

Living well within our environment.

A Perspective on environmental sustainability?

**A paper for the Victorian Commissioner for Environmental
Sustainability**

This paper was written by
Philip Sutton
Director-Strategy of Green Innovations
<http://www.green-innovations.asn.au/>
Philip.Sutton@green-innovations.asn.au
Version 2.b 12-April-2004

Introduction and Overview

Environmental sustainability and what it means for us all

Environmental sustainability is the ability to maintain the qualities that are valued in the physical environment.

For example, most people want to sustain (maintain):

- human life
- the capabilities that the natural environment has to maintain the living conditions for people and other species (eg. clean water and air, a suitable climate)
- the aspects of the environment that produce renewable resources such as water, timber, fish, solar energy
- the functioning of society, despite non-renewable resource depletion
- the quality of life for all people, the livability and beauty of the environment

Threats to these aspects of the environment mean that there is a risk that these things will not be maintained. For example, the large-scale extraction of non-renewable resources (such as minerals, coal and oil) or damage done to the natural environment can create threats of serious decline in quality or destruction or extinction.

Traditionally, when environmental problems arise environmental managers work out how to reduce the damage or wastage. But it is not always easy to work out exactly when and where threats will have their effects and often the impacts are hard to reverse. So increasingly environmental managers adopt strategies aimed to prevent damage being done in the first place. A full sustainability program needs to include actions to prevent threats and impacts from arising, actions to protect the environment from threats and damage, and restoration to reverse damage already done.

Sustainability issues arise wherever there is a risk of difficult or irreversible loss of the things or qualities of the environment that people value. And whenever there are such risks there is a degree of urgency to take action.

Environmental sustainability programs include actions to reduce the use of physical resources, the adoption of a 'recycle everything/buy recycled' approach, the use of renewable rather than depletable resources, the redesign of production processes and products to eliminate the production of toxic materials, and the protection and restoration of natural habitats and environments valued for their livability or beauty.

These sustainability programs need to operate on an adequate scale and need to continue operating reliably for as long as the threats continue.

Some of the issues that pose major environmental sustainability problems include:

- destruction of the living environments (habitats) of native species
- discharge of polluting chemicals and other materials into the environment
- emission of greenhouses gases into the atmosphere than can cause climate change
- depletion of low cost oil and other fossil fuels

Some environmental issues are largely of local significance while others have regional or even global relevance.

At the personal or household level, there are a host of actions that people can take to contribute to environmental sustainability at home, when travelling or accessing services or goods, at work, or when acting as a community member or citizen or as an investor of personal funds.

Some useful examples are include living close to work where possible and walking, using a bike or using public transport. These are good options to save energy and reduce greenhouse gases. If these options are not possible then using an ultra-efficient hybrid petrol/electric vehicle can cut greenhouse gases and petrol consumption by about 50% and cut other toxic pollutants by about 90%.

Buying products made of recycled materials will generally save materials and energy, cut greenhouse gases and toxic pollution, and reduce impacts on living things in the wild. Installing a water tank and low flow shower can save water.

Building or renovating a house using environmental sound design and lower impact materials and 5+ star appliances can make a big impact on all environmental issues.

Using food in season or from local sources and organically grown can cut impacts from chemicals, save energy and reduce greenhouse gases.

Involvement in or donations to community environmental groups can help with practical projects like revegetation or by building support for effective government policies. And investing savings in ethical investments can help accelerate the creation of an environmentally-sustainable economy.

Table of contents

Introduction and Overview	i
Environmental sustainability and what it means for us all	i
Preamble	1
A preferred definition of environmental sustainability.....	1
What is the physical environment?	1
What makes an issue a sustainability issue?	2
What exactly are we trying to maintain in the physical environment and who decides?.....	2
What motivates us to want to sustain something in the physical environment?.....	2
How long should we try to sustain something?	3
Is there any connection between environmental sustainability and social or economic sustainability?	3
Can the idea of environmental sustainability drive commitments to specific action?	4
Is restoration part of an environmental sustainability program?	4
If we pursue an environmental sustainability program how much should we try to sustain?.....	4
The origin of the core word 'sustain' and its main derivatives.....	4
The drifts in meaning	5
The benefits of definitional clarity and a strong relationship to core meanings....	6
Developing a preferred definition of <i>environmental sustainability</i>	8
A compatible suite of sustainability terms.....	12
The problematic usage of sustainability-related terms	14
Translating the usage of sustainability-related terms.....	16
Related concepts and definitions	16
Ecologically sustainable development.....	16
The Triple Bottom line.....	18
Integrating Sustainability, Genuine progress, Triple Bottom Line.....	19
How to use the definition of environmental sustainability to facilitate effective action	21
A - What preferred state (condition) do we want/need to achieve?.....	22
B - What state are we in now?	25
C - How do we get to our preferred future from here, with the least loss along the way?	25
D - What should we do right now?	26
Index.....	27
References.....	2

Preamble

In 2003, the Parliament of Victoria established the role of Commissioner for Environmental Sustainability¹ (1). The Commissioner acts as an independent voice that advocates, audits and reports on environmental sustainability.

The purpose of this paper is to explore the meaning of *environmental sustainability*. The community needs a definition of environmental sustainability that is easily understood, is logical, and is helpful in facilitating understanding, communication and effective action by all key players (government, community, business, innovators, academia, communicators, etc.).

The paper also explores the meaning of related terms and definitions eg.

- 'sustainability' and related words in common usage
- 'ecologically sustainable development' (as defined by the Commissioner's enabling legislation)
- 'sustainable development' (the Brundtland definition)
- 'triple bottom line'.

A preferred definition of environmental sustainability

Environmental sustainability is "the ability to maintain things or qualities that are valued in the physical environment "².

This is the simplest and most fundamental way to express the concept. But people using the term *environmental sustainability* can specify or elaborate the term further to add extra meaning or to apply the concept to more specialised contexts.

What is the physical environment?

This is the *physical surrounds* to something. For example, the land, waters and atmosphere, physical resources and the buildings and roads and other physical elements go to make up the urban environment. Rural environments are made up of the farms and living areas of people and the land and waters and atmosphere and biological elements (species utilised by agriculture, pest species, and native species, and ecological communities both human induced and natural). Natural environments are those where the influence of wild species (indigenous and naturalised) is dominant or very strong. Physical resources, of all sorts, including mineral resources, can be considered to be part of the environment. Physical environments can be considered on all scales from the micro to the local, global and even larger scales.

There is no sharp distinction between the environmental and other domains (eg. social and economic) - in fact the content of each domain overlaps other domains massively. The key to understanding doesn't lie in trying to set non-overlapping *boundaries* between the domains but lies in being clear about the *focus* of different domains.

¹ (Link to) Commissioner for Environmental Sustainability Act 2003

² The physical environment includes the natural and biological environments.

What makes an issue a sustainability issue?

A sustainability issue arises whenever a valued system, object, process or attribute is under threat. The *existence* of the valued system, object, process or attribute could be threatened or its *quality* could be threatened with serious decline. In other words there is a sustainability issue whenever there is something that is valued that faces the risk of not being maintained.

Whenever there is a strong sense of urgency, there is always a sustainability issue involved. This urgency could relate to something that *already exists* or to an understood *potential*. For example biodiversity might be threatened with extinction or the chance to realise the potential of a human being might be threatened, for example, if they remain in poverty or their lives are threatened by violence or disease. (The latter would usually be thought of as being *social* sustainability issues.)

What exactly are we trying to maintain in the physical environment and who decides?

There is no automatic, fixed agenda built into the term *environmental sustainability*. We have to look to the context to see what might be sustained. And many people and organisations already have well developed ideas about what aspects of the total 'environment' should be sustained when *environmental sustainability* is pursued.

In a place like Victoria, with our culture, political processes and physical environment, there is strong public pressure to maintain (sustain) things like:

- ecosystem services (eg. nutrient cycling, the water cycle, natural water purification, climate moderation, soil protection)
- high quality urban environments
- areas of natural beauty
- other species and ecological communities
- the user value flowing from physical resources (eg. minerals, energy, renewable resources, water)

What motivates us to want to sustain something in the physical environment?

We might want to sustain something in the physical environment because it is useful to us: e.g. the quality of local urban environments. Or we might want to do it because we care about the wellbeing of other people or other species - for their sake, not ours. That is we can be motivated by utilitarian concerns and/or altruism.

Sometimes we maintain something in the environmental domain in order to make it possible to achieve another goal in another domain. For example, we might sustain marine habitats in order to support the livelihood of coastal townships. Or we might sustain renewable resources so that we can support economic development or genuine progress³.

³ Genuine progress is development that creates new benefits without undermining or destroying old benefits that are still valued in the community. In recent years a lot of work has been done on 'genuine progress' indicators as alternatives to GDP measures.)

How long should we try to sustain something?

This question can only be answered after deciding specifically what needs to be sustained and why.

For example, ecosystems services for clean air would need to be sustained as long as there are living things (including people) that need to breathe clean air. For all practical purposes that means 'forever'.

Living species seem to last on average a few million years before becoming extinct though some may evolve into new species. So if we maintained a natural extinction rate for species it is so low that for practical purposes we would need to manage in the here and now *as if* we wanted all species to survive, effectively 'forever'.

Sustaining the recycling of certain materials may only need to continue for as long as those material types are needed technologically, and depending on the pace of technical change this could be for centuries or for decades. It is risky to assume that resources are only needed for a short time however as society might find new uses for materials as technology, lifestyles and environmental awareness develop.

When it comes to trying to sustain habitat on a site-specific basis, very specific localised habitat or ecological community patches might need to persist for anywhere between thousands of years and just a few years - depending on the ecological system involved - provided all of the dependent species can access these habitat or ecological community types *somewhere* consistently and at adequate scale within their local ranges 'forever'.

Is there any connection between environmental sustainability and social or economic sustainability?

Since humans depend in countless ways on the physical environment (both natural and human constructed) sustaining desired environmental conditions directly contributes to the sustaining of people and human societies, that is, to social sustainability. The viability of the economy clearly depends on environmental resources and service flows so economic sustainability depends on environmental sustainability.

More generally it can be seen that sustainability in one domain can be necessary for sustainability in another. Sustainability requirements can be mapped to show complex dependencies across domains. We classify sustainability issues into separate domains, not because the sustainability issues are unrelated, but for reasons of convenience and tradition, for example, to allow specialisations to develop in R&D and administration, to break up complex whole into mentally manageable chunks, to reflect historical connections, etc.

Can the idea of environmental sustainability drive commitments to specific action?

While the idea of *environmental sustainability* is very broad in its possible scope, concerns for *environmental sustainability* can be translated in specific practical goals - and these can and should drive action programs. See the section "How to use the definition of environmental sustainability to facilitate effective action." on page 21.

Is restoration part of an environmental sustainability program?

In a world where life-support systems and other conditions required for sustainability have been run down, *environmental sustainability* can only be achieved through a combination of both preventive and restorative actions. So restoration is a key part of what needs to be done to achieve sustainability. In most instances it is better to avoid destroying environmental values in the first place rather than relying on restoration as the primary strategy. However, where damage has been done that could prevent valued elements of the physical environment being sustained, restoration should not be overlooked.

If we pursue an environmental sustainability program how much should we try to sustain?

The physical environment is powerfully affected by and is made up of evolving systems - ecological systems, societies and economies. These evolving systems will create changes in some aspects of the physical environment and will prevent or resist changes in other aspects. So an *environmental sustainability* program could never aim to sustain or maintain absolutely every component and attribute of the entire physical environment. Any *environmental sustainability* program must start out by being clear about what it is hoped will be maintained in the physical environment and what can be allowed to change or what will be made to change. Precisely what people set out to sustain within the physical environment will depend on their value judgements, needs, skills and technology and available resources to support the action program and the current state and the dynamics of the physical environment. We cannot assume that we automatically know what should be sustained (and what should not) in the physical environment just because there is an *environmental sustainability* program operating. We need to work the answer out explicitly.

The origin of the core word 'sustain' and its main derivatives

The word 'sustain' has been in the language for thousands of years. It comes from the Latin *sustenare* meaning "to hold up" ie. to support. From there it evolved long ago to mean to keep something going or extend its duration, with an overtone of providing the support or necessities that made the extended duration possible eg. a sustaining meal. These days, for commonest non-specialised use of the word the closest synonym is 'maintain'.

Sustain and its derivatives (eg. sustainability, sustainable, sustaining) were first used in a micro or personal context. However several hundreds of years ago the Swiss and Germans invented a form of forestry designed to keep the forest going as productive systems over the very long term and this was called, in the English speaking world, sustainable forestry. The idea was then extended to sustainable fisheries.

From there it was not such a big step for the term to be applied, during the 1960s and 70s, in the macro context of environmental issues where there was a need to sustain the whole environment and human society. This usage was established by the time of the 1972 UN Conference on the Human Environment held in Stockholm.

The drifts in meaning

Having reached a macro level of application sustainability was most often talked about in terms of 'sustainable development'. The 1980 World Conservation Strategy produced by the International Union for the Conservation of Nature and Natural Resources (IUCN or World Conservation Union) put forward the concept of 'sustainable development' meaning development that would allow ecosystem services and biodiversity to be sustained. The 1987 Brundtland Report shifted the meaning of sustainable development to mean "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Then the 1992 UN Conference on Environment and Development (UNCED) in Rio set in train processes such as Agenda 21 and Local Agenda 21 that resulted in many people coming to the view that sustainability equals the integration or balancing of environmental, social and economic issues or simultaneous progress in the environmental, social and economic domains, often in the context of strong programs of consultation and participation.

Many people however felt uneasy with the notion of 'development' as it is often associated with the destruction of environmental and social attributes that they value, so they felt better talking about 'sustainability' rather than 'sustainable development'. So, over time 'sustainability' and 'sustainable development' came to be treated by many people as synonyms. This trend was reinforced because some people found the term sustainable development to be a bit of a mouthful and they used 'sustainability' as a convenient (if inaccurate) shorthand.

As the scale of the task of achieving a sustainable environment and society has become apparent many people have tried to insulate themselves from the enormity of the challenge by retreating into small incremental changes. So some people have started to say that sustainability is a process of change and not an end state, and that it's the journey that counts, not the destination.

As the terms sustainability and sustainable development have been used more and more in government and corporate circles, because of increasing discussion of environment and development, the business world has started using the terms more and more for its own purposes. Curiously in this context 'sustainable' has quickly reverted to its earlier simple meaning of 'able to be maintained'. So sustainable profits, or sustainable competitive advantage mean profits or competitive advantage that can be maintained for the longer term. The straightforward use of 'sustain' and its derivatives within the domain of business is understandable because businesses face competition and hence the risk of decline and extinction every day of the week. This experience of threat leads business people to reproduce meanings of the terms that are the same as those in long-term common usage or those in the area of biological conservation.

The benefits of definitional clarity and a strong relationship to core meanings

The important benefit of definitional clarity is that it makes it easier to avoid logical problems and makes effective action more likely.

A search on the web reveals hundreds of definitions of sustainability and sustainable development⁴. Although this diversity is a little overwhelming it is not really surprising given that there are many diverse people involved in the sustainability debate and there are legitimate complexities involved. However, a careful review of these definitions reveals that they fall into four basic categories - only one of which (type 1) is a normal dictionary-style definition. The other types are referred to in this paper as "contextual definitions" because they create a greater understanding of the context of a term rather than defining its essence. The four types of definitions are:

Type 1: definitions based on the *essence*:

'x' *is/means* 'y'

eg. 'sustainability' is/means the 'ability to sustain something'; 'sustainable development' is 'development that can be maintained'; 'sustaining⁵ development' is 'development that sustains something'

Type 2: contextual definitions based on *strategies* for achieving the thing being defined:

the *achievement* of 'x' *requires* 'y'

eg. the achievement of sustainability requires, for example, the integration of environmental, social and economic issues

Type 3: contextual definitions based on the *outcomes* of the thing being defined:

'x' *results* in 'y';

eg. sustainable development results in the meeting of needs of the present generation without compromising the needs of future generations

Type 4: contextual definitions based on what a *movement* with that label tries to achieve or is interested in:

'x' is what the 'X' movement *strives for*

eg. sustainability is what the Sustainability movement strives for ie. Sustainability encompasses the protection of the environment and people, peace, and end to poverty, the meeting of human needs, enhancement of human wellbeing, promotion of happiness, etc., etc., etc.

Furthermore any of these types of definitions can be framed in a more general or a narrower context eg. applied to whole systems eg. society and the environment or just to specific contexts eg. 'the environment' of a particular species, or to specific human communities or a particular economy.

The last three types of definition can be useful as they are carefully expressed so it is clear what sort of context they are creating. But if they are written using words that

⁴ See Susan Murcott's list of definitions of sustainable development in the Reference section.

⁵ Where sustaining is used as an adjective (not as a verb).

suggest that they are type 1, or dictionary-style, definitions then these types of definitions usually cause significant confusion.

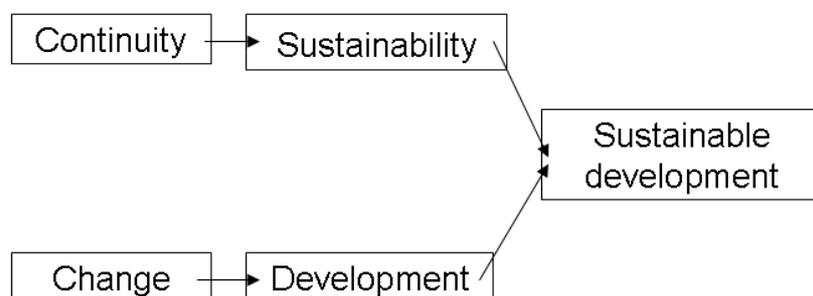
For example, the type 2 definition "the achievement of sustainability requires, for example, the integration of environmental, social and economic issues" is usually presented as if it were a type 1 definition ie. "sustainability⁶ is the integration of environmental, social and economic issues". This produces the absurd implication that if we simply consider environmental, social and economic issues together that this somehow generates a 'sustainability' outcome. Often the opposite is true because the issues are traded off against each other and one or more of the objectives are not adequately fulfilled leading to a decline (unsustainability) in the domains traded off. So in this case, a lack of clarity in the expression of the definition leads to a substitution of means for ends and the outcome is unsustainability.

The much-used Brundtland definition of sustainable development is a type 3 definition, that is, it describes what the outcome will be of pursuing sustainable development. The wording that is universally used is "sustainable development *is* development that meets the needs of the present without compromising the ability of future generations to meet their own needs". But this is in fact a not-careful-enough paraphrasing of the original in the Brundtland report which read: "Humanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs." (definition quoted from p.8 of the Brundtland Report). The Brundtland statement should have been paraphrased along the following lines: "sustainable development can under the right circumstances result in the needs of the present being met without compromising the ability of future generations to meet their own needs". This formulation then focuses people's attention on what is to be sustained, what needs are to be met in different generations and what strategies are to be applied to get the desired outcomes.

Not only is definitional clarity important but so is maintaining a strong relationship between the core meaning of words and their various derived forms. For example, the terms 'sustainability' and 'sustainable development' are now used interchangeably by many people. For some, the motivation for doing this is to find a shorter term to substitute for 'sustainable development'. Others prefer to use the term sustainability as a synonym for 'sustainable development' because they don't like talking about 'development' since in their experience it has negative connotations either for themselves or for others. But the end result is that two terms that originally had distinctly different meanings which served practical communication purposes are now blurred into each other - thus losing the distinction of meaning.

⁶ Or sustainable development.

Continuity and change



Sustainability is about *continuity* and development is about *change*. There are many things about life that we want to sustain (maintain) and many that we want to change. So it makes sense to create the notion of '*sustainable development*' that combines desired change and desired continuity - for example we might change exploitation, unhappiness, poverty, destructiveness, etc. and sustain the rest of nature, trust, tolerance, honesty, happiness, health, etc. Treated in this way *sustainable development* doesn't have to be an oxymoron (a combination of conflicting terms).

While theory says that sustainable development does not have to be an oxymoron, it can sometimes take quite a bit of negotiation before a whole society can be comfortable with a shared definition of what should be maintained and what should be changed.

Developing a preferred definition of *environmental sustainability*

The meanings of words gain their legitimacy from shared use, so in the final analysis there are no independently 'correct' meanings, just meanings that are well understood by many people⁷. But words also help to shape our understandings and then our actions, so the key question is not "what is the correct definition?" but "what do we want *environmental sustainability* to mean, what would be most desirable?"

How we choose to answer this question depends critically on our preference for treating *environmental sustainability* as either a practical goal or a utopian concept.

The historian Arnold Joseph Toynbee wrote in *A study of history (1947)* that: "The twentieth century will be chiefly remembered by future generations not as an era of political conflicts or technical inventions, but as an age in which human society dared to think of the welfare of the whole human race *as a practical objective*."⁸

⁷ Sometimes the meaning of words can evolve into almost their opposite. For example 'terrific' used to mean 'to cause extreme terror' now it most often means 'extraordinarily good'. The linking meaning was probably 'exciting' eg. 'the roller coaster ride was terrific'.

⁸ The quote by English historian Arnold J. Toynbee was used in Lester B. Pearson's Nobel Peace Prize acceptance speech in 1957. (Pearson won for introducing the concept of peacekeeping through the United Nations.) From: <http://nobelprize.org/peace/laureates/1957/pearson-lecture.html>

This could be extended so that we think of our present era as being distinguished as the age in which human society dared to think of the welfare of both the whole human race and the whole planet *as a practical objective*.

If this is so then we can perhaps put aside the idea of seeing *environmental sustainability* as a utopian concept and, instead, opt for seeing it as a practical objective, that is, something to be both aspired to *and achieved*.

But we should be doubly practical. We want to be able to use a definition of *environmental sustainability* that:

- makes it easier for us to *get things done* (the first practicality) and
- we want the definition to help us focus our minds on getting *the most important or relevant things* done (the second practicality).

To help in *getting things done* a definition of *environmental sustainability* will need to:

- *facilitate communication* between all the people who need to be involved in the issue
- *make it easier to identify actions* that need to be taken in order to achieve *environmental sustainability*

Before exploring how the choice of definition of *environmental sustainability* can help us be doubly practical we need to identify some definitional choices that we can apply our choice-criteria to.

Some of the basic types of definitions of 'environmental' and 'sustainability' that are used currently are:

environmental.....

- referring to just the biological environment
- referring to all possible environments (contexts) eg. social, economic, physical, intellectual
- referring to the physical environment including the biological, the geomorphological environment and the constructed and cultural physical environments

sustainability.....

- meaning "the integration or balancing of social, environmental and economic issues", or "programs or actions based on stakeholder or community consultation"
- meaning "sustainable development" or "making people better off in an ethically sound way"
- meaning "the ability to sustain something".

How should we select among these options if we want to *facilitate communication*?

There is really no sector of the economy or group of people in the community that should be uninvolved in efforts to achieve *environmental sustainability*. So if it is possible to use simple definitions that are in common usage throughout the whole community there is a good chance that most people will be able to understand each

other. Also definitions that are widely spread in the community are likely to be more stable because drifts in meaning that emerge in small groups are not likely to be taken up by the whole population.

The compound-concept of "*environmental sustainability*" is not widely used in the community, nor is the word "sustainability". But the core concept "to sustain" is widely used, and the term "environment" or "environmental" is widely used. In common usage "to sustain" means to "keep something going" or "maintain something". "Environment" means, in common usage, either "the context" or "surroundings" of something, or it means, more specifically, the physical environment. Clearly the Parliament of Victoria, when it passed the *Commissioner for Environmental Sustainability Act 2003*, was using the word "environment" in the sense of the "physical environment" rather than more universal meaning of "the context for anything".

How can our choice of definition *make it easier to identify actions* to take to achieve *environmental sustainability*?

Having an action focus, especially where the aim is actually to achieve desired outcomes, means that it is not helpful to use definitions that are fuzzy or based on logical confusion. So treating "sustainability" and "sustainable development" as synonyms (ie. as having the same meaning) is not likely to be a good idea. Adding the word "sustainable" to "development" must change the type of development we are talking about - otherwise why would we bother talking about "sustainable development" if we could more conveniently just use the word "development"? So if we say that "sustainability" has the same meaning as "sustainable development" what we saying in logical terms is:

Concept A = Concept A + Concept B

In other words it doesn't make any logical sense at all!

This sort of definitional fuzziness and confusion can only persist where people are not trying to be clear about what they are talking about. And indeed some people argue that sustainability is an unattainable goal so they are not greatly fussed about the details of the definition that they use. (That is, they treat *environmental sustainability* as a Utopian concept rather than a practical goal.)

However, if we want to use a definition of *environmental sustainability* that makes action easier then we should avoid confusions like defining "sustainability" as "sustainable development".

How can our choice of definition help us focus our minds on getting *the most important or relevant things* done?

We can only answer this by going back to what motivated society's interest in *environmental sustainability* in the first place. The historical record makes it clear that people became concerned about *environmental sustainability* when they discovered that aspects of the environment that they loved or depended on for survival or quality of life were threatened with extinction or serious degradation. There was an urgent concern about loss that made people think about sustainability. Were they originally thinking about integrating environmental, social and economic issues? Not at all. They were worrying about maintaining or keeping going something that they

valued. How then did the 'integration' or 'balance' definition emerge? After some years of trying to achieve *environmental sustainability* people realised that unless they also dealt with the interacting social and economic issues they would simply not succeed in achieving their environmental goals. But did this practical/pragmatic (and perhaps ethical) realisation, change people's environmental goals? Not really. So why did some people then change the definition of *environmental sustainability* to mean the "integration of environmental, social and economic issues"? It was most likely because their practical focus of attention had shifted to the integration issue and they inadvertently made a classic mistake of confusing means with ends (ie. methods with goals)⁹.

There is another issue that bears on the question of getting the most important or relevant things done. And that is, in what way does "environmental" qualify the notion of "sustainability" when they are compounded? Does *environmental sustainability* imply the sustainability of the *whole* physical environment? Or just parts of it? From a practical point of view the physical environment is so inclusive that no real-life *environmental sustainability* program would ever set out to sustain and maintain every aspect. If we tried to do that we would, for example, freeze in place or maintain the distribution and abundance of pest plants and animals, the reduced distribution and abundance of native species, coal-fired power stations and an excessive allocation of land and resources to road-based transport, dangerous and resource inefficient buildings, over-built flood plains, etc. Society's are always selective about what they want to sustain even if the agenda for action is still a huge one (eg. maintaining life support systems, maintaining quality of life, keeping native species going, maintaining the resource-base for the economy, etc.).

Finally, if we are concerned to get *the most important or relevant things* done, what definitions should we rule out? Definitions of sustainability such as "the integration or balancing of social, environmental and economic issues", or "programs or actions based on stakeholder or community consultation" no longer seem appropriate and defining *environmental sustainability* as applying to absolutely everything in the physical environment no longer seems useful.

Pulling all these issues together, it is now possible to propose a preferred definition for *environmental sustainability* as follows:

- *environmental sustainability* is "the ability to maintain things or qualities that are valued in the physical environment".

⁹ This happens because people have a way of expressing themselves that goes like this: environmental sustainability is 'all about'(insert the practical action or implication of their choice). Then people forget that this is not a definitional statement and they go on to treat it as one.

A compatible suite of sustainability terms

This suite of words has been developed to distinguish:

- between what is doing the sustaining and what it is being sustained – ie. between means and ends
- the scope of what is being sustained

Word (form)	Meaning	Suggested usage	Incompatible usage
sustain (verb)	means 'to maintain something through time; to keep it going; to extend its duration'	eg. communities are working to <i>sustain</i> ecosystem services, or quality of life or other species	
sustainability (<i>noun</i>)	means 'the ability or capability to sustain (maintain) something'	eg. will this community achieve sustainability for the things that it wants to persist through time	
(<i>adjective</i>)	means 'related to or having to do with sustainability'	eg. a 'sustainability action plan' is an action plan about sustainability	not an 'action plan that can be kept in operation over an extended period'
sustainable (adjective)	means 'able to be sustained, durable or able to be maintained' (note: in this meaning the noun that the word is attached to is the thing that is sustained)	eg. a 'sustainable policy' is a policy that is kept in force over an extended period	not a policy 'about sustainability'
sustaining (adjective)	means 'having the propensity or tendency to sustain or maintain something else'	eg. a sustaining society	
sustainability-promoting (adjectival phrase)	means 'something that will work actively to encourage or make it possible to sustain something'	eg. a sustainability-promoting organisation	
sustainability-compatible (adjectival phrase)	means 'that the object or activity that adjectival phrase qualifies can fit into a system which, when taken as a whole, is sustainable'	eg. a sustainability-compatible product (eg. photovoltaic cells) or element of infrastructure or production capacity (a recycling plant)	
sustainability-driven	means that an actor or process is motivated by sustainability	eg. a sustainability-driven organisation	
sustainability-orientated / sustainability-related / sustainability-focused (adjectival phrase)	means 'related to or having to do with sustainability'	eg. a sustainability-orientated database	

Word (form)	Meaning	Suggested usage	Incompatible usage
sustainability-effectiveness	means 'able to bring about an effect in relation to sustainability – measured in terms of the number of things that can be sustained, the closeness to the condition where something can be sustained, and the reliability or certainty that something will indeed be sustained as expected'	eg. the community was able to make a dramatic improvement in its sustainability-effectiveness	
“triple bottom line sustainability” or “holistic sustainability”	means 'the ability to sustain across all (relevant) domains'	eg. the ability to sustain in the environmental, social and economic domains	
sustenance (noun)	means 'the wherewithal used to sustain something (where the emphasis is on needed resources rather than on needed equipment)'	eg. the community was alert enough to the issues to provide the sustenance it needed	
(rarely used in recent decades) sustainment (noun)	means 'the act or process of sustaining something, or sustaining equipment or tools'	eg. it took some years of innovation and investment to build up the sustainments that were needed	
sustainable development (noun)	means 'development that does not undermine the environment, society or the economy, locally or globally, now or in the future, and that delivers genuine progress socially, environmentally and economically' <i>(Note: If something is to be sustained (eg. the environment, society or the economy) it is necessary to not only stop processes that are undermining the thing/attribute that is to be sustained but it is also necessary to undertake restorative work to reverse the effects of the undermining processes.)</i>	eg. this society has been pursuing sustainable development because it did not want its future wellbeing to decline	
sustaining development or sustainability-promoting development (noun)	means 'development that enable sustainability goals to be pursued or achieved'	eg. this society has invested in sustaining development for the last ten years because it needed to improve its energy efficiency before cheap oil ran out	

Note:

- 'sustaining' and 'sustainability-promoting' are synonyms
- 'sustainability' (in its adjectival form), 'sustainability-orientated' and 'sustainability-related' are synonyms
- most of these terms can be qualified by 'environmental' (adjective) or 'environmentally' (adverb) to indicate that they apply in the environmental domain.
- other sustainability-related words that can be found in dictionaries but that are very rarely used these days are: sustainabilities, sustainer, sustention, sustentive, sustentation.
- If you think there are a lot of words to describe sustainability-related concepts, the number of core words (lexemes) are about the same as the number of core words used by the Inuit (Eskimos) to describe snow.¹⁰

The problematic usage of sustainability-related terms

Problematic usage	Reason	Suggested usage	Reason
<i>sustainability or sustainable or sustaining</i> (where the user assumes either a narrow application or a wide domain application without giving the reader any contextual clues)	People in the community habitually use sustainability terms assuming quite different domains or domain scopes. Some people automatically assume an environmental context, others an holistic or triple bottom line context. If the assumption of the communicating parties are different and no contextualising clues are given then communications will break down.	environmental sustainability, or social sustainability or holistic sustainability	In each piece of writing about sustainability, it is advisable to include a qualified form so that it is crystal clear to the reader what the domain scope is that the communicator has in mind (eg. 'environmental sustainability' rather than just 'sustainability')
<i>the sustainable policy</i>	The form of words suggests that it is the policy that is able to be sustained, even though most times the user means that it is a policy that will guide action to achieve sustainability	the sustainability policy	This form of words here indicates that the policy has something to do with sustainability
<i>the sustainable industry/product</i>	The form of words here suggests that it is the industry/ product that is able to be sustained, even though most times the user means that it is an industry/product that would fit well into a bigger system that was sustainable.	the sustainability-promoting industry/product	This form of words makes it clear that the communicator is not trying to suggest that the industry or product is able to be maintained into the future. What they are saying is that the product or industry has a positive role to play in achieving sustainability

¹⁰ <http://www.princeton.edu/~browning/snow.html>

Problematic usage	Reason	Suggested usage	Reason
<i>more sustainable / less sustainable</i>	This form of words ignores the characteristic of sustainability that something is either sustainable (able to be maintained) or it is not, in the same way that a person cannot be 'a bit pregnant' or 'a bit dead'	greater sustainability-effectiveness / or reduced sustainability-effectiveness	This form of words can be used to indicate improvements or regressions in the status quo relating to sustainability, without inadvertently suggesting that the situation is now either sustainable or unsustainable when it isn't. For example, it is possible to indicate that an improvement has taken place even if a society or environment is actually not yet sustainable (in relation to the things that that society wants to sustain) eg. this year the community has significantly improved its sustainability-effectiveness, although it is not yet possible to guarantee that it can sustain all the items identified in the community plan
<i>towards sustainability</i>	It is easy to move towards something - and never get there. If our starting point is Melbourne, moving 'towards Brisbane' might be accomplished by going as far as Albury! If our aim is to actually achieve sustainability then we need to reinforce this mindset by not using 'towards'-type language.	to sustainability	If we take actions to move 'to sustainability' we know what our preferred destination is. Also talking about trying to 'achieve sustainability' is another way to reinforce the intention of getting to the destination (Whether we get there will depend of course on how effective our actions are.)

Translating the usage of sustainability-related terms

Text	Translation
The sustainability policy was unsustainable.	The policy about sustainability could not be maintained
The sustaining society promoted the production of sustainability-compatible products and sustainable profits for the companies involved.	The society that was actively engaged in achieving sustainability encouraged the production of products that fitted into a bigger production and consumption system that was compatible with a sustained wider system (environmental/social/economic/all three?) and the society tried to ensure that the firms producing these products were able to maintain their profits. <i>(Note that it is not clear from the text of the translated sentence whether the society was pursuing environmental or social or holistic sustainability – although it makes more sense to pursue triple bottom line sustainability rather than single bottom line sustainability)</i>
sustainable products or activities or companies	products or activities or companies that can be kept going
As a result of failing to invest in sustainability-promoting innovations the society became less <i>sustainability-effective</i> .	As a result of failing to invest in innovations that contribute to sustaining the things that society wants maintained, the society's capacity to achieve its sustainability goals has declined.

Related concepts and definitions

Ecologically sustainable development

The legislative Act establishing the office of the Commissioner for Environmental Sustainability doesn't define *environmental sustainability*. The Commissioner's role is defined instead in terms of *ecologically sustainable development*.

The concept of *ecologically sustainable development* emerged out of the ESD (ecologically sustainable development) Working Group process established by the Australian Prime Minister in 1991. See the National Strategy for Ecologically Sustainable Development reference in the reference section for the source of the ESD definition. This definition has been incorporated into the Commissioner for Environmental Sustainability Act 2003: ie.

- (1) Ecologically sustainable development is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.
- (2) The objectives of ecologically sustainable development are-
 - to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
 - to provide for equity within and between generations;
 - to protect biological diversity and maintain essential ecological processes and life-support systems.

(3) The following are to be considered as guiding principles of ecologically sustainable development-

- that decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equity considerations;
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- the need to consider the global dimension of environmental impacts of actions and policies;
- the need to develop a strong, growing and diversified economy which can enhance the capacity for environment protection;
- the need to maintain and enhance international competitiveness in an environmentally sound manner;
- the need to adopt cost effective and flexible policy instruments such as improved valuation, pricing and incentive mechanisms;
- the need to facilitate community involvement in decisions and actions on issues that affect the community.

Section (1) is the dictionary-style definition of ecologically sustainable development. Section (2) in effect provides the rationale for why one would want to pursue ESD. And section (3) covers some important 'how-to' matters.

The Brundtland definition of Sustainable Development

This is a widely used definition of *sustainable development*. (It is often misquoted as a definition of 'sustainability' - in situations where people treat 'sustainability' and 'sustainable development' as synonyms.)

The text usually quoted is:

“Sustainable development *is* development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

In fact this text is a paraphrasing of what the Brundtland Commission actually said in 1987 in its report "Our Common Future". What they originally said was: “Humanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.” (definition quoted from p.8 of the Brundtland Report). Thus it is clear that the Brundtland 'definition' of sustainable development is not a normal dictionary-style definition. Instead it is a type 3 outcomes-style statement which associates sustainable development with one of its important outcomes (ie. meeting the needs of the present without compromising the ability of future generations to meet their own needs) without actually saying what sustainable development itself is.

A type 1 definition of sustainable development can be found in the section "A compatible suite of sustainability terms" on page 12.

The Triple Bottom line

The Triple Bottom Line framework has been popularised globally since the mid-1990s by SustainAbility Plc., the UK consultancy company. The triple bottom line concept has been anticipated by others eg. in the late 1980s the Victorian State government promoted its economic, social justice and conservation policies as the centre pieces of its policy framework and in fact talked about having a triple bottom line.

The triple bottom line concept is often (but not always) associated with concerns about sustainability, but its core role is to broaden the issues-perspective of organisations. It extends the idea of the financial 'bottom line' (ie. the summarised, final outcome) to include an environmental and a social bottom line. A triple bottom line approach is often introduced into organisations that are almost exclusively financially focused to broaden their perspective. But it can also be used to broaden organisations that are tightly focused on any other single bottom line (eg. environmental or social).

There are two quite distinct reasons for having a triple bottom line approach, one pragmatic and one ethical. The pragmatic argument is that because we live in a complex interlinked world, outcomes in one area of interest often cannot be delivered without paying attention to what's happening in the rest of the system eg. good financial results, in the longer term, may depend at least in part on the health of the society and the environment too; good social outcomes may depend to some extent on the environmental and economic parts of the system; and environmental protection may depend to a degree on the social and economic parts of the system. The ethical argument for a triple bottom line (or broad-based) sustainability approach is that a narrowly focused ethical concern doesn't make much sense - if we care for people and other species at all, surely we should pay attention to their welfare as it is impacted by all aspects of the 'system' we live in - the environmental and the social and the economic spheres.

The triple bottom line concept is frequently associated with accounting and reporting. This is an historical or pragmatic¹¹ association but is not essential. Many organisations are now beginning to migrate their triple bottom line focus from accounting and reporting to the *strategy setting* aspects of management, including into the spheres of business and product development¹².

It is often easier to take a triple bottom line approach (ie. a broadly inclusive approach) if organisations are open to input from their full range of stakeholders. This can compensate to some degree for any narrowness of perspective of an organisation's management.

¹¹ Some practitioners find that it is easier to start with a focus on indicators and the accounting or reporting functions as this is less challenging for timid managements than immediately trying to change what the organisation actually does.

¹² SustainAbility Plc., the populariser of the triple bottom line concept, is now developing what it calls the Trimaran program to help companies to make triple-bottom-line-orientated change and to position themselves to achieve triple bottom line performance, that is, it is moving at last into triple bottom line strategy making.

However, the simple act of adopting a triple bottom line approach does not mean that an organisation is actively tackling sustainability issues, nor does it make clear what is being sustained, even if there is an intended connection to sustainability.

Some organisations try to capture the spirit of the triple bottom line concept using alternative language that doesn't sound so 'corporate' eg. "People, planet, prosperity"¹³ or Truly Better Living (ie. TBL). When applied broadly to social, environmental and economic issues, corporate social responsibility (CSR) programs are essentially the same as a triple bottom line programs.

A comprehensive treatment of the triple bottom line should involve consideration of:

- sustainability (continuity for things that matter)
- genuine progress (change to make things better for the first time)
- change that arises from the 'journey of life' (change that makes things different, but neither better nor worse).

The fact that the triple bottom line approach directs attention to environmental, social and economic issues does not in itself mean that it is 'about' sustainability¹⁴. And even where there is an intended connection to sustainability, the adoption of a triple bottom line approach does of itself make it clear what is being sustained. This needs to be spelled out explicitly in each triple bottom line program.

While the general triple bottom line practice is to treat the triplet of environment, society and economy as a 'universal set' that covers all issues, some people feel that they cannot shoehorn everything under one of these headings. Some people feel that 'culture' is a separate category from 'society'. Others feel that 'governance' needs to be highlighted as a distinct category – using a 'triple bottom line + one' formula.

Related concepts:

- Triple Bottom Line reporting/accounting (sometimes misnamed as 'sustainability' reporting)¹⁵
- Triple Bottom Line strategic management
- Corporate social responsibility
- Global Reporting Initiative

Integrating Sustainability, Genuine progress, Triple Bottom Line

This matrix below helps to explain the relationships between a number of key concepts that often get conflated or confused.

¹³ Another variation is “people, planet, profit”, but the limitation of this slogan is that the economic element for society is not picked up, 'profit' for individual firms being only of interest to the firm and some of its stakeholders.

¹⁴ It is sometime held, inappropriately, that sustainability means “the integration of environmental, social and economic issues”. However the core meaning of sustainability is the maintenance of something over time. The integration of issues is often needed pragmatically to get results but it is not what sustainability is 'about'. Trying to define sustainability in terms of integration involves a confusion of between 'means' and 'ends'.

¹⁵ Many people incorrectly think that 'sustainability' means 'the integration of environmental, social and economic issues', so 'sustainability accounting and reporting' is sometimes considered to be a synonym for 'triple bottom line accounting and reporting'.

Across the top of the matrix are the triple bottom line categories. These indicate the domain scope that needs to be considered when dealing with big issues like sustainability and genuine progress. The 'triple bottom line' concept in this context is simply a scope-widening mechanism to ensure that all major issues are considered.

Running down the matrix are a number of other key issues. The matrix makes it clear that sustainability and genuine progress are not the same thing and are also not the same as the triple bottom line idea. Sustainability relates to the notion of continuity and genuine progress relates to the process of deliberate change.

No major trade-offs is the concept that enables sustainability and pressing genuine progress goals to be integrated without undermining the core concept of sustainability (ie. things that are valued are actually maintained, no matter how much other things change) and without losing commitment to critically important genuine progress goals (eg. elimination of poverty, injustice) which need to be achieved despite all the other goals that are being pursued.

One of the important characteristics of the no major trade-offs concept is that projects can meet the 'no major trade-offs' standard even if they are only strongly positive in one domain eg. the project might be strong economically or socially or environmentally but not in all three areas, but it nevertheless doesn't cause major problems in *any* area.

Some projects might be strong in *all* major domains - and these are able to achieve win-win outcomes. But such all-round winner projects or initiatives are not likely to be all that common.

So the 'complete portfolio' concept is applied so that projects or initiatives can be bundled that have no major trade-offs and when combined create a package that is strong in all domain areas, even though not all the constituent projects/initiatives are win-win in themselves.

	Environment	Society	Economy
Sustainability (maintaining)	What would it take for the aspects of the environment/society/economy that we value to be sustained and sustainable? (locally / globally)?		
Genuine progress (improving - for the first time)	What would it take for everyone to have a worthwhile life (locally / globally)? How can we improve on the status quo?		
No major trade-offs (essential)	What would it take for specific initiatives in pursuit of sustainability/improvement to not undermine TBL sustainability and the achievement of a decent life in general?		
Win-win (desirable)	What would it take for specific initiatives in pursuit of sustainability/improvement to contribute simultaneously to sustainability and the achievement of a decent life in general?		
Complete portfolio	How can the portfolio of all projects/activities add up to a desirable outcome (locally / globally)? (So the combination of projects has a strong 'tick' on all env/social/econ issues but doesn't have a major negative in any one category)		

How to use the definition of environmental sustainability to facilitate effective action

If an interest in *environmental sustainability* is not to be simply utopian it must connect to practical and adequate action, undertaken in the hope that *environmental sustainability* can be achieved. But simply knowing the core meaning of *environmental sustainability* doesn't make it clear how society should pursue effective action to achieve environmental sustainability. To overcome this problem the bare bones a suitable action-framing methodology is set out below.

Two principles should drive this interest in the practical aspects of *environmental sustainability*:

- ***double practicality*** (getting things done but also making sure that that what is done is really worthwhile)
- ***strategic optimism combined with tactical pessimism*** (assume that great goals can be achieved, but also assume that masses of things can and often will go wrong on the way to achieving the great goals)

From these principles, a hierarchy of practical action programs (in order of precedence) can be developed:

- ***mission practicality*** (adopt a coherent mission and set out to complete it)
 - eg.
 - Who is to benefit? (in the environmental domain this could include both people and other species or aspects of nature)
 - What are their needs?
 - How can these needs be met?
 - What needs to be sustained?
 - What major discrete projects or programs need to be undertaken to achieve the sustainability mission in full?
 - What scale and speed of change is needed?
- ***optimistic practicality*** (build capabilities to match aspirations)
 - eg.
 - What processes of mobilisation can be undertaken to bring together people and resources in adequate amounts?
 - What creative or innovative processes are needed to adequately expand the possibilities of what can be done?
- ***pessimistic practicality*** (cut the suit to match the cloth)
 - eg.
 - How can the mission-related actions be designed, and resources and efforts be concentrated so that, in the face of constraints that exist at any moment in time, discrete and useful parts of the overall mission can be fully achieved? (eg. so that at least some things are actually sustained, and that the most important things are sustained, and that beyond that the greatest number of things are sustained) This is a sort of sustainability triage concept, much like the one used in the human health arena when resources are stretched very thin.

A good way to go about elaborating the *environmental sustainability* mission is to use a 'backcasting from principles' method to create an anticipatory adaptive management system.

The approach set out below is a modification of the Natural Step 'ABCD' methodology. It is built around action steps that answer these questions:

- A - what preferred state (condition) do we want/need to achieve?
- B - what state are we in now?
- C - how do we get to there from here, with the least loss along the way?
- D - what should we do right now?

What we need is a system that *anticipates* what will happen if we follow current trends and also *anticipates* what a desirable future state is. The adaptability of the system then relates not only to the reality and implications of current conditions ('forecasting from current reality') but also to the success or failure experienced in trying to create a preferred future.

Every aspect of such an *anticipatory adaptive management system* should be guided by the benefits of focusing on causes rather than symptoms and fundamental rather than proximate causes.

In a changing world, it is the sustainability-promoting system, standing between what we hope to sustain and the other changing elements of the world, that makes sustainability possible.

All these principles will be applied in designing the proposed anticipatory adaptive-management system for achieving *environmental sustainability*, that is, the sustainability-promoting system.

A - What preferred state (condition) do we want/need to achieve?

Most often, when people imagine a preferred future, they create a picture in which they try to fill in all the details. It's as if they were trying to take a snapshot of the future. But as time goes on these 'snapshots' look increasingly quaint and inaccurate. The truth is that there is a lot about the future that we will not know, that we *cannot* know, until it actually happens. So what's the purpose of an exercise of trying to identify a preferred future? It's really about imagining, on the one hand, dynamics in society, the economy and the environment that can be predicted to lead to results we *do not want* (at some stage, time unknown) and, alternatively, imagining dynamics that *will* reliably (we hope) lead to desirable future conditions.

This is why the Natural Step organisation, for example, recommends 'backcasting from principles'. That is, we are advised to imagine a set of principles which, if applied, is pretty certain to move us to a future we prefer. The principles have to be developed to cope with the huge uncertainty and unknowability of the future. Our knowledge of complex environmental, social and economic systems is actually quite limited so we can't be absolutely certain about the details of even systems we know reasonably well. It's a bit like the weather. We have an idea of the range of possible weather patterns but what will actually happen on any particular day is pretty uncertain. But for some issues we can't know what will happen at all if we push the

environment beyond the conditions that we have experienced in the past because the future can no longer be like the past.¹⁶

The Natural Step organisation approaches this difficulty in the following way. If we systematically push the environment strongly and systematically in any particular way, at some point, eventually, the system will be perturbed severely in a way that we are not used to and this will upset systems that depend on the status quo - for example human agricultural systems, natural habitats, other species, life support systems. So the answer is to avoid strong systematic changes to the environment. For example the transfer of materials from the earth's crust into the environment eg. heavy metals, carbon or the production and release of persistent novel compounds manufactured in the human economy, or physical perturbations of natural systems through things like clearing, fragmentation, compacting, spread of species beyond their natural distributions, changes to soils and hydrological systems, etc. The creation of a state of environmental *unsustainability* can be prevented by not systematically making these sorts of changes.

If the system has already been pushed beyond its normal safe conditions, then restoration is probably called for. There is merit in trying to develop Natural Step-style system conditions to guide the restoration effort so that people don't get lost in perplexing detail.

We can also robustly predict that we will need the ability to be very innovative in crafting actions for the prevention and restoration programs and solutions to the masses of problems that we see in more detail and certainty as we move into the future.

Questions to answer?	Comments
Who do we care for?	<p>Usually when we take action we have an unconscious rationale. Achieving sustainability however is such a big 'project' that it will pay to make the rationale conscious so that the effort to achieve environmental sustainability can be pursued in a very well-structured way.</p> <p>Most people's value system is not exclusively anthropocentric (ie. they care about people and at least some other non-humans from a compassionate or ethical point of view). So a useful response to this question for many people would be:</p> <ul style="list-style-type: none"> • people locally • people globally • future generations • nature

¹⁶ In some cases, clever modelling based on good science and good data sets might give some useful hints or speculations about possible changes that might occur.

Questions to answer?	Comments
<p>What are the needs of the people/things we care for? Is there any process working to undermine their current wellbeing? Can such a process be anticipated? Is there any process that is undermining their currently feasible <i>potential</i>? Can such a process be anticipated?</p>	
<p>What needs to be sustained in the physical environment?</p>	<p>Not even the most active <i>ecological sustainability</i> program would attempt to sustain everything in the environmental domain. So the key things to be sustained need to be determined. It is likely that the answer to this question would include:</p> <ul style="list-style-type: none"> • the human species and the other species of life • life support systems and ecosystem services • an adequate physical resource base for society (and the economy) • aspects of the environment that have special meaning for people
<i>Preventing and restoring</i>	
<p>What needs to be done in <i>society and the economy</i> to <i>prevent</i> environmental unsustainability?</p>	<p>The Natural Step program is an extremely useful program for working through this question. Contact details are provided in the reference section.</p>
<p>What needs to be done in the <i>environment</i> to <i>restore</i> environmental sustainability?</p>	<p>Toxic materials need to be cleaned up (including persistent ecotoxics¹⁷), habitat and species distributions and abundance need to be restored.</p>
<i>Enabling</i>	
<p>What form should the <i>anticipatory adaptive-management system</i> take that is to drive the achievement of <i>environmental sustainability</i>?</p>	<p>Three crucial elements are the:</p> <ul style="list-style-type: none"> • the modelling system (of futures with or without effective sustainability-promoting efforts) • the system for creating guiding principles, end-state conditions, stretch goals • the innovation and design system for creating/refining solutions

¹⁷ Persistent ecotoxics include things like heavy metals, persistent organic toxicants, greenhouse gases, ozone depleting gases, etc.

Questions to answer?	Comments
How can development be decoupled from environmental damage?	<p>If development is to continue and environmental damage is to fall, so that the key elements of the environment are sustainable, then the decoupling of development and environmental damage must be complete - otherwise further development will lead to increased damage.</p> <p>For example, to sustain human wellbeing and the survival of other forms of life, society would most likely need to:</p> <ul style="list-style-type: none"> • achieve dramatic dematerialisation¹⁸ (by a factor 'x', that increases over time) (dematerialisation needs to cover materials [including water], energy, and land area/eco-space¹⁹) • create a virtually closed material cycle²⁰ • prevent any systematic increase in the toxicity generated by the human system (in practical terms this is most easily achieved by designing for 'zero toxicity') • eventually prevent any systematic increase in the use of energy (all forms) • eventually prevent any systematic increase in the human population.

B - What state are we in now?

- How far are we from achieving the preferred-future system conditions and stretch goals?
- What strong dynamics/mechanisms are in place already to move us to achieve the preferred future?
- What strong dynamics/mechanisms are in place already that will move us away from or block a movement to the preferred future?
- What is the likely result of the interplay of these dynamics/mechanisms? ie. what is our current sustainability-effectiveness?

C - How do we get to our preferred future from here, with the least loss along the way?

- How do we close the gap between where we are now and where we want to be?
- How do we create changes of the right sort and the right scale and speed?

¹⁸ See Weaver et al. (2000) for estimates of the necessary Factor improvements in eco-efficiency. The Western Australian government has committed itself to achieving Factor 4 improvements (eg. 75%). Two European countries, Austria and Sweden have committed to Factor 10 (eg. 90%)

¹⁹ Eco-space includes land and other habitat space such as marine environments.

²⁰ If the flux of materials through the economy (the rate of cycling) increases as the economy develops then the demand on nature to give and receive materials will grow thus limiting nature's capacity to support all other species of life.

- How do we minimise the losses on the way to achieving sustainability?
- What changes are needed across society (especially system transformations)?
- What changes need to be made within organisations and by individuals?
- How do we take account of the fact that society has more goals than sustainability? How do we make sure that sustainability is not pushed to the sidelines while society deals with other important issues?
- What scenarios, options and solutions can we generate?

D - What should we do right now?

- What can we do to begin implementing our action plans?
- Are the actions that we plan to take going to advance all our main goals? Or do we need to coordinate and combine actions to cancel out or prevent any negative effects across our goals?
- How can we prepare the ground for the next wave of actions?
- How can we increase our capacity to be effective in the future?

Index

- 'ABCD' methodology, 22
- anticipatory adaptive-management, 22
- Brundtland, 7, 17
- continuity and change*, 8
- development, 5
- double practicality, 21
- Ecologically sustainable, 16
- economic sustainability, 3
- ecosystem services, 2
- environmental sustainability*, 3, 8
- Environmental sustainability*, i
- life support systems, 11
- means and ends, 12
- mission practicality, 21
- No major trade-offs, 20
- optimistic practicality, 21
- pessimistic practicality, 21
- prevention, i, 23
- restoration, i, 4
- social* sustainability, 2, 3
- strategic optimism, 21
- stretch goals, 25
- sustainability terms, 12
- system conditions, 23
- tactical pessimism, 21
- Triple Bottom line, 18
- types of definitions, 6
- unsustainability, 7, 23
- win-win, 20

References

[Commissioner for Environmental Sustainability Act 2003](#)

National Strategy for Ecologically Sustainable Development - source definition of ecologically sustainable development used in CES Act 2003

<http://www.deh.gov.au/esd/national/nsesd/index.html>

Natural Step:

www.naturalstep.org (international hub)

<http://www.au.naturalstep.org/> (Australia)

<http://www.naturalstep.org.nz/> (New Zealand)

Susan Murcott's list of definitions of sustainable development

<http://www.sustainableliving.org/appen-a.htm>

Weaver, P., Jansen, L., van Grootveld, G., van Spiegel, E. & Vergragt, P. (2000). Sustainable technology development. Greenleaf Publishing: Sheffield, UK.