

# Appraising Weak and Strong Sustainability: Searching for a Middle Ground

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## Abstract

This paper seeks to address the issue of weak and strong sustainability as well as the search for a middle ground. It discusses the differences between weak and strong sustainability while arguing for the harmonisation of both nature and humankind. Achieving harmony requires a move towards an idealist eco-socio-feminist point of view. Through this, full equality and balance may be attained.

## Author's Note

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## 1. Introduction to Weak and Strong Sustainability: A Middle Path

This paper critically analyses the differences between strong and weak sustainability by arguing for a middle-of-the-road approach to sustainability. By analysing the differences, commonalities can be drawn out, which facilitates the discovery of a middle pathway.

There are many differing worldviews of sustainability (Barr, 2008); this naturally illustrates the wide range of differences between a strong or weak approach to sustainability. However, the meaning of sustainability is contested; Dobson (1996) noted that there are over 300 definitions of sustainability. Therefore, this paper will be structured thus: firstly, the term sustainability will be defined and justified. Secondly, there will be an overview and critical analysis of the economic paradigms of the weak-strong debate with regards to manufactured capital (the economy) versus natural capital (the environment). The 'weak sustainability' paradigm states that man-made capital is more important than natural capital (Neumayer, 2003). 'Strong sustainability,' on the contrary, is based on the idea of non-substitutable natural capital (Dobson, 1998). Many academics and disciplines take different viewpoints. For example, Dryzek (1997) takes a 'strong' (not 'very strong' – see table 1) approach – which recognises environmental limits – unlike Khan (1995), who

takes a weak approach (Barr, 2008: 46). Many models have been developed trying to conceptualise the weak and strong approaches (see: Barr, 2008; Giddings *et al.*, 2002; Pearce, 1993; Roberts, 2004). They have often been regarded as opposing paradigms due to their different philosophical and ethical perspectives (Hediger, 1999; 2004). This then raises questions about consequences and whether sustainability and economic growth are compatible (Verburg and Wiegel, 1997). However, sustainability is necessary for economic growth in the long run, with the issue being that people only think in short-term horizons (see Meadows *et al.*, 1972: 8).

Thirdly, there will be an in-depth analysis of the resolution of weak and strong sustainability, offering an alternative to Norton's (1995) view of non-resolution between the two ends of the spectrum. This section discusses a hybrid approach, attempting to merge deep ecology (a common worldview of strong sustainability) and cornucopian views (a common view of weak sustainability), therefore arguing for a middle-of-the-road approach. Finally, this paper will conclude by arguing for a movement towards an eco-socio-feminist perspective as an idealist point of view (figure 3). In the future, however, we will need to compromise before reaching this ideal viewpoint because large societal transformations will be required and practice is always different from theory.

## 2. Sustainability – A Contested Paradigm?

As this paper charts two starkly different (economic) paradigms of sustainability, an understanding of this concept and the related concept of sustainable development is vital. Over time, sustainability has become a broad, continuously evolving paradigm (Redclift, 1988; 1992; 2005). There is much criticism over the lack of clarity in its meaning (Butler, 1999; Collins, 1999; Mowforth and Munt, 2003). However, the WCED (1987), which popularised sustainability through its definition of sustainable development, is outlined in the four principles below:

1. Holistic planning and strategy making
  2. Preservation of ecological processes
  3. Protection of heritage and biodiversity
  4. Development that can be sustained for future years
- (From WCED, 1987)

It is essential that these four aspects are understood as they underpin the WCED's (1987: 43) definition of sustainable development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Even though Dobson (1996) notes that there are many interpretations, the Brundtland (WCED) definition has achieved "authoritative status" (Baker, 2006: 17). Barr (2008) argues the Brundtland definition has a technocentric focus and is thus an anthropocentric ideal (Dresner, 2002; Manning, 1990). Therefore, one could argue that it falls within the weak paradigm. A definition of sustainable development that many *economists* would accept is, "development [that] [...] does not decrease the capacity to provide non-declining per capita utility for infinity" (Neumayer, 2003: 7); this illustrates a weak approach. However, sustainability is a precondition for human life because there are many essential

ecological processes that underlie its functioning (Dobson, 1998). Therefore, sustainability is, in a sense, a contested paradigm resulting from the differing views of the concept, making it flawed from its very conception (Redclift, 2005). Due to the wide range of views, a middle of the road approach is necessary if we are to make progress towards sustainability. Those who are at the weak end of the spectrum must understand that technological solutions may not always be available, while those at the strong end of the spectrum need to realise that we as humans have a part to play on the earth; not all of us will be willing to make sacrifices vis-à-vis the way that we live. For example, limiting air travel is considered “unacceptable by [...] tourists” (Becken, 2007: 351), and yet achieving a ‘very strong’ sustainability would necessitate either this or drastically increasing taxes on air travel. Therefore, achieving a middle ground – or trying to satisfy both ends – appears to be the most beneficial option.

### 3. Weak and Strong Sustainability – Notions of Capital

Capital is defined as “stock that provides current and future utility” (Neumayer, 2003: 8), with natural capital being the totality of nature (resources, plants and ecosystems that can be put to human use – see Baker, 2006: 21), or that which is capable of providing humans with “material and nonmaterial utility” (Neumayer, 2003: 8). Man-made capital, in contrast, includes factories, machinery and roads. There is a third type of capital, however, which is human capital; this differs from man-made capital as it is viewed as ‘knowledge’ – essence rather than practice (Neumayer, 2003: 8).

Natural capital is a complex idea that has three dimensions: critical, constant and tradable natural capital (Barr, 2008). Critical natural capital is that which is vital to life (e.g. atmosphere/ozone layer); it also contains valued capital (e.g. rare species). Pearce *et al.* (1989) emphasized the significance of critical natural capital, as it cannot be restored. Constant natural capital is that which is important, but not essential in its own right, and can be substituted (e.g. forest for a nature park); tradable capital is that which is not highly valued and can be replaced (Baker, 2006; Barr, 2008). It is these three components that allow differing interpretations of sustainability along the weak-strong sustainability continuum, as illustrated by Roberts (2004) in figure 1.

Weak sustainability is based on the work of two neoclassical economists: Solow (1974; 1986; 1992; 1993) and Hartwick (1977; 1978; 1990). It can be viewed as an extension of neoclassical welfare economics, thus based on a belief that man-made capital is more important than natural capital. It is possible to substitute natural capital for man-made capital according to this paradigm (Neumayer, 2003). In contrast, the strong sustainability paradigm states that natural capital cannot be substituted by man-made capital.

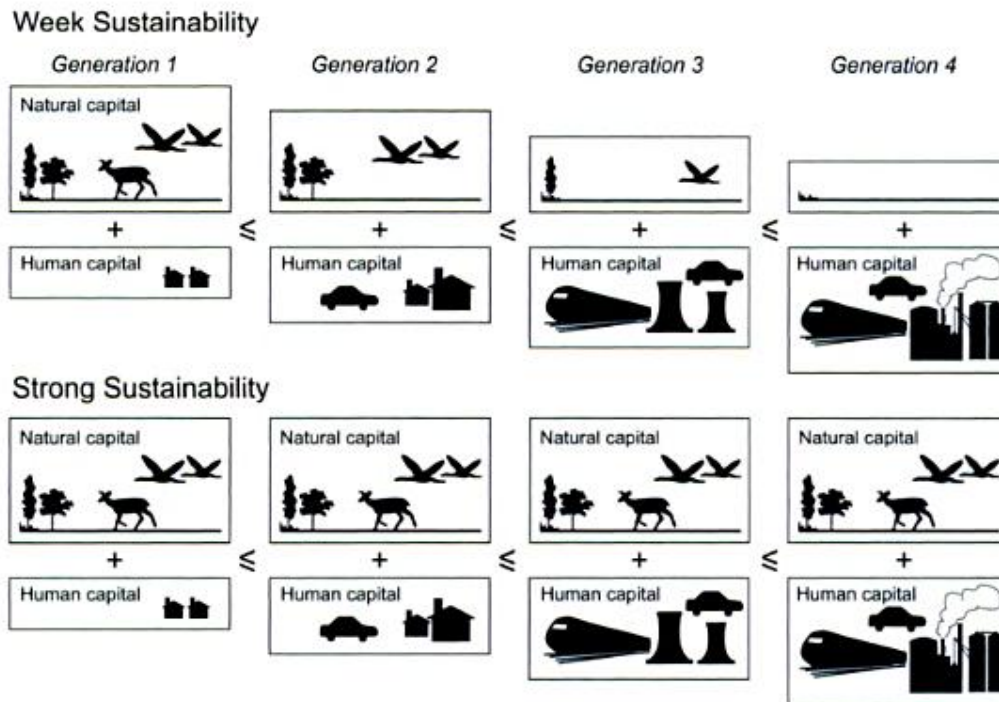


Figure 1: Weak and Strong Approaches to Sustainability (Roberts, 2004; also see Barr, 2008: 44)

Figure 1 illustrates the concepts of weak and strong sustainability in their most basic and fundamental form: the process of intergenerational capital exchange, which ensures that the “total capital passed on to the next generation is constant or growing” (Barr, 2008: 44). In both weak and strong cases, ‘capital’, whether natural or human, is carried on throughout the generations. It is the ‘type’ of capital that is important; strong sustainability implies carrying on to the next generation the same amount of natural capital, with human capital increases over time; whereas weak sustainability implies a declining natural capital over time while human capital increases (Dasgupta, 2004; 2007). At present, the trajectory of the developed world is arguably tending towards the stronger end of the spectrum with its designation of national parks, especially in the United Kingdom with its Sites of Special Scientific Interest and Areas of Outstanding Natural Beauty; this is an explicit recognition of the need to preserve our natural resources. As a global community, we are at the weak end of the sustainability spectrum, The developing world, for example, damages natural capital due to its oppression by multinational corporations such as Shell or Exxon Mobil, and in many cases the damage is irreversible (Osaghae, 1995). While MNCs do bring opportunities, Tuodolo (2009) argues in the case of Shell in the Niger Delta that most of the services and infrastructure that Shell provides to the local community to protect the environment are either absent or dysfunctional. This illustrates Atkinson’s (1991) argument that the environment and development are intrinsically linked, that a progression along the path of weak sustainability, where natural capital decreases over time, can result in unsustainable development (Barr, 2008).

The concepts of weak and strong sustainability can also be viewed as having a temporal dimension, as illustrated by the Environmental Kuznets curve (EKC) (see Baker, 2006: 32; Cole, 2003; 2004). The EKC (figure 2) illustrates a direct relationship between development and the level of pollution. However, there is a 'turning point' that occurs during an enlightenment of environmental values, causing pollution to subsequently decrease (Baker, 2006). In the case of the western world, this 'enlightenment' came about after World War II mostly through Rachel Carson's (1962) *Silent Spring*, Paul Ehrlich's (1968) *Population Bomb* and D. Meadows *et al.* (1972) with the Stockholm Conference that was held that same year. Thus, there is a movement from strong to weak and from weak to strong sustainability again as the economy and societal values shift over time.

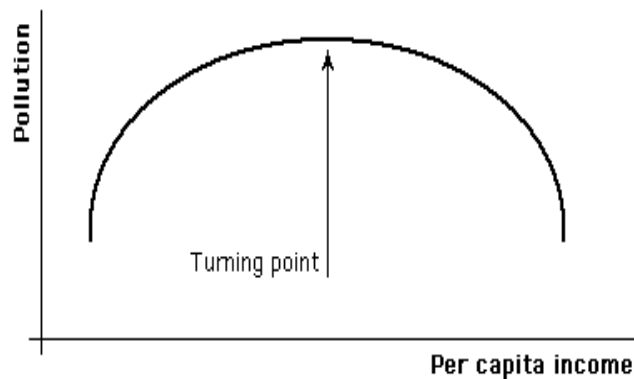


Figure 2: Environmental Kuznets Curve (from Baker, 2006: 32)

De Groot *et al.* (2004) discuss the EKC in relation to China's development and argue that solid and gas emissions decelerate at intermediate levels of gross regional product per capita, but reaccelerate at high levels of gross regional product. However, there is an inverse relationship between water pollution and gross regional product in their sample. Even though this is not representative of the whole of China, it illustrates the usefulness of the weak and strong sustainability paradigms in relation to the EKC in practice. This paper argues that it is useful to an extent.

#### **4. Weak and Strong Sustainability: A Variety of Values and Dimensions**

The weak and strong sustainability concepts have a foundation in economics (Solow, 1974; Hartwick, 1977). However, there are a variety of values, both ethical and philosophical, that are associated with these concepts. These have naturally become better known in the wider public arena, and are summarized in table 1. In practice, Gibbs *et al.* (1998) undertook a study of local authorities in England and Wales and their interpretations of sustainable development – these tended towards the weak end of the scale, which from table 1 can be seen as technocentric or anthropocentric approaches.

	Technocentric		Ecocentric	
	Cornucopian	Accommodating	Communalist	Deep Ecology
Sustainability labels	Very Weak:  Modification of existing structures; surface appearances and minor changes.	Weak:  Some processes changes; less tangible problems dealt with.	Strong:  System changes as a whole, examining 'system' as one element.	Very Strong:  A 'cultural' change; external as well as internal elements of system altered.
Green Labels	Resource exploitative, growth-orientated position.	Resource conservationist and 'managerial' position.	Resource preservationist position.	Extreme preservationist position.
Ethics	Support for traditional ethical reasoning rights and interests of contemporary individual humans instrumental value in nature.	Extension of ethical reasoning: 'caring for others'; intra- and inter-generational equity; instrumental value in nature.	Further extension of ethical reasoning; collective interests take over individual interests.	Acceptance of bioethics. Intrinsic value in nature (i.e. valuable in its own right).
Type of Economy	Anti-Green economy, unfettered free market.	Green economy and green markets guided by economic incentives.	Deep green economy; no economic and population growth.	Very deep green economy; heavily regulated to minimise 'resource-take'.

Figure 3: Sustainability Spectrum, adapted from Pearce's (1993) Sustainability Spectrum in Barr (2008: 46)

We are living in an era of pollution control, which is closely associated with the notion of weak sustainability because it is underlain by the notion that human innovation, especially technological innovation, will be able to solve the problem (Baker, 2006; Koontz and Thomas, 2006). In addition, it is an 'end-of-pipe' solution to pollution management, which affects a range of critical natural capital such as the atmosphere. This approach may be able to reduce pollution in a local area, but not the globe. Japan, where there is a high level of forest protection, for example, uses the forest resources of other countries for the production and packaging of

consumer goods (Baker, 2006). While Japan is not alone in this behaviour, it presents but one example of how displacing pollution-intense activities to the developing world is not a solution. Some have argued (Dresner, 2002) that the best way to preserve critical natural capital is to put a price on nature (see Costanza *et al.*, 1997; Ayres, 1998; Daly 1998; Thornes and McGregor, 2003). However, the pricing of nature leads to other problems. Placing a value on nature is similar to measuring weak and strong sustainability (Dietz and Neumayer, 2007), which is a complex issue. Valuing nature depends on our worldview; worldviews on the interactions between humanity and nature affect the degree to which protection is given to the environment. Figure 3 illustrates the differing worldviews and their relation to both the environmental and socioeconomic factors.

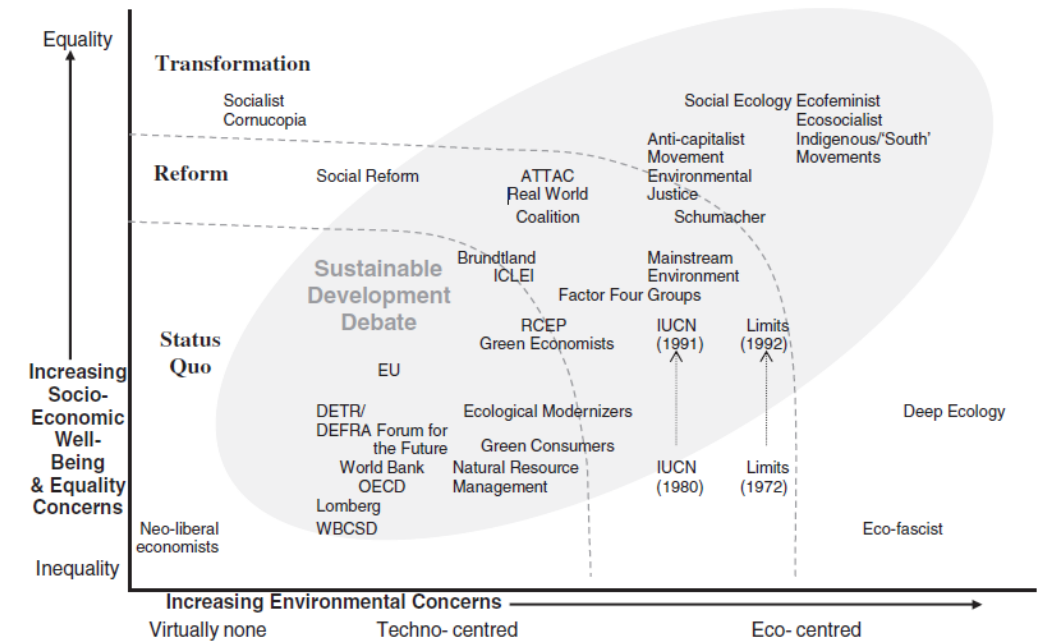


Figure 4: Various Worldviews in Relation to Weak and Strong Sustainability Paradigms (Hopwood et al., 2005: 41; After O’Riordan, 1989)

As illustrated in figure 3 (in conjunction with table 1), the viewpoint that we should adopt is that of eco-socio-feminism, the combination of eco-socialism and eco-feminism. The main reasoning behind this is that it is a strong approach both socioeconomically and environmentally, which attains maximum equality. The inclusion of gender (Little, 1994; McDowell, 1999) as well as indigenous and southern movements (Lynn, 2003) is vital for social equality. As Saegert (1980: 97) argues, “culturally bifurcated perceptions...have power.” Therefore, dichotomies need to be broken down if progress is to be made; this argument not only applies to gender, but also to weak and strong sustainability. There needs to be an effort to pull the two ends of the spectrum closer together so that they can meet on common ground. This paper views this to be a form of strong sustainability, as it brings together the two ends of the spectrum in an attempt to include and not exclude; by analysing the differences, commonalities can be drawn out, thus breaking down the dichotomy.

The deep ecology and cornucopian worldviews are each at extreme ends of the weak-strong sustainability continuum, as illustrated in Table 1. This section will attempt to bring them closer together, breaking down the dichotomy and going against Norton's (1995) view that the debate between weak and strong sustainability cannot be resolved as there are no universally agreed-upon definitions or methodologies. To an extent, Norton (1995) is correct because all paradigms of sustainability, in particular the notions of weak and strong, are non-falsifiable as "neither paradigm can be unambiguously supported by science" (Neumayer, 2003: 3). However, this does not imply that they cannot be brought closer together, in essence breaking down the dichotomy.

Deep ecology is best described as a contemporary ecological philosophy or discourse (Dryzek, 1997). Therefore it is a shared way of viewing the world that focuses on the biosphere as a whole (Naess, 2005 [1986]). The 'deep' aspect of deep ecology is its basis for the philosophy of putting the planet first, "valuing the intrinsic rights of organisms" (Conesa-Sevilla, 2006: 26). However, as with every movement, the concept has broadened out, with each branch being derived from the basic philosophy mentioned above. This paper argues that we are moving towards a deep ecology approach through the commodification of nature (Urry, 1990). The reasoning behind hailing this as progression is that we are protecting and preserving nature from its consumption by other humans, which is one of the facets of a strong approach to sustainability. Therefore, as long as we place a monetary value on nature in the capitalist (neoclassical economics) and neoliberal sociopolitical sense (Peck and Tickell, 2002), we will be able to take a relatively strong approach to sustainability by maintaining a substantial amount of intergenerational capital for the future (see figure 1, Roberts, 2004). Van den Bergh (2007) argues that we can merge the two ends through evolutionary economics, as it tries to explain how humans are naturally destructive to the environment. If we can explain this, then we can look for a middle road. Penn (2003) gives an explanation as to why we are destructive; it is due to "the human species being maladapted to its current natural environment" from population pressures (van den Bergh, 2007: 523). This brings us back full circle to the Malthusian arguments of Ehrlich (1968) and Meadows *et al.* (1972). If strong sustainability is seen in terms of a deep ecology approach – "valuing the intrinsic rights of organisms" (Conesa-Sevilla, 2006: 26), we gain what Hediger (1999: 1120) terms "constant environmental quality," a key feature of strong sustainability. Therefore, a way to bring the two views closer together is to introduce a minimum requirement for sustainability, which shall be "ecosystem resilience and basic human needs" (Hediger, 1999: 1120). Hediger (1999) goes on to argue that reconciling weak and strong sustainability requires reconsidering from an ecological economic perspective the notion of total capital – the "economy's generalised productive capacity and the aggregate of natural capital" (Hediger, 1999: 1121) – and the basic requirement for sustainability (above). Sustainability, and therefore sustainable development – the means of achieving the goal of sustainability – is only feasible if these two minimum requirements are fulfilled.

This brings us back to valuing nature and the environment. TEEB (2010) is a study that draws attention to the global economic benefits of biodiversity. It estimates the losses in monetary terms at US\$2-5 million a year. By placing a monetary value on a loss of an externality, it can then be brought into the market system. However, to truly eliminate this issue of having to monetize the



environment, Coarse (1960) argues that we need to assign property rights. Even though this evokes the weak approach as it promotes a free market economy over the environment (see table 1 – ‘very weak’), it is a step towards reconciling the two ends of the spectrum.

## 5. Conclusion and Looking Towards the Future

This paper has tried to discuss and critically analyse the differences between strong and weak sustainability by arguing for a middle-of-the-road approach to sustainability. By analysing the differences, commonalities can be drawn out, thus allowing us to discover a middle pathway. Weak sustainability is the idea that man-made capital is more important than natural capital; therefore it is possible to substitute natural for man-made capital (Neumayer, 2003). The strong sustainability paradigm states that natural capital cannot be substituted. We must remember that natural capital is made up of three intrinsic parts: critical, constant and tradable natural capital (Barr, 2008); each play a different role in formulating the aforementioned worldviews. Strong sustainability values all three, yet weak sustainability arguably views all three as substitutable. Therefore, the view taken is naturally Boserupian – that “improvements in technology [...] increase the carrying capacity of the environment” (Boserup, 1976: 21) – or the idea that our own ingenuity will be able to solve the problem of environmental limits. This paper does not take that view, but argues more in line with a strong approach, which recognises environmental limits to growth as illustrated by Giddings *et al.* (2002) in their nested three rings model. However, there cannot just be environmental sustainability; it has to be implemented in conjunction with socioeconomic and political sustainability as well, as it is impossible to have one without the other in our present economic system; we must try and think more inter-generationally (Meadows *et al.*, 1972).

The illustrated middle pathway is here to protect the environment by commodifying it, or bringing the externality of the environment and nature into the market. However, there needs to be a movement towards an eco-socio-feminist perspective if we are to gain both social and environmental equality, thereby reaching the ultimate goal of sustainability. By understanding the differences between the two ends, this paper has brought them closer together with the hope that the environment and human society will come closer together in the future. There has to be a recognition of environmental limits if any progression is to be made. When mainstream economists realise the value of ecological economics (see Daly and Farley, 2011) in working to understand and value the environment not just in monetary terms, then can progress be made towards an eco-socio-feminist world, a world with high social equality and deep ecology.

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