The Scottish Parliament
Pàrlamaid na h-Alba

# Sustainable Development Impact Assessment:

Explanatory notes for version 2.3 2022

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# Measadh Buaidh Leasachadh Seasmhach:

Nòtaichean mìneachaidh
air tionndadh 2.3 2022

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# Introduction

This document contains some basic information about each of the themes in the Sustainable Development Impact Assessment (SDIA) tool. While this information is by no means comprehensive, the tool should be generally easy to use. However, some technical advice from an expert is often helpful. It is recommended that the discussion is facilitated by a sustainable development expert the first few times the tool is used. For more information, please email spice@parliament.scot.

Sustainable development (SD) is a normative concept[1] – this means that it is an idea about how things ought to be. While it envisions a future where humans live in just societies within environmental limits, it recognises that the ways in which we can achieve this are specific to a given situation. SD practitioners try to find what works, based on evidence, which could be very specific to the situation in question.

The aim of the SDIA tool is to ask questions about the kind of issues that can affect the environment and society, and so make an impartial, politically neutral assessment.

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[1] **Sachs, J 2015:** The Age of Sustainable Development, Columbia University Press, New York.

# 1. Living within environmental limits

Environmental limits is a technical term which refers to the amount of resource that we can take from, or pollution we can put into, the environment without damaging its ability to provide for our needs.

For example, human-induced global warming is caused mainly by us putting greenhouse gases such as carbon dioxide ($CO_2$) into the atmosphere e.g. by burning fossil fuels like coal and oil. Scientific evidence and modelling tell us that it is very likely that if $CO_2$ levels reach more than 450 parts per million (ppm) of the atmosphere, climate change will become dangerous to us. Dangerous climate change is a threat to our survival. For example, it's highly likely to threaten our ability to grow food. So, a $CO_2$ concentration of 450 ppm can be considered to be an environmental limit.

## 1A  Local environment:

The local environment refers to what is in people's immediate vicinity. This includes both the built and natural environment. These do interact with each other, for example changes in the built environment such as new roads can change the way people travel and the resultant emissions from transport.

The local environment can also have a social impact, for example by improving human health through access to green space, or by allowing for communal spaces and venues where people can interact more easily with each other, and so on.

## 1B  Use of materials and energy

Almost everything we do entails the use of some materials or energy. This can have various environmental and social impacts, depending on:

- where the materials / energy came from, and how they were extracted;
- whether any wastes are produced after they are used, their quantity and environmental impact, and what happens to those wastes.

## 1C  Ecosystem services:

An ecosystem is made up of living organisms and their non-living environment. So, for example a marine ecosystem might include fish, corals, plankton, etc. as well as the sea, the seabed, tides, etc.

Ecosystems are critical for human wellbeing because they provide us with everything that we need to survive and prosper. This includes clean air that we can breathe, water we can drink, and fertile soils and a stable climate in which we can grow food, etc.

Ecosystems provide us with the material basis for life, as well as some cultural and spiritual benefits. These are called ecosystem services. Here is a simple example based on a plant:

The plant uses sunlight, water and nutrients from the soil to make energy and grow. This provides us with:

- food from its fruit, leaves and roots;
- fibre from its stem, which we weave into textiles;
- fuel when it is dried, which can be used for heating and cooking.

The plant also takes up $CO_2$ from the atmosphere, helping to stabilise the climate, and releases oxygen, which we need to breathe.

**1D  Planetary boundaries:**

Complex earth systems, which operate at a global level, maintain stable conditions in which we can survive and thrive. For example, the ozone layer absorbs ultraviolet (UV) radiation from the sun, which is harmful to human and other life. It is maintained through the ozone cycle in which oxygen, produced by living organisms, interacts with UV radiation to maintain a stable concentration of ozone in a layer of the atmosphere between 6 and 30 miles above the Earth's surface. Certain chemicals, including some produced by humans, can damage the ozone layer, creating holes such as that above the Antarctic.

Planetary boundaries are the extent to which these complex systems can cope with human-caused damage. Beyond these boundaries, the risks to humanity are thought to be very high. Nine planetary systems are considered essential to maintaining the ecological stability we depend on:

1. **Stratospheric ozone depletion** – see above

2. **Freshwater use** – excessive human use of water from rivers, lakes, reservoirs and groundwater stores can result in water stress – a shortage of water for human and/or ecosystem functioning.

3. **Ocean acidification** – as more carbon dioxide is emitted to the atmosphere, more of it is absorbed by the oceans, where some of it forms carbonic acid; this makes the area more acidic, threatening marine life such as coral and shellfish.

4. **Climate change** – increasing human emissions of greenhouse gases keeps more of the sun's heat within the atmosphere; more energy in the atmosphere destabilises the climate, leading to more extreme weather events.

5. **Land-use change** – human alteration of landscapes can affect their ecological functions; for example turning peatland into farmland can reduce the amount of carbon that can be stored, reducing climate stability.

6. Disrupting flows of chemicals such oxygen and nitrogen through the living and non-living systems of the globe (**biogeochemical flows**) affects ecosystem function.

7. Damage to the integrity of the global system of interconnected living organisms (**biosphere integrity**).

8. **Novel entities** – human-made pollutants in the environment.

9. **Atmospheric aerosol loading** – particles and droplets of pollutants in the atmosphere.

Exceeding safe levels of these poses a risk to human and other life. This can be worsened by the fact that planetary systems such as the atmosphere, climate, land, oceans, etc. interact with each other, so damage to one can damage others. For example, damage to the ozone layer can affect the climate system, creating changes in precipitation (rain, snow, etc.) patterns.

This has knock-on effects for human health and society. For example, if rainfall patterns change, agriculture could be affected. This in turn could have effects on economic activity, migration and so on.

You can find more information here:

Stockholm Resilience Institute

Planetary Boundaries: Exploring the Safe Operating Space for Humanity

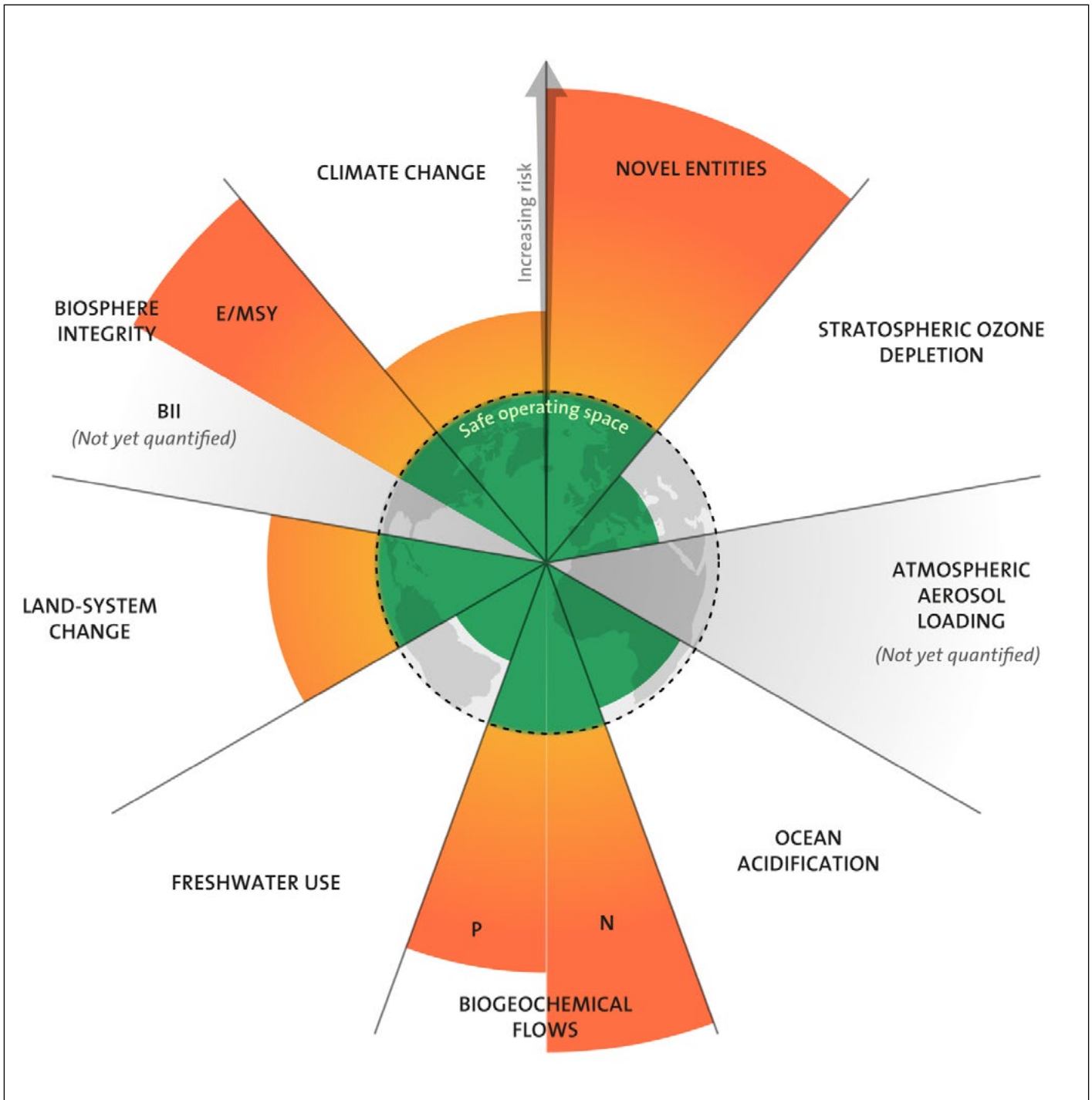Planetary Boundaries: guiding human development on a changing planet

**Current status of the control variables for eight of the planetary boundaries.[2]** The term 'control variable' refers to what is measured to assess the status of a planetary boundary, e.g. for climate change it is the amount of carbon dioxide in the atmosphere.

In the diagram below, control variables for systems and processes such as freshwater use remain within safe limits. For those which are yellow to light orange, control variable suggest that the risk to human societies is uncertain. For those which are dark orange, the status of control variables suggest a high risk.



CLIMATE CHANGE

NOVEL ENTITIES

BIOSPHERE INTEGRITY

E/MSY

STRATOSPHERIC OZONE DEPLETION

BII
(Not yet quantified)

Increasing risk

Safe operating space

LAND-SYSTEM CHANGE

ATMOSPHERIC AEROSOL LOADING
(Not yet quantified)

FRESHWATER USE

OCEAN ACIDIFICATION

P

N

BIOGEOCHEMICAL FLOWS

[2] **Persson, L. et al 2015:** Outside the Safe Operating Space of the Planetary Boundary for Novel Entities, Environmental Science & Technology 56(3):1510-1521.

# 2. Ensuring a strong, healthy and just society

Researchers have found evidence that a sense of fairness, or aversion to inequity, might have developed as part of the evolution of co-operation. Humans and several other social species are successful precisely because they co-operate – as isolated individuals our chances of survival reduce dramatically.[3]

From the point of view of SD, a healthy and just society could be considered to be one whose members can rely on each other for support (see 'social capital', section 2C) so that each has a fair chance to meet their needs (see 'equity', section 2B) and be well.

**2A  Human needs and wellbeing:**
In the 1950s, psychologist Abraham Maslow postulated that all human beings share the same fundamental set of needs, and that all their actions are motivated by the desire to try to meet these needs. In 1987, the World Commission on the Environment and Development defined sustainable development as *'development which meets the needs of the present without compromising the ability of future generations to meet their own needs.'*

According to Maslow, we have five groups of needs:

- **Physiological** – things we need in order to function well physically e.g. clean air to breathe, safe water to drink, etc.
- **Safety**, for example, a secure place to live or knowing that your family is safe.
- **Love / belonging** – the vast majority of humans need to belong to something like a family, a social group or some other organisation.
- **Esteem** – self-respect and the respect of others.
- **Self-actualisation** – being able to fulfil your individual potential. For example, some people might desire to excel at their profession or their hobby, while others might seek moral or spiritual goals.

[3] **RANDERSON, J. 2003**: Primates reveal a sense of fair play, New Scientist – https://www.newscientist.com/article/mg17924132-000-primates-reveal-a-sense-of-fair-play/ – accessed 26.06.2017.

# 2. Ensuring a strong, healthy and just society *continued...*

Another needs framework from the sustainable development literature is that of Manfred Max-Neef:

| Need | Being (qualities) | Having (things) | Doing (actions) | Interacting (settings) |
|---|---|---|---|---|
| subsistence | physical and mental health | food, shelter, work | feed, clothes, rest, work | living environment, social setting |
| protection | care, ada ptability, autonomy | social security, health systems, work | co-operate, plan, take care of, help | social environment, dwelling |
| affection | respect, sense of humour, generosity, sensuality | friendships, family, relationships with nature | share, take care of, make love, express emotions | privacy, intimate spaces of togetherness |
| understanding | critical capacity, curiosity, intuition | literature, teachers, policies, educational | analyse, study, meditate, investigate, | schools, families, universities, communities |
| participation | receptiveness, dedication, sense of humour | responsibilities, duties, work, rights | cooperate, dissent, express opinions | associations, parties, churches, neighbourhoods |
| leisure | imagination, tranquility, spontaneity | games, parties, peace of mind | day-dream, remember, relax, have fun | landscapes, intimate spaces, places to be alone |
| creation | imagination, boldness, inventiveness, curiosity | abilities, skills, work, techniques | invent, build, design, work, compose, interpret | spaces for expression, workshops, audiences |
| identity | sense of belonging, self-esteem, consistency | language, religions, work, customs, values, norms | get to know oneself, grow, commit oneself | places one belongs to, everyday settings |
| freedom | autonomy, passion, self-esteem, open-mindedness | equal rights | dissent, choose, run risks, develop awareness | anywhere |

**Wellbeing** is another way of thinking about sustainable development.

There are two types of wellbeing, sometimes referred to as subjective and objective wellbeing. Subjective wellbeing is about happiness and life satisfaction – what makes people feel good. Objective wellbeing is about being able to be, do or have those things which you feel you need (see the section on human needs above).

Oxfam Scotland has development a Humankind Index of wellbeing. They constructed it by asking people in Scotland what is important for their wellbeing.

These are the top things they said were important:

1. A safe, decent and affordable home.
2. Physical and mental health.
3. Living in a neighbourhood that you can enjoy and having a healthy environment
4. Satisfying (paid or unpaid) work.
5. Good relationships with family and friends.
6. Feeling that those you care about are safe.
7. Access to wild spaces, green spaces, social spaces and spaces for play.
8. Secure and suitable work.
9. Enough money to pay bills and buy what is needed.
10. A secure source of money.
11. Access to arts, culture, stimulation, learning, hobbies or leisure activities.
12. Having facilities that are needed locally.
13. The skills and education to live a good life.
14. Being part of a community.
15. Good transport to get where you need to go.
16. Access to high quality services.
17. Human rights, freedom from discrimination, acceptance, respect.
18. Feeling good.

You may observe that these are very similar to the fundamental human needs listed above. Remember that there is no need to duplicate what you have written into the tool – you could just refer to it instead.

There are many other measures and indices of wellbeing. Here are some useful links if you would like to find out more:

New Economics Foundation: Wellbeing

Organization for Economic Cooperation and Development Better Life Index

**2B Equity:**
Equity is different to equality, in that it is about fairness rather than sameness.

In some cases, equality is important for sustainable development – for example ensuring that there is equal access to employment regardless of ethnicity, sexuality, etc. In other instances, it is important to consider equity. As everyone is different and has different needs, equity is about recognising, understanding and ensuring that these differences are taken into account and differing needs are met.

For example, if we have one cake to share out among several people, rather than each person getting an equal share, it is more equitable for the cake to be shared out according to each person's needs. So if one of the people hasn't eaten all day, perhaps they should get a bigger piece of cake. Similarly, if another is diabetic and shouldn't eat too much sugar, perhaps they should get a smaller piece, or be provided with an alternative.

There are two technical terms commonly used in the context of sustainable development. The first is 'intragenerational equity', which is taken to mean fairness among people who are alive right now. The second is 'intergenerational equity', which is usually about fairness between people living now and those who will live in the future.

So if Scotland gets all the cake and Malawi gets none, that is an example of intragenerational inequity. Whereas if Scotland and Malawi shared a cake between them on the basis of, say, nutritional needs and population sizes, that would be more equitable.

Similarly, if we take all the fish from the North Sea, leaving none for the next generations, that is intergenerational inequity. However, if we take only so much fish that those remaining can continue to reproduce that is equitable.

**2C Social Capital:**
Social capital is a way of describing the social assets that we have. These include connections with people – networks of friends, family, neighbours, communities, etc.

Social capital is very important for human wellbeing and for sustainable development as it means groups of people can help and support each other. This could be in small ways such as checking up on an elderly neighbour, or in bigger ways such as working together on a community project.

In communities with relatively little economic capital, social capital is particularly important and often very high, as people look after and rely on each other.

Measures that undermine social capital, such as removing a place where people meet, may not support sustainable development, whereas measures which help to maintain or improve social capital can help SD, e.g. improving skills within a community, so that it can further its aims.

For more information, have a look at this section from Human Capital: http://www.oecd.org/insights/37966934.pdf

# 3. Achieving a sustainable economy

A sustainable economy could be considered to be one which does not breach environmental limits, and helps people to meet their needs by fairly distributing income, access to resources, etc. A sustainable economy would therefore need to be resilient. This means it would not undermine itself through over-reliance on particular businesses, resources, imports or exports, or by damaging the natural resources on which it depends. For example, if an economy is very heavily reliant on fishing, but climate change and overfishing cause fish stocks to decline, livelihoods will be under threat.

Below is Raworth's 'doughnut' model of a sustainable economy[4], in which both planetary boundaries and the minimum requirements of a just society are respected. They are referred to as the 'ecological ceiling' and 'social foundation' between which a safe and just space for humanity could exist.

The International Labour Organization states that 'Decent work sums up the aspirations of people in their working lives.' Ideas about decency may vary, but are mainly about working conditions that are humane, fair, and fulfilling.



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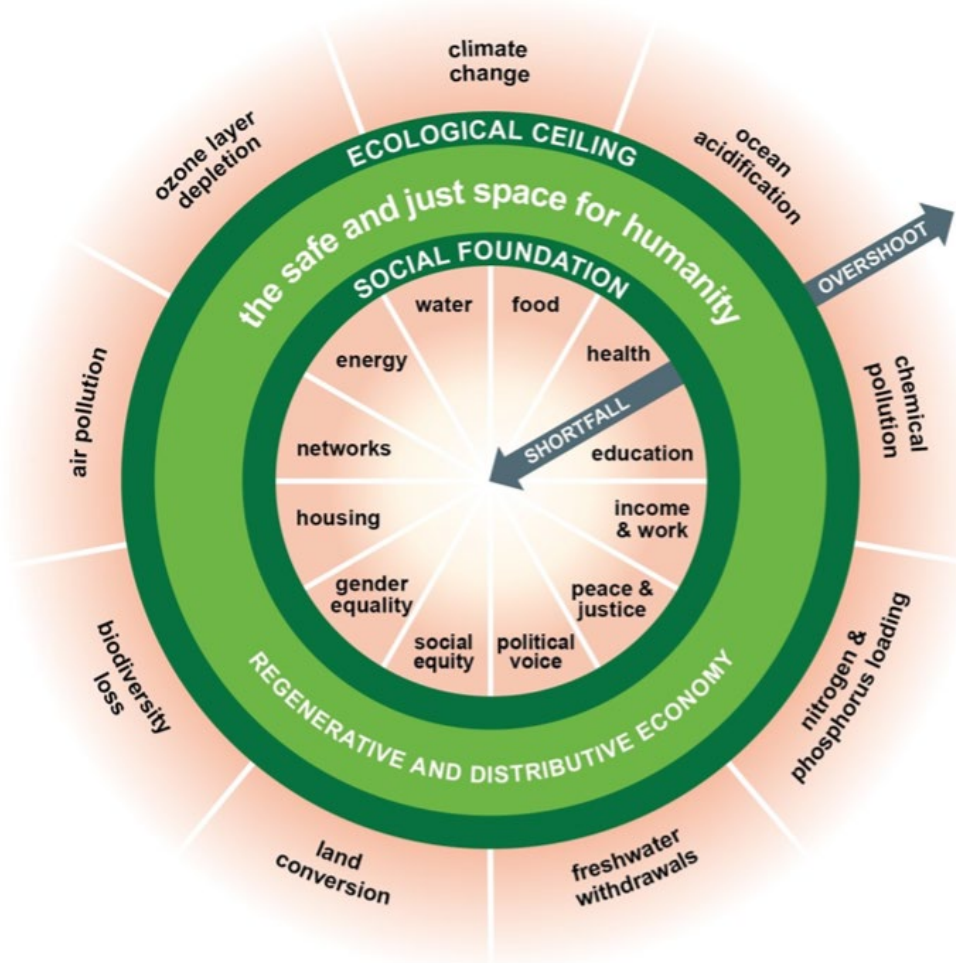
[4] **Raworth, K. 2017**: *Exploring Doughnut Economics* – https://www.kateraworth.com/doughnut/ – accessed 28.06.2017.

## 3B  Resilience

Resilience is defined as the ability to withstand shocks and stresses. At a personal level, resilience could relate to, e.g. your ability to cope with heatwaves, disease, fatigue, etc. Economic factors play a strong role in societal resilience. For example, a farmer who depends only on potatoes as a crop may be less resilient than one who grows a range of crops – if environmental conditions mean that potatoes fail in a given year, the monocropping farmer might be worse off than the one with the more diverse farm.

Similarly, communities that rely heavily on a single large multinational employer might be less resilient than those where there are a range of employers, including local businesses. If multinational decides to terminate its business, the community could be at risk. The risk could be greater as a multinational is more likely to be removing money from the local economy. On the other hand, a community based on small businesses could be more vulnerable to poor economic decision making at the national level.

## 3C  Society

Economic factors impact on society, particular in terms of the distribution of resources, services, wealth, income, etc. For example, taxes that require everyone to pay the same amount, could affect those with lower incomes more. This can be exacerbated if the taxes are used to improve conditions for those who are already well-off e.g. by improving roads where better-off people are more likely to be car owners.

## 3D  Environment

Economic activity can affect the environment. Often this is because the true cost of using natural resources is not factored into economic decision-making. For example, logging might be considered economically viable if cutting trees and selling them is profitable. However, this doesn't take into account the benefits that the trees might be providing, e.g. climate and water table stabilisation.

# 4. Promoting good governance

For development to be sustainable, good governance would need to ensure that anyone who wishes to participate in decision-making is able to do so. It would require institutions and public policy that reflect the social and ecological values of sustainable development.

## 4A Participation in decision-making
This is a fundamental human need – see 2A above. However, it is important to note that the evidence about participatory democracy is mixed.[5]

## 4B Institutions
Good governance is reliant on effective public institutions, and particularly on joined-up (coherent) policy. Where policies undermine each other within or between institutions, SD is less possible. For example, say one institution is seeking to grow the food industry to increase GDP, which might include increasing demand of higher value-added processed foods, while another is trying to reduce obesity by improving the food system. If they do not find an integrated solution, overall outcomes may be less beneficial than anticipated – society's gains in wealth could be compromised by the cost of obesity-related illness. Thus, the end result may be limited net gain.

## 4C Economy
In order for development to be sustainable, economies would have to be governed in such a way as to ensure that benefits and disbenefits are fairly distributed and that in the long term they remain within environmental limits.

## 4D Environment
Sustainable governance would require human activity to be managed so that the natural resources, including ecosystem services on which we rely, are protected. One approach is management according to the principles of maximum sustainable yield. This the maximum amount of a renewable resource that can be taken over a given time period without affecting the ability of that resource to regenerate. So, in the case of fishing, only so many fish of a particular species can be taken in a year, before the remaining population becomes too small to reproduce enough to replenish itself.

Another approach is to focus on working with ecosystems to ensure that we can continue to benefit from them. This would entail ensuring that they and their functioning are not damaged by human activity or appropriation.

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[5] **Kern, A. & Hooghe, M. 2018:** *The effect of direct democracy on the social stratification of political participation: Inequality in democratic fatigue?* Comparative European Politics 16(4), pp. 724-744.

# 5. Using sound science responsibly

As noted above, in order for development to become more sustainable, and for policy to achieve what it sets out to, it must be based on sound evidence.

**5A Evidence for the bill/policy:**
In particular, it is important to consider whether there may be any unintended or negative consequences, or barriers to effectiveness. In the case of bills (draft law), the detail of provisions, including definitions, is important – how could these be interpreted and used, and would those uses and interpretations lead to the intended outcomes?

**5B Improving knowledge and understanding:**
Some policy / legislation can include measures for improving knowledge. If it is being made in an area in which increased knowledge or understanding would be beneficial, then mechanisms for ensuring the relevant information is gathered / processed should be considered.

**5C Monitoring impacts:**
Understanding whether policy / legislation has been successful in achieving its intended outcomes is important, especially if the results are not as envisaged. Good monitoring / evaluation can help to understand why measures may not be working, or why a particular outcome is no longer desirable. This can help to develop, improve or update policy.