

D3.3 Towards a consensus on measuring transition performances within a Sustainable Human Development paradigm

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Table of contents

1. Introduction	5
2. Context: measurement frameworks and policy consensus	8
3. Theoretical consensus	12
4. Technical consensus	15
4.1 Mapping relevant indicator systems	15
4.2 Monitoring the interactions between dimensions of indicator systems	18
4.3 Methods of aggregation	22
4.4 Statistical sensitivity analysis	24
Case-study of multilevel monitoring system of the 2030 Agenda in Italy	27
5. Recommendations	30
6. Final remarks on the way forward.....	32
References	33

1. Introduction

“Living well and within planetary boundaries” is not simply an academic proposal or the heartfelt wish of climate activists, but also the EU’s long-term vision, outlined in the 7th Environment Action Programme (EAP). A most timely vision, as the negative impacts of transgressing planetary boundaries are alarming, with heat waves, droughts and collapsing ecosystems (IPCC 2023) impacting the wellbeing of human beings and other species across the globe. The political guidelines of the new European Commission reaffirm that “We must and will stay the course on the goals set out in the European Green Deal” (von der Leyen, 2024, p. 8) and uphold the commitment to achieving climate neutrality by 2050.

Many aspects of *living well* are already embedded in European and global monitoring frameworks, starting primarily from the 2030 Agenda for Sustainable Development of the United Nations. The efforts for ensuring social foundations for our societies while respecting planetary boundaries are lagging behind, despite ambitious goals and some clear signs of progress.¹ In this regard, the Sustainable Human Development (SHD)² paradigm represented (UNDP, 1990) and still represents (UNDP, 2022a; Biggeri et al., 2023) an integrated development perspective giving a clear direction to transition processes, embracing the social, economic and ecological dimensions. It can be a timely vision of a *good life for all* that does not cause harm and increase Human Security (UNDP, 2022b). In other words, SHD is also a paradigm to rethink the economy towards wellbeing from the perspective of people’s capabilities to live long/healthy and creative lives and respect planetary boundaries.

Nevertheless, along with an appropriate development vision, there is also a need for a coherent and timely measurement framework that can support the transition process.

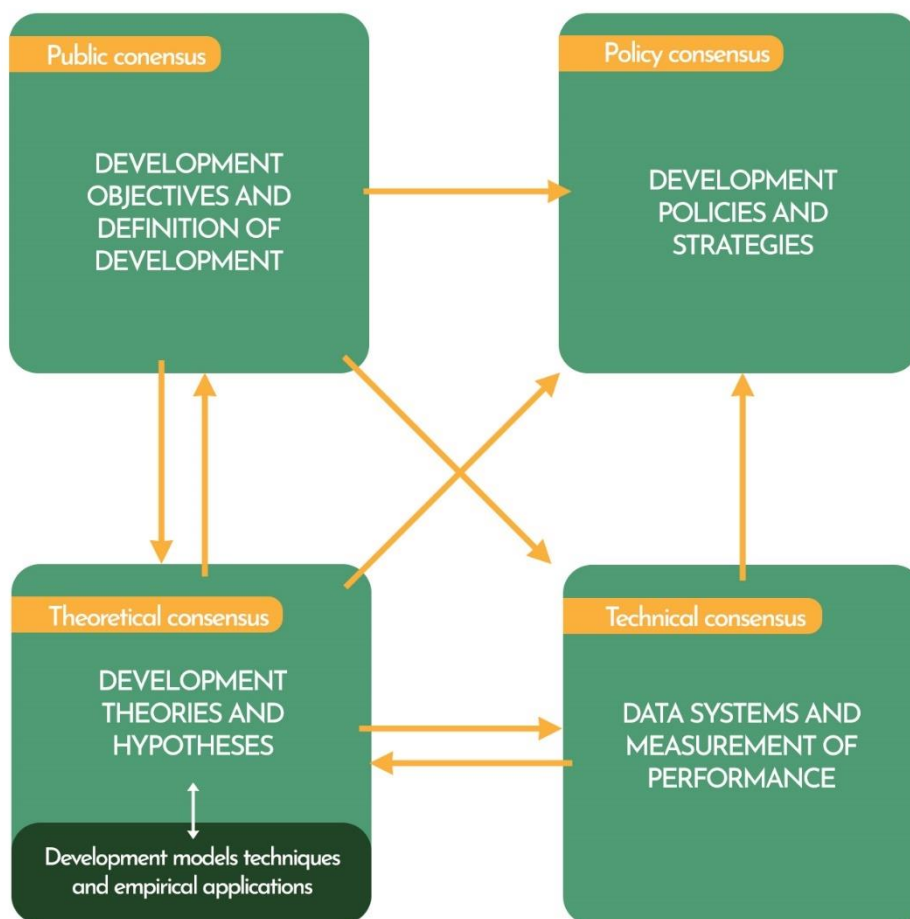
To enhance a SHD vision, the SPES project aims to provide a political economy interpretation of the beyond-GDP movement when measuring development, societal progress and human wellbeing. This interpretation forms the theoretical foundation for developing principles and guidelines for a new measurement system, then the technical elements and choices in the design of appropriate composite indicators and dashboards, as well as the foundation for the following policy measures. At the same time, it highlights that theoretical and technical capacities are a necessary but not sufficient condition for this change of vision, goal and narrative, which is conditioned, if not dictated, by the political will and by the interactions among all societal actors.

This is also illustrated in Figure 1, which - following Thorbecke (2006) - highlights that shifts in the development doctrine are rooted in the key interconnections between the definition and objectives of development, the assessment of development performance, and the formulation and execution of related policies, all of which are shaped by various theories and hypotheses.

¹ See e.g. the Report on the 8th Environment Action Programme Mid-Term Review (2024). Available at: https://environment.ec.europa.eu/publications/documents-mid-term-review-8th-environment-action-programme-eap_en. Last access date: 30th Jan 2025.

² Despite the first Human Development Report does not explicitly use the adjective “sustainable”, it clearly stresses the importance of paying attention to the natural environment. This becomes even more central and explicit across the series of HDRs published over the years (see, for instance, UNDP 2011 and UNDP 2020, among many others). Referring to “Sustainable Human Development” is meant to highlight that sustainability is a core element of the paradigm since its early definition.

Figure 1. Key interrelationships between theory, measurement and policy within the context of development definition and objectives



Source: Authors' elaboration based on Biggeri et al. (2023, p. 7)

This equally applies to the beyond-GDP debate and movement, where four elements – concepts, models, measurement, and policies – need to be integrated to enhance a shared development vision. For this reason, this working paper pays attention to and advances arguments and proposals with regard to four main areas of consensus:

- **Theoretical consensus**, in terms of alignment between different schools of thought that are all contributing to better measure and value what counts for the wellbeing of the people and of the planet.
- **Technical consensus**, in terms of advances and improvements in the technical design of composite indicators and dashboards;

- **Policy consensus**, in terms of effective uptake of a new measurement system by policy actors to make policy-making processes fully embedded into appropriate evidence on development, societal progress and wellbeing.
- **Public consensus**, through engagement and scrutiny of all citizens and all societal actors.

Indeed, given the increasing global push to the beyond-GDP debate and the proliferation of several prominent alternatives, these four consensuses appear essential to foster the alignment among different proposals by developing a clear, coherent and meaningful measurement system. This should involve the constellation of actors active in this process to make sure that a real shared change in the way we measure development, societal progress and human wellbeing is theoretically grounded, technically robust and feasible, and able to influence policy-making processes.

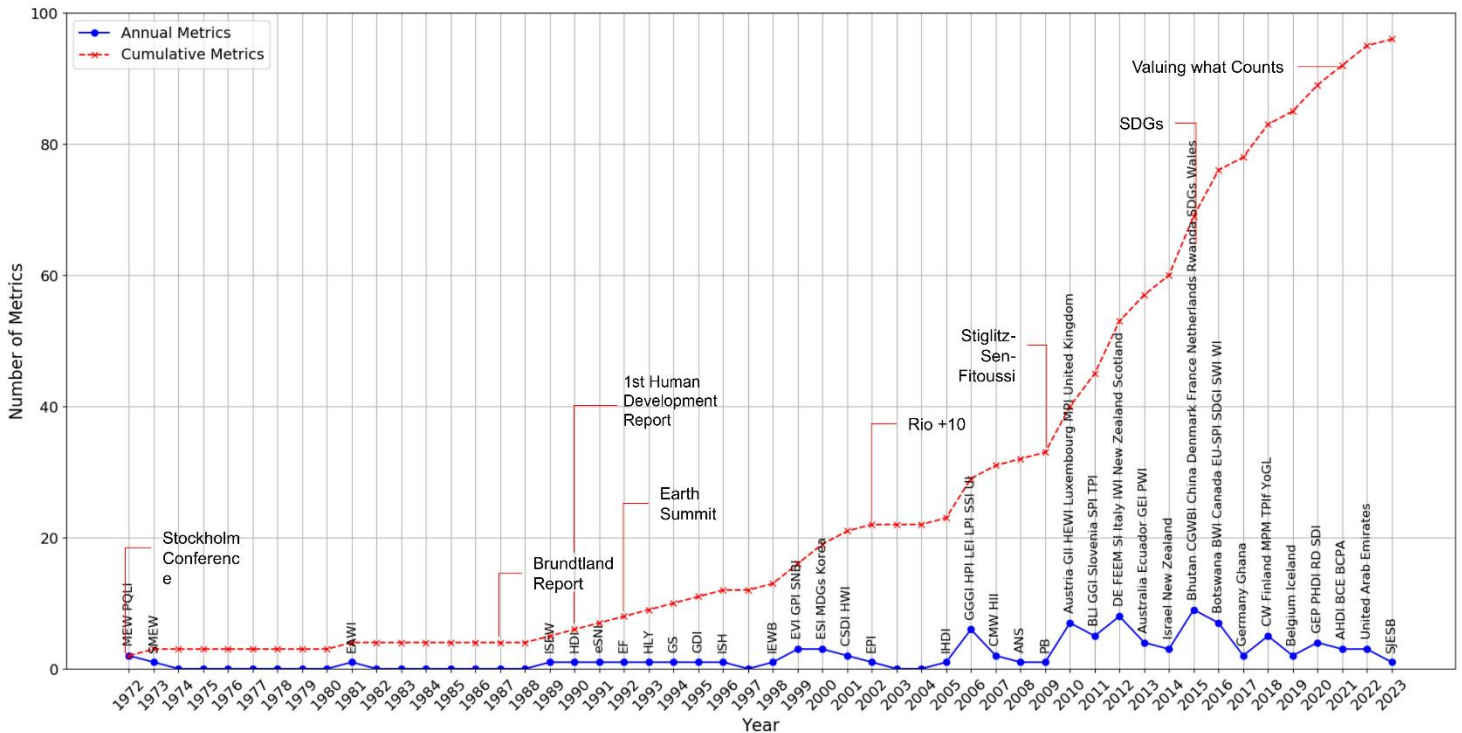
All of the above together may give rise to a virtuous circle supporting the effective consolidation and institutionalization of a new development narrative. In what follows, we provide an overview of the SPES project outcomes structured around the role of the composite indicators in measuring transition performances, building on the increasing convergence in the beyond-GDP debate. In broader terms, our effort here is meant to contribute to a new theoretical, technical, policy and public consensus in the field of Sustainable Human Development. First, we describe the context of measurement frameworks and policies in the field, with a strong emphasis on EU initiatives. Further, we present our proposed theoretical framework (Section 2), and our findings on the measuring transition towards a sustainable human wellbeing and development through composite indicators (Section 3). Finally, we provide recommendations (Section 4) and our thoughts on the way forward (Section 5).

2. Context: measurement frameworks and policy consensus

A number of beyond-GDP measurement frameworks (composite indicators or dashboards of indicators) have been developed during the past 50 years, by global and supranational institutions, international organizations, think tanks, and academic experts (Gábos et al., 2023; Rum et al., 2024). The European Union also supports the development and use of indicators that are as clear and appealing as GDP, but more inclusive of environmental and social aspects of progress. These measurement frameworks include the United Nation’s Human Development Index, the Sustainable Development Goals (SDGs) monitoring framework, the EU SDG indicator set (developed in cooperation with a large number of stakeholders and closely aligned with [the 8th Environment Action Programme](#) and the [European Pillar of Social Rights](#)), the OECD Better Life Initiative, among many other beyond-GDP measurement frameworks. A recent review by Rum et al (2024) shows that there is a clear trend in the increasing number of beyond-GDP indexes and dashboards, with major cumulative metrics reaching almost 100 (see the red line in Figure 2).

Many of the frameworks are based on the conceptual dimensions which are identified by the definition of sustainable development in the Brundtland Report (UN WCED, 1987, p. 24) to “meet the needs of the present without compromising the ability of future generations to meet their needs”. In addition, the report by Rum et al (2024) highlights the increasing prevalence of the Brundtland and Stiglitz-Sen-Fitoussi conceptual framework of wellbeing, inclusion, and sustainability among these measurement frameworks. Here we highlight also the decisive role played by the publication of the first Human Development Report (HDR) by UNDP in 1990 under the lead of the Pakistani economist Mahbub ul Haq and Indian Nobel laureate Amartya Sen, who also contributed to the Stiglitz-Sen-Fitoussi report. Key underlying concepts of the HDR include the capability approach and the basic needs approach, both of which are essential to the Sustainable Human Development paradigm.

Figure 2. Number of beyond-GDP metrics and country initiatives created by year with cumulative counts



Source: Adapted from Rum et al (2024, p. 7.).

Notes: Key events and reports of beyond-GDP development are shown in horizontal labels. Abbreviated metric names are shown in vertical labels.

All together, they contributed to a shift from the generic notion of beyond-GDP toward a more clear societal overarching goal, namely “sustainable and inclusive wellbeing”. In a nutshell, this can be defined as “the wellbeing of all people of current and future generations, and of the planet” (Benczur et al., 2024, p. 7) accounting for multidimensionality, sustainability and leave no one behind principles.

On the same ground, recent and ongoing major initiatives include the following, among others.

- The European Commission’s Internal Working Group on Sustainable and Inclusive Wellbeing.
- A 2025 revision of the System of National Accounts (SNA) will include chapters on wellbeing and sustainability which are defined as current and future wellbeing.³
- On 20-23 September 2024, world leaders convened in New York at the *Summit of the Future of the United Nations* to adopt the [Pact for the Future](#), which will include a [Global Digital Compact](#) and a [Declaration on Future Generations](#) as annexes. The result is expected to be

³ See: <https://unstats.un.org/unsd/nationalaccount/towards2025.asp> Last access date: 30th Jan 2025.

a world – and an international system – that is better prepared to manage the challenges we face now and in the future, for the sake of all humanity and for future generations.

- The UNECE summoned European statisticians to the Seminar on measurement of wellbeing on 8-9 July 2024 in Geneva, where draft chapters of the forthcoming Guidelines on measurement of wellbeing were discussed.⁴
- The United Nations Network of Economic Statisticians (UNNES) has committed to developing a framework for Sustainable and Inclusive Wellbeing using the three dimensions of the Brundtland and Stiglitz-Sen-Fitoussi perspectives.
- More than 70% of OECD countries have developed national frameworks, development plans or surveys with a multidimensional wellbeing focus, with this activity having accelerated in recent years (OECD, 2023). The large majority of national initiatives follow the recommendations of the Commission on the Stiglitz-Sen-Fitoussi Report in opting for a dashboard approach, rather than aggregating across dimensions to create a single composite indicator, although countries such as Luxembourg, Poland and Portugal have opted for a wellbeing index (OECD, 2023).
- The 7th edition of the OECD Forum on Wellbeing took place on 4-6 November 2024 in Rome, Italy. Entitled *Strengthening Wellbeing Approaches for a Changing World*, it emphasised the need to centre people’s wellbeing across all areas of public policy and all forms of societal action to successfully navigate the complex transitions facing today’s economies and societies. The event aimed to advance ongoing efforts to centre policies and collective action on inclusive, sustainable wellbeing.⁵
- The 2023 Strategic Foresight Report has announced stronger efforts by the EC on developing metrics on sustainable and inclusive wellbeing. Such complementary metrics would highlight the contributions of environmental, health, or social policies to people’s wellbeing beyond the traditional economic perspective (Benczur et al., 2024 and 2025). Such efforts include:
 - “Augmented-GDP-type indicators”: One option to develop beyond-GDP metrics consists of assigning monetary values to relevant factors of wellbeing and using these values to “adjust” GDP. These can include different aspects of quality of life (e.g., health, education, and recreation), unpaid care and domestic work, inequalities, costs of environmental damage (e.g., pollution and GHG emissions), or natural resource exhaustion. The results of a pilot, employing life expectancy as a proxy for the health dimension of wellbeing, was presented in the Strategic Foresight Report 2023: [Sustainability and people’s wellbeing at the heart of Europe’s Open Strategy Autonomy](#).
 - “GDP+3 indicator set”: A [preliminary study](#) (European Commission: Directorate-General for Research and Innovation, Charveriat et al., 2024) tested 32 indicators across five scenarios using a mixed methodology and recommended three alternative options. To promote the adoption of the GDP+3 approach, the paper presented policy recommendations as well.

⁴ See:

https://unece.org/info/Statistics/events/386045?_cf_chl_tk=Q0QTevvPRmIFZ1XU0fl1tupZZU9Trd1497xjdcqlV5A-1726770785-0.0.1.1-6036. Last access date: 30th Sept 2024.

⁵ See: <https://www.oecd.org/en/networks/oecd-world-forums-on-well-being.html>

- “Dashboard approach”: The [8th Environment Action Program](#) entered into force on 2 May 2022, as the EU’s legally agreed common agenda for environment policy until 2030. [Article 3 of the action programme](#) includes the “developing a summary beyond-GDP dashboard”. Along these lines, the JRC Report “[Measuring sustainable and inclusive wellbeing: a multidimensional dashboard approach](#)” (Benczur et al., 2025) develops a multidimensional dashboard, which integrates existing tools and frameworks into a set of 50 indicators that provide a holistic view of the wellbeing of people and the planet.
- Since the autumn of 2024 an updated and relocated version of the European Commission's beyond-GDP webpage: The “sustainable and inclusive wellbeing” EU initiative supports the development and use of indicators that aim to go beyond-GDP, including environmental and social aspects of prosperity, focusing on the wellbeing of all people and the planet: https://joint-research-centre.ec.europa.eu/scientific-activities-z/beyond-gdp-delivering-sustainable-and-inclusive-wellbeing_en
- Various Horizon Europe funded sister projects (SPES, ToBE, WISE Horizons, WISER and the Coordination and Support Action project MERGE) are developing metrics for sustainable and inclusive wellbeing in order to replace or augment the dominant GDP indicator (see e.g. Rum et al., 2024, Hirvilammi et al., 2024). SPES is committed to composite indicators as the most effective tools to measure transition performances.

Wellbeing frameworks simultaneously emphasize broad, granular, and long-term analysis of policy priorities and options that respond directly to people’s needs across a range of life areas. They typically also support ways of working that transcend policy silos through increased collaboration, coordination, iteration, and transparency (Fioramonti et al., 2022).

While the work within the European Commission relies more on dashboards to monitor progress (e.g. the new Social Scoreboard), the research on composite indicators within the SPES project is crucial to explore alternative ways to go beyond-GDP in measuring SHD. Dashboards (such as e.g. the monitoring framework of SDGs with a set of 102 indicators) are useful for experts and analysts to monitor specific details, but the development of a few headline indicators is essential for policy-makers.

While we need data to understand what happened, as well as for the granular assessment of the impact of policies, we also need forecasting models to anticipate what is going to happen. This is key for societal and economic resilience, and for an adequate adaptation of our societies to ecological and social crises.

3. Theoretical consensus

The complexity, uncertainty and urgency of current times, due to multiple concomitant societal challenges and crises in human, environmental, economic and political domains, urge for a definitive push towards a more appropriate and integrated system to measure development, societal progress and human wellbeing.

Indeed, measurement frameworks, metrics and accounts have two roles: i) to monitor progress, and ii) to set policy targets which then become part of a political evaluation process.

Over the past decades, strong evidence has contributed to the widely diffused awareness that economic growth, despite being an important driver in improving wellbeing, is not automatically equivalent to Sustainable Human Development. It is clear that there is an increasing gap between GDP and wellbeing – as focusing on GDP on its own does not automatically deliver an expansion of opportunities for all – and a minimal association between GDP growth and life satisfaction across countries (happiness paradox) (Sen, 1999; Easterlin, 1974, 2001; Hoekstra et al., 2024). Moreover, increases in GDP may often mask (or be associated with) increases in multidimensional inequality, resource depletion and pollution (UNDP, 2020; Kallis et al., 2025).

Therefore, such a long-lasting debate since the late '60s has been contributing with theoretical insights and evidence to acknowledging the shortcomings of GDP as the unique measure of progress, and more recently highlighting the need to incorporate other wellbeing and sustainability dimensions.

In other words, today it is detrimental to finding appropriate, feasible and reliable measurement solutions to truly inform decision-making processes towards a better future for all.

In line with these arguments and within this debate, several prominent initiatives and proposals to go beyond-GDP have emerged, being generated by different theoretical approaches / perspectives, which led to consolidated schools of thought in the literature. Using a metaphor, these may appear like several “water springs” with specific distinguished features (i.e., theories) as sources of “streams” (i.e., schools of thought) which have found their own course within the wider debate.

Most of them have been very prominent and capable not simply of influencing the general discussion, but also of shaping policy-making processes and concrete initiatives. Let's think for instance of the capability approach (Sen, 1999) as a “spring” generating a new and multidimensional vision of wellbeing as well as the human development paradigm (UNDP, 1990)⁶ and consequently the definition, diffusion and policy use of the Human Development Index as a metric⁷. Similarly, ecological economics (Costanza and Daly, 1987) represents a “spring” generating the stream of wellbeing economy (OECD, 2019), incorporating the natural environment in several wellbeing measures. Several other examples include the human rights-based approach (Uvin, 2007) capable of influencing global actions (UNDG, 2003), the doughnut economics (Raworth, 2017) and its underlining theory on planetary boundaries and social needs (Rockström et al., 2009), happiness

⁶ This was generated together with the basic needs approach by the UNDP HDRO as mentioned before.

⁷ Exactly to go beyond-GDP metrics, indeed the HDR was downloaded more than the World Development Report of the World Bank (Klugman and Rodriguez, 2011).

studies (Helliwell et al., 2021) shaping happiness economics, and the integrated notion of sustainability (Sachs, 2015) as the “spring” for the 2030 Agenda for Sustainable Development (UN, 2015), among others. It appears crucial to acknowledge that these “streams”, despite originating from different “springs”, have been and are still today contributing together to the common purpose of overcoming GDP, paving the way for the design and adoption of new measurement systems across the world to better account for levels, processes and performances of development, progress and wellbeing. Taken together, they have not simply shown the shortcomings of GDP and produced alternative measures, but more profoundly demonstrated that the actual mainstream frameworks, metrics and accounts are not really meant and able to value what counts in terms of wellbeing of the people and of the planet, unveiling the illusion (and somehow “pollution”, to continue using the water metaphor) in the use of GDP as a measure of progress. Similarly, they all contribute to the rapidly advancing field of post-growth research to replace the goal of increasing GDP with the goal of improving human wellbeing within planetary boundaries (Kallis et al., 2025).

However, all these alternatives separately have not yet achieved a prominent, fully conventional and, above all, embedded role in policy and public debate. GDP is still used as a valid indicator of economic growth and is the main objective of economic policies. This is also because a large, heterogeneous and somehow confusing proliferation of alternative indicators leads policy-makers to rely on GDP as the most convenient measure of development, despite its drawbacks and ambiguities. Along with opposition by mainstream economists and institutions, going beyond-GDP has been an uphill road also given the initial difficulties in bridging between these alternatives.

Therefore, we may argue that all these relevant “springs” and “streams” are equally able to contribute and push for a new development vision from different perspectives, but this cannot be argued for and proposed separately by each of them. It is time for a stronger consensus among all of them to be really capable of dethroning GDP⁸ to measure what counts. In other words, these “streams” must finally dialogue and join forces to generate a “river” thanks to their underlying common features - i.e., multidimensionality of wellbeing of all people and of the planet, now and in the future - to be incorporated into a new integrated measurement system.

Such a theoretical consensus must build on a broad global alliance among the most relevant international organisations and supranational institutions, including the UN, the OECD, World Bank and IMF, the European Union (but also other regional bodies, like the African Union, ASEAN and UNASUR) and the top experts, to coordinate convergence efforts and make the final decisive step to go beyond-GDP. Indeed, as academia and institutions increasingly seek alignment, akin to the historical evolution of GDP measurement, consensus on broader frameworks, metrics and accounts becomes imperative. However, beyond simply agreeing on measurement issues, it calls for envisioning the new world we aspire to. Overcoming the addiction to GDP requires a collective commitment to broader wellbeing and sustainability. A shared theoretical consensus can facilitate dialogue, standardisation, and mutual learning, fostering a coherent and meaningful approach to measuring societal progress and paving the way for its mainstreaming and uptake at all levels.

Consensus is here conceived in a very inclusive and participatory way. It means allowing all “streams” carrying their own specific contribution (i.e., their own “water flow”), based on the specificities of their theory (i.e., the “spring”), to a common vision (i.e., the “river”). This does not

⁸ This has been a long process since Seers’ early voice calling the ‘dethronement of GNP’ and its growth, and for paying attention to poverty, basic needs, unemployment and income distribution (Seers, 1969).

imply diluting and losing their distinguishing features, as they would be found in the water quality of the “river”. Moreover, building a consensus is meant as a way to welcome and accept different schools of thought and share a joint process for a common objective and narrative.

Building such a consensus and recognising in the “river” the capacity to include different “streams” with their own features implies focusing the attention not anymore on what differentiates each original approach, perspective and school of thought (as most often done for the sake of its own merit and contribution), but rather looking for what unites them. This appears much simpler and more valuable than expected, especially when looking at what ties together several international initiatives at UN level (e.g., the SDG measurement framework, the “Valuing what counts” initiative, the System of National Accounts 2025, the UN Network of Economic Statisticians, the Human Development Reports), at OECD level (e.g., the WISE centre and Better Life Index, the Task Force for Measuring Wellbeing), and at the EU level (e.g., the Interservice Working Group on Sustainable and Inclusive Wellbeing, the Regulation on System of Environmental and Economic Accounts, the Transformation Performance Index, the Resilience Dashboard, the GDP +3 initiative, the beyond-GDP “sister projects” funded by Horizon Europe - SPES, ToBe, WISE Horizons, WISER, MERGE and MAPS).

Taken together, all these initiatives (along with many others), share a common attention to sustainable and inclusive wellbeing of the people and of the planet, which only in a common “river” can become able to consolidate and mainstream a new measurement system (in terms of framework, metrics and accounts) valid at international level. Here, it is important to remark that relevant “springs” and “streams” must be carefully selected for the sake of consistency to the vision, as well as to stress again that the original input of each perspective would not be lost or diluted. For instance, it would remain apparent the contribution of the human development paradigm in terms of attention to human capabilities (and more recently also in terms of human security); the contribution of the human rights-based approach in terms of attention to international human rights standards; the contribution of the doughnut model in terms of simultaneous attention to planetary boundaries and social foundations; the contribution of wellbeing economy in terms of attention to the multidimensionality of wellbeing; and so on and so forth. However, what is new in a “river” composed by all these “streams” is the capacity to make all the land it passes through fertile thanks to “clean” water characterised by such high-quality components. In other words, to influence all policy-making processes with a holistic and integrated perspective on dimensions concerning people, planet, prosperity, peace and politics.

To conclude, the metaphor of “water springs”, “streams” and the “river” allows us to better explain the idea that achieving a theoretical consensus is today fundamental to merge together different approaches and perspectives in a broad global alliance, in order to definitively design a more appropriate and integrated system to measure development, societal progress and human wellbeing. Obviously, all this process would make sense only if later incorporated in policymaking mechanisms and design of relevant strategies, initiatives and actions by all societal actors belonging to the government, business, academia, civil society and natural environment, as for the Quintuple Helix model embraced by the SPES framework (Biggeri et al., 2023). Only the collective use of water from this “river” would mark a real difference for the future of humanity and nature.

Nevertheless, consolidating a technical infrastructure in terms of composite indicators and dashboards is equally necessary, calling for a similar technical consensus.

4. Technical consensus

In this section, we aim to discuss the role of composite indicators in advancing the measurement of the transition towards Sustainable Human Development and sustainable and inclusive wellbeing. Composite Indicators (CIs) are synthetic measures designed to summarize progress across complex, multidimensional processes, such as sustainability transitions. Sustainability-related CIs are commonly used to measure progress on the SDGs and often span five main areas of action of the 2030 Agenda for Sustainable Development: Planet, Prosperity, People, Partnership, and Peace (i.e., the 5Ps). Their proliferation has been fuelled by their ease of construction, communicability, and comparability across countries or entities.

Specifically, we will explore both the positive and negative aspects of their use, including mapping relevant composite indicators based on multidimensional dashboards, the monitoring of interactions between dimensions within these indicator systems, methods of aggregation and statistical sensitivity analysis. The Section also includes a case study of a multilevel monitoring system applied to the 2030 Agenda in Italy.

4.1 Mapping relevant indicator systems

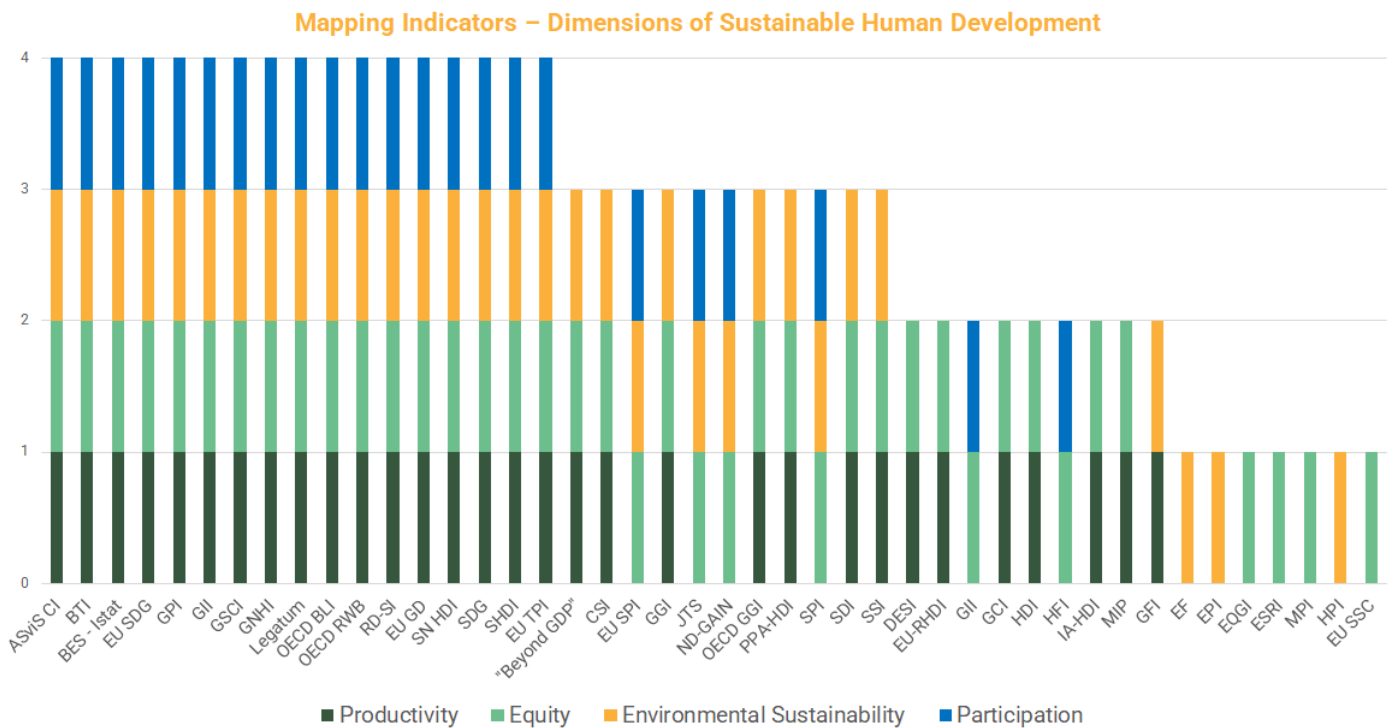
SPES project has been mapping the most relevant indicator frameworks, showing that the beyond-GDP debate is in full swing and has produced several alternative indices (Gábos et al., 2023). As the first step, we completed a mapping and assessment exercise of 44 available indicator sets and composite indicators that are widely used to measure transition performances and wellbeing in Europe and across the world.⁹ We selected them based on their relevance in policy-making and scientific research (Biggeri and Mauro, 2018; Biggeri et al., 2019; Gábos et al., 2021; European Commission, 2023).

The selection included long-standing well-known indices by international organisations, NGOs, and academics (Human Development Index, Happy Planet Index, Genuine Progress Indicator), as well as novel indicators ("Beyond GDP" Sustainable Development Index). For the assessment, we used 4 pillars of SHD (productivity, equity, environmental sustainability, participation & empowerment) as benchmark criteria (as the 5th pillar of human security was added to SHD after the start of our work). Overall, we found that only 11 out of 44 indicators cover all four pillars of SHD (see Figure 3 below). We also collected information on the objective of each indicator system, their practical use,

⁹ See Rum et al (2024) elaborated within the MERGE project for another review of the 90 most important beyond-GDP metrics, as well as the [Composite Indicators and Scoreboards Explorer](#) developed by the Joint Research Centre of the European Commission. Nevertheless, it should be reminded that that proposals of new metrics and composite indicators continue to appear in the academic and policy debate, contributing to advance the debate but also to increase the heterogeneity of methodology and terminology.

theoretical framework, unit of analysis (e.g., country, region), SDGs link, sources of data, data year(s), countries selected, as well as the time and country comparability.

Figure 3: Mapping indicators in terms of SHD dimensions



Source: Authors' elaborations based on Gabos et al. (2023)

As the second step, we assessed 44 indicator systems and compiled a shortlist of 15, as listed below. We selected indicators based on their alignment with the SHD framework, the strength of their theoretical foundation, and their relevance for policy-making. We also considered the credibility of the institutions behind them, the transparency of their data sources, and their time and geographical coverage. Additionally, we also assessed whether they included regional data and whether they had been reviewed by the EU Joint Research Centre (for technical details, see: Gábos et al., 2023). All the selected frameworks are composite indices based on either a restricted or a large dashboard.

1. ASviS Composite Index
2. "Beyond GDP" Sustainable Development Index
3. Competitive Sustainability Index
4. Genuine Progress Indicator
5. Green Growth Index
6. Just Transition Score
7. Legatum Prosperity Index

8. OECD Better Life Index
9. Planetary Pressure-adjusted Human Development Index
10. Social Progress Index
11. Sustainable Development Goals Index and Dashboards
12. Sustainable Development Index
13. Sustainable Human Development Index
14. Sustainable Society Index
15. Transitions Performance Index

A more in-depth analytical assessment of the specific indicators and data infrastructure of these indicator systems followed. This involved a thorough examination of the indicator systems by compiling a detailed list of the individual indicators underlying the 15 composite measures, including information on each indicator's data source and type. Subsequently, we carried out a methodological assessment of the 15 composite indicators.

Our analysis revealed significant variations in how national income and economic growth – a highly contested issue – are addressed across the indicators. We also noticed that the underlying concepts and the applied methodologies may lead to rather diverse outcomes.

Three of the short-listed composite indicators build upon the Human Development Index (HDI). They expand on its original three components - standard of living, health and education - by introducing additional dimensions and adjustments.

1. *Planetary Pressure-adjusted HDI (PHDI)*: Adds an ecological/environmental dimension to the original HDI components (UNDP, 2022a).
2. *Sustainable Human Development Index (SHDI)*: Incorporates environment and freedom dimensions (Biggeri and Mauro, 2018).
3. *Sustainable Development Index (SDI)*: Incorporates ecological efficiency based on planetary boundaries and includes an income sufficiency threshold of \$20,000¹⁰. It challenges the notion that high national incomes are essential for human development, arguing instead that they are often incompatible with keeping ecological impact at sustainable levels (Hickel, 2020).

Interestingly, differences in underlying concepts and methodologies can produce rather diverse outcomes. For example, while the Planetary Pressure-adjusted HDI and the Sustainable Human Development Index show a strong correlation with national income, the Sustainable Development Index exhibits a negative correlation. The latter creates a rather different global ranking compared to the others as it *prioritises countries that achieve wellbeing at low ecological cost*, often ranking *some* Global South countries (e.g. Costa Rica, Sri Lanka, India) higher than affluent nations (USA, Germany, Japan).¹¹

¹⁰ It is thus much lower than the HDI's maximum value of \$75,000 (2017\$ PPP) for GNI.

¹¹ See: <https://www.sustainabledevelopmentindex.org/time-series>

Economic growth, a highly contested issue in our conceptual framework, is approached in markedly different ways. In most cases, productivity - typically measured by GDP or GNI - is incorporated into composite indicators alongside other dimensions and indicators. This is evident in indices derived from the HDI, the two main scenarios of the Beyond GDP Sustainable Development Index, Competitive Sustainability Index, the OECD Better Life Index, and the Social Progress Index (Stern et al., 2022, OECD, 2022, Social Progress Imperative, 2022).

In contrast, the Just Transition Score excludes GDP and similar indicators entirely, as its primary focus is on measuring the carbon efficiency of the social progress of each country. Other indices, such as the Genuine Progress Indicator, take an alternative approach by adjusting GDP to account for environmental and social externalities, incorporating both their costs and benefits.

Overall, our analysis (Gábos et al., 2023) employed SHD as a conceptual benchmark and found a growing number of increasingly complex metrics for measuring transition outcomes. The diversity in underlying concepts and methodologies across these initiatives can lead to divergent results, including varying assessments of a Member State's position concerning SHD. This variability complicates the interpretation of a country's standing and progress over time. Moreover, most composite indicators face significant limitations, particularly regarding data timeliness, availability, and territorial coverage.

4.2 Monitoring the interactions between dimensions of indicator systems

Despite their utility, the widespread use of CIs raises questions about their statistical relationships and their capacity to capture the complex systemic processes of sustainability transitions. Some may even argue that the abundance of sustainability-related CIs might confuse rather than clarify the progress needed toward sustainable practices. As part of the SPES project, Combarrous et al. (2025) examine the challenges and potential benefits of this multiplicity of sustainability-related CIs and outline how they can better support sustainability transitions if their statistical connections are effectively leveraged. Two main challenges are highlighted, the first pertaining to comprehensiveness and the second to relatedness.

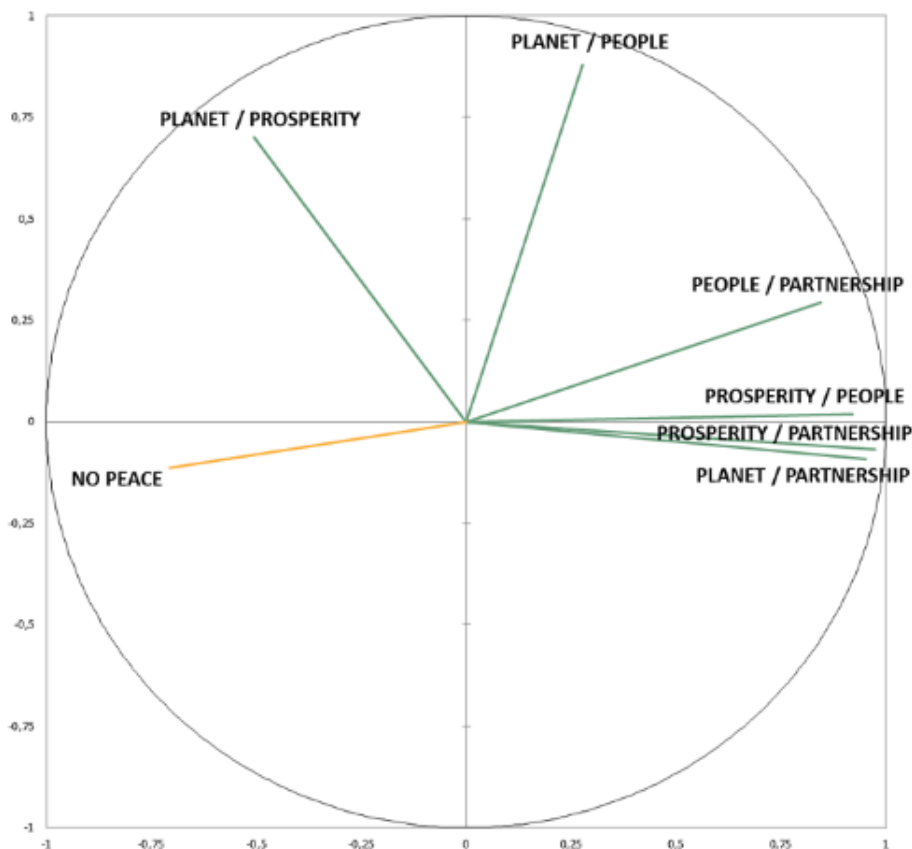
First, the diverse range of CIs reflects the multidimensional nature of sustainability and varying visions of what transitioning to sustainable development entails. However, CIs may not consistently define or measure the same aspects of sustainability or all the aspects of transitions. Users may therefore have to struggle to discern which part of the sustainability transition each particular CI addresses, and if different CIs are substitutes offering redundant information or complementary tools that collectively offer a fuller picture of sustainability. The recent systematic review of 44 sustainability-related CIs by Gábos et al (2023) shows that almost all fail to comprehensively cover all five pillars of SHD, only 26% of them encompass four of the five pillars, and 48% address fewer than three pillars. Even among the most robust sustainability-related CIs, significant imbalances exist in how dimensions are represented. Most indicators emphasise certain aspects – such as economic and social dimensions – while neglecting others, like environmental or governance-related issues. Statistical analysis of correlations among a shortlist of 15 sustainability-related CIs further highlights these disparities. Only half of the linear and rank correlations between the these CIs were positive and significant. While a small cluster of three SCIs (e.g., Social Progress Index,

Legatum Prosperity Index, and Competitive Sustainability Index) was strongly correlated, others exhibited considerable divergence in their focal areas.

Second, CIs are designed to provide summary measures by aggregating data from multiple dimensions. However, this process often obscures critical trade-offs, synergies, and independent interactions among sustainability dimensions. For instance, trade-offs occur when improvements in one dimension (e.g., economic growth) result in setbacks in another (e.g., environmental health). Synergies arise when progress in one dimension supports advancements in others. Independence or decoupling reflects dimensions that progress without influencing each other. By construction, the overall score is the result of all these interactions. Yet, its aggregate nature creates a "black box" effect making it challenging to discern how different dimensions interplay. To better understand how CIs capture the related nature of sustainability, the SPES study conducted by Combarrous et al (2025) chose to analyse six sustainability-related CIs selected for their capacity to measure all six possible interfaces between the four primary SDG pillars (Planet, Prosperity, People, and Partnership). Principal Component Analysis (PCA) was applied to detect trade-offs, synergies, and independence across two datasets: a global sample of 168 countries and a subset of the 27 European Union (EU27) countries.

First and foremost, the global analysis conducted on the largest sample of countries shows only synergies (and no trade-off) between the six one-to-one interfaces covering the five pillars of just sustainability transitions (Figure 4).

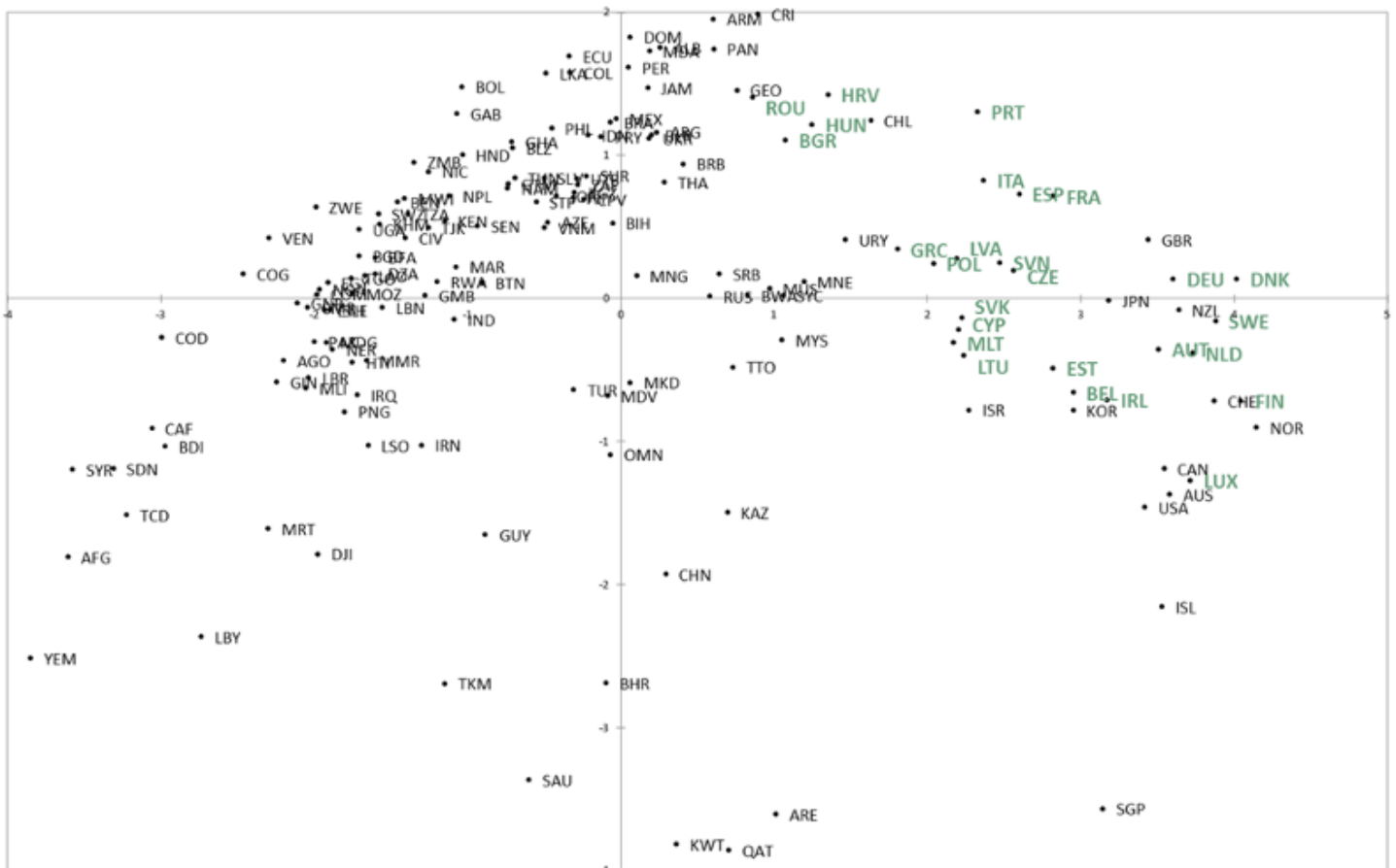
Figure 4. Correlation circle of the first 2 components of PCA – Global sample



Source: Combarrous et al. (2025)

The positive correlations captured by the first factor showcase that the sample countries find strong synergies between all the possible interfaces encompassing the 3 pillars of People, Prosperity and Partnership. The first factor is thus labelled “Inclusive Economic & Human Development” (IEHD). Noteworthy, these synergies also deliver strong attainments in terms of human security (Peace) and of the ‘Planet-Partnership’ interface, which has a strong focus on adaptation to climate change in its measurement and it is therefore positively correlated with economic development level. Next, the second factor captures the synergy between ‘Planet-Prosperity’ and ‘Planet-People’ and therefore captures heterogeneity in Social and Environmental Sustainability (SES) achievements. These two findings suggest that attainments in SES are decoupled from all the others (notably in IEHD) when the analysis covers the whole diversity of countries.

Figure 5. Scatter plot of countries on the first 2 components of PCA in 2020



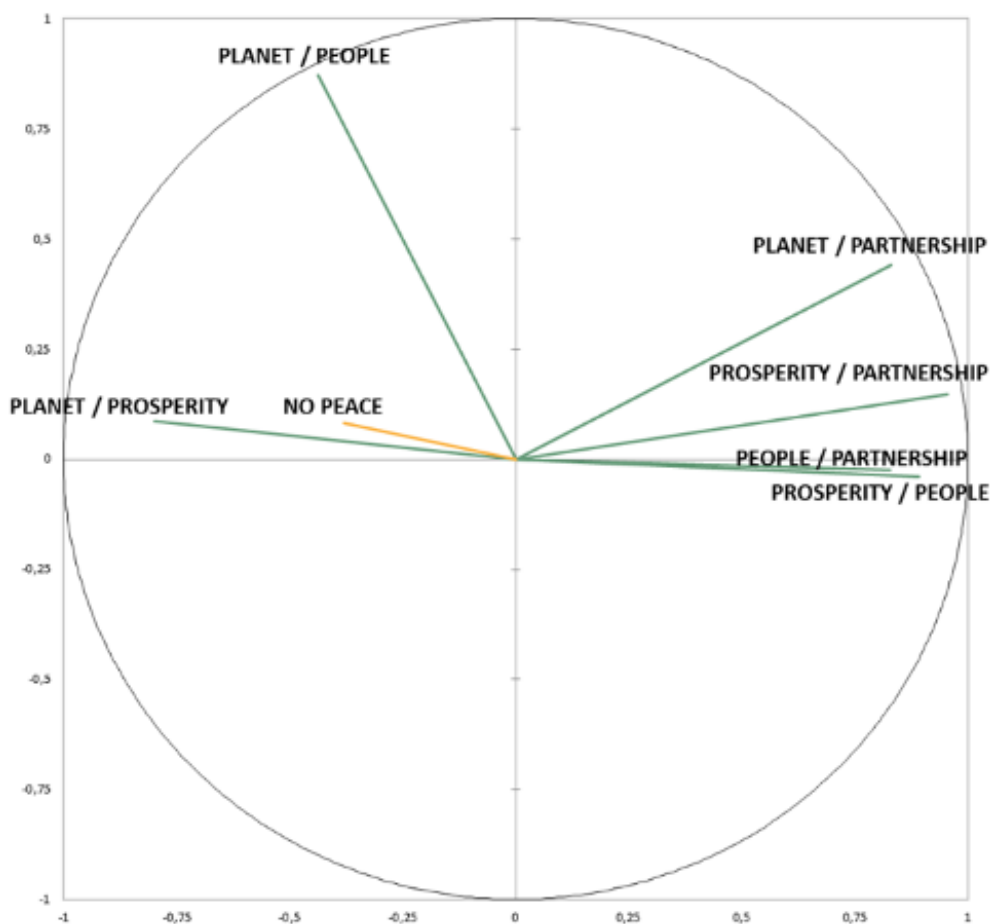
Source: Combarnous et al. (2025)

Note: EU27 countries are shown in bold green characters.

Interesting contrasts nonetheless materialise when looking at how individual countries map onto these two factors (Figure 5). For countries that are the least advanced in the process of transition

(which also happens to be the poorest in terms of GDP per capita in the sample), a good performance in IEHD indeed tends to combine with a better performance in SES. For these countries, the apparent absence of trade-off might thus facilitate further progress along their transition path. On the contrary, for the countries already advanced in their transition (which also happen to be the richest), better performance on IEHD seems to have been traded against setbacks in SES. Therefore, it seems that these economies might no longer be able to progress in one dimension without harming the other. Finally, there is a real decoupling for middle-income countries where average levels of IEHD achievement combine with extremely variable levels of SES.

Figure 6. Correlation circle of the first 2 components of PCA – EU27 countries



Source: Combarrous et al. (2025)

The PCA conducted on the sample restricted to EU-27 countries exhibits patterns that are convergent with the global sample across the board (Figure 6), but for a crucial trade-off that only shows up in the former sample. Indeed, in the EU-27, the synergetic cluster of IEHD dimensions emphasizing wealth, social justice, and democracy is clearly negatively correlated with dimensions tied to environmental sustainability (SES) (consistently with what was pointed out above for the

group of countries the most advanced in their transition). Mapping EU member states on the two factors nonetheless show three different clusters with relative internal similarity, the Northern European countries standing in the North-East quadrant, the Mediterranean European countries at the top of the graph, and the Eastern-European countries on the left-hand side of the graph. These positions could be a sign of different transition trajectories at work across the continent. However, when widening the focus of observation by including major emerging countries and candidates for EU membership countries in the analysis, the EU-27 remains a very homogeneous group in terms of the multidimensional phenomena considered.

These findings highlight the importance of monitoring the interactions between dimensions to avoid fragmented or counterproductive strategies or to adapt very comprehensive strategies to different contexts of interactions.

4.3 Methods of aggregation

Composite indicators (CIs) are valuable for summarizing complex social phenomena, but their construction is not arbitrary. Multidimensional indicators can have undesirable properties and produce misleading results (OECD and JRC, 2008; Costanza et al., 2004; Ravallion, 2012; Kubiszewski et al., 2013). Key considerations when constructing aggregate indicators include concept definition, variable selection, normalization, and aggregation procedures.

To guide this process, several researchers and institutions developed guidelines to create reliable composite indicators, discussing several methods for constructing these indicators (OECD and JRC, 2008; Cherchye, 2007, European Commission, 2008; Mazziotta and Pareto, 2013). Although these contributions agree on the substantive importance of the theoretical framework, including the definition of the phenomenon and the selection of the relevant indicators, here we focus on the statistical methodological side.

Chronologically, once the conceptualization of the measure has been set and the key variables selected, the steps followed when building composite indicators continue with the normalization, which is fundamental to compare variables of different natures such as air pollution or the gender wage gap. Choosing the appropriate normalization method requires careful consideration (Ebert and Welsch, 2004), with the min-max re-scaling being the most popular approach. This transformation requires a minimum and maximum value, defined either empirically (based on the smallest and biggest values within the sample of countries or regions under study) or theoretically (setting a fixed theoretical threshold). We suggest that the former option has a major drawback because the normalization is sample-dependent. Indeed, just by including or excluding “good” or “bad” performance countries we run the risk of altering the reference thresholds, and hence the final scores. This sample dependence also hampers comparisons across time, as the thresholds may vary depending on the years we study. The longer the period of time considered, the larger the possibility of changes in the components. Moreover, these maximum and minimum values do not correspond to (un)desired goals or marks, so researchers cannot evaluate how good/bad a country is doing in terms of a specific target.

Although the theoretical thresholds, which - if verified with data - are more reliable and stable, avoid this dependence and the min-max may refer to a given target, this method is not free from problems as the reference values may be too broad or narrow. In the first case, if the thresholds are far above

or below the country's values, the normalized values will be very compressed around a middle point, thus hindering a straight comparison or ranking. On the other hand, if the threshold values are too narrow, many countries will perform better or worse than the proposed thresholds, thus receiving the highest or lowest score, respectively. In such a case, reliable country comparisons and the construction of the indicator may be compromised. A desirable practice would consist of setting theoretical thresholds that are updated with some regularity, such that the majority of countries considered have their value ranging across the possible values.

Regarding the aggregation process, there are two key elements, namely the aggregation function and the weights. Most composite indicators use standard aggregation techniques, based on arithmetic or geometric averages of the normalized values. Choosing one or another approach is not trivial. The arithmetic mean assumes perfect "substitution" across dimensions. It implicitly compensates between components, so that worse scores in a given variable can be compensated with a better performance in another dimension, masking the negative outcomes. The geometric mean does not allow for substitutability, but it assumes complementarity among components. This reflects a preference for balanced development in which progress is made together in all components, and it penalizes countries with high scores in a few dimensions but poor results in the others. Moreover, multiplying components assigns a higher implicit weight to lower values, which highlights the bad effect of cumulative "deprivations" when there are multiple components with bad scores. Finally, note that the geometric mean requires all components to have positive values and that it collapses to zero when one or more dimensions is close to zero.

From the lesson learned by Alkire and Foster's Multidimensional Poverty Index (MPI) and the Dual Cutoffs Approach, there are two main messages: the relevance of multidimensionality compared to unidimensionality and identification (of cutoffs) before aggregation. The first regards avoiding the loss of information related to a specific dimension, in line with the capability approach perspective. The second aspect, the dual cutoff approach, emphasizes the importance of identification before aggregation. Aggregating dimensional achievements prematurely allows for substituting one dimension for another, thereby overlooking the specific cutoffs that signify the distinct value of each dimension, particularly in the absence of a clear identification of deprivation. Since each dimension is inherently valuable and its deprivation undesirable, proper identification ensures that the distinct importance of each dimension is recognized and preserved in the analysis (Alkire et al., 2015).

Recent developments offer alternatives to relax the substitutability and complementarity surrounding composite indicators. Mazziotta and Pareto (2020) propose estimating an interval of potential values of the index (i.e. 'performance interval'), which is constructed to allow for different levels of compensability of individual components. This makes it possible to avoid an arbitrary choice of the aggregation function while offering an inferential estimate of the index. From a different perspective, Biggeri, Bortolotti, and Mauro (2021) propose the Multidimensional Synthesis Indicator (MSI) where compensation across dimensions varies in accordance with individual (as a unit of the analysis) characteristics. Mauro, Biggeri, and Maggino's (2018) approach to synthesising and analysing multidimensional poverty and wellbeing indicators is rooted in the capability approach and SHD paradigm. It emphasises sensitivity, continuity, flexibility in dimension substitution, and clear interpretability, achieved through a transparent process aligned with Amartya Sen's call for public scrutiny and reason. Then, by linking substitutability between dimensions to individual wellbeing, address the 'inescapable arbitrariness' critique raised by Anand and Sen (1997).

Similarly, Trani, Biggeri, and Mauro (2013) highlight the importance of using the individual as the unit of analysis, enabling the identification of spatial deprivation patterns within vulnerable groups. Instead of offering just an aggregation method, this approach provides a framework for identifying

child poverty (Note: their analysis finds that younger children, particularly girls and children with disabilities in rural Afghanistan, are among the most deprived). Together, these approaches reduce arbitrariness in substitutability, as critiqued by Anand and Sen (1997), and lower the risk of the geometric mean collapsing to zero, supporting more effective measurements of wellbeing and sustainable transition performances.

Weights assign a different level of importance to the indicators' components. When weights are not included, the indicators assume equal weights, which does not imply "no weights", but rather assumes that all components are equally important (implicit weighting, see OECD and JRC, 2008). Nevertheless, when the components are grouped into different dimensions and then further aggregated into the composite indicator, equal weighting may become unequal, as dimensions capturing a larger number of components will implicitly receive a higher weight (i.e. explicit weighting). Employing equal weights may also risk double counting when two or more collinear components are aggregated without adjusting their weights for this effect, resulting in an indicator receiving a higher weight than intended (Freudenberg, 2003; Greco et al., 2019). Indeed, equal weighting disregards implicit effects arising from mutual dependence across variables in the indicator structure. The relevance of the weighting schemes is addressed in detail in Becker et al (2017), who provide a series of tools for a detailed analysis of the importance of weights assigned to the index component.

4.4 Statistical sensitivity analysis

Given the above-mentioned details and their capacity to shape results, assessing the performance of the indicators is crucial (for a recent contribution to post-evaluation methods see Greco et al., 2019). The quality and robustness of composite indicators have also been addressed by institutions such as the European Commission's Competence Centre on Composite Indicators and Scoreboards (COIN). Indeed, the JRC has recently published a set of detailed reports for auditing various indicators (Papadimitriou et al., 2019; European Commission, 2022).

Following this strand of the literature, we have assessed measurement challenges and sensitivity in transition performance indicators (Palencia-Esteban et al., 2024). After formally discussing their construction and data requirements, we provide statistical robustness analyses for five indicators selected in Gábos et al (2023): the Planetary Pressure Adjusted Human Development Index (PHDI), the Transition Performance Index (TPI), the Better Life Index (BLI), the Green Growth Index (GGI), and the Sustainable Development Goals (SDG). Focusing on Europe (2019), we simulate the sensitivity of each indicator to changes in their components. This partial analysis allows us to measure the relative change in the composite indicator after increasing each single component by 2% for each country. A set of robustness checks relaxes some assumptions in the simulation exercise and reinforces the reliability of the results.

We find indicators rather insensitive to changes in most components and quite robust to perturbations in the data. This finding has two readings. On the one hand, it seems beneficial, because it ensures that the scores are stable and robust to measurement errors or punctual variations in some of its components. On the other hand, the main driver behind this insensitivity is found to be the country's relative position within the component range of variation and their dispersion around the mean value. The sensitivity is higher when the component values are very clustered around the mean, hence presenting a low relative dispersion. In these cases, small

changes in the component's values are associated with big changes in the country's relative position within the total distribution, so the effect on the indicator is larger. If countries are clustered, a change in the value of one component may escalate the position of the worst-performing to the top of the country distribution, thus affecting the final score. We argue that this association is problematic because the effect of a change in the component over the indicator is not driven by its theoretical relevance, but the distribution of the components' values.

This is especially relevant when measuring transitions toward sustainability because many components presenting higher sensitivity values are not necessarily considered "green". For example, the GGI is rather insensitive to changes in components related to climate, pollution, and resource use. We thus stress the need to rethink the construction of transition performance indices given their limited capacity to assess sustainable development.

Besides our sensitivity exercise, previous work also remarks on this point. The TPI audit performed by the JRC revealed that the environmental dimension shows an independent behaviour and, thus contributes less to the overall index than the other three pillars (economic, social, governance). The report suggests further analysis and monitoring to highlight the different scores deriving from the environmental pillar and the aggregation of the other three (European Commission, 2022).

Overall, both our results and the audit question the ability of aggregate indicators as sole measures of eco-social transition towards sustainability. While composite indicators monitor and assess socioeconomic trends, the environmental side should be examined independently. Moreover, some variables used to measure the green transition are not strongly correlated with each other, often providing a different picture depending on what we focus on. As shown in the TPI audit, the environmental pillar shows a lack of internal relation, with the correlation between the environmental indicators being weak. While aggregation can be helpful, it can also obscure critical tipping points and discontinuities in environmental deterioration, hindering our ability to understand the true ecological and environmental risks a country faces. As such, we suggest looking at different green-indicators when assessing sustainable transition.

We suggest that simpler indicators, defined as conceptually rich but including fewer variables in their construction, have the potential to shed more light on the matter. The Planetary Pressure Adjusted Human Development Index (PHDI) is a good example. It adjusts the level of human development by carbon dioxide emissions and material footprint. As shown in the report, we find differences in the scores and ranks between the classic HDI and PHDI, reflecting its ability to account for the disproportionate human impact on the planet.

Beyond the technical discussion and sensitivity analysis there are other points to consider. As already posed by Fleurbaey (2009), although the intuitiveness of the indicators makes them accessible to the public and policy-makers, the lack of a concrete interpretation hampers their utility for policy advising beyond the elaboration of country ranks. Rankings may be appropriate in political terms because they signal a country's position and may push governments to make changes so as to improve and scale up. However, they should focus on clear thresholds and targets. The point should not only be whether a country ranks 26th or 28th, but how far it is from a certain goal and what it is doing to achieve it. Ranks should thus be complemented with clear marks that may be associated with the maximum and minimum thresholds in the normalisation process.

Many policies are implemented at the regional level, so an avenue forward might be to assess the performance of composite indicators at that level. Regionally computed composite indicators could also signal which areas are performing better, and which ones need to catch up, enhancing policy analyses. However, adding this regional dimension is harder when the indicator includes many specific components, as some dimensions are measured at the national level. Although international

organisations and governing bodies are often constrained to using data provided by recognised official statistical offices, satellite data –provided by public institutions- may also be used to explore the regional dimensions.

Regarding the data, although most institutions provide the data needed to replicate their indicators, it is not always complete. Just checking data availability for the five indicators under study, we found several limitations. For instance, we found missing values in several components for different indicators, even if these were imputed by the institutions. Missing observations may reduce statistical power, bias estimation of parameters, reducing the representativeness of the samples and increasing the complexity of analysis. In some cases, the website to download the data is not the same across editions, which complicates its time comparison. Similarly, the developers of some indicators cap the values in several components to avoid outliers, but the publicly available data does not include these corrections, so researchers need to consider this step when building the index. Overall, institutions should ensure easy, transparent and public access to their databases.

Case-study of multilevel monitoring system of the 2030 Agenda in Italy

In this box, we show the methodological framework defined by the Italian Alliance for Sustainable Development (ASviS) – one of the SPES partners – to include sustainable development and its goals in strategic planning documents like the Economic and Finance Document for the Regions (DEFR) and the Single Programming Documents for the Local Authorities (DUP). The proposed model aims to make strategic planning consistent with national and European planning.

Governance is an essential element of Cohesion Policy architecture. The interplay among diverse decision-makers at different territorial levels and among a wide range of stakeholders is a key component of policy implementation effectiveness. Unfortunately, territorial governance as a notion is not specifically defined. As mentioned by Böhme et al (2015)[1] and stated in the Article 4.4 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council (Common Provisions Regulation (CPR))¹: ‘Member States, at the appropriate territorial level, in accordance with their institutional, legal and financial framework, and the bodies designated by them for that purpose shall be responsible for preparing and implementing programmes and carrying out their tasks, in partnership with the relevant partners referred to in Article 5, in compliance with this Regulation and the Fund-specific rules.’

ASviS's work merges territorial governance with sustainable development, specifically with the 2030 Agenda, in the so-called *multilevel approach*. This approach consists of the definition, implementation, and monitoring of sustainable development strategies at the territorial level, created to contribute to the achievement of the SDGs. The model consists of four stages:

1. Assessment of the territory's positioning concerning the SDGs of Agenda 2030.
2. Identification of quantitative targets that the regional/territorial administration wants/needs to achieve.
3. Development of policies that promote the achievement of quantitative targets.
4. Involvement and dialogue with all stakeholders in sharing “specific” goals, actions, and projects.

Evaluating the territory's positioning enables an analysis of its sustainability level in relation to the 17 Goals of the UN 2030 Agenda. This analysis is carried out through composite indicators calculated for each Goal. Indicators are selected following these criteria:

- the indicator must be comparable across different territorial levels;
- the indicator must effectively describe the phenomenon during the period of analysis;
- information for the indicator must be available in time series;
- the polarity of the indicator must be clear, ensuring that its interpretation—whether in case of an increase or decrease—is unambiguous.

Since the 2030 Agenda is an action plan applicable to all countries worldwide, which exhibit significant heterogeneity, it defines quantitative targets only in a few cases. This step is delegated to local governments (supranational, national, and subnational). Therefore, it is essential that territorial strategies for sustainable development quantify the objectives of the 2030 Agenda, tailored to the morphological, economic, and social characteristics of a specific territory.

The values of the quantitative goals used by ASviS are identified according to the following hierarchy:

- A.** values defined by supranational or national institutional levels (e.g., European Union and/or national government);
- B.** in the absence of a value defined as in point A, the assessment of the target value is based on the judgment of the experts of the ASviS working groups;
- C.** if the above methodologies are not applicable, the best value recorded in territorial areas similar to the one analysed is identified.

Therefore, these must be consistent with the goals set at a higher level (national and international) and consider the territory's specificities and starting situation.

As an example, the Emilia-Romagna Region has indicated in its Regional Strategy all the strategic goals it intends to achieve by 2026. For the most part, these are consistent with the national goals but, for some issues, the Region has identified its own specific goals. For example, it set a more ambitious target than national and European ones for reducing early exit from the education system (setting it at 8.5 percent compared to 9 percent by 2030).

Strategic objectives should be considered an integral part of the programming of territorial entities; this approach makes it easier to define actions that should support the achievement of these objectives.

This means that in the DEFR and DUP, the strategic objectives that the territorial government intends to achieve during the legislative term should be specified, along with the expected results.

The quantitative objectives included in the DEFR or DUP should align with national strategic areas and choices and, through them, with the global goals of the 2030 Agenda. Monitoring and evaluation of regional and local policies lead to the establishment of what we call a "Multi-level System" of interventions across the territory. To measure performance, it is necessary to introduce outcome and output objectives, and consequently, impact indicators that are closely tied to the defined objectives.

This shift in the way policies are defined and evaluated also brings a change in the way of acting. Ideally, the contributions of various actors—public, private, and civil society—who can support the success of these actions should be anticipated. Achieving the goals of the 2030 Agenda, in fact, heavily depends on the action and collaboration of all actors within the territorial system.

This is supported by the changing role of territorial administrations, which have moved from a predominant role of direct service provision and management to one of "direction," guidance, and oversight of territorial development. The subsidiarity network involves public and private entities, both for-profit and non-profit, collaborating with the administration in policy-making and in achieving objectives. Public-private partnerships bring together public entities, private companies, and the third sector to help realize projects and initiatives capable of generating positive impacts for the community.

Territorial entities must therefore equip themselves with new tools, suited to participatory activities and aimed at achieving shared governance of the entire process. Lack of participation is one of the causes of ineffectiveness of proposed actions which, without the support of the beating heart of the territories (citizens, universities, the third sector, and private sector), struggle to become a reality. As a best practice: in the Metropolitan City of Milan, ASviS, with the contribution of the Politecnico di Milano, organized a workshop in 2022 where public and private stakeholders actively engage in discussing defined quantitative objectives, as well as the policy actions to be implemented to achieve them.

In conclusion, sustainable development represents a new paradigm that should not be viewed as an end goal, but as a crucial tool to ensure the wellbeing of present and future generations.

The growing need to measure and monitor sustainable development at subnational levels highlights the importance of a shared framework of goals and indicators. Consistent with the multidimensional nature of this concept, the approach developed by ASviS, known as the Multi-level System, enables the adaptation of national and supranational programmatic goals to the territorial scale, aligning them with local specificities.

An effective Multi-level System of programming requires a thorough mapping of the local context against the 17 SDGs, supported by the calculation of composite indicators and measurement of the gap from shared quantitative targets. This approach allows for performance comparisons across territories at different institutional levels. Actively engaging public and private actors in defining specific quantitative objectives aligned with territorial characteristics is essential to outline public decision-makers' commitments and monitor the impact of proposed policies.

The innovative nature of this approach lies in promoting a planning model that prioritizes quantitative targets and rigorous monitoring, providing decision-makers with the tools needed to define impactful actions and citizens with clear, reliable information to evaluate public decision-making processes

5. Recommendations

Using composite indicators to measure multidimensional outcomes has many advantages, as well as some shortcomings (e.g. Biggeri et al., 2022). Our work within the SPES project, summarised in this paper, highlighted several aspects of the application of these measurement tools in the field of transition processes towards a sustainable and inclusive wellbeing. Theoretical, measurement and policy issues were considered. In this section, we formulate our recommendations that aim to facilitate the cooperation and active involvement of various actors to achieve consensus in measuring development, societal progress and human wellbeing in a way that is theoretically grounded, technically robust and feasible, and able to influence policy-making processes.

Theoretical consensus on development vision and beyond-GDP frameworks

- Going beyond-GDP is not simply a matter of adopting a new measurement framework. It requires embracing a Sustainable Human Development vision, shifting the narrative toward the overarching goal of sustainable and inclusive wellbeing (Lelkes, 2021; Biggeri and Ferrannini, 2024) and consequently boosting institutional changes in policy-making processes and measurement as well as *political commitment*.
- Stakeholders are familiar with many beyond-GDP concepts (Hirvilammi et al., 2024), but various initiatives now call for *international harmonization* driven by a strong alliance and collective commitment to sustainable and inclusive wellbeing, defining a coherent framework for societal progress.

Technical consensus on the design and use of composite indicators

- Users of composite indicators in the field of sustainability must carefully select indicators that align with their objectives and comprehensively cover relevant dimensions. It is essential to understand: (i) what each CI measures; (ii) its gaps and overlaps with other sustainability-related CIs; (iii) whether it addresses the specific aspects of sustainability relevant to the user's goals. Also, monitoring sustainability transitions over time requires consistency in the choice of sustainability-related CIs and an awareness of their limitations. Policy-makers should also prioritize sustainability-related CIs that effectively balance and represent all five pillars of SHD.
- CIs must be appropriately designed in technical terms - especially concerning standardization, weighting and aggregation choices - to capture synergies and trade-offs across multiple dimensions.
- Current sustainability-related CIs are limited in their ability to capture relational aspects of sustainability transitions. Moving forward, there is an urgent need to design new indicators that account for trade-offs, synergies, and independence between dimensions. Systemic indicators should incorporate dynamic interactions across dimensions rather than treating them as isolated components (even if hierarchized as in multiplicative indexes), and reveal the systemic obstacles and enabling factors that influence progress. Despite their limitations, existing sustainability-related CIs can be used to monitor interactions across dimensions through more specific statistical techniques, such as PCA. These methods allow researchers

and policy-makers to uncover patterns of correlation, enabling a deeper understanding of systemic dynamics.

- Greater coordination is needed to harmonize sustainability-related CIs, ensuring that overlaps, substitutability, and complementarity are explicitly acknowledged. Collaborative efforts among institutions can lead to more coherent frameworks for sustainability measurement. The urgency of global sustainability demands that policy-makers and researchers work toward creating comprehensive and more systemic approaches to measuring and managing the transition towards SHD.
- Institutions should simplify their composite indicators. The more variables are added, the less we can discern and understand. While it is crucial to account for trade-offs, synergies, and independence between dimensions, the indicators should also synthesize reality in a clear and comprehensible way. These two points are not contradictory but rather complementary. The HDI is an example of a good practice, standing out for its simplicity and capacity to capture socioeconomic development.
- For their construction we defend the use of theoretical thresholds in the normalization, which could be based on specific targets or goals, as well as the careful exploration of weights. Depending on the data availability, weighting systems could be used to highlight specific dimensions such that the final indicator captures exactly what it is intended to measure.
- Investments in technical capacities are necessary to improve SHD measurement, by providing adequate financing and tailored support to national statistical offices and other data providers.
- Some composite indicators used by international policy institutions to jointly evaluate wellbeing, sustainable development and economic transition have limited capacity to assess the so-called “green transition”. We suggest focusing on more standard and simpler indicators and complementing the analyses with one-dimensional measures such as greenhouse gas emissions, water supply, biodiversity proxies, among others. Whenever composite indicators are used, disaggregated information should be made easily accessible in the same document.

Public and policy consensus on a new overarching goal

- Adopting a new vision based on the Sustainable Human Development paradigm necessarily requires the engagement and scrutiny of all citizens and all societal actors in setting a new overarching goal of sustainable and inclusive wellbeing for all policies.
- It is crucial to adopt a multilevel and multistakeholder approach in the design, monitoring and assessment of public policy processes, promoting connection among quintuple helix actors and across different governance levels.
- Effective communication and a supportive role of media is equally crucial to definitively go beyond-GDP in terms of goal and measurement, and thus improve and inform policy choices based on a different narrative of development, sustainability and wellbeing.

6. Final remarks on the way forward

As the world is facing multiple and concomitant societal challenges and crises that require urgent action, the time to act and build a crucial theoretical, technical, policy and public consensus detailed above is pressing. The way forward proposed by this working paper is to design a well-structured and participatory process of consultation to build a shared consensus. Three preliminary suggestions may arise from SPES for this co-creation process, respectively dealing with *who*, *how* and *when* issues.

First, the process should be built on a broad global alliance among the most relevant international organizations and supranational institutions, including the UN, the OECD, the European Union, and the top experts to coordinate convergence efforts of several prominent initiatives.

Second, the process should be able to truly engage with experts from different disciplines and schools of thought (i.e., from the different “streams”) to make informed choices about the dimensions to be measured, as well as technical experts to make informed choices about indicators and their design, and policy experts to ensure the feasibility of uptake and use of a new system.

Third, the process should start as soon as possible in 2025, as a new European Commission has just taken office, and taking advantage also of the very relevant advancements from the UN initiative “what counts”, from the OECD WISE Centre, from the JRC COIN, as well as from the ongoing work by several beyond-GDP “sister projects” funded by Horizon Europe - SPES, ToBe, WISE Horizons, WISER, and MERGE.

We truly believe that all actors are ready, and all components are well set to let the different “streams” merge in a “river” that can finally ensure a coherent and meaningful approach to measuring societal progress.

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