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Equitable and sustainable well-being indicators: A study of Italian regional disparities towards sustainable development

Idiano D'Adamo¹ | Cristina Di Carlo² | Massimo Gastaldi³ | Antonio Felice Uricchio^{4,5}

¹Department of Computer, Control and Management Engineering, Sapienza University of Rome, Rome, Italy

²Sapienza University of Rome, Rome, Italy

³Department of Industrial and Information Engineering and Economics, University of L'Aquila, L'Aquila, Italy

⁴Governmental Agency for the Evaluation of Universities and Research System (ANVUR), Rome, Italy

⁵University of Bari Aldo Moro, Bari, Italy

Correspondence

Idiano D'Adamo, Department of Computer, Control and Management Engineering, Sapienza University of Rome, Rome, Italy.
Email: idiano.dadamo@uniroma1.it

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Abstract

Sustainable development serves as a guiding principle for societies aiming to progress beyond purely economic measures of well-being. This paper constructs a composite indicator based on the framework of equitable and sustainable Well-being (BES), integrating 105 indicators for Italian regions over the period 2018–2022. The results show that the provinces of Bolzano and Trento led the ranking. Regionally, those in the north scored highest in 2022 (0.603), followed by those in the central region (0.556) and south (0.404). Disaggregated data on the 12 BES dimensions highlighted specific areas for policy intervention. The results advocate for a pragmatic, non-ideological approach to sustainability, asserting that Italy's competitive advantage (i.e., the “Made in Italy” program) is not contingent on territorial differences, but on provinces' relative ability to leverage and integrate their unique attributes on a global scale.

KEYWORDS

equitable and sustainable well-being, indicators, Italian regions, MCDA, sustainable development

1 | INTRODUCTION

Traditionally, a nation's gross domestic product (GDP) has been used as a proxy for well-being. However, this measure fails to encompass the full spectrum of human life, neglecting social and environmental dimensions. Consequently, scholars have called for new indicators to address this limitation (Conceição & Bandura, 2008). GDP, designed primarily to gauge productive capacity and economic growth (Kapoor & Debroy, 2019), proves inadequate as a measure of public welfare (Giannetti et al., 2015). The emergence of the Sustainable Development Goals (SDGs) and the 2030 Agenda has prompted many countries to reorient their policies (Guang-Wen et al., 2023; Kostetckaia & Hametner, 2022) towards holistic measures of well-being, in recognition of the intrinsic link between economic prosperity and sustainability. Notably, in Europe, economic well-being has been

shown to align with the SDGs (Cook & Davíðsdóttir, 2021) when growth is inclusive and equitable. However, this result has not necessarily been replicated in jurisdictions characterized by tax havens (D'Adamo, Gastaldi, & Morone, 2022). The determination of appropriate indicators to measure well-being has become paramount, to facilitate the delineation of best practices and non-virtuous behaviors (D'Adamo & Gastaldi, 2023). To this end, the aggregation of disparate information poses a challenge (Ricciolini et al., 2023), which the utilization of composite indicators may help to overcome (Ruiz & Cabello, 2021).

Within Europe, several composite indicators have already been proposed. Examples include the Quality of Life Spain, the Equitable and Sustainable Well-Being (BES; Benessere Equo e Sostenibile) framework of Italy, and the WBI Portugal (Bacchini et al., 2020). In 2010, the National Institute of Statistics (ISTAT) and the National

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Council for Economy and Labor (CNEL) launched a new BES project aimed at developing an effective measure of equitable and sustainable well-being (Davino et al., 2018). Through this initiative, Italy set a virtuous example at the global level (Ermini et al., 2023) as the first OECD country to introduce measures supplementing GDP in economic planning (Dello Strologo et al., 2021). The 12-dimension BES assesses welfare at a local level, taking into account variability between and within local units (Ciommi et al., 2017) and considering factors beyond GDP (Alaimo et al., 2020).

As noted by the study center of the Camera dei Deputati (2022), BES indicators are complementary to the SDGs, demonstrating only partial overlap. Building on this complementarity, researchers have proposed regional-level analyses integrating both BES and SDG indicators (Tebala & Marino, 2021), while emphasizing the importance of maintaining their distinctiveness (Guarini et al., 2022). The pursuit of quality of life and equitable, sustainable development hinges on the identification of points of convergence between the SDGs and BES (Richiedei & Pezzagno, 2022). Thus, the establishment of sustainable communities depends on a pragmatic approach that transcends ideological divides (Biancardi et al., 2023).

Historically, Italy has been characterized by regional disparities in economic growth, with poorer performance shown by southern regions. A methodological approach based on multicriteria decision analysis (MCDA) may shed light on environmental, economic and social performance at both regional (D'Adamo & Gastaldi, 2023) and municipal levels (D'Adamo, Gastaldi, Ioppolo, & Morone, 2022), to guide sustainability planning.

Following this line of research, the present study aimed at providing an accurate assessment of the performance of Italian regions in relation to BES. Leveraging 105 BES indicators aggregated using MCDA over a 5-year period (2018–2022), the analysis sought to provide policymakers and citizens key insights into regional performance, to support sustainable development. The analyses were further disaggregated at the level of individual BES dimensions and subsequently aggregated according to macro geographical areas.

2 | LITERATURE REVIEW

The role of universities is critical in achieving sustainability goals (Moustairas et al., 2022; Pactwa et al., 2024), and university courses aim to offer problem-solving approaches (Biancardi et al., 2023). Other insights emerge in the link between sustainability and resilience (Fernández-Miguel et al., 2022), the role played by leadership in environmental contexts (Zorpas et al., 2021), and the role of technology towards or human well-being and environmental protection (Vacchi et al., 2024).

The concept of “well-being” lacks a universally agreed definition, though it is generally understood to refer to the life situation of individuals (McGillivray, 2007). Many dimensions of well-being have been identified, including knowledge, friendship, self-expression, health, physical integrity, economic security, freedom, affection, wealth and leisure (Alkire, 2002).

Recognizing the complexity of socio-economic phenomena such as development, progress, social inequality, well-being and quality of life, scholars have advocated for multidimensional representations over those relying on a singular descriptive indicator. Thus, statistical methodologies, culminating in the creation of synthetic indices, may facilitate the comprehensive measurement and quantification of this phenomena (Mazziotta & Pareto, 2020).

MCDA represents an approach to managing decision complexity through the integration of multiple criteria. Widely used in decision-making processes, it enables a ranking of decision alternatives (Triantaphyllou & Baig, 2005) amidst conflicting objectives, including economic, environmental, social, technical, and esthetic considerations (De Montis et al., 2004). MCDA can be used to formulate a composite indicator, amalgamating specific indicators to evaluate a multidimensional issue (Zhou & Ang, 2009), thereby supporting informed decision-making processes (Ricciolini et al., 2022).

Composite indicators function by aggregating carefully selected sub-indicators, which are normalized and weighted to produce a single index score (Saisana et al., 2005). The proliferation of composite indicators among major international organizations highlights their political importance and operational impact in shaping policy decisions (Munda & Nardo, 2009). Rather than supplanting income-based development indicators, these composite indicators may serve as valuable supplements, facilitating the assessment of complex constructs (Booyens, 2002).

The efficacy of composite indicators stems from their harmonious blend of rigorous statistical analysis and high communicative ease. Methodologically, the choice of weighting system—be it implicit (with equal weight assigned to all elements) or explicit (entailing the input of experts to determine weights)—is a crucial consideration. While numerous approaches exist (Mazziotta & Pareto, 2022), the literature shows that equal-weighting methods are generally favored for their simplicity and directness (Gan et al., 2017).

Sustainability decision-making requires the decision-maker to take a position regarding the concept of sustainability. For this, two distinct perspectives have been identified: weak sustainability and strong sustainability (Ayres et al., 2001; Dietz & Neumayer, 2007). Weak sustainability contends that human capital can substitute for natural capital, in the sense that the former can be utilized as long as it is converted into produced capital of commensurate value. In contrast, strong sustainability posits that human and natural capital are complementary and cannot be substituted for each other (Roszkowska & Filipowicz-Chomko, 2020).

3 | METHODOLOGY

MCDA is capable of synthesizing a large multiplicity of data, while accommodating diverse characteristics and scenarios. In sustainability research, MCDA has been widely used to consider the multidimensionality of decision problems, characterized by conflicting objectives. It facilitates a ranking of alternative described by different indicators or criteria, thereby allowing comprehensive and simultaneous evaluation (Colasante et al., 2024; D'Adamo & Gastaldi, 2022; Talukder et al., 2018).

MCDA can be used to measure performance and draw comparisons across geographical regions, through the creation of a composite indicator. Useful for policymakers, this composite indicator amalgamates a set of sub-indicators representing different components of a multidimensional concept. Considering a matrix $X = \{x_{ij}\}$ of original data with n rows, corresponding to different alternatives i (i.e., the regions of Italy ($i = 1, \dots, 21$), considering Trentino-Alto Adige divided into the provinces of Trento and Bolzano) and m columns representing the j indicators of BES ($j = 1, \dots, 105$), the normalized matrix would be calculated $Y = \{y_{ijt}\}$ con $t = 2018, 2019, 2020, 2021, 2022$. The composite index (CI) for each alternative i would be given by:

$$IC_{it} = f(y_{i1t}, y_{i2t}, y_{i3t}, \dots, y_{imt}; w_1, w_2, w_3, \dots, w_m),$$

where f is a linear or nonlinear aggregation function and w_j ($j = 1, \dots, m = 105$) is the weight of the individual indicator j .

In the present work, the construction of the composite indicator involved several steps: (1) selecting the sub-indicators, (2) normalizing these sub-indicators, and (3) weighting and aggregating the sub-indicators into two synthetic indicators to assign performance scores for each alternative. The first method used to create the composite indicator was data normalization using the min-max method, which scales values between 0 (worst performance) and 1 (best performance) and aggregates them using the arithmetic mean (D'Adamo & Gastaldi, 2023). An alternative method (i.e., utility value analysis) was also utilized for a comparison of the results. This method involves a different normalization approach (i.e., distance versus the maximum or minimum method) and aggregation using the arithmetic mean (Bielli et al., 1996), and results in less dispersion compared to the min-max method. As an example, with reference to the present study, if the value of the considered indicator performed better when the impact of the indicator on welfare decreased (i.e., the case of costs), then for each alternative i and indicator j the normalized value was given by:

$$y_{ijt} = \frac{\min(x_{it})}{x_{ijt}}$$

In contrast, if the value of the considered indicator performed better when the impact of the indicator on welfare increased (i.e., the case of benefits), then for each alternative i and indicator j the normalized value was given by:

$$y_{ijt} = \frac{x_{ijt}}{\max(x_{it})}$$

Using these two approaches, two composite indicators of well-being were constructed based on 105 indicators. Subsequently, these composite indicators were applied to data referring to 21 Italian regions over a 5-year period (2018–2022). Data for the analysis were sourced from ISTAT's official website, within the "Wellbeing and Sustainability" category, pertaining to all indicators for which there was available information at the regional level over the study period (ISTAT, 2023).

TABLE 1 Number of indicators examined for each dimension of well-being.

BES dimension	Number of indicators
Health	11
Education and training	12
Work and life balance	10
Economic well-being	8
Social relationships	8
Politics and institutions	9
Safety	7
Subjective well-being	4
Landscape and cultural heritage	6
Environment	12
Innovation, research and creativity	6
Quality of services	12
Total	105

The Fair and Sustainable Welfare Report, first published in 2013 by ISTAT, marked a significant milestone in the quest for alternative well-being indicators beyond GDP. This effort, which was supported by both the scientific community and civil society, underscored the inadequacy of GDP as a sole measure of national development. The BES project, representing an integral part of this endeavor, has evolved significantly since its inception, expanding from 134 to 152 indicators. Recognized in Italy as a cornerstone for evidence-based development policies, BES continues to inform governance practices. Table 1 presents the number of indicators examined for each BES dimension of well-being in the present study, taking into account constraints on data availability.

Of note, each indicator was assigned equal weight, in accordance with the approach in the literature that presents sustainability goals as comprised of several dimensions of equal priority (D'Adamo, Gastaldi, Ioppolo, & Morone, 2022).

4 | RESULTS

The results were derived from a calculation of BES using the MCDA methodology. Section 4.1 presents the results of the baseline scenario, while Section 4.2 introduces the alternative scenario. Subsequently, the BES results for the baseline scenario are aggregated at the macro geographical level (Section 4.3) and disaggregated by size (Section 4.4).

4.1 | Equitable and sustainable well-being—baseline scenario

The initial step in the analysis involved calculating BES using the baseline method for each of the 5 years under review (2018–2022), as depicted in Table 2 and Figure 1.

Across all 5 years, a consistent pattern emerged: regions in the north tended to dominate the upper echelons of the ranking, while central regions occupied the middle ground and southern regions trailed below the national average. Notably, the provinces of Trento and Bolzano consistently secured the top two positions, with scores of 0.740 and 0.724, respectively, in 2022. However, despite their high rankings, these regions fell short of the theoretical maximum value of 1, indicating opportunities for improvement across some of the

TABLE 2 Equitable and sustainable well-being ranking of Italian regions in 2018–2022 (baseline scenario).

	2018	2019	2020	2021	2022
Province of Trento	0.735	0.751	0.746	0.739	0.740
Province of Bolzano	0.733	0.724	0.696	0.691	0.724
Friuli-Venezia Giulia	0.620	0.610	0.609	0.593	0.609
Valle d'Aosta	0.611	0.635	0.619	0.611	0.593
Emilia-Romagna	0.584	0.548	0.572	0.592	0.580
Veneto	0.568	0.541	0.574	0.576	0.570
Lombardia	0.578	0.563	0.551	0.560	0.565
Umbria	0.529	0.541	0.556	0.554	0.565
Toscana	0.569	0.548	0.556	0.570	0.564
Lazio	0.478	0.492	0.508	0.521	0.552
Marche	0.536	0.538	0.538	0.534	0.541
Piemonte	0.539	0.545	0.517	0.532	0.535
Italy	0.506	0.507	0.514	0.512	0.518
Liguria	0.529	0.536	0.561	0.539	0.515
Abruzzo	0.454	0.481	0.490	0.475	0.484
Sardegna	0.429	0.452	0.474	0.486	0.477
Molise	0.465	0.436	0.484	0.455	0.453
Basilicata	0.396	0.409	0.421	0.397	0.419
Puglia	0.355	0.377	0.379	0.357	0.371
Calabria	0.316	0.312	0.333	0.352	0.358
Campania	0.293	0.302	0.300	0.306	0.335
Sicilia	0.310	0.303	0.322	0.314	0.332

considered indicators. Friuli-Venezia Giulia (0.609) and Valle d'Aosta (0.593) interchangeably claimed the third and fourth positions, though at a significant distance from the top two provinces. With the exception of Piemonte and Liguria, northern regions outperformed their central and southern counterparts.

Among the central regions, Toscana scored the highest over 3 years, while scoring equivalent to or just below Umbria (0.564 vs. 0.565) in the remaining 2 years. Marche followed closely, then Lazio, with the latter surpassing Marche only in 2022. Of note, Lazio was the only non-southern region that fell below the national average in the years 2018–2020—a position later assumed by Liguria in 2022. Conversely, Basilicata, Puglia, Calabria, Sicilia and Campania consistently occupied the bottom positions in precisely that order across all years (with the exception of 2022, when the position was occupied by Sicilia). Abruzzo (0.484) and Sardegna (0.477) emerged as noteworthy among the southern regions, scoring nearer to the national average (0.518).

A comparative analysis of the regional rankings over the 5-year period (Figure S1) revealed some notable shifts in positions, with Lazio and Umbria ascending by three positions (Table S1) in 2022, compared to 2018. Similarly, positive movement could be observed for Veneto (+2), as well as Abruzzo, Sardegna and Campania (+1). Conversely, Piemonte displayed the most significant decline (−3) followed by Toscana and Molise (−2), and Liguria, Lombardia, Marche and Sicilia (−1).

A further comparison of BES scores across regions relative to the year 2022 revealed significant disparities, with variations reaching 55% between the top-ranked (province of Trento) and the bottom-ranked (Sicilia) regions (Table S2).

4.2 | Equitable and sustainable well-being—alternative scenario

The second step in the study involved calculating BES according to an alternative scenario, in order to provide solidity to the results obtained. Specifically, while the absolute values or weights assigned

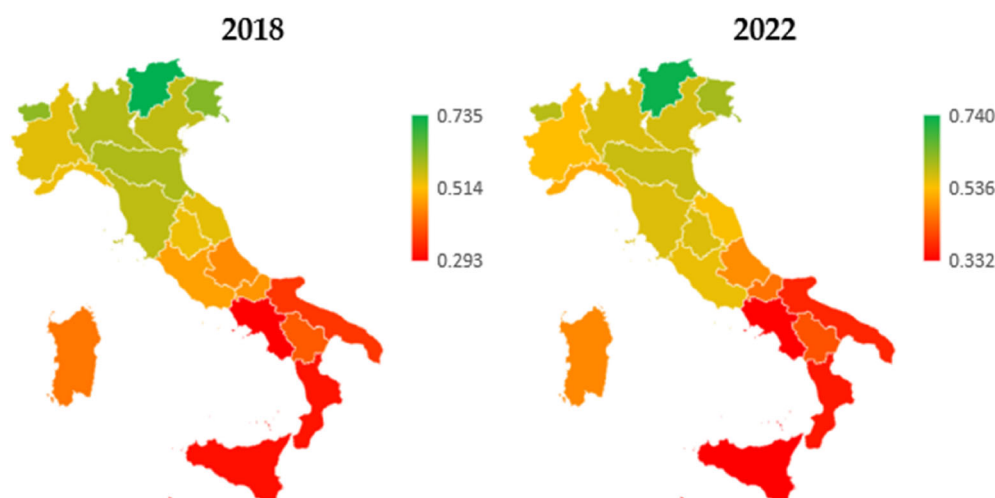


FIGURE 1 Map of Italy according to the equitable and sustainable well-being ranking—baseline scenario.

to individual indicators remained unchanged (i.e., equally weighted), the normalization process was altered. This analysis was conducted for each of the 5 years under examination (Table 3, Figures 2 and S2).

The alternative scenario confirmed the dominance of northern regions at the top of the ranking and the lower positions occupied by southern regions. However, notable changes were evident. The provinces of Trento and Bolzano alternated between the top two positions: Bolzano claimed the first position for the years 2018, 2019 and

TABLE 3 Equitable and sustainable Well-being (BES) ranking of Italian regions in 2018–2022 (alternative scenario).

	2018	2019	2020	2021	2022
Province of Bolzano	0.774	0.766	0.756	0.745	0.774
Province of Trento	0.747	0.755	0.771	0.766	0.758
Friuli-Venezia Giulia	0.685	0.668	0.688	0.691	0.689
Valle d'Aosta	0.687	0.702	0.708	0.710	0.683
Emilia-Romagna	0.657	0.623	0.666	0.678	0.665
Lombardia	0.649	0.634	0.651	0.647	0.661
Veneto	0.632	0.632	0.652	0.667	0.648
Toscana	0.621	0.618	0.642	0.648	0.643
Umbria	0.612	0.619	0.632	0.631	0.640
Marche	0.616	0.603	0.634	0.621	0.637
Piemonte	0.618	0.614	0.618	0.624	0.624
Lazio	0.580	0.580	0.607	0.617	0.621
Liguria	0.600	0.598	0.624	0.604	0.607
Molise	0.605	0.594	0.634	0.602	0.603
Sardegna	0.567	0.615	0.605	0.596	0.598
Italia	0.580	0.578	0.595	0.587	0.591
Abruzzo	0.554	0.583	0.589	0.583	0.587
Basilicata	0.569	0.573	0.581	0.580	0.586
Calabria	0.526	0.525	0.534	0.538	0.556
Campania	0.524	0.514	0.532	0.528	0.543
Puglia	0.516	0.527	0.542	0.530	0.538
Sicilia	0.527	0.516	0.543	0.533	0.536

2022 (reaching 0.774 in 2022), while Trento took the lead in 2020 and 2021 (settling at 0.758 in 2022, in the second position). Of note, these values surpassed those obtained in the baseline scenario—a trend observed across all regions.

A comparison of values between the alternative and baseline scenarios in 2022 revealed significant shifts in the regional rankings, with southern regions leading (Table S3). Campania and Sicilia displayed the most significant differences, with increases of 0.208 and 0.204, respectively, while the provinces of Trento and Bolzano showed the smallest variation (0.049 and 0.017, respectively). In contrast, the lowest increases were observed for the two provinces of Trentino-Alto Adige. In the baseline scenario, regional scores ranged on average from 0.332 to 0.740, while in the alternative scenario they ranged from 0.536 to 0.774. Therefore, the range narrowed, bringing regions at the lower end of the ranking closer to those at the upper end. However, this method inadvertently rewarded regions with very weak performance, as their performance value was no longer 0, but normalized to 1. Of note, under this method, Liguria, Molise and Sardegna surpassed the national average. Conversely, considering the arithmetic mean of Italy in 2022 as 0.628 (and not 0.591), these regions (as well as Piemonte and Lazio) would be classified as underperformers.

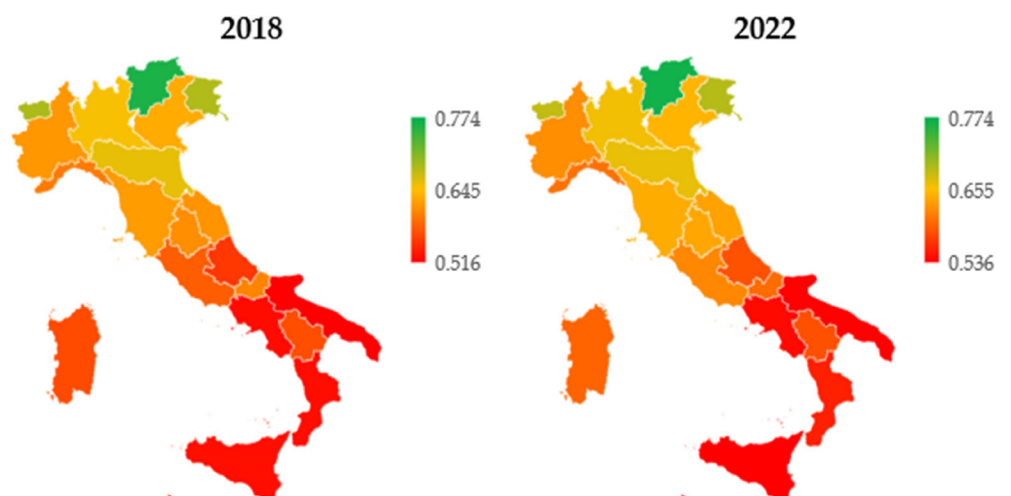
Similar to the baseline scenario, in the alternative scenario, the percentage reduction in BES was calculated (Table S4), verifying a reduction in the range among territories.

4.3 | BES disaggregation at the macro geographical level

The third phase of the work involved aggregating the Italian regions into three macro areas (i.e., north, center, south) for each year from 2018 to 2022, using the baseline method (Figure 3). Each macro area contained the following regions:

1. North: Liguria, Lombardia, Piemonte, Valle d'Aosta, Emilia-Romagna, Friuli-Venezia Giulia, Province of Bolzano, Province of Trento and Veneto.

FIGURE 2 Map of Italy according to the equitable and sustainable well-being ranking—alternative scenario.



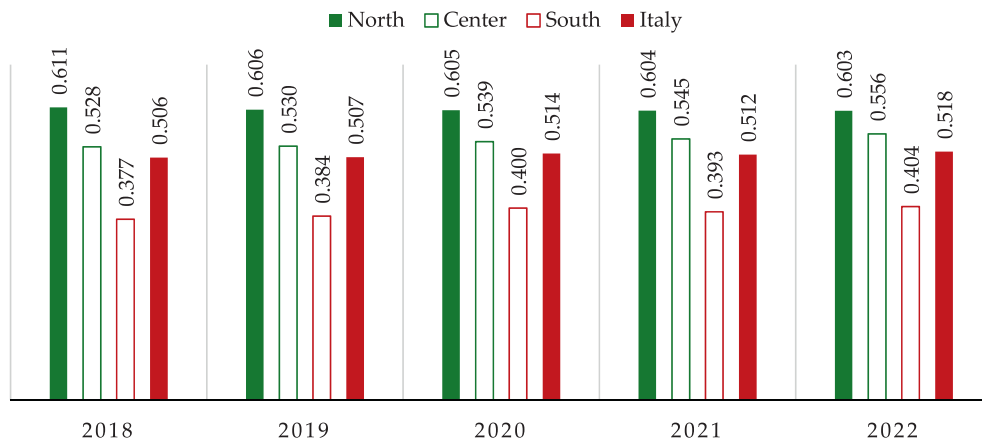


FIGURE 3 Equitable and sustainable well-being at the macro area level.

- Center: Lazio, Marche, Toscana and Umbria.
- South: Abruzzo, Basilicata, Calabria, Campania, Molise, Puglia, Sardegna and Sicilia.

The analysis of these macro areas revealed interesting insights. Across the 5-year period, the north consistently obtained the highest scores, followed by the center and the south. Additionally, both the north and the center surpassed the national average, whereas the south fell below. On average, the north outpaced the benchmark (peaking at 0.105 in 2018) by 0.094, the center (reaching 0.037 in 2022) by 0.028 and the south (achieving a maximum of -0.129 in 2018) by -0.120 . Notably, both the north–south and center–south gaps exceeded that of the north–center, with maximum differences occurring between the north and center in 2018 (0.082), the center and south in 2021–2022 (0.152), and the north and south in 2018 (0.233). These results confirm the historical gap among Italian regions. However, analysis of the temporal trend revealed an interesting fact. While northern regions collectively reduced their value by 0.007, there is an increase among southern (0.026) and central regions (0.027). In this regard, it is worth noting that the central area was made up of only four regions, while each of the other two macro areas consisted of significantly more.

4.4 | BES disaggregation at the dimensional level

The fourth and final step involved breaking down the BES according to the dimensions of well-being for the year 2022 in the baseline scenario. The 105 indicators were therefore disaggregated into 12 dimensions (Table 4). Of note, the number of indicators varied across each dimension, ranging from 4 (subjective well-being) to 12 (education and training, environment and quality of services).

A comparison of regional performance against the national average provided interesting insights into areas of regional weakness. For almost all dimensions, the number of regions ranking above (and therefore below) the national average was similar and proportionate. However, for two dimensions (subjective well-being; innovation, research and creativity), approximately two-thirds of the regions

scored below the national average (of 0.430 and 0.470, respectively).

The primacy of the province of Bolzano was evidenced by its leadership across five BES dimensions. Other top positions were shared among the province of Trento, Emilia-Romagna, Friuli-Venezia Giulia, Lazio and Basilicata. Some dimensions, such as education and training (0.910), social relationship (0.888) and safety (0.877), scored relatively close to the maximum value of 1. However, others, such as landscape and cultural heritage (0.633) and innovation, research and creativity (0.698), fell short. The range between the maximum and minimum values across the different BES dimensions varied significantly, with the most notable differences observed for education and training (0.820) and social relationships (0.805), and the least significant variations observed in innovation, research and creativity (0.433), policy and institutions (0.406) and environment (0.365).

Additionally, a concentration indicator was calculated (Figure S2), with higher values indicating better performance across many dimensions, such as security (0.616) and economic well-being (0.612). On the other hand, minor differences were observed for landscape and cultural heritage (0.416) and subjective well-being (0.431). While only Liguria and southern regions fell below the national average in the overall indicator, this was not true for the individual dimensions. Figure S3 illustrates the number of dimensions in which regions exceeded the national average, with only two alternatives (the provinces of Bolzano and Trento) registering an increase. Conversely, Friuli-Venezia Giulia lagged in two dimensions, while Lombardia, Toscana, Lazio and Umbria failed to reach the national average in three dimensions. Similarly, Puglia consistently underperformed in all dimensions, along with Sicilia in one dimension and Calabria and Molise in two dimensions. Figure S4 proposes the ranking of each region according to all dimensions for the year 2022 relative to the baseline scenario. More detailed analyses of the top two regions are presented in Figure 4.

5 | DISCUSSION

This section presents the policy implications of the work (Section 5.1) and the role played by the Essential Levels of Performance

TABLE 4 Regional equitable and sustainable well-being ranking in 2022 at the dimension level.

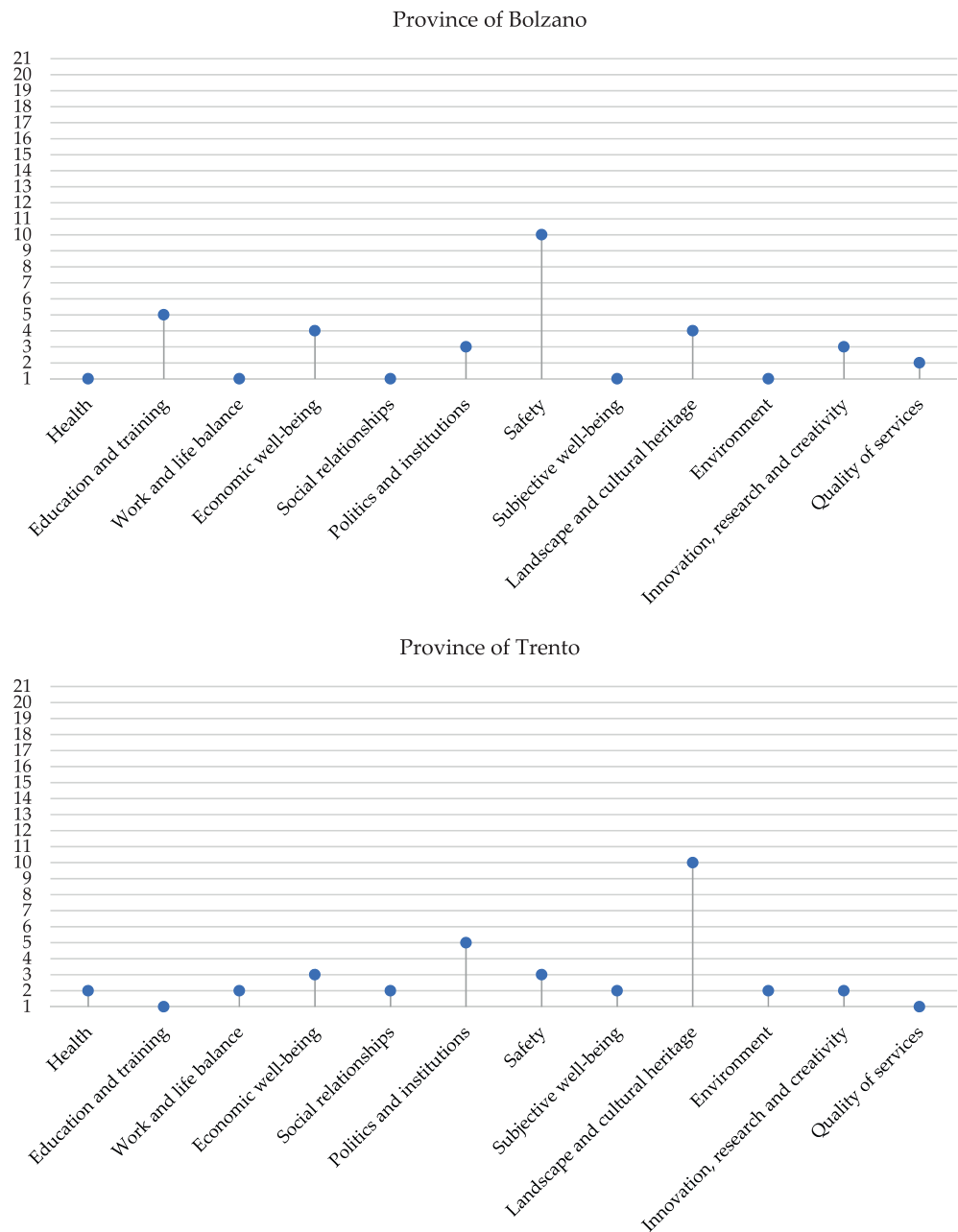
Health			Education and training			Work and life-time balance		
1	Province of Bolzano	0.816	1	Province of Trento	0.910	1	Province of Bolzano	0.793
2	Province of Trento	0.795	2	Valle d'Aosta	0.687	2	Province of Trento	0.688
3	Lombardia	0.649	3	Friuli-Venezia Giulia	0.687	3	Valle d'Aosta	0.682
4	Toscana	0.620	4	Emilia-Romagna	0.681	4	Lombardia	0.666
5	Piemonte	0.598	5	Province of Bolzano	0.675	5	Piemonte	0.649
6	Lazio	0.586	6	Umbria	0.662	6	Emilia-Romagna	0.631
7	Valle d'Aosta	0.581	7	Marche	0.643	7	Friuli-Venezia Giulia	0.627
8	Veneto	0.575	8	Lombardia	0.631	8	Lazio	0.625
9	Umbria	0.566	9	Veneto	0.630	9	Veneto	0.585
10	Emilia-Romagna	0.558	10	Lazio	0.623	10	Toscana	0.557
11	Sardegna	0.550	11	Toscana	0.609	11	Liguria	0.520
12	Friuli-Venezia Giulia	0.534	12	Piemonte	0.570		Italy	0.510
13	Marche	0.522	13	Abruzzo	0.535	12	Marche	0.493
14	Liguria	0.519		Italy	0.533	13	Umbria	0.481
	Italy	0.511	14	Liguria	0.524	14	Molise	0.425
15	Abruzzo	0.431	15	Molise	0.520	15	Abruzzo	0.386
16	Calabria	0.383	16	Sardegna	0.430	16	Puglia	0.381
17	Puglia	0.383	17	Basilicata	0.411	17	Calabria	0.340
18	Molise	0.313	18	Puglia	0.245	18	Sardegna	0.328
19	Sicilia	0.278	19	Campania	0.227	19	Basilicata	0.318
20	Campania	0.244	20	Calabria	0.208	20	Campania	0.297
21	Basilicata	0.226	21	Sicilia	0.090	21	Sicilia	0.249
Economic well-being			Social relationships			Policy and institutions		
1	Emilia-Romagna	0.835	1	Province of Bolzano	0.888	1	Emilia-Romagna	0.723
2	Friuli-Venezia Giulia	0.802	2	Province of Trento	0.888	2	Toscana	0.682
3	Province of Trento	0.798	3	Valle d'Aosta	0.632	3	Province of Bolzano	0.677
4	Province of Bolzano	0.792	4	Friuli-Venezia Giulia	0.593	4	Lazio	0.662
5	Lombardia	0.768	5	Veneto	0.549	5	Province of Trento	0.625
6	Umbria	0.739	6	Lombardia	0.536	6	Sicilia	0.617
7	Veneto	0.731	7	Liguria	0.520	7	Abruzzo	0.615
8	Marche	0.711	8	Emilia-Romagna	0.518	8	Umbria	0.585
9	Valle d'Aosta	0.681	9	Piemonte	0.508	9	Campania	0.572
10	Toscana	0.677	10	Umbria	0.501	10	Liguria	0.560
11	Lazio	0.659	11	Marche	0.461	11	Friuli-Venezia Giulia	0.557
12	Liguria	0.622	12	Toscana	0.448	12	Marche	0.542
13	Basilicata	0.614		Italy	0.436		Italy	0.540
	Italy	0.612	13	Lazio	0.402	13	Calabria	0.537
14	Piemonte	0.576	14	Abruzzo	0.399	14	Veneto	0.522
15	Calabria	0.534	15	Sardegna	0.379	15	Piemonte	0.504
16	Sardegna	0.497	16	Molise	0.225	16	Puglia	0.482
17	Puglia	0.493	17	Campania	0.200	17	Lombardia	0.448
18	Abruzzo	0.416	18	Calabria	0.157	18	Molise	0.445
19	Molise	0.406	19	Basilicata	0.151	19	Valle d'Aosta	0.387
20	Sicilia	0.307	20	Sicilia	0.123	20	Sardegna	0.377
21	Campania	0.196	21	Puglia	0.083	21	Basilicata	0.317

(Continues)

TABLE 4 (Continued)

Safety			Subjective well-being			Landscape and cultural heritage		
1	Basilicata	0.877	1	Province of Bolzano	0.770	1	Friuli-Venezia Giulia	0.633
2	Molise	0.861	2	Province of Trento	0.719	2	Toscana	0.629
3	Province of Trento	0.833	3	Lombardia	0.633	3	Umbria	0.621
4	Valle d'Aosta	0.829	4	Sardegna	0.618	4	Province of Bolzano	0.542
5	Friuli-Venezia Giulia	0.825	5	Basilicata	0.547	5	Veneto	0.531
6	Calabria	0.783	6	Lazio	0.533	6	Piemonte	0.514
7	Sardegna	0.752	7	Campania	0.455	7	Emilia-Romagna	0.498
8	Marche	0.735		Italy	0.430	8	Lombardia	0.489
9	Abruzzo	0.692	8	Abruzzo	0.425	9	Marche	0.486
10	Province of Bolzano	0.674	9	Valle d'Aosta	0.413	10	Province of Trento	0.472
11	Sicilia	0.649	10	Umbria	0.404	11	Lazio	0.461
	Italy	0.620	11	Piemonte	0.402		Italy	0.420
12	Liguria	0.575	12	Puglia	0.400	12	Valle d'Aosta	0.381
13	Puglia	0.558	13	Veneto	0.392	13	Liguria	0.372
14	Umbria	0.547	14	Emilia-Romagna	0.373	14	Abruzzo	0.359
15	Veneto	0.517	15	Liguria	0.362	15	Campania	0.353
16	Piemonte	0.479	16	Toscana	0.359	16	Molise	0.294
17	Toscana	0.435	17	Friuli-Venezia Giulia	0.324	17	Puglia	0.269
18	Emilia-Romagna	0.400	18	Calabria	0.300	18	Sardegna	0.251
19	Campania	0.337	19	Molise	0.263	19	Basilicata	0.250
20	Lombardia	0.325	20	Sicilia	0.203	20	Sicilia	0.222
21	Lazio	0.255	21	Marche	0.156	21	Calabria	0.113
Environment			Innovation, research and creativity			Quality of services		
1	Province of Bolzano	0.740		Lazio	0.698	1	Province of Trento	0.725
2	Province of Trento	0.653	2	Province of Trento	0.616	2	Province of Bolzano	0.682
3	Molise	0.618	3	Province of Bolzano	0.612	3	Friuli-Venezia Giulia	0.668
4	Valle d'Aosta	0.604	4	Lombardia	0.534	4	Liguria	0.662
5	Basilicata	0.595	5	Veneto	0.516	5	Emilia-Romagna	0.662
6	Sardegna	0.590	6	Campania	0.515	6	Veneto	0.648
7	Abruzzo	0.555	7	Umbria	0.506	7	Lombardia	0.627
8	Friuli-Venezia Giulia	0.554	8	Toscana	0.506	8	Lazio	0.626
9	Marche	0.543		Italy	0.470	9	Toscana	0.621
10	Calabria	0.539	9	Marche	0.463	10	Marche	0.592
11	Umbria	0.535	10	Friuli-Venezia Giulia	0.456	11	Umbria	0.580
12	Piemonte	0.534	11	Valle d'Aosta	0.452		Italy	0.560
	Italy	0.530	12	Sicilia	0.442	12	Valle d'Aosta	0.550
13	Toscana	0.520	13	Molise	0.441	13	Abruzzo	0.536
14	Liguria	0.490	14	Piemonte	0.430	14	Sardegna	0.525
15	Lombardia	0.482	15	Sardegna	0.428	15	Molise	0.521
16	Puglia	0.474	16	Abruzzo	0.422	16	Piemonte	0.514
17	Veneto	0.465	17	Emilia-Romagna	0.405	17	Basilicata	0.438
18	Sicilia	0.457	18	Basilicata	0.378	18	Puglia	0.418
19	Emilia-Romagna	0.451	19	Liguria	0.376	19	Sicilia	0.417
20	Lazio	0.442	20	Puglia	0.329	20	Campania	0.410
21	Campania	0.375	21	Calabria	0.265	21	Calabria	0.238

FIGURE 4 Equitable and sustainable well-being dimensional rankings for the provinces of Bolzano and Trento.



(Section 5.2). Subsequently, the limitations of the study are discussed (Section 5.3).

5.1 | Policy implications

Pragmatic sustainability entails a move away from ideological sustainability, integrating both quantitative analysis and conceptual frameworks. This necessitates the development of ideas prioritizing the harmonious coexistence of humans and nature, enabling ecosystems to meet human needs without compromising the environment or jeopardizing future generations. Quantitative assessments are crucial for gauging progress in this direction, underscoring that a nation's

wealth cannot be measured by economic metrics, alone (D'Adamo, Gastaldi, & Morone, 2022).

In this context, the first policy implication of the present work surfaces: universities are bastions of knowledge, and their links to industry and public administration must be strengthened. In particular, in-demand professional profiles must be cultivated and thesis/stage paths should be initiated to attract youth and facilitate a change in public administration. The provision of analytical tools and support for decision-makers in the public sector would offset reliance on consulting firms, laying the groundwork for sustainable communities (Biancardi et al., 2023). To this end, the present study produced diverse insights for all Italian territories, giving rise to the second policy implication.

Italy, as a member of the G7, offers a compelling case study for sustainability (Alola et al., 2023; Su et al., 2020). In this country, the north–south divide remains prominent (Paolotti et al., 2019; Salvati & Carlucci, 2014), and political agendas aimed at uplifting the south are widespread. However, despite incremental improvements in BES indicators, disparities persist. It is therefore crucial to stimulate a paradigm shift by championing projects that capitalize on the unique human and natural riches associated with specific regions. As an example, the “Made in Italy” program celebrates territorial strengths and can be used to enhance global competitiveness, especially when aligned with green, bio and circular principles (D'Adamo & Gastaldi, 2022). In particular, all endeavors should be accompanied by sustainable policies and green investments (D'Adamo, Gastaldi, Iopolo, & Morone, 2022), taking geographic location into account (Puertas & Marti, 2023).

The literature emphasizes the key role played by indicators in evaluating national sustainability, necessitating robust monitoring procedures (D'Adamo & Gastaldi, 2023; Mugellini et al., 2021). Consequently, the third implication of this work underscores the importance of acquiring up-to-date, comprehensive data. To this end, data collection structures should be strengthened, potentially leveraging digitization. Simultaneously, there is a need for effective citizen communication through widespread information campaigns.

Finally, the fourth implication of this work points to the dissemination of the concept of sustainability—a task that is sometimes hindered by opposing business stakeholders, ideological biases and political incumbents. Sustainability encompasses resource sharing and respect for nature, which entails not merely refraining from intervention but actively protecting the environment and inviting as many citizens as possible to appreciate and participate in its beauty (Colasante et al., 2024). Young people should be empowered to spearhead this change, and their involvement in problem-solving projects and approaches should be fostered.

5.2 | The role of essential levels of performance

Law Dec. 29, 2022, No. 197 (Budget Law for 2023), in paragraphs 791–798 of Article 1, sets forth conditions for the full implementation of Article 116, third paragraph, of the Constitution. In more detail, it aims at addressing territorial disparities in service accessibility by mandating the adoption of Essential Levels of Performance (LEPs). This requirement seeks to uphold the unity of the constitutional reform envisaged by Title V (Constitutional Law No. 3/2001).

The introduction of LEPs aims at ensuring uniform service provision for citizens amidst the devolution of administrative powers from the state to regions. This effort strives to balance regional and local autonomy while mitigating disparities in the use of public services. The delineation of LEPs has been entrusted to a Cabina di Regia, supported by the Technical Commission for Standard Requirements (pursuant to Article 1, paragraph 29 bis, Law No. 208 of December 28, 2015), and these administrative bodies are tasked with formulating and presenting technical proposals for standard costs and

requirements as per Article 116, third paragraph, of the Constitution. This work also encompasses specific LEPs on environmental performance (LEPTAs), ensuring national consistency.

5.3 | Limitations and future work

Researchers and practitioners in sustainable development will not fail to observe the parallels between BES and the SDGs. While these frameworks have evolved independently, they both address issues of inequality and sustainability. Some BES indicators overlap with those of the SDG, either because they align with international indicators or because they offer complementary insights into the phenomenon under consideration (Richiedi & Pezzagno, 2022; Tebala & Marino, 2021). ISTAT refers to both BES and the SDGs, working to disseminate and update the latter. These activities extend globally, in line with wider efforts to modernize, strengthen and compare measures to foster and analyze sustainable policies.

In this context, the primary limitation of the present analysis lies in the need to complement the BES-based analysis with a similar analysis based on the SDGs, facilitating a precise comparison at national and regional levels. Such a comparison would be particularly relevant for supporting evidence-based policy-making for sustainable development. Furthermore, a future cluster analysis could reveal points of contact among several regions. Similarly, enhanced data availability would enable analyses at a smaller territorial (i.e., municipal) level. Finally, another step is to provide cluster analysis in order to see point of contact among several regions. Similarly, the availability of data would also allow such analyses to be carried out at the level of smaller territorial realities (e.g., cities).

6 | CONCLUSIONS

Sustainable development is a global imperative that requires a comprehensive assessment of each nation's efforts across economic, environmental and social dimensions. In this regard, the present study focused on the case of Italy, and particularly its Equitable and Sustainable Well-Being (BES) framework, analyzing 105 available indicators over the past 5 years. The data show that, though northern regions have consistently excelled over this period, the gap with central regions has been narrowing. In contrast, southern regions have been significantly lagging, highlighting strong disparities. The overall BES values over 2018–2022 were: 0.606 for the north, 0.539 for the center and 0.392 for the south. The provinces of Trento and Bolzano led the ranking, with a significant margin over Friuli-Venezia Giulia. Central regions, led by Umbria, outperformed some northern regions, such as Piemonte and Liguria, with the latter falling below the national average. Southern regions, ranked after Liguria, notably included Abruzzo, which scored closest to the national average.

Further analysis broke down the BES into 12 dimensions, providing insight into individual performance in the following domains: (i) health; (ii) education and training; (iii) work and life-time balance;

(iv) economic well-being; (v) social relationships; (vi) policy and institutions; (vii) safety; (viii) subjective well-being; (ix) landscape and cultural heritage; (x) environment; (xi) innovation, research and creativity and (xii) quality services.

The results determine some policy implications. First, universities must forge stronger partnerships with both industry and public administrations. Second, overcoming the north–south divide requires a focus on enhancing human and natural wealth through sustainable innovation projects for global competitiveness. Third, there is an urgent need for up-to-date data and awareness campaigns targeting all citizens, particularly leveraging experts in the field to engage youth. Fourth, a pragmatic vision, free from ideological biases, is essential for ensuring that the message of green change aligns with the needs of younger generations.

Finally, the work points to the need to link BES concepts with LEPs and the SDGs, to overcome regional disparities. In particular, the Made in Italy program provides an example of how territorial peculiarities may be leveraged to enhance global competitiveness, rather than exacerbate regional disparities.

AUTHOR CONTRIBUTIONS

All authors equally participated in the definition and writing of this paper.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

ORCID

Idiano D'Adamo  <https://orcid.org/0000-0003-1861-8813>

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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