

Choices, Capabilities and Sustainability

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Defining Sustainability through Capabilities

The notion of sustainability is traditionally expressed in terms of the interface between the economy and the limits imposed on natural resources. In this paper we take a different approach, and situate the concept in the broader context of choices and capabilities.

The basic idea of human development refers to the promotion of equal life chances for all, based on the principle that all people are of equal worth (Kant 1781). This notion of universalism implies the unacceptability of any form of discrimination based on class, gender, race, community and, importantly, the generation in which one happens to be born (Anand and Sen, 2000). Future generations should be able to avail themselves of similar choices as the current generation. As the 1994 Human Development Report points out, there is no tension between human development and sustainable development, “both are based on the universalism of life claims”². Progress achieved by current generations thus should not impinge on or reduce the choices that are potentially available to future generations. This then implies that development progress must be achieved in a sustainable way.

But how do we define sustainability? Among the first to bring serious attention to sustainability was the Brundtland Commission Report (WCED 1987). This report presents the crucial idea that sustainability includes an obligation to future generations, thus incorporating the notion of inter-generational justice. Sustainability is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Drawing on the Brundtland Report, a 2000 report by The Royal Society argued for greater understanding of the environmental precariousness arising from consumption habits around the world (Heap and Kent 2000).

More recently, the 2012 Rio+20 conference took a broad stance on what should be considered as sustainable progress, arguing that this must cover all three of the dimensions that affect life chances—the social, the economic and the environmental. There is, for instance, a continuing development imperative to improve life chances for people in poor countries. There is also a growing concern about the need to protect the human development achievements of people in some advanced countries, as policies of austerity threaten the social fibre of societies and potentially reduce the choices available to future generations, not only for their own societies but potentially, in a globally connected world, for southern societies as well. As the 2013 Human Development Report puts it, “some developed countries, in response to the debt crisis,

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² UNDP 1994, page 19.

are pursuing austerity policies that could foreclose or reduce future choices and options for people in the South”.³ Such choices are symptomatic of a partial view of sustainability, restricted to the sustainability of public debt.

A single dimensional view in the end can impose large costs to socio-economic and environmental systems, and undermine sustainable human development.

Current definitions: Weak and strong sustainability

Current definitions of sustainability are rooted in the notion of different forms of capital and its substitutability, with much debate on the conditions that define whether our past or current actions are within the bounds of ‘weak’ or ‘strong’ notions of sustainability.

Under the weak sustainability concept, natural and other forms of capital are substitutable, and the depletion of exhaustible resources can be compensated for by the accumulation of reproducible capital (Hartwick 1977). According to the strong sustainability view, a certain level of natural capital is critical and its depletion cannot be compensated for by investment in other forms of capital (Neumayer, 2011). Certain levels or forms of natural capital, it is argued, have functions that cannot be substituted and losses caused by their depletion are irreplaceable.

A common measure of sustainability that is consistent with weak sustainability is the World Bank’s *adjusted net savings*. This measure adds education spending to the rate of savings and subtracts the depletion of energy, minerals and forests—as well as the damage from carbon dioxide emissions and pollution. It assumes that the different kinds of capital are substitutes: so, for example, financial savings can replace a loss in natural resources or human capital. One of the biggest disadvantages of the adjusted net savings indicator is the controversial use of monetary evaluations for natural resources. As natural resources become scarcer and their market value rises, valuing natural resources at market prices can overestimate the sustainability of the economy. The monetary evaluation of greenhouse emissions is also fraught with problems.

Whether sustainability is considered strong or weak, the problem is not monetary evaluation per se, but the system of weights we use to aggregate different goods: i.e., monetary evaluation or not, we need a unit of account. This is all the more required given that there are no markets for most natural resources, and market failures often lead to inaccurate valuation of assets. There have been attempts to build a sustainability index in which assets are not valued at market prices, although these use imputed accounting prices based on physical-economic modelling. If we were able to derive an index from a model predicting future interactions between the economy and the environment in a reliable way, then this index would send us correct forewarning of non-sustainability, through an increase in the relative imputed price of the critical assets. The problem with this way of approaching sustainability, however, lies in the “ifs” that have been necessary to build the model.

Closely related to the concept of strong sustainability is the idea of planetary boundaries (Rockström et al 2009). These are nine critical natural thresholds—among them climate change, freshwater use and biodiversity loss—that the world must not breach if we want to maintain environmental stability and sustainability.⁴ These boundaries define a safe operating space for humanity; breaching them can result in

³ UNDP 2013, page 40.

⁴ The nine planetary boundaries are: climate change, ocean acidification, stratospheric ozone depletion, interference with the global phosphorous and nitrogen cycles, rate of biodiversity loss, global freshwater use, land-system change, aerosol loading and chemical pollution.

tipping points that may set off irreversible environmental changes. According to this perspective, humankind has already transgressed three of these planetary boundaries: those for climate change, rate of biodiversity loss, and changes to the global nitrogen cycle. Estimates indicate that we are also fast approaching the boundaries for freshwater use and land-system use.

More specifically, these concepts of sustainability have been expressed in terms of consumption (C) and the stock of capital (W) available in an economy. The stock of capital at any time determines the range of consumption choices available at that time. Consumption today, however, draws down the stock of capital available to future generations. Sustainability requires that the stock of capital available tomorrow must be at least as high as the stock of capital available today, so as to not reduce, over time, the extent of consumption possibilities.⁵

The requirement for weak sustainability can be expressed as

$$\begin{aligned} \Delta W &\geq 0 \\ \text{or } W_1 &\geq W_0 \end{aligned} \quad (1)$$

where ΔW is the change in the stock of capital during the time period, W_0 is the stock of capital at the start of the period and W_1 is the stock of capital at the end of the period.⁶ In equation (1), W represents all forms of capital, natural and otherwise. In the weak sustainability formulation, all forms of capital are perfect substitutes, implying that the concern is with only the total sum of all forms of capital, W .

Environmental sustainability, requiring the maintenance of natural capital specifically, is a strong sustainability concept. Environmental sustainability requires that the stock of natural capital available to future generations is at a minimum as high as the stock of natural capital available to today's generation. The amount by which current consumption reduces natural capital should be lower than the increase in natural capital.

Environmental sustainability requires satisfying equation (1) and in addition:

$$\begin{aligned} \Delta N &\geq 0 \\ \text{or } N_1 &\geq N_0 \end{aligned} \quad (2)$$

where ΔN is the change in the stock of natural capital during the time period, N_0 is the stock of capital at the start of the period and N_1 is the stock of capital at the end of the period.

⁵ See, for example, the Brundtland Report (WCED 1987), Common and Perrings 1992, and Cart 2001.

⁶ An alternate way to view this concept is the following. If C is the current state of consumption, and $W(C)$ is the wealth that is required to sustain that level of consumption forever, then consumption is weakly sustainable if the wealth bequeathed to the next generation is at least as large $W(C)$. The change in the stock of wealth ΔW then provides a measure of whether current consumption is sustainable (Fitoussi 2013).

Sustainability and capabilities

The above capital- or wealth-based approach to sustainability is plagued with conceptual and estimation challenges. Our effort here is to frame the concept of sustainability in terms of ‘capabilities’ and ‘choices’, thereby also broadening the discourse beyond environmental sustainability to encompass social and economic sustainability.

Sen (2013) argues for a broadening of the original Brundtland conception of sustainable development to development that promotes the capabilities of present people without compromising capabilities of future generations. He calls for a freedom and capability based view of sustainability rather than a needs or a consumption based view. Humans are both the means and the end of development, and future generations should have the freedom to live the lives they value. This goes beyond expert conceptions of their ‘needs’.

Earlier, we discussed the capital and consumption based view of sustainability. Making consumption sustainable so that the stock of capital is drawn upon in a sustainable manner for future generations can require an altering of current consumption patterns. However, how can such a change be brought about? This can be done through compulsion or, alternately, through volition and consent. If freedom has to be sustained, then sustainability of freedom and choices have to be integrated into the concept of sustainability (Sen 2013).

Let us take this approach forward, with K being the set or ‘stock’ of capabilities in a society and Ch the choices that are afforded by the stock of capabilities. Capabilities are fundamentally at the individual level. Access to education, healthcare, decent employment, the levels of economic and political participation, all contribute to the ability to live a full life. Yet social institutions and other aspects of societies—such as social cohesion, social inclusion, etc—also affect individual choices. We use the term ‘social competences’ in this case to differentiate these aspects from individual capabilities (Stewart 2013). This stock of capabilities (individual and social) implies a certain set of choices available to individuals. The environment, which is not a capability as such, can be most usefully seen as influencing the conditions under which capabilities translate into choices.

This can be represented as:

$$Ch = f_E(K) \quad \text{with } f_E'(K) > 0 \text{ and } f_E''(K) \leq 0 \quad (3)$$

where Ch represents the set of choices made or potentially available and K is a vector of capabilities (stocks). E represents the environmental conditions that may directly influence the function f itself, and through that conditional context, affect choices.⁷

According to Sen (1999), in judging the well-being of a person, we have to consider the ‘functionings’ of the person. A functioning is an achievement—what a person manages to do or be with the commodities at his or her command. In this conception, capabilities reflect an endowment: the various combinations of functionings that a person can achieve. The actual combination of functionings achieved depends on the characteristics of the commodities available and the choices that a person exercises in terms of how to utilize these commodities. We can say that capability is the ability to do (or be) something, while functioning is something that a person can be observed doing (or being).

While functionings are observable, as are the actual choices that are made, the broader concept of choice includes the choices that are not made, and allows reflection on the opportunity costs of choices

⁷ The function f is increasing in the stock of capabilities K but shows diminishing returns to K .

made. The concept of choice also allows considerable flexibility. In particular, we can go beyond individual choices and also examine collective choices made by a society or a system. Collective choice of a particular policy or path rules out other possible choices or paths, and in principle it is possible to estimate the costs implied by not taking alternative paths. Collective choices matter, as individual and social choices determine jointly what human beings are able to achieve.

The stock of capabilities is influenced and shaped by policy and the broader actions taken by society. Social policies and budgetary expenditures, along with rules for private participation, have a strong influence on the stock and composition of the capabilities available to a society. These determine the frame in which individuals exercise their choices. Individual choices, in turn, have the capacity to alter the stock of capabilities that will be available in the future. An obvious example is individual choices that impact the environment. Society's choices, through the creation of rules such as emissions standards and the provision of public transport, can counter the adverse impacts of individual choices. This highlights the crucial role of public goods for sustainability, where public goods include the rules, laws and norms that are part of the culture of a society.

Sustainability requires that any change in the stock of capabilities today does not lead to a reduction in the range of choices for tomorrow. Therefore, choices made today should not, in the net, deplete the stock of capabilities that will determine the availability of choices for future generations. Putting this in analogous terms to equation (1), we can say that sustainability requires that

$$\Delta K \geq 0 \quad (4)$$

where ΔK is the change in the stock of capabilities, so that choices made today do not, in the net, deplete the stock of capabilities and the choices available to the next generation. We can also say, more explicitly, that sustainability requires

$$Ch_1 \geq Ch_0 \quad (5)$$

where Ch_0 is the set of choices available at the beginning of the period and Ch_1 is the set of choices at the end of the period that will be available to future generations. There is of course a functional relationship between the two sets of capabilities—for instance, the children of educated people are more likely to be educated. How K evolves and therefore the set of choices available also depend on the state of the environment E , as noted in equation (3).

While sustainability of capabilities and choices has been defined here analogously to sustainability of capital and consumption, it is important to draw a distinction between the two ideas. Capital is an input in the production process whose value is derived from the value of the final product. Capabilities, however, are ends in themselves, and not only means. Health, education, political participation and social competencies are all essential elements of leading a full life. Their value is not only instrumental. Maintaining and preserving the stocks of various capabilities is fundamental to achieving human development.

Within the space of capabilities and choices, we can think of weak and strong sustainability. If our criterion were weak sustainability in terms of capabilities, Ch and K would refer to the totality of choices and capabilities relevant to a society. If, however, our interest were to ensure strong sustainability then we would check if the above requirement is met individually in each dimension or category of capabilities and the choices associated with it.

From the above discussion, in some ways, we are taking a 'strong' approach to sustainability, since our concern extends to social, economic and environmental sustainability where we are requiring each of these dimensions to be sustainable.

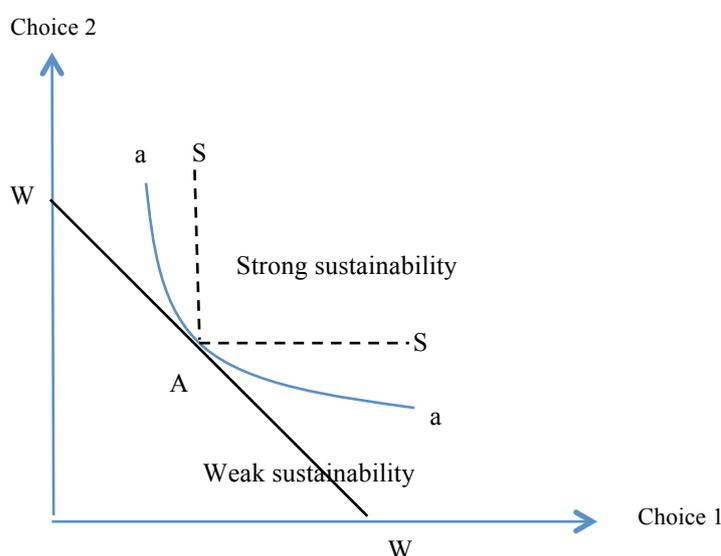
Weak and strong sustainability can be represented graphically in two dimensions as in Figure 1. Consider a representative individual of society who exercises choice in two areas or dimensions and whose current choices place him or her at the state represented by point A. This point A lies within the capability set, or the set of states of being that are available to the individual or society to choose from, and is the state that the individual is choosing from these available choices.

aa is the indifference curve through the point A. It represents all the combinations of choices that the individual values equally to A.

Weak sustainability is obtained on the straight line WW that passes through A, representing all the (combinations of) choices for which the sum of both choices is constant⁸. Weak sustainability is achieved if the points on this line are available to the individual *as future choices*.

Strong sustainability requires that in each dimension, the availability of future choices is to the right of and above the lines SA and AS. That is, at least as high as the choices being made today.

Figure 1: Weak and strong sustainability in two dimensions



When we view sustainability from the prism of capabilities, it is clear that all the points that are strongly sustainable are preferable to the initial state A, as they imply at least an increase in one dimension, while all the points that are weakly sustainable are at maximum equal to A from the point of view of the representative individual, as they rely on an indifference curve. This analysis therefore provides support to the comprehensive view of sustainability taken in this paper by extending the purview to include sustainability in the social, economic and environmental dimensions. Given their individual importance, these cannot be easily clubbed together, as would be the case under weak sustainability.

Sustainability and policies

Our concern is sustainability of a system made up of a network of complex interactions between the economic, social and environmental subsystems.⁹ To ensure sustainability, we have to elicit conditions for

⁸ Assuming a numerical representation is possible for each dimension of choice.

the whole system to be sustainable. If policies are grounded in a partial view of sustainability they will almost certainly miss the target of sustainable human development.

Taking a comprehensive view of sustainability allows us to study the impacts of global or local trends on the sustainability of human development. Rising inequality in some countries can threaten the stock of social competences in those countries, in particular the degree of adhesion to democracy, and social cohesion. Inequality leads to an implicit violation of the universal suffrage as the media, think tanks and the university system may be overly influenced by a small part of the population. Secondly, when an increasing proportion of the population is no longer benefitting from the system, it may be tempted to change the system itself. High enough levels of inequality can precipitate a tipping point beyond which high levels of social unrest are witnessed and the potential stability of a social system is called into question.

The enduring economic crisis in some countries of Europe has been accompanied by a strong emphasis on financial sustainability, in particular the sustainability of public debt. Austerity policies and sharp cuts in public spending, however, have arguably placed restrictions on pre-crisis stock levels of education, health and other capabilities. Sustained high levels of unemployment deplete capabilities such as labor market skills and human capital. The disenfranchising of a large part of the population from the labor market leads to a deterioration of societal conditions. In addition, a decrease in spending to repair the degradation of the environment and a lack of investment in renewable energy can lead to the deterioration of the environment.¹⁰

The reduction in these capability stocks leads to restricted choices for current and, more importantly, future generations. How far these policies affect future choices depends on how they impinge on the development of capabilities of the younger groups of the population, or create untenable long-term conditions for those without jobs or with reduced pensions. The restrictions placed on future choices directly reduce human development.

As mentioned, the “stock” of capabilities depends directly or indirectly on policy measures. Let us for the sake of argument describe as follows the balance sheet of the economy: on the liabilities side, we will find public and private debts (although most of them should net out). On the asset side, we will have intangible and tangible assets. Intangible assets include social competencies such as the degree of social cohesion, social inclusion, belief in democracy and democratic institutions. Tangible assets are made of public assets, private ones, an educated population and natural resources.

Debts and tangible assets can be valued in the regular manner.¹¹ We can try to evaluate, at least qualitatively, other elements on the balance sheet. Inequality beyond a certain level, as we have already seen, is jeopardizing the sustainability of democracy in Europe. “We can have democracy in this country, or we can have great wealth concentrated in the hands of a few, but we can’t have both”.¹² The rise of inequality

⁹ The political subsystem could be a fourth, but in our view it may be more suitable for political conditions to be seen as contextual, influencing the degree of sustainability in these other subsystems from one period to the next.

¹⁰ Based on Fitoussi and Stiglitz (2012) and Fitoussi (2013).

¹¹ However, the current crisis highlights the problem of relying on market prices for the valuation of wealth. Net wealth as measured was increasing in periods prior to the crisis, but that was the consequence of a market failure. Private debt was increasing, but according to the market, asset prices were increasing at a faster pace. A reliance on market prices would have led to the conclusion that the high levels of pre-crisis consumption in many countries were sustainable. The revaluation of wealth that occurred subsequently showed that they were not.

¹² US Supreme Court Justice Louis Brandeis (1856-1941), quoted by Howard Steven Friedman in *The Measure of a Nation*, Prometheus Books, 2012.

due to current austerity policies is thus reducing the value of this intangible asset. The effects of this policy on the balance sheet of the economy are, at least in our opinion, obvious.

Through the increase in unemployment and insecurities that this implies (in Spain, for example, while overall unemployment is at 27%, youth unemployment is approaching a remarkable 60%), austerity is causing a decrease in the choices available to these people, and arguably even to ‘human capital’.¹³ Even if we assume that such policies are reaching their goal, which is debt sustainability, we cannot call this situation sustainable. Employment is more than the wages it secures; it is in effect a privileged means of social stability and integration that contributes greatly to the building of networks of social relations. Such high rates of unemployment cause a loss in the autonomy of the working population, leading to fear and distrust and negatively affecting social competencies. Austerity policies also negatively affect private capital, as the deleveraging of public debts puts a brake on the deleveraging of private debt required to cope with the financial crisis. For reasons already cited, it also leads to a decrease in ‘natural capital’. If this policy is also accompanied by a fire sale of public assets—as, say in Greece—it will reduce further net wealth.

In a highly connected world, Europe and other developed economies are important markets for developing and emerging economies. Continued recession in these economies is impacting the public and private debt on the balance sheet of the South. High levels of debt, as well as leading to unsustainability, also engender an environment of austerity in developing countries, leading to policies that negatively impact human and social capabilities and other intangible assets.

“What we measure affects what we do” was highlighted in the Stiglitz-Sen-Fitoussi report.¹⁴ The lack of a metric to measure different types of capabilities and environmental sustainability could lead to wrong policy decisions. European governments may well be right—their policies may lead to a greater decrease of liabilities than of the different categories of assets—but absent a measurement system we simply do not know.

Critical thresholds for sustainable human development

If such trends continue, concerns that the stocks of certain capabilities available for future generations will fall below certain critical levels are warranted. Similar to the notions of planetary boundaries for environmental sustainability, we might define social thresholds or critical levels of capabilities, beyond which societal degeneration is inevitable. If the stock of education capabilities in a society is below a critical threshold, it can be too low to sustain a virtuous cycle of human capital, entrepreneurship, economic growth and human development. In other examples, high unemployment and the resultant social exclusion of large numbers of people can lead to social tipping points if the stock of social capabilities is below the threshold required to sustain human progress through broad participation and policy dialogue. In addition, environmental tipping points can be reached, as embodied in the concept of planetary boundaries.

Under planetary boundaries, we talk about global and local thresholds. For example, a land-locked country in the Arab region may dramatically exceed its local water usage threshold, but still be well under the global threshold. Global or local boundaries, or sometimes both, can also be relevant for thresholds for capabilities. High levels of inequality can lead to particular tipping points, with ‘local’ thresholds varying according to tolerance for inequality, which in turn depends on history and political culture.

¹³“Human capital” is further decreased as most countries are decreasing their spending on health. An extreme example is Greece, where the health system is being progressively drained of the means to cure the population.

¹⁴ Cf. Stiglitz et al 2010.

Cuts in education, health and other expenditures not only limit current human capabilities, but also potentially limit future choices—through, for instance, impacts on birth rates, affecting the age structure of the population years later. Countries with lower levels of education, especially countries where girls lack secondary education, tend to have higher fertility rates. Education reduces fertility rates by enhancing information, changing the incentives for behaviour and empowering people to better pursue their own preferences. The 2013 Human Development Report finds that the rise in fertility rates in some Sub-Saharan countries appears to be associated with social expenditure cuts, particularly in education, made as part of structural adjustment programmes in the 1980s.¹⁵ With real per capita expenditure on education falling nearly 50% on average in the 1980s in Sub-Saharan Africa, the region saw a partial reversal in the progress towards demographic transition.

Weak and strong sustainability are also related to concepts of critical thresholds. In fact, we should not expect that only one of these concepts applies in a particular area. Which concept is most applicable changes as the context changes. With the environment, for example, it is likely that while weak sustainability may be applicable below the critical threshold, strong sustainability kicks in once the threshold is crossed. In particular, it seems evident that the planetary temperature is likely to increase by more than two degrees Celsius, crossing the global threshold for climate change. Scientific studies have shown that this is certainly a point of irreversibility that will set in motion several permanent changes in the earth's climate.

The tradition of the human development index already provides a way to measure changes in certain critical capability stocks: education (ΔE), health (ΔH) and command over resources (ΔI). These existing measures can provide a gauge of the depletion in the stock of capabilities. Once social and other thresholds are defined, we can monitor when a society is in danger of falling below these thresholds. This approach would guide us to individually track ΔE , ΔH and ΔI along with other similar measures subject to data availability, and compare the capability stock levels with the corresponding boundaries. This, in our view, is a promising idea to develop through further research.

To consider other alternatives, the measures of stocks in different capabilities can be combined into a single measure. The exact definition of this measure will depend on the marginal rates of substitution between the different dimensions that are deemed suitable. On one extreme is weak sustainability, where all dimensions are perfect substitutes for one another, which as discussed above is not suitable. The real world may warrant some points between weak and strong sustainability.

Definitions alone are not sufficient. But they are a start, since they force a dialogue on how broad a perspective should be taken on what constitutes sustainability, and by extension the mix of policies that can or should be adopted, by taking an equally broad look at their short- and long-term impacts. Much needs to be done if we are to pursue this approach in a systematic manner. The measurement exercise will therefore involve drawing up a list of appropriate indicators that measure the stock of capabilities, the HDI indicators being a good start. The list would include a measure of environmental conditions. These measures can be individually compared with the corresponding boundaries. Alternately, a composite index and a composite threshold could be defined, to alert us to when a critical boundary for sustainability is crossed. But much remains to be done.

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¹⁵ UNDP 2013.

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