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SPECIAL FEATURE: NOTE AND COMMENT

Valuation of Nature and Nature's Contributions to People

The inclusive wealth index and sustainable development goals

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Abstract
In September 2015, the United Nations General Assembly agreed on an agenda for sustainable development in member countries. Nations committed themselves to meeting 17 Sustainable Development Goals (SDGs), involving 169 socio-economic targets, by year 2030. To measure progress in meeting those targets, it was proposed to track more than 240 socio-economic indicators over the coming years. What is, however, missing from the list is an indicator that can be used to judge whether the policies that countries follow to meet the targets protect and promote sustainable development. We offer an account of the concept of inclusive wealth report findings that has tracked the inclusive wealth of 140 countries for the period 1992–2014.

Keywords Inclusive wealth · sustainable development · Natural capital · Produced capital · Human capital · Global

Introduction

In September 2015, the United Nations General Assembly agreed on an agenda for sustainable development in member countries. Nations committed themselves to meeting 17 Sustainable Development Goals (SDGs), involving 169 socio-economic targets, by year 2030. To measure progress in meeting those targets, it was proposed to track more than 240 socio-economic indicators over the coming years. Reasonably, the indicators reflect various features of the SDGs (United Nations 2015). What is, however, missing from the list is an indicator that can be used to judge whether the policies that countries follow to meet the targets protect and promote sustainable development. The required indicator is an inclusive measure of wealth, which is the value of all the capital assets to which an economy has access (Dasgupta 2004; Arrow et al. 2013). Here we offer an account of the concept of inclusive wealth and report findings in a recent study [sponsored by the United Nations Environment Programme (Managi and Kumar 2018)] that has tracked the inclusive wealth of 140 countries for the period 1992–2014.

Methodology

The Inclusive Wealth Index (IWI) provides a framework for assessing the economic growth and development of nations (Managi and Kumar 2018). In this framework, economic progress is measured by growth in inclusive wealth, conceptualised by 3 categories of assets, or capital: produced capital, human capital and natural capital. These aspects (among others) comprise the productive base of any country's economy. Data is needed to explore interlinkages across environmental areas together with social and economic information to produce insights. However, for 68% of the environment-related SDGs there is not sufficient data at the global level to assess progress. Data on health, education, the state and rates of decline and improvement of natural capital, investment in infrastructure are some types of data which are collected for the Inclusive Wealth Index and can also help to address the lack of data issue for SDG indicators.

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According to Fig. 1, the Inclusive Wealth framework itself underpins the targets of SDG 8: Promote inclusive and sustainable economic growth, employment and decent work for all.

SDG 8 calls for a progressive improvement in global resource efficiency and to endeavour to decouple economic growth from environmental degradation, with developed countries taking the lead (target 8.4). A framework based

Fig. 1 Sustainable Development Goals with The Inclusive Wealth Index

on wealth (which includes natural capital) helps to de-couple economic growth from environmental degradation, by acknowledging environmental assets as imperative for economic activity and development.

Looking within both frameworks (SDG and IWI) it is clear that many parallels arise; the improvement of any category of capital corresponds with a development objective- this may fall under a number of themes such as environment, infrastructure or social justice focused. Using the IWI as the primary indicator of economic progress, we have the best chance to succeed in measuring and monitoring the progress of the Sustainable Development Goals.

Human capital

All aspects included under human health in some way or another affect an individual's capacity for working. Whether this is in the form of improving mental health (target 3.4), the development of new vaccines (target 3.8) or decreasing risk of exposure to hazardous toxins (target 3.9), the productive base in terms of human resources and capacity for working would be improved markedly.

Education is an obvious component directly relating to an individuals' capacity to contribute to the well-being of society via paid work. SDG 4 outlines the need for ensuring free, equitable and quality education for boys and girls particularly in the least developed countries (target 4.1), improving rates of adult literacy and numeracy (target 4.6), and ensuring access for all to quality technical, vocational and tertiary education to create relevant skills and knowledge in the workforce (target 4.3).

Human health and education for their own sake (i.e. of quality of human experience) is of course intrinsically valuable- the case for protecting and promoting human health is further strengthened however, by the stance that it affects the economic output.

Natural capital

This SDG crosscuts both human and natural capital. Water, as an increasingly scarce resource globally, is a priority for countries to secure in the long term. Ecosystem services and natural capital that involve water resources will require that proper sanitation is maintained so as not to avoid contamination of water reservoirs. Proper sanitation is a necessary step for avoiding epidemics of water-borne communicable diseases—a major priority in terms of improving human capital in developing countries.

The Inclusive Wealth Index provides conceptual assistance in understanding the long-term implications of short-term gains in GDP- namely the use of fossil fuels as the primary source of energy globally. For example, by including natural capital as one of the primary indicators of sustainable economies, forest resources may be conceptualised as carbon sinks rather than just income as timber resources. Furthermore, climate damage is accounted in Inclusive Wealth as negative value.

SDG 15: protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

The resilience and productivity of ecosystems, both marine and terrestrial, creates the foundation from which natural capital stocks and ecosystem service flows may be derived for the benefit of human communities. Target 15.9 of SDG 15 re-iterates this, with the objective to integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts. This is echoed in target 14.2 of the SDGs, with the call for sustainable management and protection of marine and coastal ecosystems by 2020. Pollution is a major driver of degradation of many types of natural capital—target 14.1 of SDG 14 aims to prevent and significantly reduce marine pollution of all kinds by 2025.

The depletion of fishery stocks as a type of natural capital has been highlighted in the Inclusive Wealth Report 2018. Target 14.4 of SDG 14 explicitly calls for the regulation of harvesting of fish stocks and to end illegal, unreported and unregulated fishing to restore fish stocks in the shortest time feasible.

The Inclusive Wealth Index does not aim to reduce the value of ecosystems and their constituencies to their economic value only. Rather, it provides an alternative lens from which to understand their value in terms of human utility and social value.

Produced capital

There is a need for infrastructure and industrialisation that can occur in line with sustainability and planetary boundary considerations. On a global level, produced capital per capita has experienced the largest increase compared to human and natural capital, often at the expense of the latter. The IWI framework provides data and guidance in monitoring the trade-offs of achieving this SDG without compromising the progress of other development goals.

Social capital

Social capital is recognised within the inclusive wealth framework as being paramount for sustainable economic growth. Though this is not one of the listed types of capital (as it is, for now, notoriously difficult to measure and assess), the importance of promoting resilient and useful institutions

is highlighted in both the Inclusive Wealth Framework and Sustainable Development Goals.

Results and discussion

Inclusive wealth is a quantitative measure of an economy's productive capacity, on which the Brundtland Commission Report (World Commission on Environment and Development 1987) based the idea of sustainable development. An economy should be viewed as following a path of sustainable development over a period of time only if inclusive wealth per capital were to increase in that same period. Inclusive wealth per head is the right coin with which to measure sustainable development, not gross domestic product (GDP) per head nor any of the other measures that have been suggested in recent years, such as the United Nations' Human Development Index (HDI). A glaring weakness of GDP is that the measure does not deduct the depreciation of capital goods. As we see below, GDP could increase over a period of time even as inclusive wealth declined. In that situation, people would no doubt enjoy economic growth, but it would be at the expense of the future people: the economy's productive base would be found to have declined. Dasgupta review (2021) has estimated that to attain the SDGs by 2030, the efficiency with which the biosphere's goods and services are converted into global GDP would need to increase would be more than 3 times than the rate at which it has been increasing in the recent past. This suggests strongly the goals of SDGs were unattainable in a sustainable manner even when they were fashioned.

The limitations of conventional measures like GDP have been much discussed in recent years (Bergh 2009; Costanza et al. 2014; Dasgupta 2015; Halkos et al. 2018; Managi 2020; Sato et al. 2018). In the Inclusive Wealth Report 2018, the authors tracked inclusive wealth per head over the period 1992–2014 in 140 countries (Managi and Kumar 2018). The value of produced capital (PC) was obtained from official national accounts. Data limitations meant that natural capital (NC) was limited to minerals and fossil fuels, agricultural land, forests as sources of timber, and fisheries (market prices were used to value them as well). The accounting value of human capital (HC) was estimated by using the approximations in Arrow et al. (2013) for both education and health. Adjustments were then made to the values of the three classes of capital goods by including population growth, the social cost of carbon emissions [at a price of $50 per ton (Tol 2011)], capital gains on oil, and official estimates of technological progress. The aggregate of those estimates yielded the measure of inclusive wealth per head.

Figure 2a depicts time series of changes in the value of the stocks of per capita produced capital, natural capital, and human capital, respectively, over the period under study. Globally, produced capital per head approximately doubled and human capital per head increased by about 13%, but the value of the stock of natural capital per head declined by nearly 40%. When the adjustment owing to capital gains on oil (for oil-importing countries the corresponding term was a negative contribution to inclusive wealth; for oil-exporting countries the contribution was positive) and technological progress are included, global inclusive wealth per head was found (Fig. 2b) to have grown by about 10% (implying an annual rate of increase of 0.45%), in contrast to GDP per capita, which grew by nearly 80% (i.e., an annual increase of 4%). Strikingly, only 84 out of the 140 countries were found to have experienced non-declining inclusive wealth per head during the period in question. Moreover, in most countries (and they included both developed and developing economies) the value of the stocks of produced capital per head, and to a lesser extent that of human capital per head, increased, even while the value of the stock of natural capital per head declined. In addition, the aggregate wealth composition indicating that human capital and produced capital are increasing while natural capital is decreasing alarmingly (Fig. 2c).

Conclusion

The UN's Sustainable Development Goals (SDGs) are 17 in number, with 169 specific targets. As of now, the proposal has been to measure and track the progress over time of more than 240 socio-economic indicators. But if the SDGs are themselves to be sustainable, it should be required of nations to provide estimates of changes of inclusive wealth per head. Inclusive Wealth Report 2018 (Managi and Kumar 2018) also compares percentage annual growth rates in inclusive wealth per head with those of GDP per capita in the 140 countries over the period 1992–2014. The publication reported that although there is a positive correlation between the two growth rates, the correlation is relatively weak (correlation coefficient, 0.24). Oil exporting Middle Eastern countries, for example, have enjoyed high growth rates in GDP per head, but suffered from negative growth rates in inclusive wealth per capita. The SDGs require nations to strike a balance between investment in their capital goods and their enabling assets. The notion of inclusive wealth formalises a way that balance can be struck. National accounts of inclusive wealth are rather like balance sheets of firms.

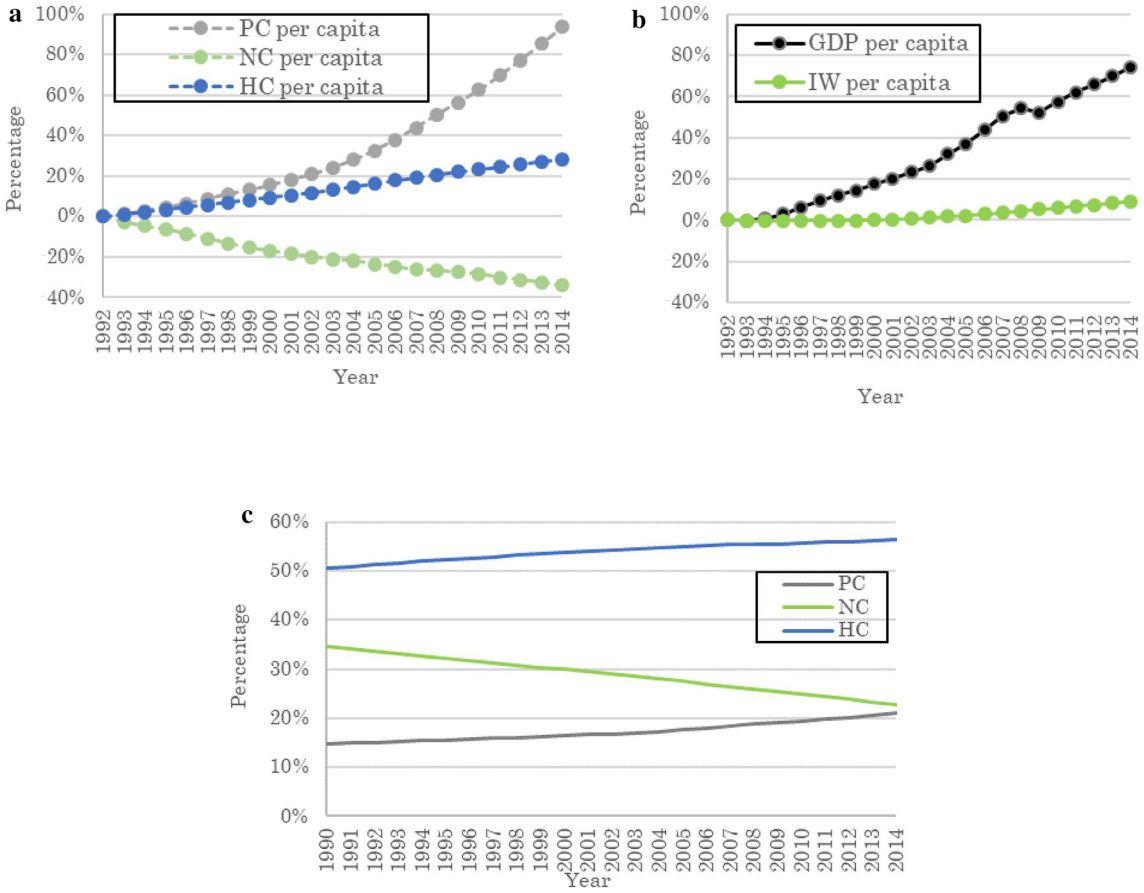

Fig. 2 Growth rates of inclusive wealth per capita and its components (**a**, **b**) and global aggregate wealth composition change (**a**). IW, PC, NC and HC stand for inclusive wealth, produced, natural and human capital, respectively

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