Strong sustainabilty as a paradigm for brinding economics and sustainability science

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Background

The concept of sustainable development is rooted in the rise of environmental issues in international institutions. In the 1987 Brundtland Report, sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Economists have adopted this concept in their models, proposing that the stock of capital (human, financial, physical and natural) must remain constant to enable the production of goods and services that guarantee human well-being over time. This conceptualisation, known as "weak sustainability", has been widely institutionalised, notably with the production of "genuine savings" indicators[1] and the regular publication of World Bank reports (Changing Wealth of Nations). However, another conceptualisation, known as "strong sustainability", is also possible.

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Further reading

Comte A., Ionescu C., Lecuyer O., 2021 – *Vers une évaluation fiable de la soutenabilité environnementale des territoires*. QDD, 50, AFD, https://www.afd.fr/fr/ressources/evaluation-soutenabilite-environnementale-esgap

Wu J., 2013 – Landscape sustainability science: ecosystem services and human well-being in changing landscapes. *Landscape Ecology*, 28 : 999-1023. DOI: 10.1007/s10980-013-9894-9

Strong sustainability as a conceptual and operational challenge

The weak sustainability approach focuses on the sum total of capital, including social, manufactured and natural capital (see illustration A). Quite soon after the concept of weak sustainability emerged, another school of thought proposed a different way of defining sustainable development. This second school of thought believes that natural capital is different from other forms of capital, and that it must be protected to maintain the integrity of the biosphere. This proposal reflects two criticisms of the definition of natural capital in weak sustainability. The first is its "substitutability" for other forms of capital, since it is the total stock that must be constant. Broadly speaking, we might imagine destroying natural areas if we build a school or a production plant in their place. The second criticism relates to how we value this natural capital, which must be commensurate with other forms of capital and therefore requires a monetary valuation of the flows of ecosystem services that provide benefits to human societies. The proposal for strong sustainability addresses these two criticisms. Firstly, natural capital is defined as the functional characteristics of ecosystems and the integrity of the environment that must be maintained over time. This is similar to work on defining planetary limits, which determine critical thresholds for different aspects of the environment, beyond which the habitability of the biosphere is compromised. This definition therefore does not provide for any substitutability between different forms of capital, but defines a system as sustainable only if it operates within these sustainability thresholds. The strong sustainability approach makes achieving a healthy state of the environment an essential condition of sustainability (see illustration B). This approach can be applied to the Sustainable Development Goals (SDGs) (see illustration C), where achieving sustainability is based on the healthy state of the four environmental goals (see illustration D). Strong sustainability can be integrated into national accounting through the valuation of abatement, preservation and restoration costs, which differs from conventional financial valuations and is useful as an operational tool to inform public decision-making.

Strong sustainability as a boundary object to bring the sciences closer together

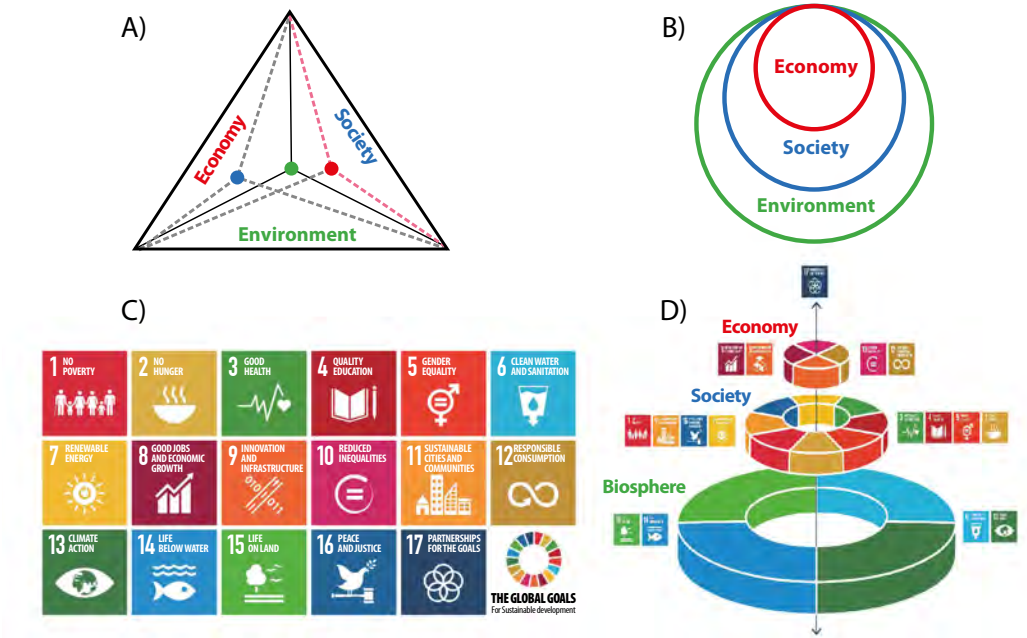
An important issue in operationalising this concept of strong sustainability is the definition of thresholds that must not be exceeded or environmental objectives that must be achieved. This is where the other sciences involved in sustainability come into play. Whereas the weak sustainability approach allows economists to produce models and indicators virtually in isolation, the strong sustainability approach is intrinsically interdisciplinary. Developing environmental objectives is a frontier issue that requires a dialogue between disciplines. Many ecologists, who might be described as pragmatists, have jumped on the weak sustainability bandwagon by developing tools for valuing

1 • Defined as the sum of a country's investments in manufactured capital and natural capital.

ecosystem service flows, without necessarily considering the framework within which these valuations would be used in economics to aid decision-making. Although monetary valuations of ecosystem services provide useful information for making decision-makers aware of the importance of protecting the environment, they have not yet led to a paradigm shift in favour of sustainable development. Strong sustainability also needs ecologists and all the natural sciences to qualify and quantify the integrity and functionality of the environment, at different levels, and to recommend definitions of environmental objectives to be achieved or maintained. Social sciences and humanities must also be called upon to describe other aspects of this boundary object, including the production of legal standards, the adoption and governance of environmental objectives, and the production of biocultural indicators that include values other than those relating to ecosystem functionality. The role of economists here would be limited to providing a framework for transforming this information into indicators that can be compared with other information needed to inform development policies, in the form of a dashboard or an assessment of the costs involved in achieving these objectives, for example.

The need for transdisciplinarity to build strong sustainability pathways

To ensure that the right environmental objectives are defined and adapted to each territory and each development scenario, the strong sustainability approach must not only bring together different scientific disciplines, but also include non-academic stakeholders. The first to be affected are the decision-makers who define development policies and institutionalise them in the form of legal standards. These can be interpreted as shared values that contrast with the sum of individual preferences currently employed in neoclassical economic frameworks. Nor can environmental objectives be defined solely by the natural sciences. This is primarily because these objectives have to be defined at administrative levels (municipalities, regions, states) that do not exactly overlap with the study of ecosystems, but also because of the uncertainty involved in defining these objectives. Some advocate the objective of returning to a state of the environment prior to human intervention (Anthropocene/industrial revolution), while others consider that humans have in fact been changing land use for thousands of years, so an objective based on an environment untouched by human intervention makes no sense. This new research agenda to help define environmental objectives could be based on the Sustainable Development Goals and on scientific frameworks such as planetary limits or the Environmental Sustainability Gap, a conceptual framework that recommends assessing a country's environmental sustainability in terms of achieving good ecological status through the sustainable use of natural resources, the critical load of pollution on ecosystems, biodiversity and human health and well-being.



Approaches to sustainability (based on Wu, 2013):
A) the weak sustainability approach, B) the strong sustainability approach,
C) SDGs prioritised according to sustainability (D)
(Sources A and B: Wu, 2013; sources C and D:
https://www.stockholmresilience.org/research/ research-news/2016-06-14-the-sdgs-wedding-cake.html).

KEY POINTS

Defining sustainable development always poses a problem when it comes to formulating development pathways in concrete terms, at all levels. Strong sustainability, based on the definition of environmental objectives to be achieved as boundary objects, proposes a conceptual framework that enables some economists to embark on a new scientific, transdisciplinary and co-construction-based approach. In its unique position, IRD has begun to lay the foundations for a common understanding of research into sustainability science, by bringing together a community of researchers around Knowledge Communities and by having a strong institutional network.

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