutes a minimum'.[167]

Fieldwork took place in the Midlands, and, to a lesser extent, Scotland, Wales and London. The extra needs of disabled people were not taken into account, and budgets required to reach the MIS assume no additional health needs.

In practical terms participants were presented with text from the UN Convention on Human Rights which provides an understanding of 'minimum' as those things necessary for a person's physical, mental, spiritual, moral and social wellbeing. Groups recognized the need for presentation to be socially acceptable – the need to be able to invite people into their home or

participate in activities that peers undertake.[168] MIS budgets are not constrained by actual income.

Items deemed crucial in order to live with dignity in the UK (these were then costed to calculate the MIS)[169] [170] were:

- Food
- Alcohol
- Clothing
- Water rates
- Council tax
- Household insurance
- Fuel
- Other housing costs
- Household goods
- Household services
- Childcare
- Personal goods and services
- Travel costs
- Social and cultural participation
- Rent

3. The Office of National Statistics' wellbeing consultation

The ONS undertook a public consultation (November 2010 to April 2011) asking 'what matters to you?' There were many aspects of the consultation: nearly 8,000 people participated in an online and paper survey (two rounds); 34,000 people participated via online discussions, a phone line, letter and email; and over 7,000 joined events across the UK. The consultation invited comment on a pre-determined set of 10 areas or 'domains' (with space to list others) and 40 potential headline measures of national wellbeing.

Drawing on responses to this debate, existing research and international initiatives, the ONS developed domains and measures which are frequently revised.[171] These measures are grouped into a set of domains covering areas such as individual wellbeing, health, personal relationships and 'what we do'.

ONS wellbeing domains[172]

Personal life satisfaction

- Percentage with medium and high rating of satisfaction with their lives overall
- Percentage with medium and high rating of how worthwhile the things they do are
- Percentage who rated their happiness yesterday as medium or high
- Percentage who rated how anxious they were yesterday as low or very low

Our relationships

- Average rating of satisfaction with family life (out of 10)
- Percentage who were somewhat, mostly or completely satisfied with their social life
- Percentage who said they had one or more people they could really count on in a crisis

Health

- Healthy life expectancy at birth
- Percentage who reported a long-term illness and a disability
- Percentage who were somewhat, mostly or completely satisfied with their health
- Percentage with some evidence indicating probable psychological disturbance or mental ill health

What we do

- Unemployment rate
- Percentage who were somewhat, mostly or completely satisfied with their job
- Percentage who were somewhat, mostly or completely satisfied with their amount of leisure time
- Percentage who were somewhat, mostly or completely satisfied with their leisure time
- Percentage who volunteered in the past 12 months

Where we live

- Crimes against the person (per 1,000 adults)
- Percentage who felt very or fairly safe and walking alone after dark
- Percentage who accessed green spaces at least once a week in England
- Percentage who agreed or agreed strongly that they felt they belonged to their neighbourhood

Personal finance

- Percentage of individuals living in households with less than 60 per cent of median income after housing costs
- Mean wealth per household, including pension wealth
- Percentage who were somewhat, mostly or completely satisfied with their household income
- Percentage who report finding it quite or very difficult financially to get by

Education and skills

- Human capital – the value of individuals' skills, knowledge and competences in the labour market
- Percentage with five or more grades A*–C (including English and maths)
- Percentage of UK residents aged 16–64 years with no qualifications

The economy

- Real household income per head
- Net national income of the UK (£ million)
- UK net national debt as a percentage of gross domestic product
- Consumer Price Inflation index (2005-100)

The ONS domains of relationships, health, what we do, where we live, personal finance, and education and skills are used below because they seem to shed most light on what a modest social foundation might encompass.

4. The Equalities and Human Rights Commission's Equalities Measurement Framework (EMF)

The EHRC's EMF[173] is a measurement framework to assess equality and human rights via a baseline of evidence. It is underpinned by the capabilities approach, and has an underlying focus on the areas people say are important to them to do and to be (equality of outcomes, inequality of process and inequality of autonomy). Its development entailed 'extensive consultation' with the general public and with individuals and groups at risk of discrimination and disadvantage (10 consultations in London; full-day events in Scotland and Wales; a web-based consultation; and one-to-one meetings with stakeholders and subject specialists).

The domains and associated indicators distilled from these events are:

Domain	**Indicators**
Life	Life expectancy; homicide; specific cause mortality rates; death from non-natural causes for people resident or detained in public or private institutions
Health	Limiting illness, disability and mental health; subjective evaluation of current health status; dignity and respect in health treatment; healthy living; vulnerability to accidents
Physical security	Violent crime; hate crime; physical security for people in public or private institutions; fear of crime
Legal security	Offences reported and brought to justice (rape, domestic violence and hate crime); equal treatment by the police and criminal justice system (objective and subjective measures); deprivation of liberty (numbers and conditions); equal protection and support for individuals with justiciable civil justice problems
Education and learning	Basic skills; educational qualifications; participation in lifelong learning; use of the internet; being treated with respect in education
Standard of living	Housing quality and security; poverty and security of income; access to care; quality of the local area; being treated with respect by private companies and public agencies in relation to your standard of living
Productive and valued activities	Employment; earnings; occupation; discrimination in employment; unpaid care and free time
Individual, family and social life	Availability of support; being free from domestic abuse (emotional or financial); being able to participate in key social and cultural occasions that matter to you; being able to be yourself; being able to form and pursue the relationships you want
Identity, expression and self-respect	Freedom to practice your religion or beliefs; cultural identity and expression; ability to communicate in the language of your choice; self-respect; freedom from stigma
Participation, voice and influence	Formal political participation; perceived influence in local area; political activity; taking part in civil organisations; being treated with dignity and respect while accessing and participating in decision making forums

5. Oxfam Humankind Index for Scotland

Oxfam has built a measure of Scotland's prosperity (the Oxfam Humankind Index[174]), based on a consultation with Scottish people, to understand what sort of assets they need to live well in their communities; what sort of human assets; what sort of financial assets; what sort of social assets and so on. This reflects the Sustainable Livelihoods Approach[175] which highlights that to

prosper, be resilient, build a life free of poverty, families (and individuals) require five types of asset: financial, environmental, physical, human and social.[176]

In doing so, Oxfam engaged almost 3000 people, making a particular effort to reach out to seldom-heard communities and creating time and space for deliberation, discussion and debate around the question 'what do you need to live well in your community?'. This generated a set of priorities that were weighted to reflect the relative importance of each factor of prosperity relative to the others.

The Humankind Index is about assets people need to build sustainable livelihoods – it is not a measure of minimum standards, and certainly not a measure of poverty.

The table below shows the 18 sub-domains that make up the broad range of factors people in Scotland believe are necessary to live well in their communities and, of equal importance, details the weightings for each of these to reflect their relative importance to Scottish people (the total weighting adds up to 100).

Domain (factors of prosperity)	**(Weighting)**
Affordable/ decent home + Having a safe and secure home	11
Being physically and mentally healthy	11
Living in a neighbourhood where you can enjoy going outside + Having a clean and healthy environment	9
Having satisfying work to do (whether paid or unpaid)	7
Having good relationships with family and friends	7
Feeling that you and those you care about are safe	6
Access to green/ wild spaces + open spaces/ play areas	6
Secure work/ suitable work	5
Having enough money to pay the bills and buy what you need	5
Having a secure source of money	5
Access to arts/ culture/ hobbies/ leisure activities	5
Having the facilities you need available locally	4
Getting enough skills and education to live a good life	4
Being part of a community	4
Having good transport to get to where you need to go	4
Being able to access high-quality services	3
Human rights/freedom from discrimination / acceptance /respect	2
Feeling good	2

NOTES

[1] Stockholm Resilience Centre: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

[2] This paper has been developed alongside another outlining a UK Doughnut which will be available later in 2014. Where possible, indicators have been selected that are comparable between Scotland and the rest of UK.

[3] Rockström, J. et al. Planetary boundaries: Exploring the Safe Operating Space for Humanity (2009). *Ecology and Society* 14(2): 32. see http://www.ecologyandsociety.org/vol14/iss2/art32/ (accessed July 2014)

[4] Stockholm Resilience Centre and Stockholm Environmental Institute, *National Environmental Performance on Planetary Boundaries: A study for the Swedish Environmental Protection Agency (2013)* http://www.stockholmresilience.org/21/research/research-news/6-28-2013-a-safe-operating-space-for-sweden.html (accessed July 2014)

[5] Raworth, K. 2012 *A Safe and Just Space for Humanity: Can We Live Within the Doughnut?* Oxfam, Oxford http://policy-practice.oxfam.org.uk/publications/a-safe-and-just-space-for-humanity-can-we-live-within-the-doughnut-210490 (accessed July 2014)

[6] For further discussion see Oxfam http://policy-practice.oxfam.org.uk/blog/2012/02/can-we-live-inside-the-doughnut-planetary-and-social-boundaries (accessed July 2014)

[7] Potential solutions are discussed in detail in Trebeck, K and Stuart. F (Oxfam 2013) *Our Economy: Towards a new prosperity*, Haddad. M (Oxfam 2012) *The Perfect Storm: Economic stagnation, the rising cost of living, public spending cuts and the impact on UK poverty,* and other reports

[8] Scottish Government http://news.scotland.gov.uk/News/Unequal-start-for-one-in-three-children-c42.aspx

[9] Plunkett, P. *Do Workers Reap the Benefits 0f Productivity Growth?* (OECD Insights, February 2012) http://oecdinsights.org/2012/02/20/do-workers-reap-the-benefits-of-productivity-growth/ accessed April 2014

[10] This measure is based on household income, adjusted for family size, compared to median income. Those with less than 60 per cent of median income are classified as poor. Latest figures can be found at http://www.scotland.gov.uk/Topics/Statistics/Browse/Social-Welfare/IncomePoverty accessed July 2014

[11] The High Pay Commission. *More for Less: What Has Happened to Pay at the Top and Does it Matter? (2011)* see http://highpaycentre.org/img/High_Pay_Commission_More_for_Less.pdf accessed June 2014

[12] Resolution Foundation, *Gaining from Growth: the Final Report of the Commission on Living Standards (2012) pg.9*

[13] http://www.guardian.co.uk/commentisfree/2012/oct/01/income-squeeze-holding-back-economy

[14] Oxfam statistics released on 25 July 2014: www.oxfam.org.uk/scotland/blog

[15] See, for example, Resolution Foundation, (2012), op. cit. Chapter 1, and Oxfam's *Whose Economy? (2011)* http://policy-practice.oxfam.org.uk/publications/whose-economy-seminar-papers-complete-series-188809 accessed July 2014

[16] Initially Rockström et al (2009) had proposed nine processes but this later increased to 10 as the SRC/SEI proposed splitting phosphorus and nitrogen cycles into separate domains: See, Stockholm Resilience Centre & Stockholm Environmental Institute, *National Environmental Performance on Planetary Boundaries: A Study for the Swedish Environmental Protection Agency* (2013)

[17] Rockström et al, *op.cit.*

[18] See Ratcliff, A *Hot and Hungry: How to Stop Climate Change Derailing the Fight Against Hunger* (Oxfam, 2014) http://policy-practice.oxfam.org.uk/publications/hot-and-hungry-how-to-stop-climate-change-derailing-the-fight-against-hunger-314512

[19] Stockholm Resilience Centre, *op. cit*. (2013)

[20] Rockström *et al, op. cit*. (2009)

[21] Raworth, *op. cit.* (2012)

[22] Oxfam and a number of other organisations are members of a roundtable chaired by the Cabinet Secretary for Finance, John Swinney, reviewing various aspects of the National

Performance Framework. The existing National Performance Framework can be viewed at http://www.scotland.gov.uk/Resource/Doc/933/0124202.pdf accessed July 2014

[23] The Community Empowerment (Scotland) Bill proposes placing the National Performance Framework on a legislative basis. See http://www.scottish.parliament.uk/parliamentarybusiness/Bills/77926.aspx accessed July 2014

[24]This understanding of poverty resonates with the concept of *social exclusion*, which Levitas *et al* define as:

A complex and multi-dimensional process. It involves the lack or denial of resources, rights, goods and services, the inability to participate in the normal relationships and activities available to the majority of people in a society, whether in economic, social, cultural or political areas. It affects both the quality of life of individuals and the equity and cohesion of society as a whole. Levitas, R. et al *The Multi-Dimensional Analysis of Social Exclusion: report for Department for Communities and Local Government*. (University of Bristol, 2007) p.9

[25] See http://sustainabledevelopment.un.org/rio20.html (accessed May 2014)

[26] Raworth, *op. cit.* (2012) pg.10

[27] Workshop participants felt that resilience should be removed or converted to a sensitivity measure for the following reasons: it is a descriptive term that can apply to other domains; it can be negative in that resilience to poverty keeps people poor; and social scientists and natural scientists argue over the definition of resilience.

[28] Poverty and Social Exclusion: UK, *What do We Think We Need? March 28, 2013 www.poverty.ac.uk/pse-research/3-what-do-we-think-we-need* (accessed May 28, 2013) &

Fahmy, E, Pemberton, S, Sutton, E, *Public Perceptions of Poverty, Social Exclusion and Living Standards: Preliminary Report on Focus Group Findings, Working Paper – Methods Series 12, Poverty and Social Exclusion in the UK (2011)*

[29] World Health Organisation http://www.who.int/social_determinants/strategy/Marmot-Social%20determinants%20of%20health%20inqualities.pdf

[30] Oxfam http://policy-practice.oxfam.org.uk/~/media/Files/policy_and_practice/poverty_in_uk/HKI/HKI%20local%20authority%20appendix.ashx

[31] McManus S, et al. *Adult psychiatric morbidity in England, 2007. Results of a household survey.* (Leeds: NHS Information Centre, 2009)

[32] White, D. *Across the Divide: Tackling Digital Exclusion in Glasgow* (Carnegie, 2013)

[33] Office of National Statistics. *Statistical Bulletin, Internet Access Quarterly Update Q3* (2013)

[34] PSE:UK (2013) pg6

[35] White, op. cit.

[36] Ofcom http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr13/scotland/

[37] Office of National Statistics. *Statistical Bulletin, Internet Access – Households and Individuals* (2013) pp.14–16

[38] Office of National Statistics. *Internet Access Quarterly Update: Q1 2014* (May 2014)

[39] Social Exclusion Unit *Making the Connections: Final Report on Transport and Social Exclusion* (2003)

[40] See for example: The Poverty Alliance. *Surviving the Impact of Lone Parenthood: Research into Experiences of Lone Parents in Rural Fife* (2013)

[41] Lucas, K. *Transport and social exclusion: Where are we now?* In *Transport Policy 20 (2012)* pg.109

[42] *Ibid.* pg.112

[43] See for example Passenger Focus http://www.passengerfocus.org.uk/bus-passengers,

DfT, *Statistical release: Public Attitudes to Buses: Great Britain, March 2013* pg.4

DfT *Public attitudes towards train services: results from the April 2012 Opinions Survey* fig.3.6

[44] Joseph Rowntree Foundation. *Monitoring Poverty and Social Exclusion 2013 pg.22*

[45] See DfT statistics at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/49966/acs0108.csv/preview

[46] Halsey, K. and White, R. *Young people, Crime And Public Perceptions: A Review of the Literature* (LGA 2008)

[47] Scottish Crime and Justice Survey 2012/13: Main Findings (2014)

[48] Home Office *User Guide to Home Office Crime Statistics (2011) app.3*

[49] *Scottish Crime and Justice Survey* (2014) table 3.1

[50] *Scottish Crime and Justice Survey* (2014) pg. iv

[51] *Scottish Household Survey* (2012) table 7.1

[52] ONS *Measuring National Well-being Wheel* http://www.ons.gov.uk/ons/interactive/well-being-wheel-of-measures/index.html

[53] The Poverty Site http://www.poverty.org.uk/59/index.shtml

[54] The Marmot Review Team, *The Health Impacts of Cold Homes and Fuel Poverty* (2011)

[55] Boardman, B. *Fuel poverty: From Cold Homes to Affordable Warmth,* Belhaven Press, (London 1991)

[56] The traditional definition of a *standard heating regime* is that the main living area is heated to 21 C and the rest of the property to 18 C, for seven hours a day during the week, and 16 hours a day during weekends. However, it should be noted this is under review.

[57] Hills, J. *Getting the Measure of Fuel Poverty: Final Report of the Fuel Poverty Review(2012)*

[58] Centre for Sustainable Energy, *Nowcast* @ http://www.cse.org.uk/pages/resources/open-data/fuel-poverty-data (accessed April 2014)

[59] http://www.nea.org.uk/policy-and-research/publications/2014/monitor-2014 (accessed June 2014)

[60] The SHS uses eight household types defined as follows: A **single adult** household contains one adult of working age and no children; A **single parent** household contains one adult of any age and one or more children; A **single pensioner** household contains one adult of pensionable age and no children. Pensionable age is 60 for women and 65 for men; A **small family** household contains two adults of any age and one or two children; An **older smaller** household contains one adult of working age and one of pensionable age and no children, or two adults of pensionable age and no children; A **large adult** household contains three or more adults and no children; A **small adult** household contains two adults of working age and no children; A **large family** household contains two adults of any age and three or more children, or three or more adults of any age and one or more children. http://www.scotland.gov.uk/Topics/Statistics/SHCS (accessed June 2014)

[61] Oxfam, *Below the Breadline* (2014) http://policy-practice.oxfam.org.uk/publications/below-the-breadline-the-relentless-rise-of-food-poverty-in-britain-317730 accessed July 2014

[62] Trussell Trust, http://www.trusselltrust.org/stats (accessed April 2014)

[63] For example West Dunbartonshire Community Foodshare statistics (February 2014) online at: http://www.oxfam.org.uk/scotland/blog/2014/01/worrying-surge-in-foodbank-use

[64] PSE-UK, unpublished data

[65] PSE-UK *The Impoverishment of the UK* (2013) table 3

[66] Natcen, *British Social Attitudes Survey 30,* (2013) pp. 68-71

[67] Scotcen, *Scottish Social Attitudes Survey 2009,* table 2.9

[68] See page 8 of *Oxfam Humankind Index First Results* http://humankindindex.org/ accessed July 2014

[69] Glasgow Centre for Population Health. *Three Cities Report,* pg.4 http://www.gcph.co.uk/publications/440_exploring_potential_reasons_for_glasgows_excess_mortality

[70] European figures are collected for the UK as a whole and known as healthy life years (HLY). They are comparable with 26 other EU countries and presented at http://www.ehemu.eu/

[71] For more details see http://www.scotland.gov.uk/Topics/Statistics/SIMD/BackgroundMethodology

[72] Based on two-year averages (Scotland) 2010

[73] SCOTPHO http://www.scotpho.org.uk/population-dynamics/healthy-life-expectancy/data/deprivation-quintiles

[74] SCOTPHO http://www.scotpho.org.uk/population-dynamics/healthy-life-expectancy/data/deprivation-quintiles

[73] World Health Organization. *Mental Health: New Understanding, New Hope* (2001)

[76] *Ibid*. pg.xiv

[77] See http://www.chooselife.net/Evidence/statisticssuicideinscotland.aspx

[78] NHS Scotland, *Measuring Metal Wellbeing* http://www.healthscotland.com/scotlands-health/population/Measuring-positive-mental-health.aspx

[79] See http://www.dhsspsni.gov.uk/bulletin_3_-_deprivation_-_2011-12.pdf

[80] Offfice of National Statistics. *Measuring National Wellbeing – Health* (2013)

[81] ESRC, *Understanding Society, A Summary of First Findings* (2011), Chpt. 9

Office of National Statistics. *Measuring Subjective Wellbeing in the UK* (2010)

Scottish Government. *Scottish Health Survey* (2012)

[82] Office of National Statistics. *Measuring National Wellbeing – Health* (2013) pg. 5

[83] Scottish Health Survey 2012 table 1.6 http://www.scotland.gov.uk/Publications/2013/09/3684/downloads (accessed July 2014)

[84] Office of National Statistics. (2013), *op. cit.*

[85] SCOTPHO. *Scotland's Mental Health, Full Report* (2012) spine 7 pg.58

[86] SCOTPHO. *Scotland's Mental Health, Full Report* (2012) pg.56

[87] Crisis. *The homelessness monitor: England 2013 pg. X*

[88] Crisis. *The homelessness monitor: Great Britain 2012 pg. 14 &* Scottish Government (2013) *Operation of Homeless Persons Legislation in Scotland statistics for 2012/13*

[89] Housing (Overcrowding) Act 2003

[90] *Scottish House Conditions Survey (SHS) 2012 Key Findings,* table 47

[91] *English Housing Survey, Headline Report 2011–12*, table 10

[92] *Northern Ireland Housing Statistics,* (2011–13), table 6.7

[93] SHS (2012) table 48

[94] See Shelter http://england.shelter.org.uk/campaigns/why_we_campaign/housing_facts_and_figures/subsection?section=overcrowding (accessed March 2014)

[95] Oxfam (2013), *Summary of Oxfam response to UK government Measuring Child Poverty consultation*, http://policy-practice.oxfam.org.uk/publications/summary-of-oxfam-response-to-uk-government-measuring-child-poverty-consultation-277916 accessed July 2014

[96] See http://www.jrf.org.uk/topic/mis (accessed Jan. 2014)

[97] Joseph Rowntree Foundation and New Policy Institute. *Monitoring Poverty and Social Exclusion* (2012) pg.6

[98] Office of National Statistics HBAI July 2014 table 3.19ts https://www.gov.uk/government/publications/households-below-average-income-hbai-199495-to-201213 (accessed July 2014)

[99] Padley, M. and Hirsch, D. *Households Below a Minimum Income Standard: 2008/9 to 2011/12* (2014) pg.12 and figure 8 http://www.jrf.org.uk/media-centre/households-on-inadequate-incomes-increases (accessed Jan. 2014)

[100] Gingerbread http://www.gingerbread.org.uk/content/365/Statistics (accessed July 2014)

[101] Office of National Statistics HBAI. July 2014 table 3.10ts

[102] Reid, S. and Curtice, J. *Scottish Social Attitudes Survey 2009: Sustainable Places and Greenspace* Scottish Government 2010 www.scotland.gov.uk/Publications/2010/07/02134238;

Natural England http://publications.naturalengland.org.uk/category/127020 accessed 30/01/14;

Good Places, Better Health: A New Approach to the Environment and Health in Scotland (Scottish government, 2008) www.scotland.gov.uk/Publications/2008/12/11090318.

[103] *Scottish Household Survey 2012*, pg. 125

[104] *Scottish Recreation Survey: Annual summary report 2012*

[105] *Scottish Recreation Survey: Annual summary report 2012* pg. 6

[106] Social grading is a method developed by the Office of National Statistics to categorise households according to factors such as type of employment, qualification and tenure. AB is the highest classification and DE the lowest.

[107] *Scottish Household Survey (2012)* pg.114

[108] Scottish Natural Heritage. Proportion of Adults Visiting the Outdoors for Leisure or Recreation at Least Once a Week, 2006–2012

An Official Statistics Publication for Scotland http://www.snh.gov.uk/docs/A913324.pdf

[109] McFall, S. L. (Ed.) *Understanding Society: Findings* (2012) Pg.5

[110] PSE:UK. Unpublished data

[111] For the purposes of this report *not much* and *none at all* have been reinterpreted to mean *little* or *no* support.

[112] *Economically active* refers to those aged 16–64 who were either in work (employed or self-employed) or unemployed and actively seeking, and available for, work.

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surveys/search/index.html?newquery=*&survey=Labour+Force+Survey&sortDirection=DESCENDING&sortBy=pubdate

[115] *Ibid*.

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[118] See for example Joseph Rowntree Foundation (2014) *Climate Change and Social Justice: An Evidence Review*, http://www.jrf.org.uk/sites/files/jrf/climate-change-social-justice-summary.pdf

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[128] See http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/267556/agindicator-de5-18dec13.pdf (accessed March 2014.)

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[133] Good data exist on POPs in the eggs and tissues of predatory birds (Predatory Bird Monitoring Scheme 2012 http://data.gov.uk/dataset/the-predatory-bird-monitoring-scheme-pbms accessed on 16 December 2013) and for a range of POPs, including PCBs and dioxins, in air samples monitored annually at stations across the UK by Defra under their Toxic Organic Micro Pollutants (TOMPs) scheme (see Defra 2013 http://uk-air.defra.gov.uk/data/tomps-data, accessed 9 March 2014). Both of these sources provide data from which an index or indices could be derived; however, at present, they simply record information for individual chemicals

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[144] Friends of the Earth Europe (FOEE), *Hidden Impacts: How Europe's Resource Overconsumption Promotes Global Land Conflicts(2013*) tbl. 3.1

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http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=TAG00090 (accessed March 2014)

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[152] National Performance Indicator 44 see http://www.scotland.gov.uk/About/Performance/scotPerforms/indicator/marine

[153] Scottish Government/Marine Scotland, *National Performance Indicator 44*

[154] National Geographic http://environment.nationalgeographic.com/environment/global-warming/ozone-depletion-overview/

[155] Stockholm Resilience Centre (2013) fig. 17

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[157] UKTAG is a working group of experts drawn from the following agencies: Natural Resources Wales, Natural England (NE), Environment Agency, Northern Ireland Environment Agency (NIEA), Joint Nature Conservation Committee (JNCC), Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH), Republic of Ireland's Department of Environment, Community and Local Government (DECLG).

[158] UKTAG. *Updated recommendations on phosphorus standards for rivers: River Basin Management (2015–2021)Table 3*

[159] PSE:UK. *The Impoverishment of the UK: first summary report* (2013)

[160] Gannan, M. and Bailey, N. *Attitudes to the 'necessities of life' in Scotland* (2013)

[161] Bradshaw, J, Middleton, S, Davis, A, Oldfield, N, Smith, N, Cusworth, L, Williams, J. (Joseph Rowntree, 2008) *A Minimum Income Standard for Britain – What People Think*

[162] *Ibid* pg. 1

[163] *Ibid* pg. 3

[164] *Ibid* pg. 3

[165] Centre for Research in Social Policy (Joseph Rowntree Foundation, 2012) *A Minimum Income Standard for the UK in 2012*

[166] *Ibid*

[167] Bradshaw et al pg. 3

[168] *Ibid* p.14

[169] *Ibid* p.27

[170] MIS budgets are 'well below median income levels, but higher than the 60% of median income poverty threshold (except pensioner couples)... people at the standard poverty line, 60% of median, are mostly well below the MIS'. Bradshaw et al p.38

[171] Self, A and Beaumont, J (ONS, 2012) *Initial Findings from the Consultation on Proposed Domains and Measures of National Well-being*, http://www.ons.gov.uk/ons/dcp171766_257206.pdf

[172] ONS (2013) *Domains and Measures spreadsheet,* http://www.ons.gov.uk/ons/rel/wellbeing/measuring-national-well-being/domains-and-measures---may-2013/rft---domains-and-measures.xls

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[174] *Oxfam Humankind Index,* www.oxfam.org.uk/humankindindex

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[176] Financial assets include income from work, pensions, other income support and stocks of wealth. Environmental assets include local green space, air quality, parks, and clean streets. Physical assets include infrastructure, houses, tools and equipment. Human assets include skills, education and health. Social assets are people's networks of friends, family and contacts.

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