

International Conference on
"New indicators for a better world"
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NEW INDICATORS FOR
A BETTER
ENVIRONMENT & LIFE

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1. MEASURING ECOSYSTEM STATUS AND EVOLUTION

MONITORING ECOSYSTEM STATUS & EVOLUTION

- Environmental policies require that a number of characteristics defining the status of ecosystems are continuously measured.
- The monitoring of environmental and biological variables measuring the status of environment has been carried out for many years.
- The main objective of this monitoring is to detect the trends and to describe their evolution.
- How do these data inform us? Are the data collected in a way that allows us to interpret them?
- Do we have effective indicators measuring the quality level of the investigated system (e.g. water, air, soil, an entire territory)?

MEASURING ECONOMIC AND SOCIAL STATUS

- The economic and social conditions affect significantly the welfare of human communities.
- The primary parameter taken into account is the Gross Domestic Product (GDP). But GDP only gives partial economic information while disregarding data related to human health, environment and social aspects.
- The idea that purely economic measures such as gross domestic product (GDP) do not show whether people are feeling happy and living well has been around for more than a decade.
- New social indicators and indices able to measure quality of life and environment are required.
- UNDP proposed the Human Development Index (HDI) at the beginning of the '90 to take into account three indicators: GDP, life expectancy and education.

WHY NEW INDICATORS ARE REQUESTED

- Our society has used and still uses GDP as the unique indicator of a good economic and social status of a human community.
- The Gross Domestic Product doesn't take into account other factors such as different aspects of social life, culture and tradition, good health conditions, safety, etc.
- The recent studies show that the GDP alone is not able to express the level of wellbeing.
- To go closer to the conditions able to reach a high degree of wellbeing (happiness, better life, satisfaction, etc.) the use of an index including all the relevant indicators is needed.

WELLBEING INDICATORS

- In recent years the development of indicators able to measure the level of the wellbeing has proceeded and important studies have been conducted especially in Europe.
- Relevant results are expected in the coming years: the possibilities to propose indices able to measure a number of conditions, such as human health, clean environment, stable social life, personal security, vital economy, etc. are under investigation.
- During the Conference outstanding speakers coming from European States and from Russian Federation will present the approach followed for introducing suitable indicators in different fields of interest such as air and water quality, conservation of natural resources and cultural heritage.
- The idea to realize specific observatories able to monitor environmental and wellbeing indicators will be also presented.

A CHANGING ENVIRONMENT

- Every day our environment is facing different conditions that determine positive or negative effects on nature and man
- The size of the effects depends on the nature and intensity of the parameters to whom the system undergoes.
- In many cases we need to keep the system under control in order to follow its evolution in time and space.
- The requested response is the attempt to address the system towards better conditions by using suitable parameters (indicators) able to measure the quality of the investigated systems.
- Indicators able to characterize a system are manifold, including not only environmental parameters, but also economic and social variables (income, health, wellbeing happiness, social status, etc.)

KEEPING UNDER CONTROL THE RIGHT INDICATORS

- The local and global environmental situation is continuously changing.
- Change in some cases is not perceived especially by the general public.
- Continuous monitoring of sustainability is therefore imperative.



Air monitoring station

What is happening in the Italian city of Taranto is a clear example of what is the result of not having taken under control the environmental effects produced by the big steel manufacturing plant located close to the urban area.

WHAT HAS HAPPENED IN TARANTO

According to the data published the amounts of pollutants released into the air in the year 2010 were :

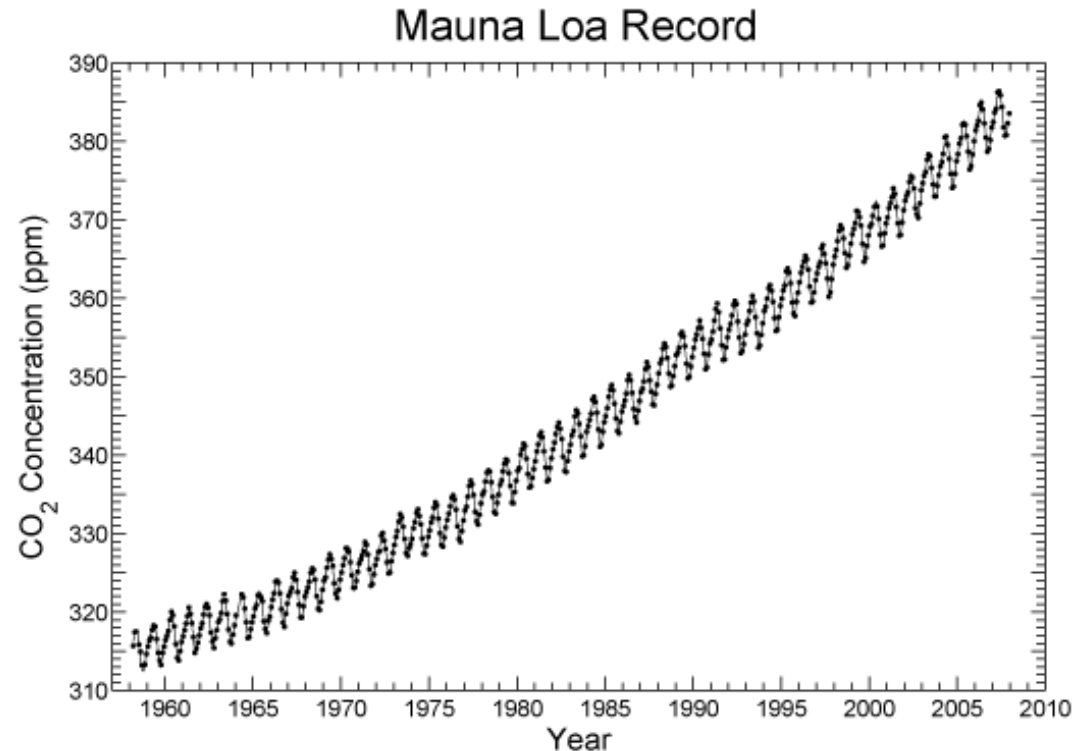
- 4,000 tons of dusts, 11,000 tons of nitrogen oxide, 11,000 tons of sulphur oxide, 1,300 kg of benzene, 115 g of dioxins, 338 kg of polycyclic aromatic hydrocarbons, 172,000 tons of carbon monoxide, 8.6 Mt of carbon dioxide and many more other dangerous substances (As, Cd, Cu, Hg, Ni, Pb, Zn, etc.)
- Until the year 2010, even if those data were known by many people and Institutions involved in environmental protection, only few people were complaining the situation.



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CONTROLLING THE SUSTAINABILITY STATUS AND EVOLUTION

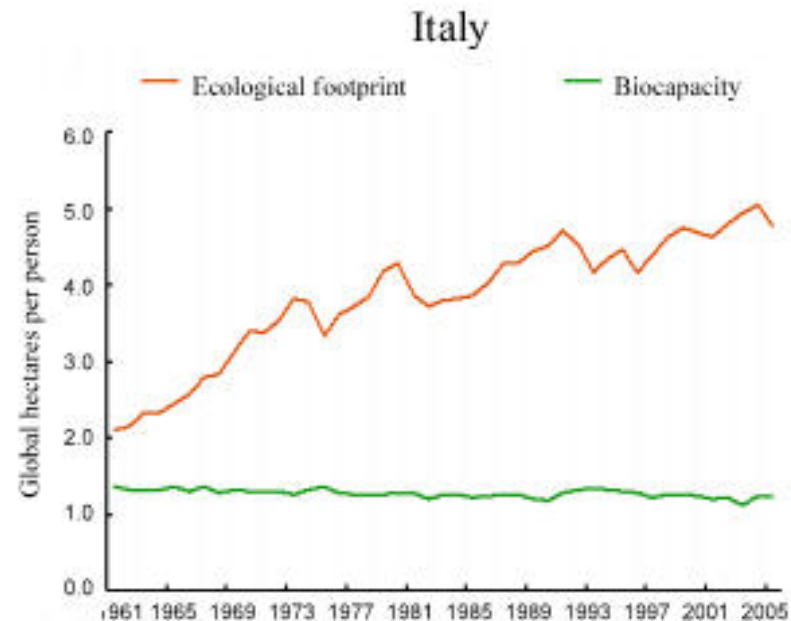
- The control systems concerning the environmental quality and the level of sustainability require specific tools, able to evidence the trends in both, positive and negative sense.



To keep the sustainability of a given territory under control it is necessary to adopt indicators able to measure it; these parameters are usually referred to as sustainability indicators.

THE SUSTAINABILITY OF A TERRITORY

- The concept of sustainability can be linked to a given human activity, or a local context, or even a product.
- A territory to be sustainable must satisfy the requirements requested by the principles of sustainable development.



The theoretical requirement calls for a system completely self-sustaining: this means that the resources available are enough to satisfy the need of the territory; in other words the ecological footprint is equal to the biocapacity; this is a very difficult result to be reached, especially for territories located in the northern part of the planet.

2. INDICATORS AND INDICES: CONCEPT AND DEFINITION

WHAT IS AN INDICATOR?

- An indicator is a physical (chemical, biological etc.) variable providing evidence that a certain condition exists or certain results have or have not been achieved.
- Indicators enable decision-makers to assess progress towards the achievement of intended outputs, outcomes, goals, and objectives.



REQUIREMENTS FOR SUSTAINABILITY INDICATORS

- The criteria for choosing a good indicator is based on quality characteristics, such as validity, reliability, sensitivity to the phenomenon studied; among other properties an indicator must possess the ability to be easily understood also from decision-makers.
- Sustainability indicators intend to offer information to local citizens and local authorities which are committed to achieve a sustainable model of development.
- The sustainability indicators go beyond the functions typically performed by environmental parameters by taking into account also the economic and social dimensions.

MOST USUAL SUSTAINABILITY INDICATORS

- demographic and working activities data,
- physical characteristics of the territory,
- features of residential areas,
- types of mobility,
- production and use of energy,
- effects on climate related to forest, timber availability, agriculture,
- hunting and fishing,
- availability of water,
- quality of soil and subsoil,
- air quality,
- level of noise and radiation,
- waste management and recycling,
- presence of polluted sites.

WHY AN OBSERVATORY ON SUSTAINABILITY

- The different territorial realities are very dissimilar in political, economic, social and environmental features.
- There is a need to keep under control the evolution of sustainability parameters in space and time.
- One of the most suitable tool to achieve this task is a

Territorial Observatory on Sustainability (TOS)

- TOS is particularly suitable for local realities: the limited surface and little number of inhabitants make the monitoring of indicators easier.

3. GDP FOR DIFFERENT COUNTRIES

GDP FOR DIFFERENT COUNTRIES

COUNTRY	\$
Qatar	98,948
Luxembourg	80,559
Singapore	59,710
Norway	53,396
Brunei	49,536
Hong Kong	49,417
United States	48,328
United Arab Emirates	47,729
Switzerland	44,452
San Marino	43,090
Netherlands	42,023
Kuwait	41,701

per capita

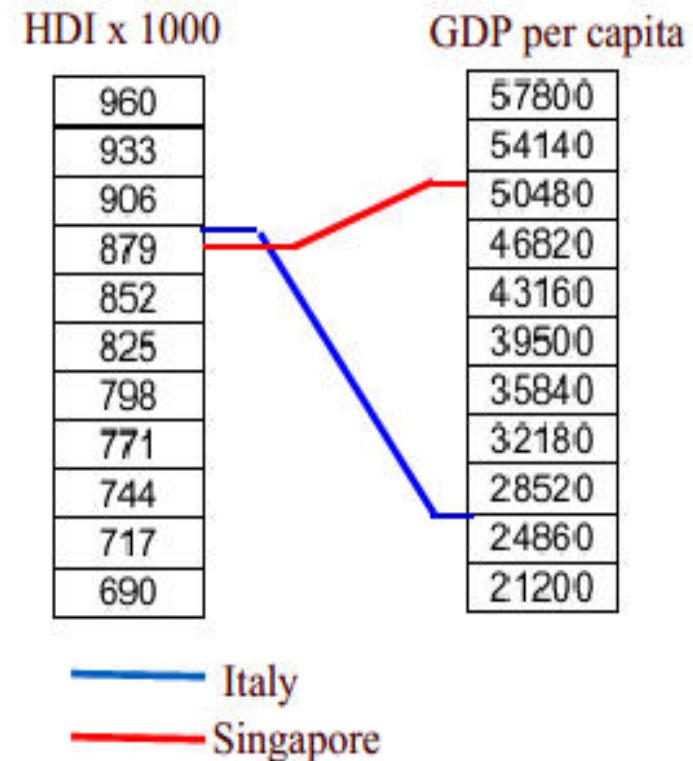
- The value of GDP for Italy (year 2009) was 2.199.000 Million US \$ PPA (purchasing power parity),
- Other countries show higher values

Country	Milion US \$
United States	15,075,675
China	7,298,147
Japan	5,866,540
Germany	3,607,364
France	2,778,085
Brazil	2,492,907
United Kingdom	2,431,310
Italy	2,198,732
Russia	1,850,401

total

SAME HDI WITH DIFFERENT GDP

- Italy and Singapore have almost the same HDI, but there is much difference in GDP per capita.
- GDP is not enough to measure the wellbeing.
- HDI represents a first step forward indices taking into account some more wellbeing indicators.

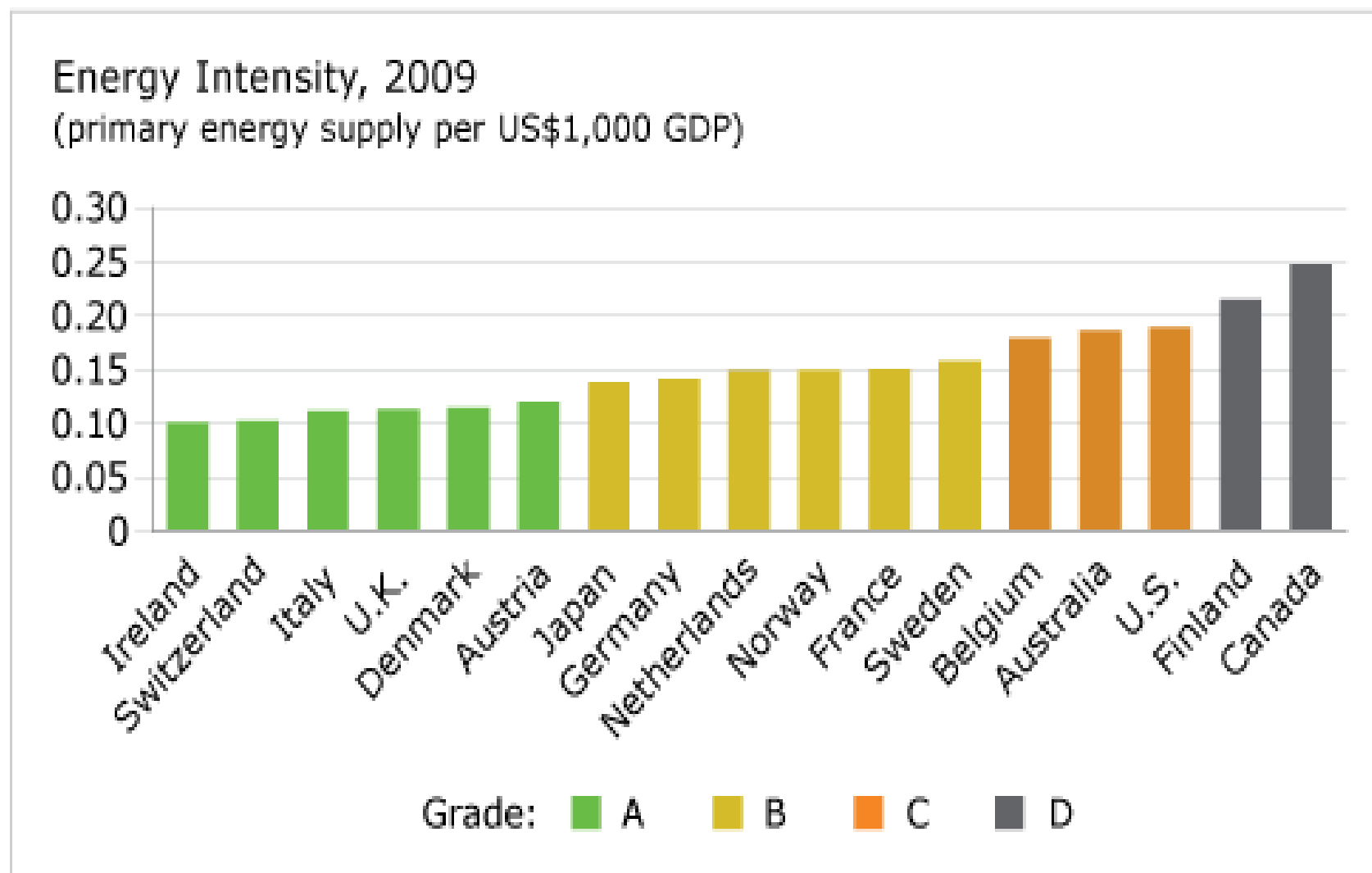


4. BEYOND GDP: ENERGY INTENSITY AND AVAILABILITY

BEYOND THE GDP

- In recent decades, some other indicators were introduced with the aim of assisting administrators and economists in defining a correct policy.
- In this respect we recall a couple of these relationships:
 - Energy intensity measuring the energy efficiency of a nation's economy through the ratio ENERGY/GPD .
 - The relationship between HDI and energy consumption per capita.

ENERGY INTENSITY IN DIFFERENT COUNTRIES

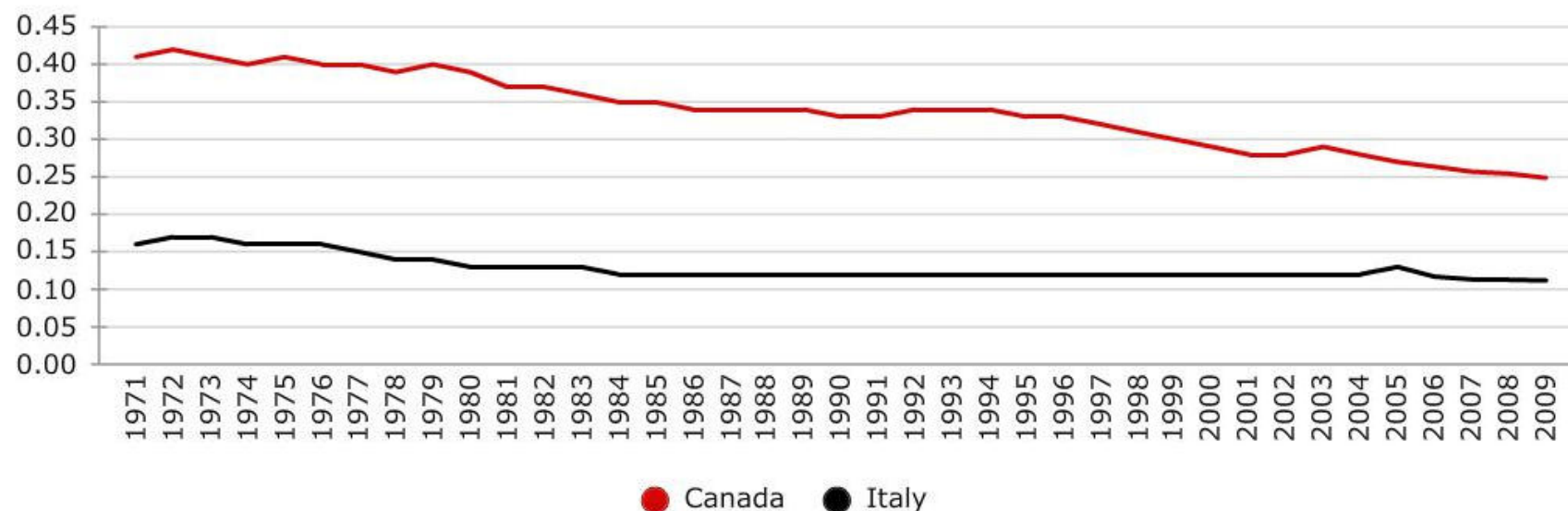


ENERGY INTENSITIES OF CANADA AND ITALY

Energy Intensity

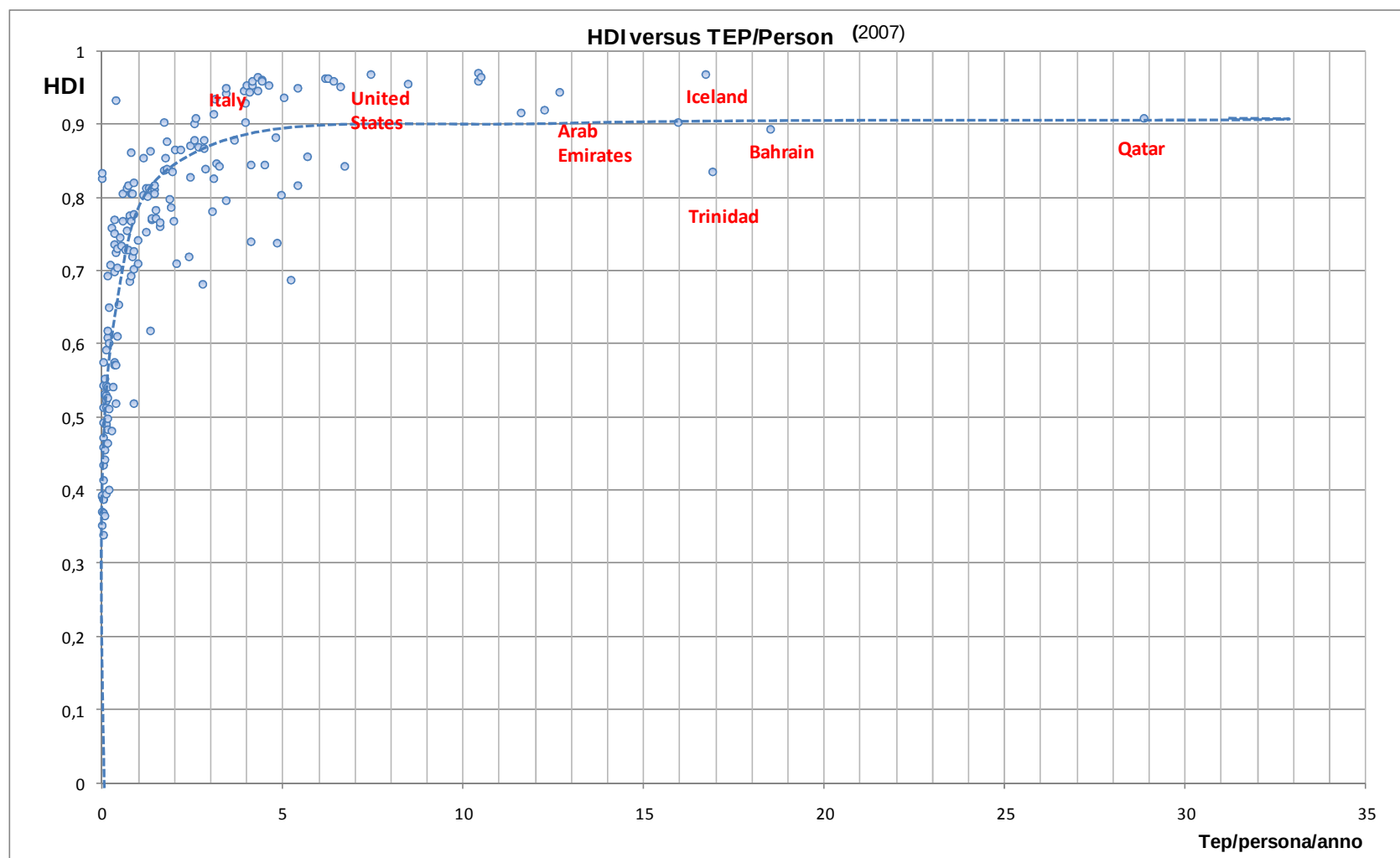
(total primary energy supply per unit of GDP)

Italy



Energy intensity for European countries is much lower than the USA and Canada values; in both cases it is lowering vs time
Low values of energy intensity means a more efficient way in using energy (energy saving; soft technologies, etc).

ENERGY AVAILABILITY IS A FUNDAMENTAL REQUIREMENT FOR QUALITY OF LIFE



5. OVERCOMING THE GDP BY INTRODUCING HDI

BEYOND GDP: THE SOCIOECONOMIC INDICATOR HDI

- Since long time there is a diffused conviction that GDP per capita is insufficient to measure the wellbeing.
- To be satisfied of your life you need to be in good health, to have a high level of education and adequate economic resources.
- On the basis of these premises UNDP has introduced a new index, the HDI (Human Developed Index) containing information on health, education and money availability.

TOWARDS INDICATORS ABLE TO MEASURE THE WELLBEING

- In the last years indicators measuring the wellbeing have started to be developed.
- These indicators should be able to measure the wellbeing or happiness of a human community.
- The first step forward was the introduction of the HDI.
- Recently, studies and analyses have been developed, attempting to express the level of wellness of a given society through a larger number of parameters than those included in the calculation of HDI.
- This possibility has been the subject of a study made by the Commission entitled "Measurement of Economic Performance and Social Progress", instituted in 2008 and chaired by the Nobel Prize Joseph Stiglitz.

BEYOND GDP: HDI THE FIRST STEP FORWARD

- The first step in the direction of overcoming the use of GDP was the introduction of the Human Development Index (HDI) that takes into account not only economic aspects but also the state of health and the level of education.
- The Human Development Index combines life expectancy data and years of schooling with standard of living indicators. Standard of living is calculated by adjusting GDP with purchasing power parity. The index then ranks 177 member countries by its HDI result.

The CNEL - ISTAT method

EQUITABLE AND SUSTAINABLE WELL-BEING (BES)

First Report, March 2013 - initiative CNEL - ISTAT

- In recent years, the debate on how to measure the well-being of individuals and societies has been of primary interest to global public opinion.
- The crises of the last few years (food, energy, environmental, financial, economic and social situation) have made clear the urgent need to develop new statistical measures capable of guiding decision-makers in policy making, as well as firms' and citizens' individual behaviours.
- On this line more recently an important initiative was taken from two Italian important public institutions: ISTAT (Istituto Nazionale di Statistica) and CNEL (Consiglio Nazionale dell'Economia e del Lavoro). They introduced 12 domains of wellbeing.
- Each one of these domains include an average of 11 high quality indicators for a total of 134.

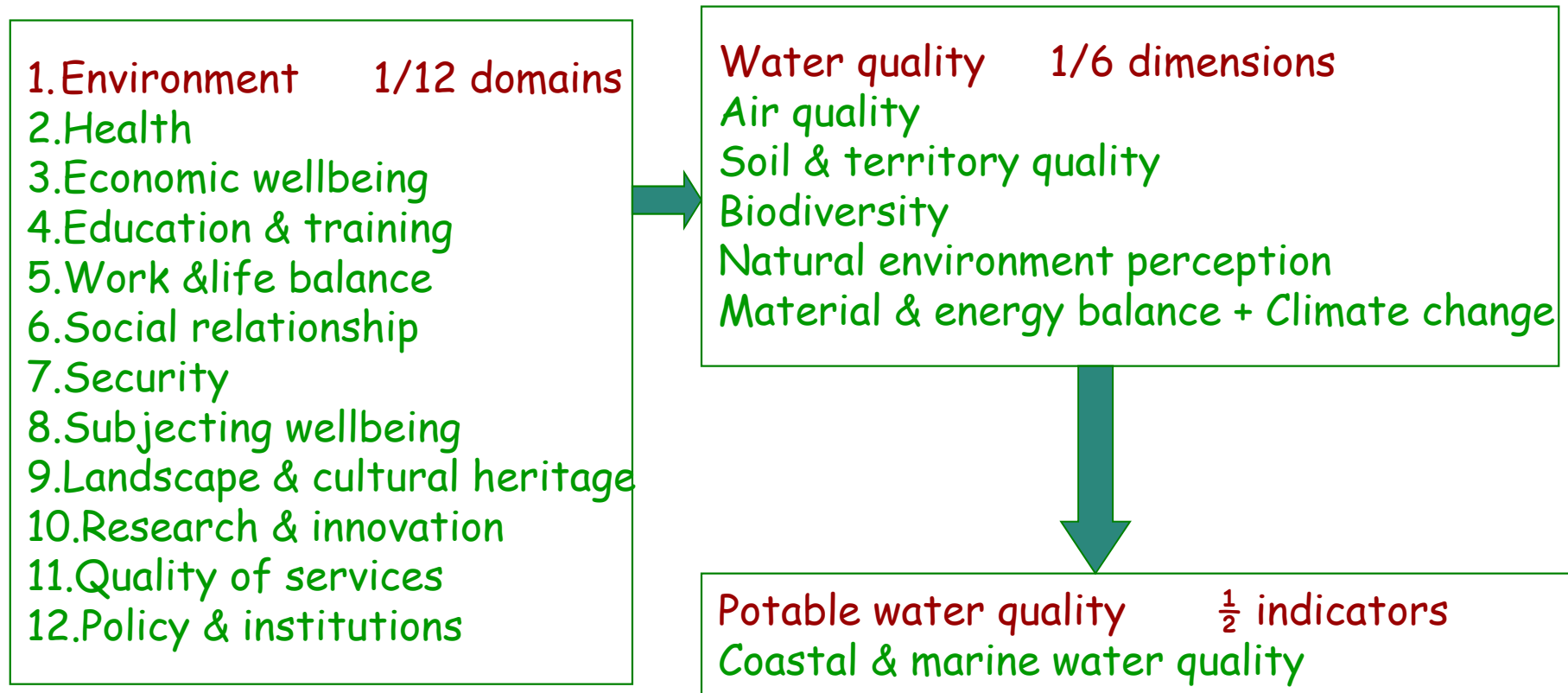
CNEL - ISTAT TWELVE DOMAINS

- 1) Environment
- 2) Health
- 3) Economic wellbeing
- 4) Education and training
- 5) Work and life balance
- 6) Social relationships
- 7) Security
- 8) Subjective wellbeing
- 9) Landscape and cultural heritage
- 10) Research and Innovation
- 11) Quality of services
- 12) Policy and institutions

ITALIAN DOMAIN SITUATION vs EUROPE

DOMAIN	ITALIAN SITUATION
Health	People are living longer, but with stronger social inequality
Education and training	Delay in comparison with Europe, but slowly improving
Work and life balance	A serious waste of resources, exacerbated by the crisis
Economic well-being	Social security has softened the crisis, poverty rise
Social relationships	Scarce trust in other people, heavy reliance on family
Politics and institutions	Politics is increasingly distant from its citizens
Security	Criminality rates have fallen, but improvement stopped
Subjective well-being	High levels of life satisfaction, down in the last year
Landscape & and heritage	A great wealth not adequately protected
Environment	Some signs of improvement and persisting problems
Research and innovation	Companies are committed to innovation, gap with EU
Quality of services	Still delays, with significant improvements

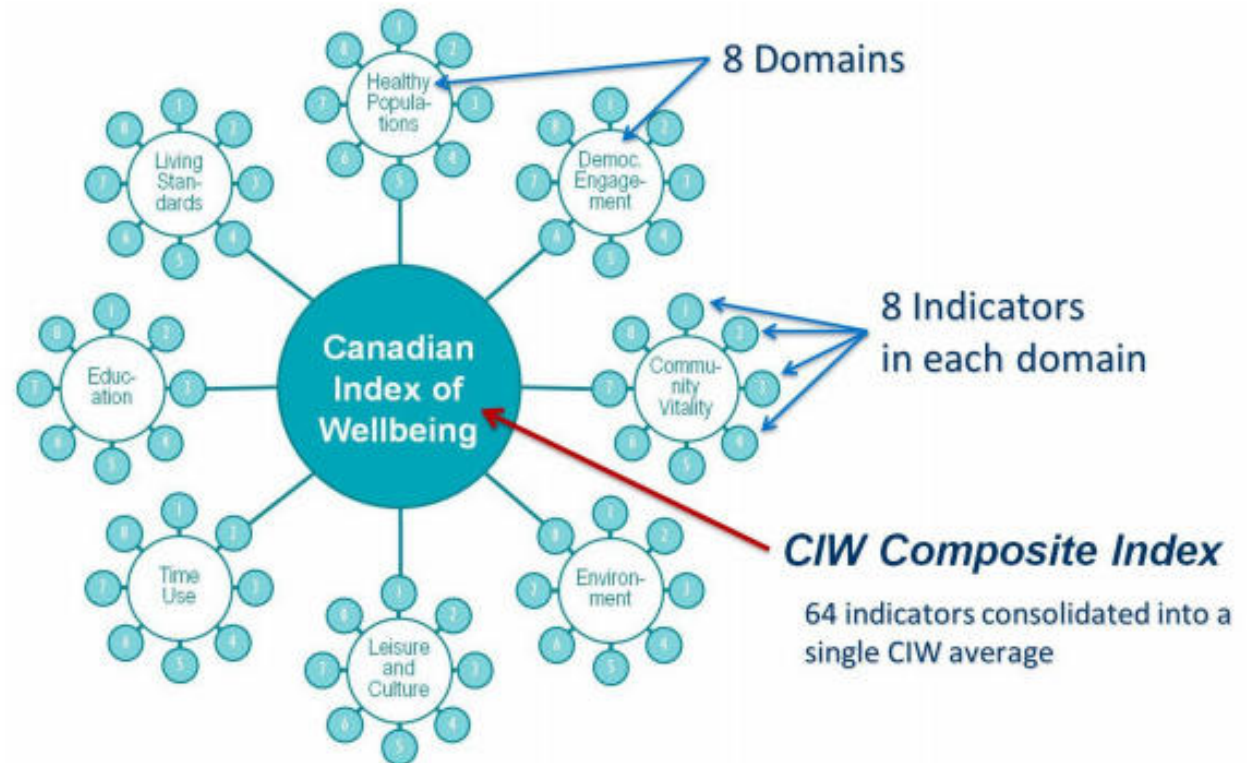
RELATIONSHIP BETWEEN DOMAINS, DIMENSIONS, & INDICATORS



OTHER METHODS TO CALCULATE WELLBEING INDEX

CANADIAN APPROACH

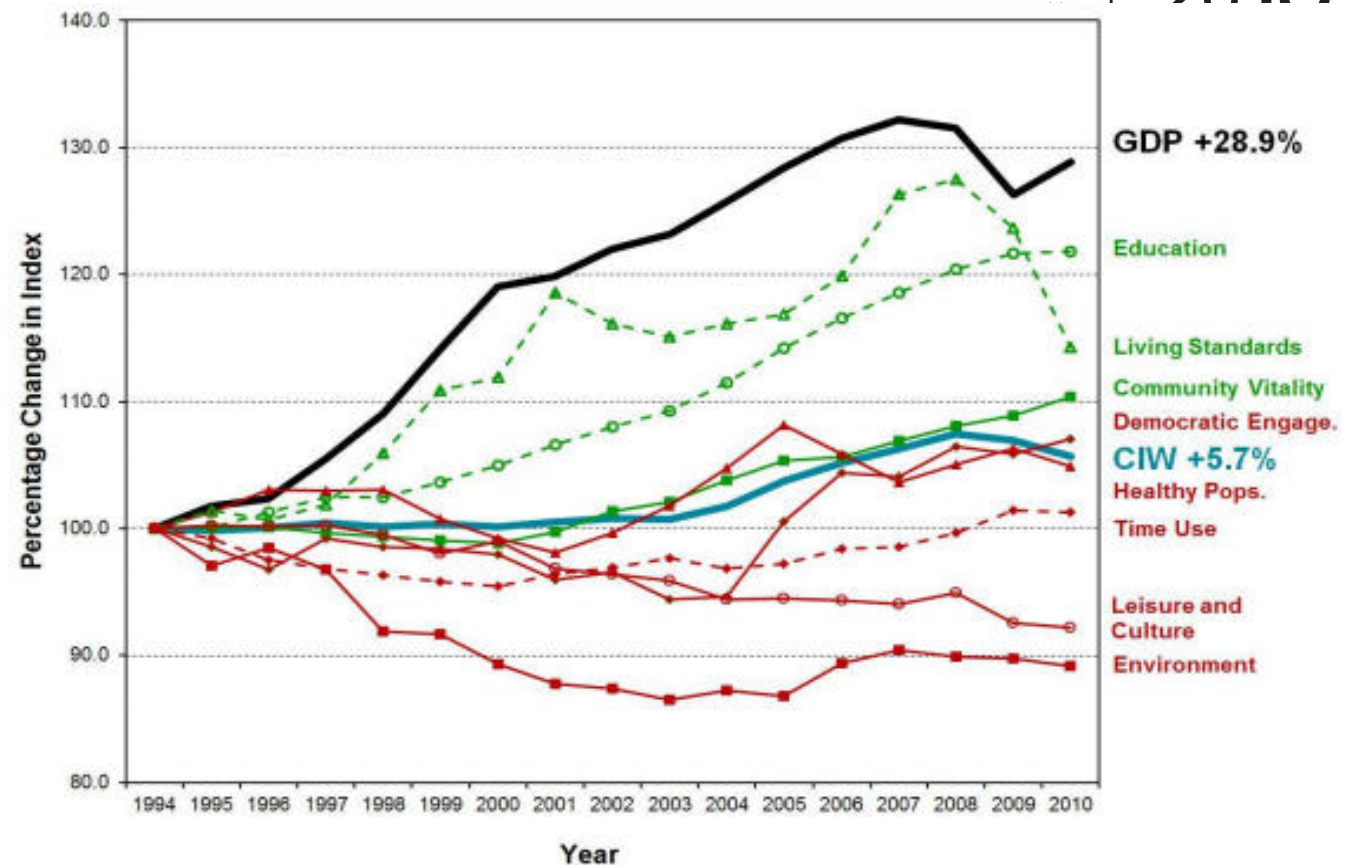
- The Canadian method, based on data collected in 17 years is able to calculate the wellbeing index using the statistical data regarding the most interesting aspects for the general public.



Statistical data consist in 64 indicators grouped in eight domains

RESULTS OF CANADIAN ANALYSIS

The graph shows a continuous increase of GDP (except the temporary drop due to the crisis of the last years). Total increase of GDP (17 years) is 29%, whereas the growth of CIW has been only 5,7%.



In the graph you can notice that the more penalized sectors were environment and culture; among the positive trends there are education and living standards.

YOUR BETTER LIFE INDEX (OECD)

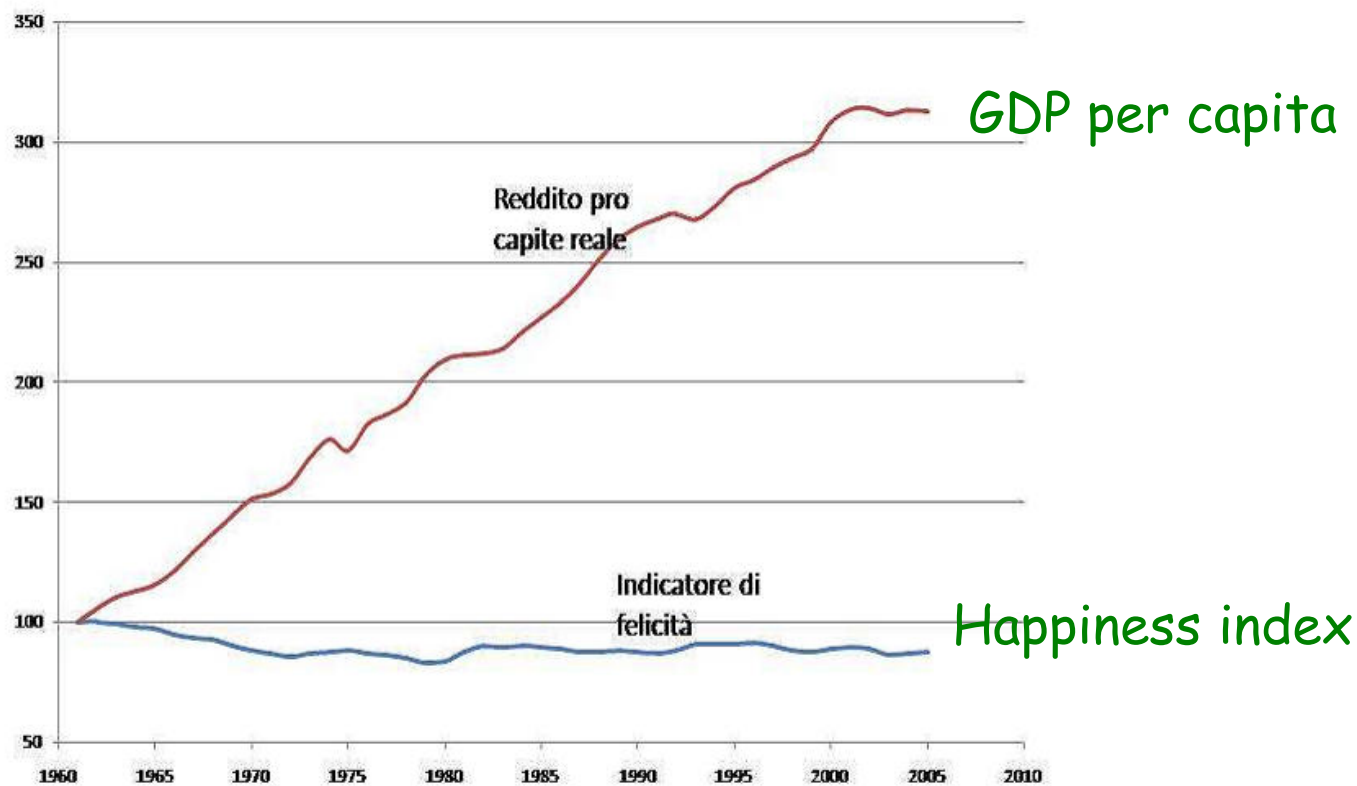


- Your Better Life Index is designed to let you visualise and compare some of the key eleven factors.
- It's an interactive tool that allows you to see how countries perform according to the importance you give to each of 11 topics that make for a better life.
- The OECD Better Life Initiative allows understanding what drives well-being of people and nations and what needs to be done to achieve greater progress for all.

Housing
Income
Jobs
Community
Education
Environment
Civic Engagement
Health
Life Satisfaction
Safety
Work-Life Balance

GDP IS GROWING, HAPPINESS IS CONSTANT

Evoluzione reddito pro capite e felicità – Italia



Fonte: Vision su dati NEF e ISTAT

HAPPINESS AND GDP TREND IN USA

The **Happy Planet Index** includes life expectancy at birth, life satisfaction, and ecological footprint. It does not indicate the 'happiest' country in the world but the relative efficiency with which nations convert natural resources into happy lives for their inhabitants.

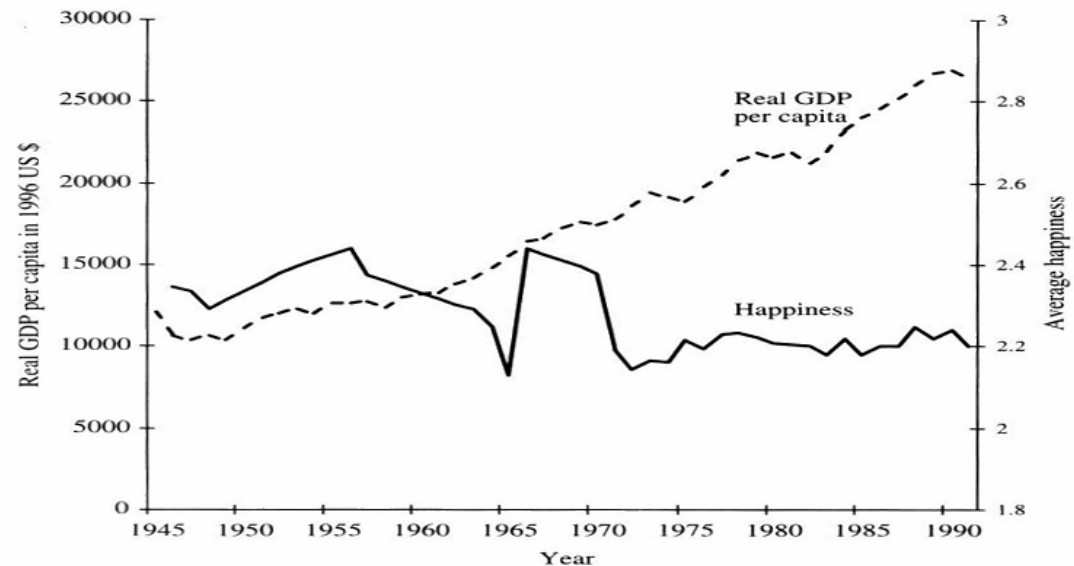
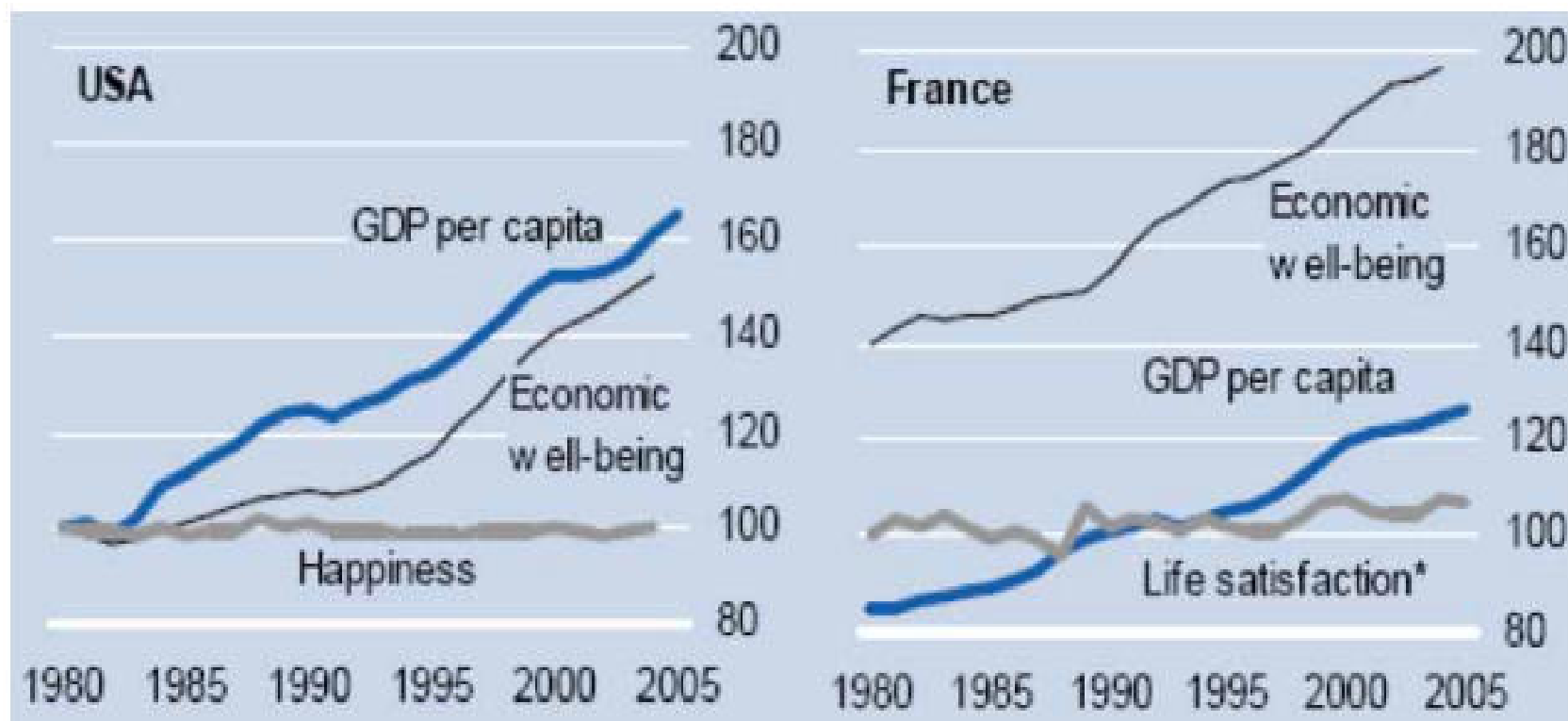


Figure 1. Happiness and income per capita in the United States, 1946–91. Data from World Database of Happiness, Bureau of Economic Analysis of the U.S. Department of Commerce and U.S. Bureau of the Census.

$$\text{Happy Planet Index} \approx \frac{\text{Experienced well-being} \times \text{Life expectancy}}{\text{Ecological Footprint}}$$

GROSS DOMESTIC PRODUCT, HAPPINESS, WELLBEING

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A NOVEL APPROACH TO WELLBEING INDEX

- The proposal to introduce an index related not only to the economy, as it is the case for the GDP, is not new.
- The need of a novel approach to guide the development was premonitory stated in 1968 by Robert Kennedy, who prophetically warned:

"Yet the gross national product does not allow (to evaluate) for the health of our children, the quality of their education, or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages; the intelligence of our public debate or the integrity of our public officials".