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Measuring the Sustainability of Well-Being: a Capital Approach

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Abstract

One interpretation of sustainable development is that its objective is to ensure the maintenance of the preconditions necessary to ensure human well-being across time. This interpretation gives sustainable development an explicit intergenerational focus, distinguishing it clearly from other interpretations in which the well-being of the current generation is seen also as a sustainable development objective.

In the first part of this paper, we put forth an argument in favour of an intergenerational focus for sustainable development. It is shown to logically more defensible, of greater practical value for policy and theoretically more tractable.

The second part of the paper puts forth an argument for an extended notion of capital as the basis for measuring sustainable development from an intergenerational perspective. The theoretical framework is first elaborated and then proposals are made for key sustainable development indicators. The discussion then turns to practical questions of measurement frameworks, advocating the benefits of an accounting approach.

I – The case for an intergenerational focus for sustainable development[1]

Sustainable development is widely interpreted as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" This definition was first put forth by the World Commission on Environment and Development (1987), better known as the Brundtland Commission.

The Brundtland Commission spoke of two sets of needs, those of the present and those of the future, without offering a clear position as to which should be given primacy. On the one hand, the Commission argued for giving "overriding priority" to the needs of the world's poor, a clear concern for the present. One the other, it spoke of the long-term need to ensure social equity between generations. This focus on matters of both short-term and long-term concern has played an important role in the interpretation of sustainable development in the time since.

For several years after the Brundtland Commission's report, sustainable development was taken mainly as an imperative for improving the lot of the world's poor through new-style development suitably transformed to respect the long-term integrity of the environment. This changed gradually in the 1990s. Sustainable development lost its focus on reconciling the environment and development, becoming instead a program to simultaneously balance social, economic and environmental goals for both the current generation and generations to come. This idea had taken firm hold by the mid-1990s and is today the almost unquestioned objective of sustainable development. The most recent report on sustainable development from the United Nations (2008) makes the point explicitly:

> "at the political level, sustainable development has grown from being a movement mostly focusing on environmental concerns to a widely recognized framework utilized by individuals, governments, corporations and civil society that attempts to balance economic, social, environmental and inter-generational concerns in decision-making and actions at all levels."

Clearly, a very broad scope has been established for sustainable development in the time since Brundtland. So broad, in fact, that it is difficult today – perhaps impossible – to argue that any issue of substance does not deserve a spot under the sustainable development "umbrella."

Such a broad scope is likely more than any single concept can meaningfully bear. If everything is within the purview of sustainable development, the concept can offer little new insight. After all, covering everything amounts to the same thing as covering nothing at all. Defined in this way, sustainable development becomes simply the *status quo* by another name. Nearly anyone dealing with an economic, social or environmental issue – that is, with <u>any</u> issue of importance for development – can claim he is working on sustainable development simply by saying so. Refuting such a claim is almost impossible,

[1] The views expressed in this paper are the author's alone and should not be taken as representative of the views of Statistics Canada or the Government of Canada.

so one finds all sorts of issues, expected and unexpected, claiming special status as part of sustainable development. Evidence of this is found in the declaration of the *2002 World Summit on Sustainable Development*, whose signatories pledged to:

> "place particular focus on, and give priority attention to, the fight against the worldwide conditions that pose severe threats to the sustainable development of [their] people, which include: chronic hunger; malnutrition; foreign occupation; armed conflict; illicit drug problems; organized crime; corruption; natural disasters; illicit arms trafficking; trafficking in persons; terrorism; intolerance and incitement to racial, ethnic, religious and other hatreds; xenophobia; and endemic, communicable and chronic diseases, in particular HIV/AIDS, malaria and tuberculosis."

The list of issues above is obviously very broad and, it would appear, arbitrary. It is unclear, for example, why foreign occupation, racial hatred and chronic diseases should enjoy spots on the list but not climate change or levels of indebtedness – or dozens of other worthy concerns. With or without such additional issues, if sustainable development must concern itself with everything in the World Summit list it is hard to see how it can actually chart an alternative course for development. All of these issues were apparent long before sustainable development was conceived and they all, along with many more, receive attention today not because of any association with sustainable development but because they are patently important. It is reasonable to ask, then, what the value is in bringing the concept to bear on them.

If it is not necessary to call upon sustainable development in order to identify particular social, environmental or economic issues as important and if sustainable development offers no special insight into their resolution, then it would seem that the concept offers little of practical value. At most, it serves as a vague exhortation to include environmental issues along with the traditional pairing of social and economic issues when development is considered. While important, this is neither very profound nor very novel. Moreover, it falls far short of what could be achieved if the concept were defined more rigorously.

The problem with sustainable development has been argued above to be its excessively broad scope, so broad that sustainable development simply becomes the *status quo* by another name. Solving this problem is the first step in realizing its real potential as a guide for development. Doing so requires constraining sustainable development to a defensible and meaningful subset of development issues. In thinking about how this might be done, two choices are apparent.

One is to constrain the concept across its material horizon; that is, to focus it on just a certain domain of issues, say those related to the environment. This would be a poor choice. Those who argued in the 1990s for a broadening of sustainable development to cover economic, social and environmental concerns were right to do so. The concept is, in the end, about ensuring human well-being, a challenge that demands attention to all three development domains.

The proper choice for constraining sustainable development is to do so across its temporal horizon; that is, to focus it on either current or future concerns but not on both. Of the two, a focus on future concerns is the obvious choice. Focusing on current concerns would make sustainable development redundant, as it would become coincident with what we already understand as just "development." A great deal of effort, both public and private, is already devoted to ensuring increased well-being for the current generation. There would be no value in relabelling all of this effort as "sustainable development."

Focusing on current concerns would also ignore the obvious reason for the word "sustainable" in the term. Something that is sustainable may be carried out over a long period of time. Clearly then, what separates sustainable development from traditional development is a focus on the long term.

Narrowing the scope of sustainable development to long-term economic, social and environmental concerns serves the purpose at hand. It reduces the range of issues covered sufficiently that it is possible to define with clarity what sustainable development is and is not about. This is the first step in realizing sustainable development's potential. It creates at least the possibility that sustainable development could chart a new and more appropriate course for future development. Before this could happen, however, two other missing pieces must be put in place.

The first is a conceptual framework that translates the broad objective of sustainable development – assuring the environment, economic and social well-being of future generations – into a rigorously defined, finite set of variables amenable to human intervention. The conceptual framework must make clear in theoretical terms how these variables are related to the objective of sustainable development and to each other. The framework will not spell out how the variables should be actually be managed. This is the job of policy makers. It simply provides essential guidance on what to manage and, equally, what need not be managed. In so doing, it avoids *ad hoc* policy making in the name of sustainable development.

The final missing piece is a measurement framework that provides guidelines for expressing the theoretical, and possibly abstract, variables of the conceptual framework into quantitative statistical measures. A measurement framework is essential if the conceptual framework is actually to serve as a guide for policy. It is the means by which policy makers will monitor progress towards targets for specific variables. It is only in this way that they will have any assurance that the policies they design are having their desired effect.

At this point, an obvious question is whether conceptual and measurement frameworks can be found that fit the "future-oriented" view of sustainable development argued above to be appropriate. If not, the future-oriented view might be more logically defensible than the current broad view, but not of any greater practical value. Fortunately, as is argued in the next section, robust conceptual and measurement frameworks do exist by which the future-oriented view can be put into practice.

II – The capital approach to sustainable development[2]

There has been a current of thought within the economics literature since the early 1990s that has interpreted sustainable development quite differently from the prevailing broad view (Pearce and Atkinson, 1993; Dasgupta and Mäler, 2000). Though rigorous and well articulated, it has not yet gained a wide following outside of economic circles. According to it, sustainable development can be defined as non-declining *per capita* wealth over time.

It is immediately clear that the temporal horizon of this definition matches that argued for in the preceding section. The emphasis is squarely on the future and not on the present. This is reflected as well in the adoption of wealth as the central concept. Wealth is, by definition, the value of what we accumulate by way of capital assets over time. We invest in these assets not mainly because they provide well-being in the current period, but because of our expectation that they will do so in the future.

Looking at this view more deeply, a well defined conceptual framework can be found underlying it. The framework, built upon an extension of the economist's notion of capital, starts from the notion that human well-being is a function of consumption of goods and services. Capital is the basis for the production of these goods and services and, therefore, is closely tied to well-being. Without careful attention to the maintenance of capital over time, production will necessarily decline and, along with it, well-being.

Traditionally, economists have concerned themselves with the workings of the market and, therefore, have focused on capital stocks employed there. From the earliest days of economics, the importance of financial and produced capital in this regard have been recognized. Human capital – the value of the knowledge and capacities embodied within workers – has also been studied by economists since the 1960s (Becker, 1964).

The adoption of capital as the conceptual framework for sustainable development requires a broader view of capital than this however. While human well-being is undoubtedly a function of the consumption of goods and services produced within the market, it is also clearly related to consumption outside of the market. Many environmental goods and services, for example, are consumed at no cost but yield significant well-being benefits. Likewise, household production of meals, cleaning and child rearing are also important sources of non-market well-being, as are the benefits of well-functioning social structures. Recognition of these additional sources of well-being requires broadening the traditional economic concern for capital into additional areas.

From this broader view, a society's total capital base is seen to comprise five individual stocks:

- financial capital like stocks, bonds and currency deposits

[2] This section draws heavily upon a recent report on measuring sustainable development prepared by the Joint UNECE/OECD/Eurostat Working Group on Statistics for Sustainable Development. The author served as Chair of this Working Group.

- produced capital like machinery, buildings, telecommunications and other types of infrastructure
- natural capital in the form of natural resources, land and ecosystems providing services like waste absorption
- human capital in the form of an educated and healthy workforce; and
- social capital in the form of functioning social networks and institutions.

Not all these forms of capital are equally well understood, either conceptually or empirically. Indeed, the order in which they have just been presented reflects well the degree to which they are understood. Social capital, the least well studied of the five, remains a controversial concept for which no single definition is universally accepted.

It should be noted that managing total national wealth in a manner that sustains it over time, measured *per capita*, only provides the potential for sustainable development. This is because there is no guarantee that future generations will manage well the capital base they inherit. They may fail in utilising it effectively to create well-being and instead waste the resources on wars or on excessively "high living" without concern for the well-being of their descendants.

While stable or growing total wealth *per capita* is no guarantee of sustainable development, the opposite is a guarantee of its impossibility. That is, in the face of declining *per capita* capital stocks, well-being will in the long run deteriorate and sustainable development will not be possible (Hamilton and Ruta, 2006).

By taking the perspective of capital, the challenge of sustainable development is simplified into a question of whether a country's capital base – or national wealth – is managed in a way that secures its maintenance over time. In simplifying it thus, the focus of the sustainable development challenge is sharpened and put into concrete terms. The question whether financial, produced, natural, human and social capital stocks *per capita* are increasing or declining over time is one that lends itself to a precise answer.

Furthermore, this focus helps make sense of the inevitable tradeoffs that must be weighed as development proceeds. For example, if one capital stock – let us say, petroleum wealth – declines, the framework allows us to ask whether it is being offset by growth of another stock, human capital perhaps.

Limitations on the capital approach

To reach its fullest potential as a framework for measuring sustainable development, the capital approach requires measurement of all capital stocks with a single unit. The only obvious choice of unit – money – is problematic for two reasons. First, it is difficult to uniquely determine all of the ways in which capital contributes to well-being. Those ways that cannot be identified obviously cannot be valued. Second, even for those contributions we can identify, it is sometimes difficult to translate their value into dollars. This is partly because functioning markets rarely achieve the ideal conditions economists

impose upon them in their valuation methods and partly because the methods themselves remain underdeveloped in some cases.

There is in addition a debate over the ethical underpinnings of valuation. Certain observers place a question mark after the right of humans to exploit nature in a destructive manner, even if this, at least in the short run, may increase total national wealth. Clearly, aggregating the value of nature along with other forms of wealth as though humans were indifferent to its existence is at ethical odds with this view.

A third limitation on valuation is the degree of substitutability among capital types. It is generally accepted that the various components of national wealth cannot always and without difficulty be replaced with each other. It is not so, for instance, that ecosystem services, which may be considered as one of the dividends of natural capital, can easily and always be replaced by increased income, the dividend of financial, produced or human capital. Capital services for which no substitute can be found are said to flow from critical capital stocks. To the extent that some capital stocks are indeed critical, the possibility of using exclusively monetary aggregates to measure sustainable development disappears. It would be of no value to aggregate values for non-critical capital with those for critical capital into a single measure. In doing so, essential information for sustainable development would be lost.

All of this suggests that a practical implementation of the capital framework cannot rest on monetary measures alone. Certainly, monetary measures are desirable and should form part of any effort to quantify sustainable development based on capital. Additionally, though, the approach requires separate measures of critical capital stocks measured in physical units.

A practical set of capital-based indicators

It is clear that not all capital stocks can or should be measured in monetary terms. Yet many stocks and/or the goods and services they provide are bought and sold in markets and there is good reason to argue that the market value assigned to these assets (or goods and services) is a close approximation of their contribution to well-being. This is true of all financial and produced capital. It also applies to those elements of natural capital and related products that are commonly traded in the market; including, timber, fish, minerals and energy. It applies as well to the output of human capital (labour) insofar as it is used in the market.

Using market prices as a guide, then, it is possible to estimate the contribution of a fair range of capital assets to what might be called the economic component of well-being. Given this, extending the valuation of these assets as far as possible into an indicator of market-based economic wealth is an important task in a practical set of capital-based sustainable development indicators. To be precise, the correct form of the indicator would be real *per capita* economic wealth.

Economic wealth, as defined above, is equal to the sum of the value of all assets that contribute to market production, including financial, produced, natural, human and social capital. In practice, it is not possible to observe market values for all capital types directly, so calculating economic wealth by summing just observed values is not possible. Only in the cases of financial and produced capital are market values normally directly observable. Market values for natural capital are observable in some instances, but natural assets are generally not traded on markets. Well-established indirect methods based on universal principles of valuation can be used, however, to estimate natural capital values in the absence of market prices (Freeman, 1993). Human capital values are also not directly observable, but again indirect methods exist for valuing it (Greaker, 2007). Most problematic is social capital, where neither directly observed values nor well-established indirect methods exist.

While economic wealth is an important measure of sustainable development from the capital perspective, it cannot stand alone. It must be supplemented to form a practical and complete indicator set from a capital perspective. Additional indicators must be selected to reflect the well-being effects of capital that cannot or should not be captured in a market-based monetary measure. They must take into consideration the limited substitutability among different forms of capital, the existence of critical forms of capital and the fact that well-being is derived from more than market consumption. Finally, they must take into account the fact that it is not just stocks, but flows too that are important from a capital perspective. Flows are important because they are what determine changes in stocks from one period to the next.

The first necessary extension to the set of capital stock indicators is to complement the aggregate indicator of economic wealth with separate monetary indicators of financial capital, produced capital, human capital, natural capital and social capital. Extending the indicator set in this way takes care of the concern about the non-substitutability of capital stocks at the margin. As with economic wealth, these separate monetary indicators should all be measured in real per capita terms.

The next extension of the practical indicator set is necessary to take care of the fact that some capital assets are “critical” to development. One category in which critical assets are found is natural capital, as it is here where the assets that are essential for basic life support reside. Although there remain scientific debates as to just which environmental assets are critical, there is reasonable consensus that the following are all very important if not essential:

- a reasonably stable and predictable climate;
- air that is safe to breath;
- high-quality water in sufficient quantities; and
- natural landscapes suitable for supporting a diversity of plant and animal life.

There may well be other forms of capital that also have critical elements, including social capital. It is not known yet what these might be, so only a place holder can be set aside within the indicator set at this time.

The next extension to the practical set is necessary to account for the fact that some capital assets contribute to well-being outside of the market place. While this is not a concern for financial and produced capital, it is for natural, human and social capital.

Natural capital contributes to well-being outside the market mainly when humans experience nature directly (for example, when camping) or when they derive pleasure from the knowledge that nature continues to exist. Since many of the same features of the environment that are critical to development are also those from which humans would derive non-market well-being, the same set of physical indicators listed above can also serve as indicators of non-market natural capital.

Human capital also contributes to well-being outside the market place. In the same way that education and good health make us better workers, they also allow us to be better parents, to be finer members of society, to better enjoy the arts and to find deeper personal fulfilment. Indicators are therefore added for the two core dimensions of human capital: educational achievement and health status.

As for social capital, it has been suggested (Grootaert and van Bastelaer, 2002; pp. 31-32) that the focus should be on three types of proxy indicators: membership in local associations and networks, trust and adherence to norms, and collective action.

Though the central focus of the capital approach is asset stocks, the measurement of flows is also integral to the approach. To the extent that an asset changes in value or size over time, there must be an identifiable flow that is the cause of the change. Indicators of these flows must be included in the practical set of sustainable development indicators.

When it comes to economic wealth overall, the fundamental flow variable is net investment in all forms of market assets. This is the value of new investment in these assets during a period net of the depreciation in their value as a result of their use in production. The term “genuine economic savings” has been used to denote this flow (Hamilton and Clemens, 1999).

For financial capital, the fundamental flow variable is net investment in foreign financial assets.

For produced capital, the fundamental flow indicator is net investment. This is the value of new investment in produced capital during a period net of the depreciation of the existing produced capital stock.

For human capital, the fundamental flow indicator is also net investment. This would be the value of the increase in human capital during a period less its depreciation. Depreciation of human capital results from the obsolescence of skills and the loss of

workers from the labour force as a result of retirement, unemployment or other factors. Investment in human capital occurs through education and training and through improvements to health status.

For natural capital, there are several flow indicators that are important. First, for non-critical forms of natural capital – that is, those that can be meaningfully aggregated together and measured in monetary terms – the fundamental indicator is the aggregate value of net depletion. A separate flow indicator is included for each critical form of natural capital noted earlier.

When it comes to social capital, identifying flow indicators to parallel the proxy stock indicators discussed above is not straightforward. Only the indicator of membership in local associations and networks has an obvious flow parallel: change in membership in these same groups. No obvious flow variable parallels the indicator of trust and adherence to norms or the indicator of collective action. For now, place holders are included for these two flow indicators.

The final set of practical sustainable development indicators based on the capital approach is presented in the table below. The set includes 15 stock indicators. The flow indicators also total to 15, though both of the social capital flow indicators and the indicator of changes in age-specific mortality and morbidity are simply proposed as place holders for the time being until research in these areas matures.

A practical set of capital-based sustainable development indicators

Stock indicators	**Flow indicators**
Real *per capita* economic wealth	Real *per capita* genuine economic savings
Real *per capita* net foreign financial asset holdings	Real *per capita* investment in foreign financial assets
Real *per capita* produced capital	Real *per capita* net investment in produced capital
Real *per capita* human capital	Real *per capita* net investment in human capital
Real *per capita* natural capital	Real *per capita* net depletion of natural capital
Real *per capita* social capital (place holder)	Real *per capita* net investment in social capital (place holder)
Temperature deviations from normal temperatures	Greenhouse gas emissions
Ground-level ozone and fine particulate concentrations	Smog-forming pollutant emissions
Quality-adjusted water availability	Nutrient loadings to water bodies
Fragmentation of natural habitats	Conversion of natural habitats to other uses

Percentage of the population with post-secondary education	Enrolment in post-secondary educational institutions
Health-adjusted life expectancy	Changes in age-specific mortality and morbidity (place holder)
Membership in local associations and networks	Change in membership in local associations and networks
Trust and adherence to norms	Flow indicators of trust/adherence to norms and collective action (place holder)
Collective action	

Legend: MONETARY INDICATORS PHYSICAL INDICATORS

Regarding the feasibility of the set, all of the indicators that are not place holders can be estimated today using existing methods and data that are available in most developed nations. Not all of the methods are equally well established however. Some, like those for estimating produced capital, are formally part of official statistical methods. Other methods, like those for measuring human capital or fragmentation of habitats, exist and are used in the research community but are not yet formally recognized as statistical standards.

III – A capital-based measurement framework for sustainable development

Compiling sustainable development indicators based on the capital approach – or on any conceptual framework for that matter – first requires translation of the concepts into a practical measurement framework. A measurement framework is a set of methodologies and organizational rules for turning basic data into useful information coherent with the underlying conceptual framework.

The *System of National Accounts* (United Nations et al., 1993) is a good example of what is meant by a measurement framework in this context. The *System of National Accounts* translates the conceptual framework explaining economic development put forth by John Maynard Keynes and others in the 1930s into an information system for producing the macroeconomic indicators that Keynes and others felt were needed to guide economic policy.

For the purposes here, the *System of National Accounts* (SNA) is more than just a useful example of a measurement framework. It is, in fact, the most obvious starting point for designing a measurement framework for capital-based indicators of sustainable development. This is true for several reasons. First, the SNA is already the source for measures of financial and produced capital stocks, which were argued above to form a necessary part of a capital-based sustainable development indicator set.

Second, as described in more detail below, there already exists a measurement framework for natural capital consistent with the SNA. This is the United Nations *System of Environmental and Economic Accounts* (United Nations et al., 2003). Third, while no

fully developed SNA-based measurement framework for human capital exists, many of the data required to compile estimates of human capital are available from the SNA. Thus, it seems likely that an SNA-based measurement framework for human capital could be easily conceived.

Social capital is the one area where little thinking has been done with respect to measurement frameworks. In principle, a framework for social capital based on the SNA could be devised, particularly insofar as monetary estimates of social capital are concerned. Physical indicators of social capital (self-reported measures of trust, for example) are obviously less well suited to such a framework, though perhaps not more so than the complex physical indicators of ecosystems that are part of the *System of Integrated Environmental and Economic Accounts*.

To illustrate what is possible with regard to an SNA-based measurement framework, the *System of Integrated Environmental and Economic Accounts* is described in more detail below.

The System of Integrated Environmental and Economic Accounts[3]

The *System of Integrated Environmental and Economic Accounts* (SEEA) comprises four categories of accounts.

- Flow accounts for pollution, energy and materials provide information in physical terms at the industry level about the use of energy and materials as inputs to production and the generation of pollutants and solid waste. The objective is to see the extent to which the economy is dependent on particular environmental inputs and the sensitivity of the environment to particular economic activities. Bringing physical flow data together in these accounts allows links to be made with economic data series, helping answer questions like, "Does an industry which is environmentally sensitive play a particularly large role in international trade of the country or provide many employment opportunities?" In the SEEA, accounts that combine physical environmental and monetary economic data are called "hybrid" environmental accounts. It is flow accounts like those of the SEEA where the data necessary to compile the natural capital flow indicators proposed earlier would be organized in a capital-based measurement framework.

- Environmental protection and resource management expenditure accounts identify expenditures undertaken by industry, government and households to protect the environment or to manage natural resources. They take those elements of the existing SNA that are relevant to the good management of the environment and show how the environment-related transactions can be made more explicit. In addition, these accounts also measure the use of economic instruments – taxes, subsidies, licence fees and similar tools – to encourage more environmentally friendly behaviour. The environmental protection and resource management expenditure accounts of SEEA could not be used as the direct source of any of the

[3] This section draws heavily upon Chapter I of the SEEA handbook (United Nations *et al.*, 2003, pp. 1-23)

indicators proposed earlier. They could, however, serve as a source of important additional information in support of the monetary indicators of financial capital and produced capital. This is because they take the financial and produced capital stock data from the SNA and disaggregate them to show details relevant to natural capital that are hidden in the aggregates. For example, they would show what share of total business investment in construction was devoted to installations designed to protect the environment such as a sewage treatment plant. In principle, the same approach could be used in a capital-based measurement framework to show flows of financial and produced capital relevant to other forms of capital; for example, the share of government investment in construction devoted to building new educational institutions.

- Natural resource asset accounts in both monetary and physical terms record stocks of natural resources such as fish, forest, water and minerals, as well as land and ecosystems. It is accounts like the land and ecosystem accounts of the SEEA where the data necessary to compile the indicators of critical natural capital proposed earlier would be compiled in a capital-based measurement framework.

- The final set of accounts within the SEEA describes how the production accounts of the SNA can be adjusted to take into account depletion and degradation of natural capital. When such adjustments are applied to GDP, the result is an environmentally adjusted domestic product – EDP – or what is more commonly referred to as "green GDP." Although the techniques discussed in the SEEA for the valuation of depletion and degradation of natural capital are relevant in a capital-based measurement framework, the adjustments to the flow aggregates of the SNA are not.

As can be seen, much of the SEEA is directly relevant for measuring the natural capital indicators proposed earlier. Some of it is not directly relevant, but is useful nonetheless for the supplementary information that it provides.

The lesson of the SEEA shows that it is possible to craft a coherent and rigorous measurement framework for complex, non-traditional forms of capital starting from the basic elements of the SNA. What matters most is consistency with the core conceptual and organizational principles of the SNA; for example, use of same dividing lines for breaking the economy up into institutional sectors and the same standards for classifying industries.

IV – Conclusion

Sustainable development is a popular and important concept, but one that has proven difficult to define with precision. It has been argued here that the excessively broad – and therefore imprecise – definition of sustainable development that prevails today deprives the concept of any chance of realizing its full potential as a guide for policy. By claiming to cover all material and temporal dimensions of development, the concept has come to mean anything and everything. Left this way, it will almost surely sink under the weight

of its own "success," as increasingly divergent groups address increasingly divergent issues under the sustainable development umbrella. Such dilution cannot continue forever.

If sustainable development is to meaningfully serve as a guide for policy, a means will have to be found to stop this dilution and focus the concept on a limited but important set of development issues. A means of doing this has been presented in some detail here. There are probably others as well, but the one presented here – focusing on the economic, social and environmental determinants of long-term well-being – has several features that recommend it.

First and foremost, there exists a sound conceptual framework that can serve to express this future-oriented view of sustainable development in terms of a finite number of rigorously defined measures. The value of such a framework as a means of avoiding *ad hoc* measurement in the name of sustainable development cannot be overstated.

Second, the conceptual framework in question – the capital framework – has the advantage of coherence with the well-established, well-tested body of economic thought surrounding capital. Though some might see this close connection with economic thinking as a reason for skepticism, a balanced review of the approach reveals that it goes well beyond what would normally be considered the domain of economics. It is, in fact, an approach that demands multi-disciplinarity, incorporating the thinking of economists, sociologists and natural scientists.

Third, there exists a clear approach to establishing a measurement framework for the future-oriented view of sustainable development. This is to build upon the existing *System of National Accounts*, which are already the source of estimates for two out of the five categories of capital that require measurement, financial and produced capital. Of the remaining three categories, a sound measurement framework coherent with the *System of National Accounts* already exists for natural capital; a similar one could easily be conceived for human capital. Only social capital remains to be explored in this regard.

In spite of these advantages, the future-oriented view of sustainable development remains outside of the mainstream. There are signs that this may be changing however. A Joint UNECE/OECD/Eurostat Working Group on Statistics for Sustainable Development recently spent two years considering exactly this approach and comparing it with existing approaches to measuring sustainable development, most of which are based on the prevailing broad view (Conference of European Statisticians, 2008). The report of this group was well received by heads of statistical offices that make up the Conference of European Statisticians. The Government of Norway has adopted a capital approach to its national sustainable development indicators (Moe, 2007). In Canada, the National Round Table on the Environment and Economy recommended in 2003 that national sustainable development indicators for Canada be based on the approach (National Round Table on the Environment and the Economy, 2003). The Canadian government has subsequently published three reports presenting a subset of the indicators recommended by the National Round Table (Environment Canada, Statistics Canada and Health Canada, 2005,

2006 and 2007). Switzerland (FSO/FOEN/ARE 2004) and Belgium (Federal Planning Bureau of Belgium, 2006) both make use of the capital approach in their national sustainable development indicators, though their indicators are not restricted to measurement of the future determinants of well-being.

The coming period will be an important one for sustainable development and its measurement. The Conference of European Statisticians is considering options for pursuing work on the capital approach. If this work continues, it may well be the case that more countries begin to look seriously at it as an alternative to the prevailing approach to sustainable development.

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