



Composite Indicators in the Context of the Data Revolution

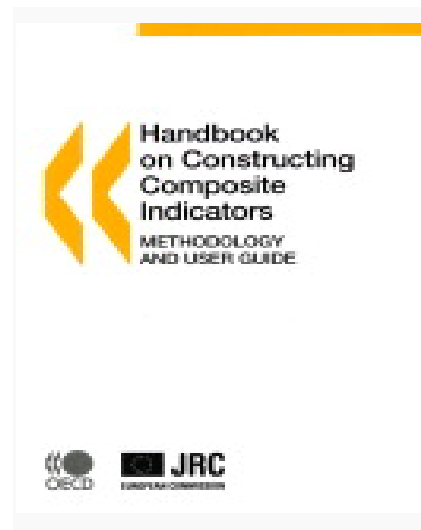
Prof. Enrico Giovannini

University of Rome “Tor Vergata”



The OECD Handbook on Composite Indicators

This Handbook aims to provide a guide to the construction and use of composite indicators, for policy-makers, academics, the media and other interested parties. While there are several types of composite indicators, this Handbook is concerned with those which compare and rank country performance in areas such as industrial competitiveness, sustainable development, globalization and innovation. The Handbook aims to contribute to a better understanding of the complexity of composite indicators and to an improvement in the techniques currently used to build them. In particular, it contains a set of technical guidelines that can help constructors of composite indicators to improve the quality of their outputs.



The OECD Handbook on Composite Indicators

| | | |
|------|--|----|
| 1. | Steps for constructing a composite indicator | 19 |
| 1.1 | Developing a theoretical framework | 22 |
| 1.2 | Selecting variables | 23 |
| 1.3 | Imputation of missing data | 24 |
| 1.4 | Multivariate analysis | 25 |
| 1.5 | Normalisation of data | 27 |
| 1.6 | Weighting and aggregation | 31 |
| 1.7 | Robustness and sensitivity | 34 |
| 1.8 | Back to the details | 35 |
| 1.9 | Links to other variables | 39 |
| 1.10 | Presentation and dissemination | 40 |
| 2. | A quality framework for composite indicators | 44 |
| 2.1 | Quality profile for composite indicators | 44 |
| 2.2 | Quality dimensions for basic data | 46 |
| 2.3 | Quality dimensions for procedures to build and disseminate composite indicators | 48 |

The OECD Handbook on Composite Indicators

Box 1. Pros and Cons of Composite Indicators

| Pros: | Cons: |
|---|---|
| <ul style="list-style-type: none">• Can summarise complex, multi-dimensional realities with a view to supporting decision-makers.• Are easier to interpret than a battery of many separate indicators.• Can assess progress of countries over time.• Reduce the visible size of a set of indicators without dropping the underlying information base. | <ul style="list-style-type: none">• May send misleading policy messages if poorly constructed or misinterpreted.• May invite simplistic policy conclusions.• May be misused, e.g. to support a desired policy, if the construction process is not transparent and/or lacks sound statistical or conceptual principles.• The selection of indicators and weights could be the subject of political dispute. |
| <ul style="list-style-type: none">• Thus make it possible to include more information within the existing size limit.• Place issues of country performance and progress at the centre of the policy arena.• Facilitate communication with general public (i.e. citizens, media, etc.) and promote accountability.• Help to construct/underpin narratives for lay and literate audiences.• Enable users to compare complex dimensions effectively. | <ul style="list-style-type: none">• May disguise serious failings in some dimensions and increase the difficulty of identifying proper remedial action, if the construction process is not transparent.• May lead to inappropriate policies if dimensions of performance that are difficult to measure are ignored. |

The OECD Handbook on Composite Indicators

Table 5. Quality dimensions of composite indicators

| CONSTRUCTION PHASE | QUALITY DIMENSIONS | | | | | | |
|----------------------------|--------------------|----------|-------------|------------|---------------|------------------|-----------|
| | Relevance | Accuracy | Credibility | Timeliness | Accessibility | Interpretability | Coherence |
| Theoretical framework | ✓ | | ✓ | | | ✓ | |
| Data selection | | ✓ | ✓ | ✓ | | | |
| Imputation of missing data | ✓ | ✓ | ✓ | ✓ | | | |
| Multivariate analysis | | ✓ | | | | ✓ | ✓ |
| Normalisation | | ✓ | | | | ✓ | ✓ |
| Weighting and aggregation | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| Back to the data | ✓ | | ✓ | | | ✓ | |
| Robustness and sensitivity | | ✓ | ✓ | | | ✓ | |
| Links to other variables | ✓ | | ✓ | | | ✓ | ✓ |
| Visualisation | ✓ | | | | | ✓ | |
| Dissemination | ✓ | | ✓ | | ✓ | ✓ | |

The value added of official statistics

$$V_{tsu} = P_{tsu} - C_{tsu}$$

V_{tsu} = value added at time t

P_{tsu} = value of production

C_{tsu} = intermediate costs

Where do we classify the production of statistics?

----> ISIC: public services

Where does the value of a service come from?

----> SNA: change in the consumer

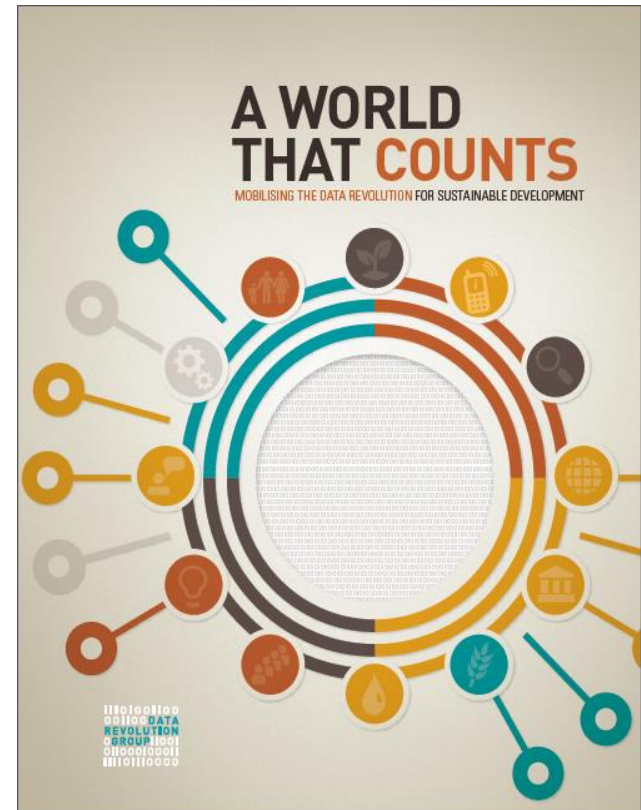
What kind of change should happen in a consumer of statistics?

----> more knowledge

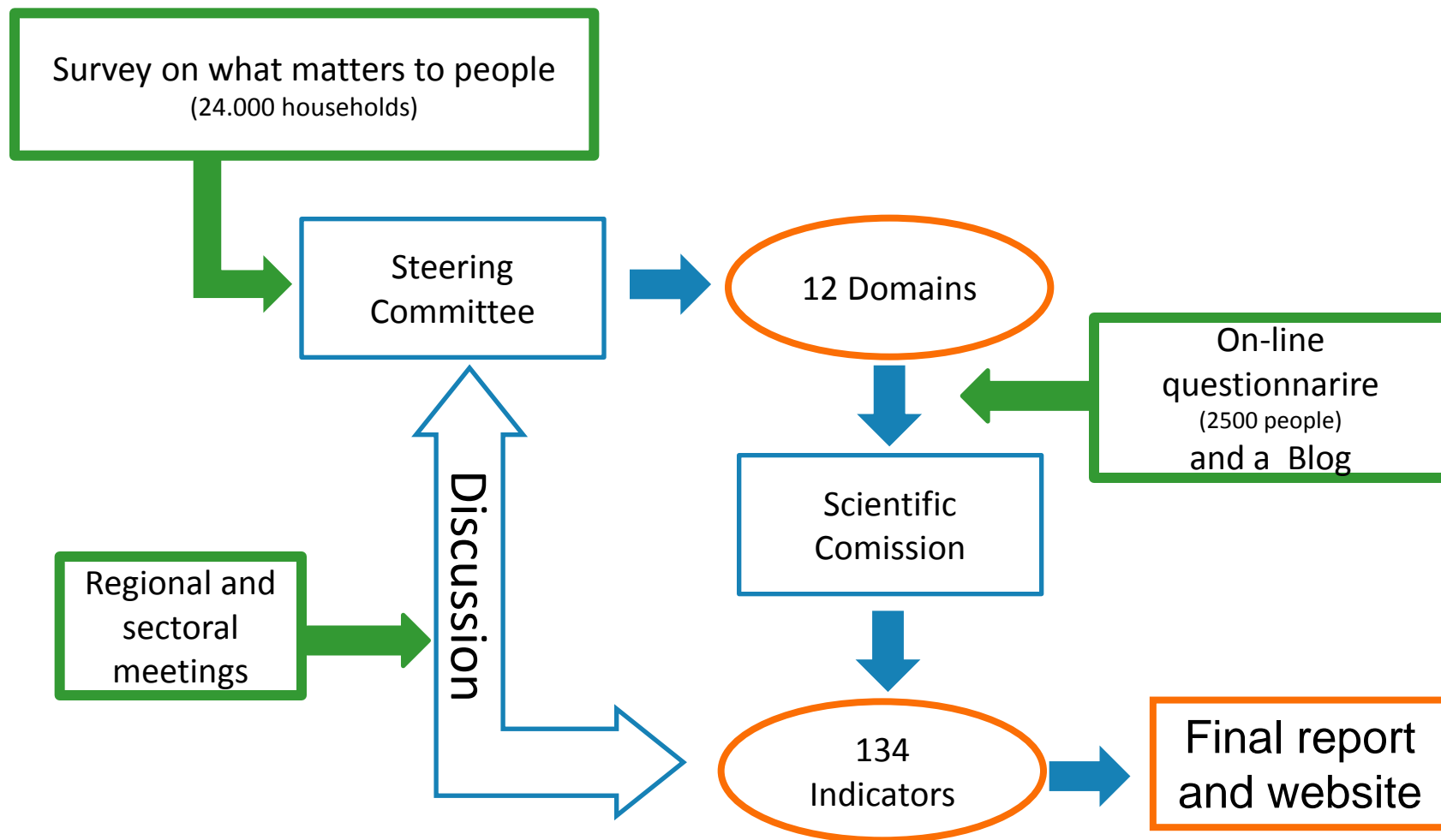
The European Statistics Code of Practice

Principle 11: European Statistics meet the needs of users.

What does it mean in the context of the “Data Revolution”?



The Istat-Cnel initiative on Equitable and Sustainable Well-Being (BES)



What is important for your well-being?

Score from 0 to 10 given to wellbeing dimensions – Year 2011

| | Mean | % of 10 |
|---|------|---------|
| Being in good health | 9,7 | 79,9 |
| Guarantee the future of your children socially and economically | 9,3 | 66,1 |
| Have a decent work of which being satisfied | 9,2 | 59,5 |
| Have an adequate income | 9,1 | 56,0 |
| Good relationships with friends and relatives | 9,1 | 53,2 |
| Be happy in love | 9,0 | 53,6 |
| Feeling safe with respect to criminality | 9,0 | 56,3 |
| Good education | 8,9 | 48,8 |
| Present and future environmental conditions | 8,9 | 48,3 |
| Live in a society in which you can trust others | 8,9 | 48,8 |
| Good governance | 8,8 | 46,6 |
| Services accessible and of good quality | 8,7 | 43,9 |
| Adequate free time and of good quality | 8,5 | 37,4 |
| Be able to influence local and national policies | 7,8 | 30,6 |
| Participation to community life | 7,1 | 18,7 |

Key domains for the Italian BES

The individual sphere

1

ENVIRONMENT

2

HEALTH

3

ECONOMIC WELL-BEING

4

EDUCATION AND TRAINING

5

WORK AND LIFE BALANCE

6

SOCIAL RELATIONSHIPS

7

SECURITY

8

SUBJECTIVE WELL-BEING

The context

9

LANDSCAPE
AND CULTURAL HERITAGE

11

QUALITY OF SERVICES

10

RESEARCH AND INNOVATION

12

POLICY AND INSTITUTIONS

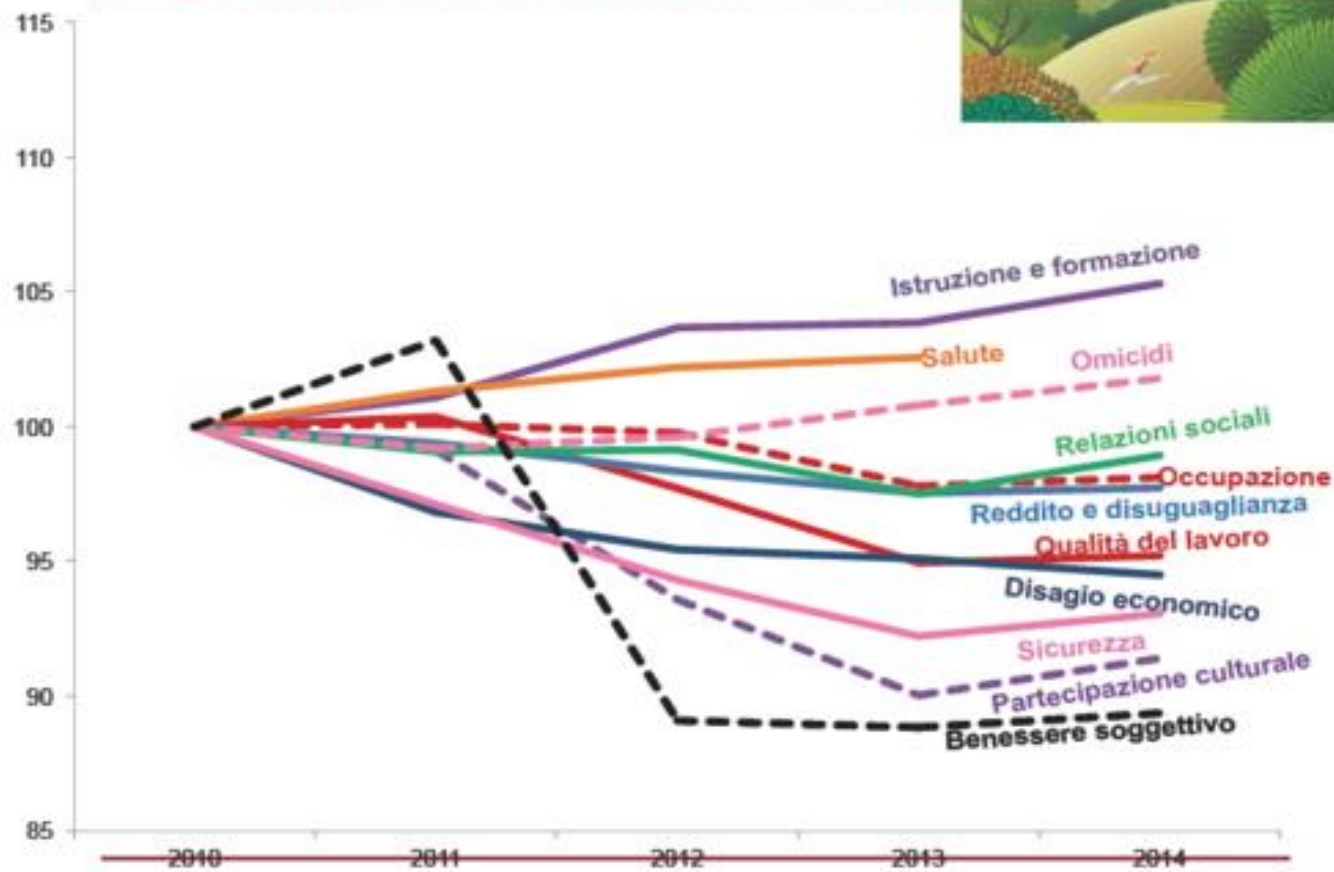
The Italian BES 2014

Le tendenze del benessere

| INDICATORE | PERIODO CONSIDERATO | FINO AL 2008 | DAL 2008 IN POI |
|--|-----------------------------|--------------|-----------------|
| Salute | | | |
| Speranza di vita alla nascita (Maschi) | 2004-2012 | ↑ | ↑ |
| Speranza di vita alla nascita (Femmine) | 2004-2012 | ↑ | ↑ |
| Speranza di vita in buona salute alla nascita (Maschi) | 2009-2012 | | ↑ |
| Speranza di vita in buona salute alla nascita (Femmine) | 2009-2012 | | ↑ |
| Indice di stato fisico (Pcs)* | 2005, 2012 | ↑ | |
| Indice di stato psicologico (Mcs)* | 2005, 2012 | ↓ | |
| Tasso di mortalità infantile | 2004-2011 | ↑ | ↑ |
| Tasso standardizzato di mortalità per incidenti di trasporto | 2006-2011 | ↑ | ↑ |
| Tasso standardizzato di mortalità per tumore | 2006-2011 | ↑ | ↑ |
| Tasso standardizzato di mortalità per demenze e malattie del sistema nervoso | 2006-2011 | ↓ | ↓ |
| Speranza di vita senza limitazioni nelle attività quotidiane a 65 anni (Maschi) | 2008-2012 | | ↑ |
| Speranza di vita senza limitazioni nelle attività quotidiane a 65 anni (Femmine) | 2008-2012 | | ↑ |
| Eccesso di peso | 2005-2013 | = | = |
| Fumo | 2005-2013 | = | ↑ |
| Alcol | 2007-2013 | = | ↑ |
| Sedentarietà | 2005-2013 | = | ↑ |
| Alimentazione | 2005-2013 | ↑ | ↓ |
| Istruzione e formazione | | | |
| Partecipazione alla scuola dell'infanzia | a.s. 2007/08-a.s. 2011/12 | | = |
| Persone con almeno il diploma superiore | 2004-2013 | ↑ | ↑ |
| Persone che hanno conseguito un titolo universitario | 2004-2013 | ↑ | ↑ |
| Uscita precoce dal sistema di istruzione e formazione | 2004-2013 | ↑ | ↑ |
| Giovani che non lavorano e non studiano (Noet) | 2004-2013 | = | ↓ |
| Partecipazione alla formazione continua | 2004-2013 | = | = |
| Livello di competenza alfabetica degli studenti** | a.s. 2012/2013 | | |
| Livello di competenza numerica degli studenti** | a.s. 2012/2013 | | |
| Persone con alti livelli di competenza informatica | 2006, 2007, 2009, 2011-2013 | ↑ | ↑ |
| Partecipazione culturale | 2006-2013 | = | ↓ |

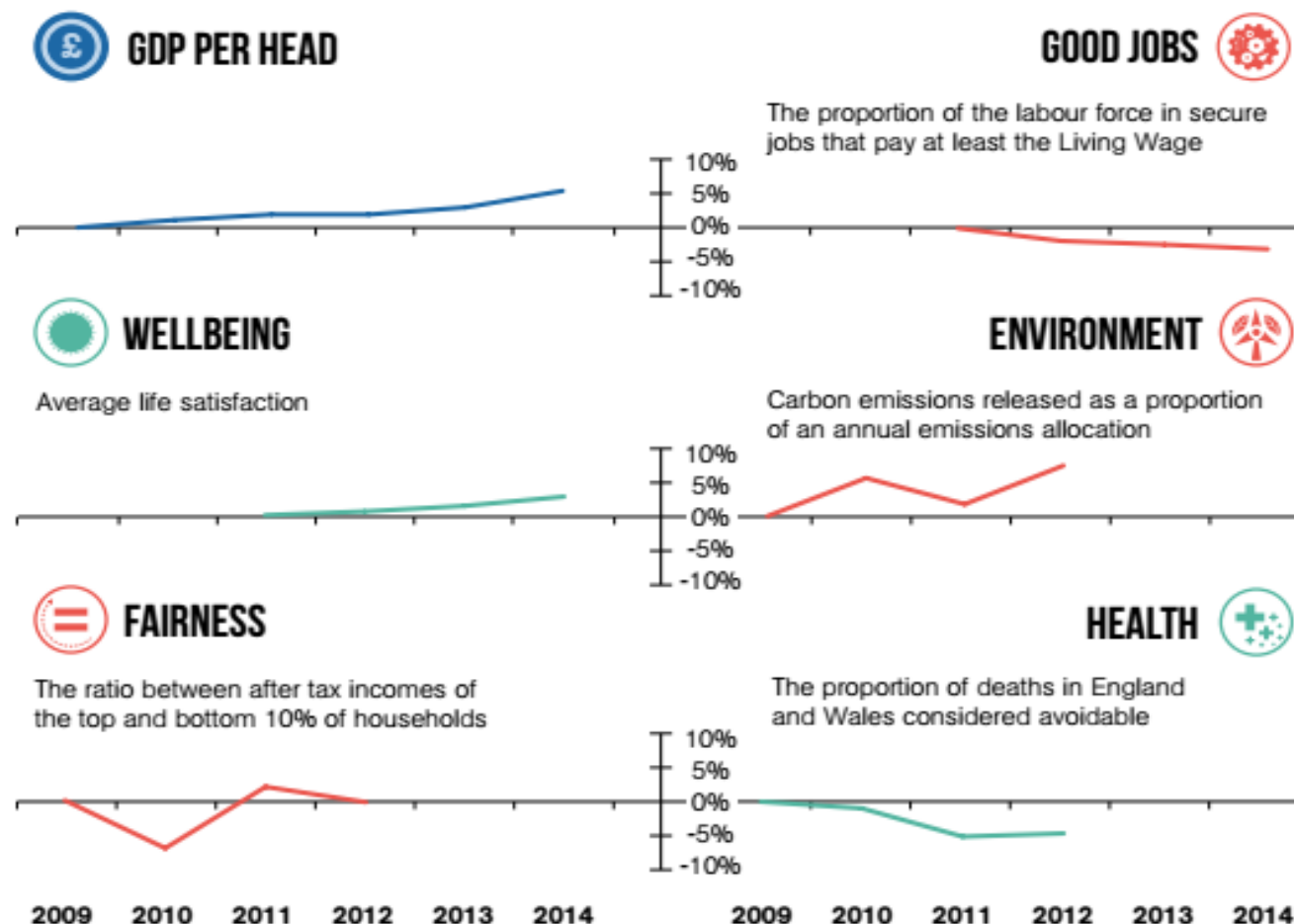
The Italian BES 2015

2014: anno di transizione importante



The NEF «5 headline indicators of national success»

Figure 2. Changes in GDP per head and in each of the headline indicators, indexed to the first year of available data between 2009–2014.

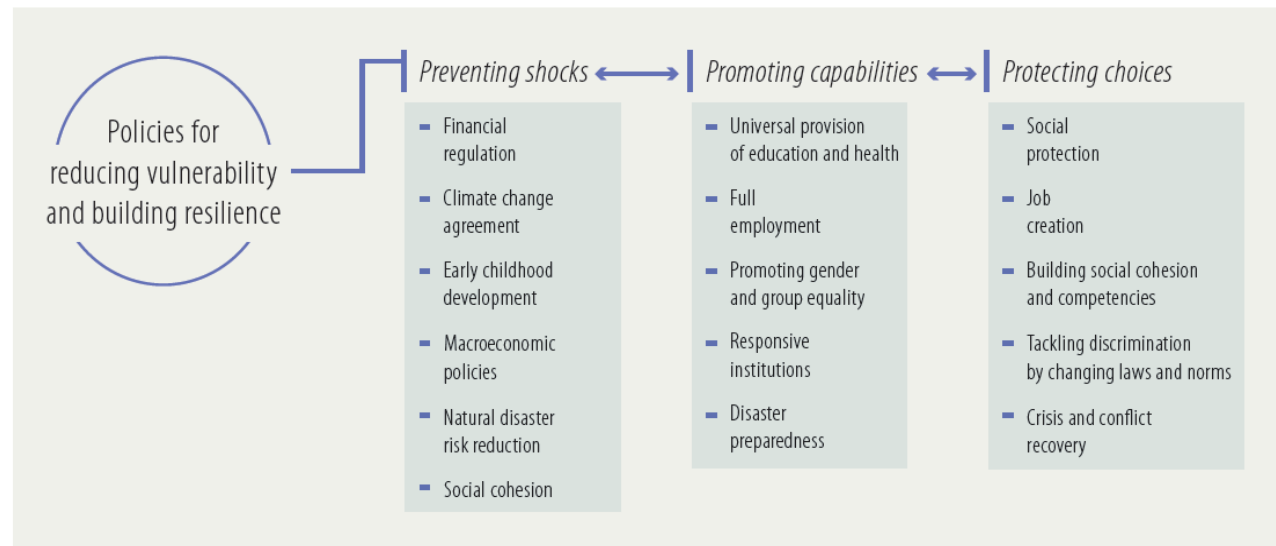


The UNDP Approach: Vulnerability and Resilience

Who is vulnerable to what and why?



Policies for reducing vulnerability and building resilience



The Forthcoming indicators for SDGs

| | |
|---------|--|
| Goal 1 | End poverty in all its forms everywhere |
| Goal 2 | End hunger, achieve food security and improved nutrition and promote sustainable agriculture |
| Goal 3 | Ensure healthy lives and promote well-being for all at all ages |
| Goal 4 | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all |
| Goal 5 | Achieve gender equality and empower all women and girls |
| Goal 6 | Ensure availability and sustainable management of water and sanitation for all |
| Goal 7 | Ensure access to affordable, reliable, sustainable and modern energy for all |
| Goal 8 | Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all |
| Goal 9 | Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation |
| Goal 10 | Reduce inequality within and among countries |
| Goal 11 | Make cities and human settlements inclusive, safe, resilient and sustainable |
| Goal 12 | Ensure sustainable consumption and production patterns |
| Goal 13 | Take urgent action to combat climate change and its impacts [†] |
| Goal 14 | Conserve and sustainably use the oceans, seas and marine resources for sustainable development |
| Goal 15 | Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss |
| Goal 16 | Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels |
| Goal 17 | Strengthen the means of implementation and revitalize the global partnership for sustainable development |

The Forthcoming indicators for SDGs

Results of the list of indicators reviewed at the second IAEG-SDG meeting

| | Column B | Column C | Column D | Column E | Column F |
|---|--|--|---|---|---|
| | Target | Original Indicator Proposal | Initial classification before the meeting | Proposed modification/alternative indicator or additional indicator | New classification at the conclusion of the meeting |
| Goal 1 End poverty in all its forms everywhere | | | | | |
| 1.1.1 | Target 1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day. | Proportion of population below \$1.25 (PPP) per day disaggregated by sex and age group and employment status (or Proportion of employed people living on less than \$1.25 PPP a day) | YELLOW | Proportion of population below international poverty line disaggregated by sex and age group and employment status (or Proportion of employed people living below the international poverty line) | GREEN |
| 1.2.1 | Target 1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions. | Proportion of population living below national poverty line, disaggregated by sex and age group | YELLOW | | GREEN |
| 1.2.2 | Additional | | | Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions | GREEN |
| 1.3.1 | Target 1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable. | Percentage of population covered by social protection floors/systems, disaggregated by sex, composed of the following: a) Percentage of older persons receiving a pension; b) Percentage of households with children receiving child support; c) Percentage of working-age persons without jobs receiving support; d) Percentage of persons with disabilities receiving benefits; e) Percentage of women receiving maternity benefits at childbirth; f) Percentage of workers covered against occupational injury; and g) Percentage of poor and vulnerable people receiving benefits. | YELLOW | Percentage of the population covered by social protection floors/systems disaggregated by sex, and distinguishing children, unemployed, old age, people with disabilities, pregnant women/new-borns, work injury victims, poor and vulnerable | GREEN |