Virtual Indicator Exhibition

Adjusted Net Saving

by **Alexandra Sears** and **Giovanni Ruta**, The World Bank

What is Adjusted Net Saving?

Adjusted net saving measures the true rate of saving in an economy after taking into account investments in human capital, depletion of natural resources and damages caused by pollution. Adjusted net saving, known informally as genuine saving, is an indicator aiming at assessing an economy's sustainability based on the concepts of extended national accounts.

Positive savings allow wealth to grow over time thus ensuring that future generations enjoy at least as many opportunities as current generations. In this sense, adjusted net saving seeks to offer policy-makers who have committed their countries to a "sustainable" development pathway, an indicator to track their progress in this endeavor.

Adjusted net saving is derived from the standard national accounting measure of gross saving by making four adjustments:

(i) consumption of fixed capital is deducted to obtain net national saving;
(ii) current public expenditure on education is added to account for investment in human capital;
(iii) estimates of the depletion of variety of natural resources are deducted to reflect the decline in asset values associated with extraction and depletion;
(iv) deductions are made for damages from carbon dioxide and particulate emissions.

Gross national saving – Consumption of fixed capital = **Net National Saving +** Education Expenditure – Energy depletion – Mineral depletion – Net forest depletion – Damage form carbon dioxide emissions – Damage from particulate emissions = **Adjusted net saving**

The indicator is measured in percentage by dividing ANS by GNI.

The Need for Adjusted Net Saving

Saving is a core aspect of development. Without the creation of a surplus for investment, there is no way for countries to escape a state of low-level subsistence. Resource dependence complicates the measurement of saving effort because depletion of natural resources is not visible in standard national accounts. The same is true for pollution damages to existing assets.

Adjusted net saving overcomes this problem by measuring the change in value of a specified set of assets, excluding capital gains. If a country's net saving is positive and the accounting includes a sufficiently broad range of assets, economic theory suggests that the present value of wellbeing is increasing. Conversely, persistently negative adjusted net saving indicates that an economy is on an unsustainable path.

In addition to serving as an indicator of sustainability, adjusted net saving has several other advantages as a policy indicator.

- **It presents resource and environmental issues within a framework that finance and development planning ministries can understand.**
- **It reinforces the need to boost domestic savings, and hence the need for sound macroeconomic policies.**
- **It highlights the fiscal aspects of environment and natural resource management, since collecting resource royalties and charging pollution taxes are basic ways to ensure efficient use of environmental resources.**

History of the Indicator

The publication of the Brundtland Commission report in 1987 introduced a critical new dimension to our conception of economic development by raising the issue of sustainability of development. The United Nations Conference on Environment and Development (the Rio Conference) in 1992 helped to cement this understanding and prompted most countries to commit to achieving sustainable development. Achieving sustainable development is at heart a process of creating and maintaining wealth.

Wealth is more than the value of produced assets. It includes natural resources, healthy ecosystems, and human resources. The measurement of com-

prehensive wealth falls entirely in the realm of integrated economic and environmental accounting or *green national accounting* – and suggests that expanding our traditional national accounting measures of savings and wealth could be an important step in guiding policies for sustainable development.

The idea that saving, or changes in wealth, is crucial for sustainability is already present in Blueprint for a Green Economy (Pearce et al (1989)). But it is in Pearce and Atkinson (1993) that the concept is introduced formally.

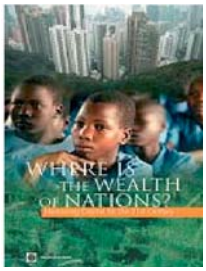
Pearce and Atkinson combine published estimates of depletion and degradation for 20 countries with standard national accounting data to examine true savings behavior. By this measure many countries appear to be unsustainable because their gross savings are less than the combined sum of conventional capital depreciation and natural resource depletion.

Hamilton and Clemens (1999) provide a theoretical foundation and empirical evidence showing that levels of saving are negative in a wide range of countries when the environment and natural resources are included in the savings measure. Negative genuine saving is more than a theoretical possibility, therefore, and the evidence is that many countries particularly in Sub-Saharan Africa are being progressively impoverished as a result of poor government policies.

The World Bank has a 35-year time series of ANS estimates which has permitted empirical tests of whether net saving today does in fact translate into future increases in wellbeing. Ferreira and Vincent (2005) show that this relationship holds if the sample is limited to developing countries only; Ferreira *et al.* (forthcoming) show that these results can be extended to incorporate the wealth-diluting effects of population growth.

Today, the World Bank publishes two important sources of indicators that provide an annual snapshot of progress in the developing world: The Little Green Data Book and World Development Indicators. These indicators allow us to assess the scope of the problems we face and measure progress in solving them. Both set of publications feature the ANS indicator.

As part of this reporting effort, the World Bank launched, Where is the Wealth of Nations? (World Bank, 2006), which offers new estimates of total wealth, including produced capital, natural resources, the value of human skills and capabilities, and updated measures of saving.



Challenges

We should be cautious in interpreting a positive genuine saving rate. Some important assets from the analysis are omitted for methodological and empirical reasons, which may mean that saving rates are only apparently positive. Challenges include:

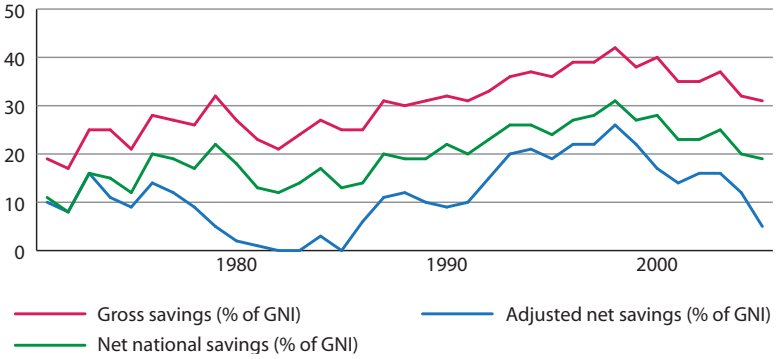
- Lack of data (i.e. underground water, land degradation, fish stocks, diamonds)
- Lack of methods (i.e. how can we put a value on biodiversity)
- Measurement errors

The Path to Sustainability

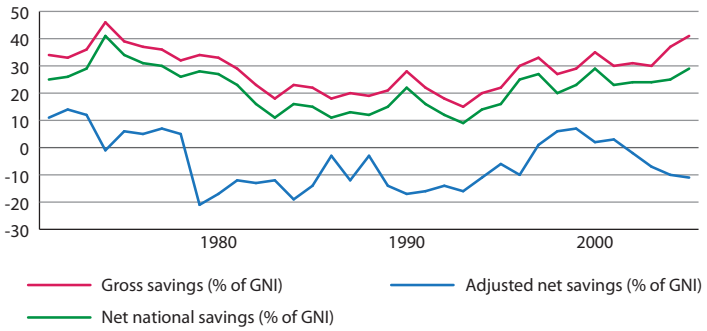
The following graphs illustrate the directions Malaysia and Venezuela are taking on the path to sustainable development.

In Malaysia, positive saving has been associated with substantial growth leading the country to become an important example of success in East Asia. In Venezuela, negative saving rates have been associated with a poor rate of economic growth. Between 1980 and 2006, the country has experienced one of the slowest growth rates in Latin America.

Adjusted Net Saving for Malaysia



Adjusted Net Saving for Venezuela



** For an Interactive Tool on obtaining the ANS for every country, please go to http://go.worldbank.org/7QFHSRIE40*

Next Steps

A number of efforts are currently underway to strengthen the measurement of adjusted net saving. These include:

- Updating methods to estimate energy and mineral extraction costs and their evolution over time. This is necessary to correctly measure the value of energy and mineral resource depletion, which constitute a major deduction to saving and a large source of rents for many developing countries. Extraction costs are not usually available and must be estimated using scattered data from extractive companies.

- Adjusting for population growth. While negative saving rates are an indication of unsustainability, positive saving rates may be masking a potential source of unsustainabiliy if population is growing fast enough. Population growth dilutes the effect of capital accumulation as it increases the number of people that share the country's total wealth. Estimates of changes in wealth per capita are presented in World Bank (2006). Numbers for Ghana, for example, show that it is possible to have positive genuine saving but declining wealth per person.

  Areas for which future work is needed include the improving of estimates of the investments in human capital. Genuine saving treats public education expenditures as an addition to the saving effort. However, current expenditure of $1 on education does not necessarily yield $1 of human capital. The calculation should capture the varying effectiveness of education expenditure, include private expenditure, and value the depreciation of human capital.

Additional Resources:

- Adjusted Net Saving Web Page (World Bank) (find everything from tools, papers, and data to manuals) http://go.worldbank.org/3AWKN2ZOY0
- For a full set of publications on Green Accounting please visit our Publications Site

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Canadian Index of Wellbeing (CIW)

by **Lynne Slotek**, CIW National Project Director

The Canadian Index of Wellbeing A Transformational Initiative

The Canadian Index of Wellbeing (CIW) is a new and transformational initiative that will report on the quality of life of Canadians. It is our hope that it will one day become Canada's principle means of measuring genuine progress.

The CIW will chart and provide unique insights into how the lives of Canadians are getting better or worse in areas that really matter to: our health, our standard of living, the quality of our environment, the way we use our time, our education and skill levels, the vitality of our communities, our participation in the democratic process, and the state of our arts and culture. Most importantly, the CIW will shine a spotlight on how these important areas are interconnected. How, for example, changes in income are linked to changes in health, or how community engagement and living standards are connected.

The CIW is being built by the CIW Network – a partnership of national indicator experts and practitioners together with business and civic leaders, and representation from government and grass roots organizations across the country in consultation with international experts. Our goal is to help refocus the political discourse in Canada, reshape the direction of public policy, pinpoint policy options and solutions that will genuinely improve the wellbeing of Canadians, and give Canadians a tool to promote wellbeing with policy shapers and decision makers.

Why Canada Needs National Indicators

In Canada, as in much of the world, the most commonly cited measurement of progress is the GDP but there is a growing awareness among Canadians that the GDP focuses on a narrow set of economic issues. By relying on such a limited perspective, it fails to capture many of the things that really matter to Canadians. As the natural environment is depleted, the gap between rich and poor grows, chronic diseases skyrocket, life for Canada's Aboriginal peoples fails to improve, and the pressures of time stress drive people to distraction, it's no wonder that so many Canadians are feeling that the rosy economic picture presented in the news is at odds with what they know to be our everyday reality.

Even within the limited scope of the economy, the GDP fails to distinguish between economic activities that are beneficial and those that are harmful to our overall wellbeing. The sale of cigarettes and trans-fat-loaded fast foods, for example, causes the GDP to go up, but no one would really argue that this is good for our wellbeing.

The CIW will treat beneficial activities as assets and harmful ones as deficits. It will, for example:

- distinguish between good things like health and clean air, and bad things, like sickness and pollution;
- promote volunteer work and unpaid caregiving as social goods, and overwork and stress as social deficits;
- put a value on educational achievement, early childhood learning, economic and personal security, a clean environment, and social and health equity; and
- encourage a better balance between investment in health promotion and spending on illness treatment.

Description of the CIW Model

The CIW will track changes in eight quality-of-life domains. The development of each domain is under the leadership of world-class experts and backed by rigorous Canadian and international peer review and public consultation.

The following are the working definitions that have been adopted for each of the domains:

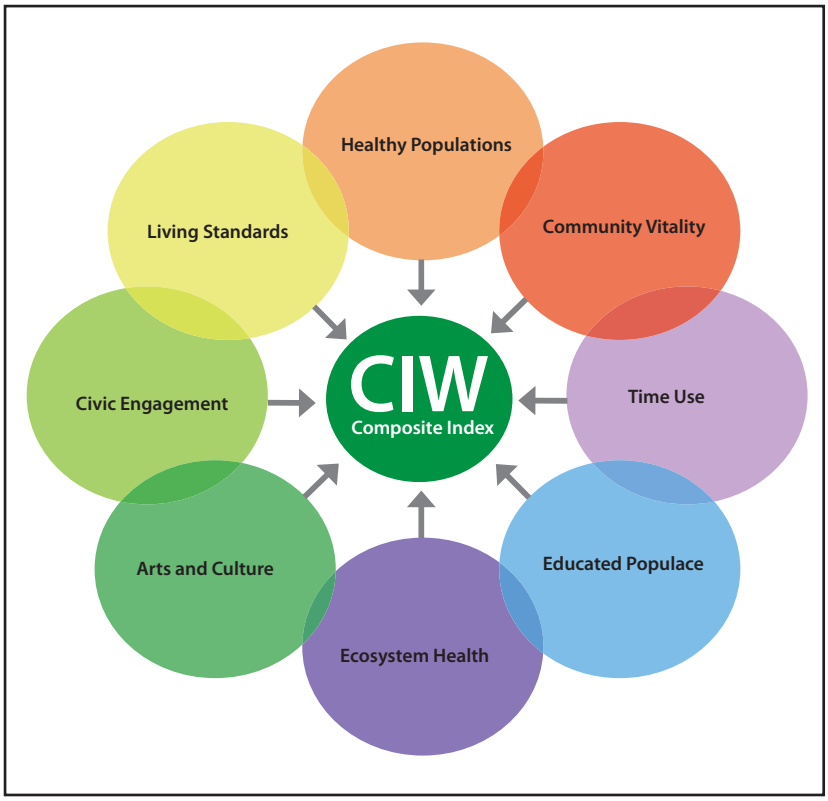
Living Standards measures the quality and quantity of goods and services, both public and private, available to the population, and the distribution of these goods and services within the population.

Healthy Populations measures the physical and mental wellbeing of the population — experiencing disease, disability and delaying death, lifestyles people lead, and care people receive.

Educated Populace measures the literacy and skill levels of the population, including the ability to function in various societal contexts and plan for and adapt to future situations.

Community Vitality measures the strength, activity and inclusiveness of relationships among residents, private sector, public sector and voluntary organizations.

Ecosystem Health measures the state of wellbeing and integrity of the natural environment. This includes the sustainability of Canada's natural resources and the capacity of ecosystems and watersheds to provide a sustained level of ecological goods and services for the wellbeing of humans and other species.



Civic Engagement measures the health of Canadian democracy. It addresses three aspects of public life and the governance of society: How engaged are citizens in public life and governance? Do Canadian governments function in an open, transparent, effective, fair, equitable, and accessible manner? And are Canadians, their governments and their corporations good global citizens?

Time Use measures the use of time, how people experience time, what controls its use, and how it affects wellbeing.

Arts and Culture (working concept and not a definition) measures activity in both the very broad area of culture, which covers all forms of human expression, and in the much more focused area of arts, which includes performing arts, visual arts, media arts, and art facilities and institutes.

The domains will be blended into a composite index that will provide a quick snapshot of whether overall Canadian wellbeing is changing for better or for worse. CIW reports will present detailed information on both the composite index and the individual domains. The CIW's 'basket' of domains will be reported regularly with clarity about trends and interrelated stories (e.g., "While X is on the rise, it is interesting to note that Y is flat, and Z is declining. Possible explanations include...").

A Short History

In 1999, The Atkinson Charitable Foundation (ACF), a prominent Canadian foundation, recognized the need for a credible national voice to measure the economic, health, social and environmental progress of Canadians. The ACF convened a group of index experts from across Canada, including Statistics Canada**,** to discuss what it would take to create such a voice.

Following a number of years of public consultations, research and development, a pan-Canadian National Research and Development Working Group was established in May 2004, and from 2005-2007 held annual two-day working meetings, and developed the CIW model. In November 2005, an initial model was presented to a workshop led by composite index experts from the Joint Research Centre of the European Commission, and received favourable reviews. The model was further tested through two rounds of cross-Canada stakeholder roundtables in 2006 and 2007, and further modified.

Current Status

The CIW model will shortly be reviewed by independent validation groups consisting of national and international experts who have not been involved with the project. Reports have been pre-

pared on three domains: Living Standards, Healthy Populations, and Community Vitality. These reports will also be reviewed by validation groups and updated for release. Further development and refinement of the models for Educated Populace, Ecosystem Health and Time Use domains is underway. Work on the Civic Engagement and Arts and Culture domains will begin in 2008.

The Future

The CIW will be publicly launched at a high-profile event in the next year or so.

In the meantime, the CIW Network is viewed internationally as a global pioneer in developing a holistic, integrated approach to measuring wellbeing. Because of this position of leadership, we are often invited to partner with experts in other countries and participate in international conferences to help build this important global movement. These connections are important in raising the benchmark of research and data integrity and changing the global dialogue about genuine progress. Our continued contribution on the international scene will not only strengthen the CIW project in Canada, but at the same time, give the project access to the best international minds.

Capability Index

by **Ingrid Robeyns**, Radboud University Nijmegen, The Netherlands
and **Robert van der Veen,** University of Amsterdam, The Netherlands

Need for a *capability approach* to quality of life

Several approaches exist to conceptualise and measure 'quality of life' (as is reflected in the large diversity of indicators in this Virtual Exhibition). What quality of life is, is not merely a philosophical issue. The practical implications of different theories on what constitutes quality of life lead to diverging recommendations on what, if anything, government should undertake to promote it, and also give rise to distinct ideas concerning the design of social and economic institutions. Three theoretical approaches to quality of life can be distinguished that argue for a distinct interpretation of the substantive content of life quality.

The first of these approaches is the liberal *resource approach*: people need access to certain resources, in order to become capable of developing and pursuing their own conceptions of the good life, by deploying their resource shares autonomously within the boundaries of equitable social institutions. An example of an index representing a narrow view of resources is GDP.

In opposition to this view, the utilitarian tradition identifies quality of life (or in effect synonymously: well-being) with a metric of subjective utility – which is often measured as *happiness* or alternatively *life satisfaction*. The happiness indices in this Virtual Exhibition are examples of the utilitarian approach.

The third approach understands life quality as a *set of capabilities*, that is to say of real possibilities for people to function effectively in diverse domains of social life, in accordance with their own views of the valuable life in terms of one's 'doing and being'. According to the capability approach, the government is tasked to make available the resources which are necessary for the capabilities of individuals. This concerns both individual and collective resources. We claim that on theoretical grounds the capability approach is to be preferred as the foundation for a measure of quality of life. At the request of the Netherlands Environmental Assessment Agency (MNP), we have developed initial ideas for a capability index that measures quality of life (see Robeyns and van der Veen, 2007, http://www.mnp.nl/en/publications/2007/Sustainablequalityoflife.html).

Situating the *capability approach*

Figure 1 presents the causal relations between the three approaches to quality of life.

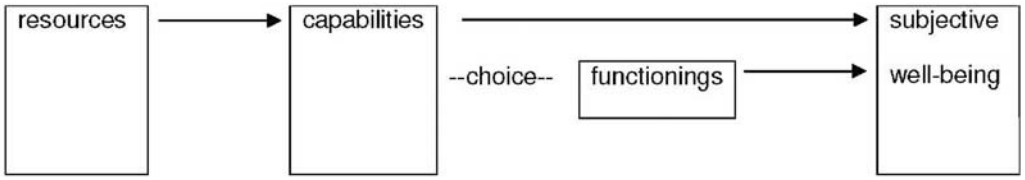


Figure 1: The direction of causal relations between resources, capabilities, and subjective well-being.

The resource-based approach holds that the 'quality of life' is what people do with their resources. Questions about the content of the quality of life are not considered to be a legitimate task of the government, which needs to be neutral between the divergent views that people have about the good life. The government needs to restrict its care to guaranteeing access to collective resources and to regulate entitlements to individual resources, and it ought not to impose its own views about the appropriate use of those resources.

The capability approach holds that resources are important *inputs* for the quality of life, but that the quality of life itself is captured by the functionings and capabilities of individuals. In contrast to liberalism, which doesn't want to go beyond identifying resources that can be used for a wide range of goals, the capability approach argues that a debate about the general and specific opportunities to shape our lives surely lies within the legitimate domain of the government. The subjective well-being approach agrees with the view that resources are means for multiple goals, but in addition holds that the only neutral indicator for judging how well people fare in their achievement of those goals, is their life satisfaction. This is why the subjective well-being situates quality of life at the righthand end of the causal scheme of figure 1. Thus the subjective approach holds that it is the government's duty to advance 'happiness' or 'life-satisfaction', even though not all variants endorse giving an absolute priority to the utilitarian master principle of maximizing average life satisfaction. Against this, the capability approach argues, on ontological grounds, that subjective well-being cannot be regarded as the ultimate measure of the quality of life, but should rather be seen as a (undoubtedly desirable) by-product. In the scheme in figure 1, capabilities and functionings, but also subjective well-being, are presented as *outputs* of the all-purpose means at the resource end. However, there are two differences. First of all, capabilities and functionings are outputs that can be intersubjectively identified only within a given society, in open discussion. We should debate and discuss their relevance, for the notion of life quality is not interculturally and universally determinable by philosophical reflection. By contrast, happiness, life satisfaction, or satisfaction on domains, are purely subjective outputs of persons' resource utilisations. However, secondly, in so far as life satisfaction issues from the way in which people experience their opportunities to function, and their actual functioning levels, it is also a causal output of functionings and capabilities. For as figure 1 shows, functionings and capabilities are situated as *intermediating* between resources and subjective well-being.

Next, it is important to note that capabilities -the real opportunities to function effectively can have a strong effect on life satisfaction, independently of the satisfaction that people derive from their actual functioning. Even the secure knowledge that certain opportunities are open to persons can have a positive effect on their happiness. The presence of these capabilities subsequently produces subjective well-being, quite apart from the choices that citizens actually make to divide their time over political participation and other activities that generate life satisfaction. The capability approach thus allows that causal relations between resources and subjective well-being follow different chains. Thus, even if one ultimately prefers a subjective approach to the quality of life, it may still be important to examine functionings and capabilities, as is in fact being done in some of the literature. A similar observation holds for those who prefer the resource-based approach to life quality. For it is by no means immediately evident what types of resources are actually required for people to realize their own and diverse conceptions of the good life.

Towards a *capability index*

We propose the following list of capabilities in a range of domains that we believe should be included in a policy-relevant index of life quality (see Robeyns and van der Veen, 2007, http://www.mnp.nl/en/publications/2007/Sustainablequalityoflife.html):

Table 1: Domains for a capability-index: a first attempt.

1. physical health
2. mental health
3. knowledge and intellectual development
4. labour
5. care
6. social relations
7. recreation
8. shelter
9. living-environment
10. mobility
11. security
12. non-discrimination and respect for diversity
13. political participation

Early attempts of concretising and quantifying the *capability approach*

The literature on the capability approach evolves rapidly: a survey written today may be outdated in six months from now. A recent survey of empirical applications shows that at present, no scholar even has worked out the theoretical foundations of a capability-index of life quality, let alone engaged in the work of operationalizing and testing empirically such a quality index (Robeyns, 2006). Thus in the prevailing state of the art, developing a capability-index is a pioneering task. Nevertheless, current literature does offer two important insights.

The first insight is that we need to distinguish between the design of an index based on existing secondary statistics, versus an index constructed against a background of sufficient time and resources to collect most of the data on the capability-domains. Existing empirical applications are strongly determined by the available datasets, both with respect to the selection of capabilities, as well as the possibilities to measure capabilities rather than levels of realised functionings. Almost all these applications work with datasets constructed with other purposes in mind. This is a disadvantage. If we are limited by available datasets, then it is likely that we will remain far removed from an adequate capability-index of life quality. Since in this chapter we are primarily interested in a conceptual exploration, we assume that there are no constraints on the data that can be gathered.

Another insight from the existing literature concerns the character of the index itself: at what level of abstraction and aggregation would one like to construct an index? One of the criteria an index should meet is that it be useful for policy design and evaluation. A capability-index which seeks to inform governmental policies should be formulated at a lower level of abstraction than the very general dimensions that have typically been worked out ni the literature.

State of play and work left for the future

If we consider all advantages and disadvantages of the different approaches that were discussed in this chapter, our conclusion is that *on theoretical grounds* the capability approach is to be preferred as the foundation for a measure of the quality of life. However, it must be kept firmly in mind that the *empirical* development of the capability approach is still in an early stage. It is possible that further research will reveal disadvantages of a capability-based life quality-index that are insufficiently appreciated at present. The full construction of a capability-index will still involve a lot of hard and detailed work.

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Comparing welfare of nations

by **Hans-Olof Hagén**, Statistics Sweden

Why it is necessary to use composite indicators and make sensitivity test of them:

In my paper [1] I have done an attempt to show how a complex reality can be illustrated using different statistical methods. The purpose of this report was not to exhibit the actual results of analysis, but rather to show the methods used to arrive at those results. The example chosen for analysis was a comparison of the level of welfare in OECD countries and the efficiency of these countries to create a high economic standard and welfare for their citizens. Because welfare is an extremely ambiguous concept, it is very difficult to measure. There are no given answers on the meaning of the concept of welfare, nor any explanations on how to measure it. Attempts to do so are thus much debated. In simple terms, a composite indicator is a way of putting apples and oranges together in order to decide which fruit basket is the most attractive. But this indicator can be problematic. For example, to someone who only likes grapes, it doesn't matter how many apples and oranges there are in the baskets. Furthermore, many statisticians also believe that only single variables can be reported in a satisfactory way. But neither decision-makers nor the general public wants a report that looks like a huge catalogue where variable after variable is listed page after page as a base for their understanding. Even though subjectivity is inevitable, they prefer to find out which fruit basket is probably the most interesting, rather than a list that states how many twenty or so different kinds of fruit each basket contains.

In this analysis, the composite indicator that is created is an attempt to measure welfare in the OECD countries. A sensitivity analysis of this chosen example has been conducted to study how the results are affected if certain partial components and extreme values are excluded. In addition, the significance of different valuations of variables is tested. The correlations between these components have also been studied, as well as the correlations between them and the measurement of welfare. A composite indicator for the input has also been created. The significance of different valuations of the various inputs for the ranking of the countries has been studied for this index as well. The ability of the input indicator and the factors that are included in it, to explain the differences between countries in economic standard and welfare has also been tested. Finally, it has been studied which countries are most effective in creating economic standards and welfare, respectively.

The indicator

The first part of the indicator is of course the economic resources in a country. I have argued that GNI is a better measure of that than GDP. But work is not everything why I did try to assess the existing labour input in the different countries by determining how much has been set aside for leisure time in the form of shorter work weeks, longer holiday leave, early retirement, housewives and other reasons that people of working age are not part of the labour force. However, other factors affect one's well being besides consumption space and leisure time. Of employed persons, Koreans take the lead by far in working the most hours per year, and the Icelanders have the highest proportion of people of working age that are employed. However, people from Netherlands, Italy and France have on the whole chosen to give up a significant share of their potential economic standard by using a large share of this potential in leisure time.

Not everything can be bought with money, even though economic resources are very important in many areas. Health is one of these other factors. How to measure people's health is justifiably a debatable subject. However, nearly all illnesses and health aspects affect length of life. In principle, we can maintain that there is another dimension to health other than survival and that dimension is suffering. Of course, no international statistics exist on such a subjective occurrence as reducing pain and increasing comfort, even if these occurrences would be of great significance for well being as well as for welfare. In addition, these measures most likely also increase length of life indirectly, just as many other factors that increase quality of life. The environment is also significant for welfare. In the end, the environment is also a question of survival and affects all aspects of health. But the effects on health may only be visible a relatively long time afterwards, so it is a good idea to also include the environment in the concept of welfare.

1 http://www.scb.se/statistik/OV/OV9999/2004A01/OV9999_2004A01_BR_X100ST0415.pdf

This section discusses suitable indicators for the environment. The selected indicators show that the geographically large countries with heavy industry such as Australia, Canada and the US have by far the highest emissions of environmentally hazardous gases per inhabitant. However, New Zealand and the Czech Republic are at the other end of the scale.

In the end, the environment is also a question of survival and affects all aspects of health. But the effects on health may only be visible a relatively long time afterwards, so it is a good idea to also include the environment in the concept of welfare. The state of the environment will then be a kind of early warning of health aspects and the quality of life in the future. Besides, the threat of a worsening environment usually affects how we regard quality of life, long before it can be traced as an effect on length of life. Besides health risks, a worsening environment can also deteriorate quality of life in other ways, while a good environment can be seen as quality of life in itself. All in all, it is preferable to include the environment in the design of this welfare indicator.

Sensitivity analysis, importance of choice of indicators

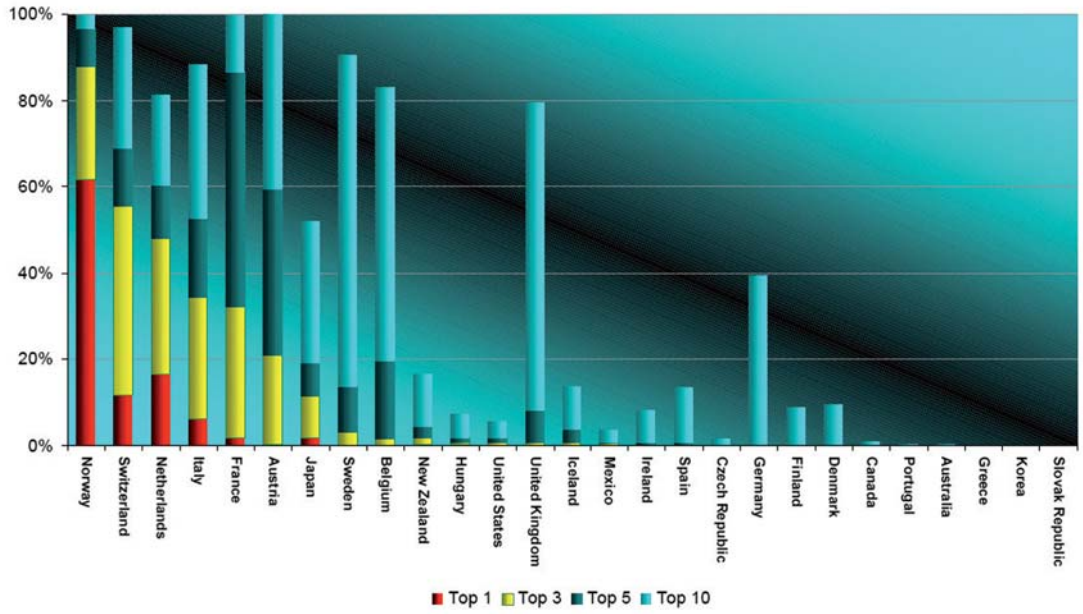
A sensitivity analysis of the welfare index has been done by studying the effects of removing components, sub-components and extreme values. An attempt to find correlations between the different indicators is also made. Here it is only room for showing how robust the ranking order of countries is for changes in the weight system. To analyse the importance of which weight that has been given to the different factors, a comprehensive sensitivity analysis has been done. In this analysis, the 8 different standardised indicators have been weighed with random weights, after which of the different countries have been ranked according to the value on their welfare index. This has been done for a million alternative weights.

The program generates a list of the number of times each country has been ranked with the highest value on the welfare index, the second highest value etc. down to the 27th place and the lowest value. To obtain an overall picture of the results, a figure has been made showing how often each country has come first, among the 3 best, among the 5 best, and finally the 10 best. The choice of these limits is based on how the structure of the actual results looked.

What is the cost of welfare?

A composite indicator for the input factor has also been chosen. Sensitivity for selected weights is tested in the same way as for the welfare index. Further, the correlations between the

The robustness of the ranking of countries according to the welfare index for different weights for the sub-indices



different components are analysed. The correlation between the components that can be said to form indicators on the knowledge society; quality of the labour force, formation of knowledge and IT use are strongly correlated. However, the quantitative input of labour is independent of all these other indicators. To determine if a country has succeeded in producing welfare effectively, the results must relate to the resources a country has invested to obtain welfare. The vital resource is labour, and since there is comparable data for the share of the population of working age, which is the relevant measure in this case, the choice is simple. However, in addition to quantity, quality is also significant. The broadest available measure of quality of the labour force is the level of education of the labour force, measured in a number of ways.

Besides the level of education of the labour force, other formation of knowledge is also important. Therefore, other indicators such as research and development innovation activities are often included among the selected input indicators. In this example, R&D costs per inhabitant, adjusted for differences in cost levels among countries (PPP adjusted), have been used. Another area of growth is IT development. The IT revolution is very important for development in many areas, even though it is not directly evident that IT investments have led to larger production profits. This applies on a more aggregated level, but studies of individual enterprises or smaller groups of enterprises have shown clear effects of more developed IT use. Combinations of organisational changes and IT investments have produced results.

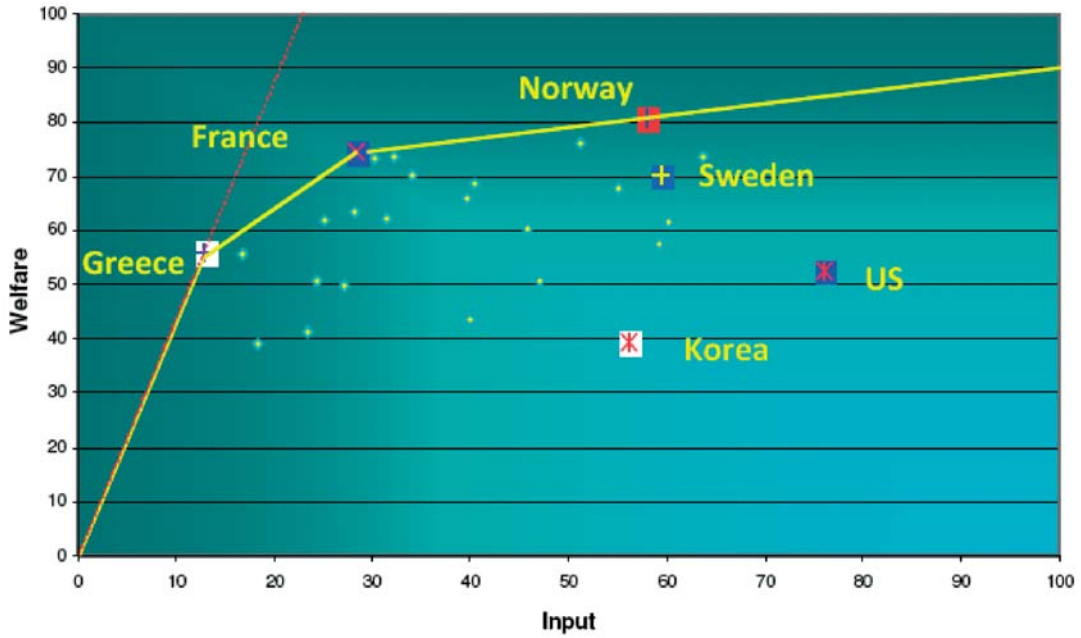
There is a considerable variation in values of the welfare indicator between different countries, even if they have about the same value on the input indicator.

Korea, Iceland and the US are among those countries that have high values on the input index, but considerably lower values on the welfare index. Meanwhile countries such as Italy and France have high values on the welfare indicator with low inputs. Those countries that have obtained a relatively high welfare with small investments can be regarded as efficient in this respect. An effective instrument to find out which countries belong in this category (and how far behind other countries are) is known as the frontier production function.

The general conclusion

The general conclusion of this analysis is that if we want to compare the complex concept of welfare in different countries, we must be ready to evaluate and compare factors of very different character. Since there are no undisputable choices, different evaluations and access to data can lead to more or less separate conclusions of analyses of the same phenomenon. For this reason it is very important for credibility of results that the data that is used

A frontier production function with the welfare indicator as the production variable and the input indicator as the input variable



and choices that have been made are openly reported. It is also important that a comprehensive sensitivity analysis has been carried out and is presented together with the main results. Furthermore, it is worthwhile to point out that the technique with random weights is a very relevant and effective instrument in the sensitivity analysis of the weight system. Concerning comparisons of efficiency, the frontier production function is also a good tool.

Finally, even if the composite indicators provides a valuable base for preparing basic information for political processes, we must realize that these results only give us an overview of one area. When forming concrete political measures, a more detailed analysis of separate phenomena is required. Then what has the analysis of the chosen example of a welfare index and the attempt to illustrate this measure in different ways provided us with? First, a general reservation must be made, namely that the conducted analysis has in no way shown what the consequences would have been if other factors had been included. It is of course possible to justify with very good reasons why many other aspects of welfare should be included in this example. In general, it is also apparent that other factors besides those that create economic standard are important to study, if the goal is to obtain a high level of welfare (as has been defined in this example).

Corruption Perceptions Index

by Transparency International

Aims and Objectives

The Corruption Perceptions Index (CPI) is a composite index – a survey of surveys – that assesses and compares perceived levels of corruption among public officials and politicians in a wide range of countries around the world. The CPI is produced annually, reflecting the views of business people and country analysts from around the world.

The overall objective of the CPI is to provide a global assessment of corruption and enhance comparative understanding of levels of corruption worldwide. It is an influential advocacy tool that stimulates worldwide media coverage, promotes public debate and drives demand for change. The CPI was the first successful attempt to measure and compare corruption levels in a wide range of countries, and has continued to do so since 1995. It has proven that corruption can be measured with a sound methodological instrument and has opened the way for further corruption research of all kinds.

CPI Achievements

The CPI has greatly contributed toward putting corruption on national and international agendas. It is widely credited to be the main measure of corruption worldwide. It is one of the most quoted indices in the social science community and has provided an incentive to conduct complementary local diagnostics. It responds to a need among researchers, policy makers and others for global and comparative data reflecting the views of people who influence decisions. By generating public debate and creating incentive for reform, it has proved to be a powerful awareness raising tool both at national and global levels. Many countries have used the CPI as a starting point for launching reforms, and the worldwide anti-corruption movement has used it as a powerful tool to advocate for change.

The CPI Method

The CPI draws on corruption-related data from surveys of experts and business people carried out by a variety of independent institutions external to TI. The interviewed experts and business people are both residents and non residents of the countries evaluated. A minimum of three surveys have been conducted for each country included in the CPI, which increases the reliability of each individual figure and lowers the probability of misrepresenting a country. In 2007, 180 countries were included in the CPI, achieving the greatest scope for the index to date.

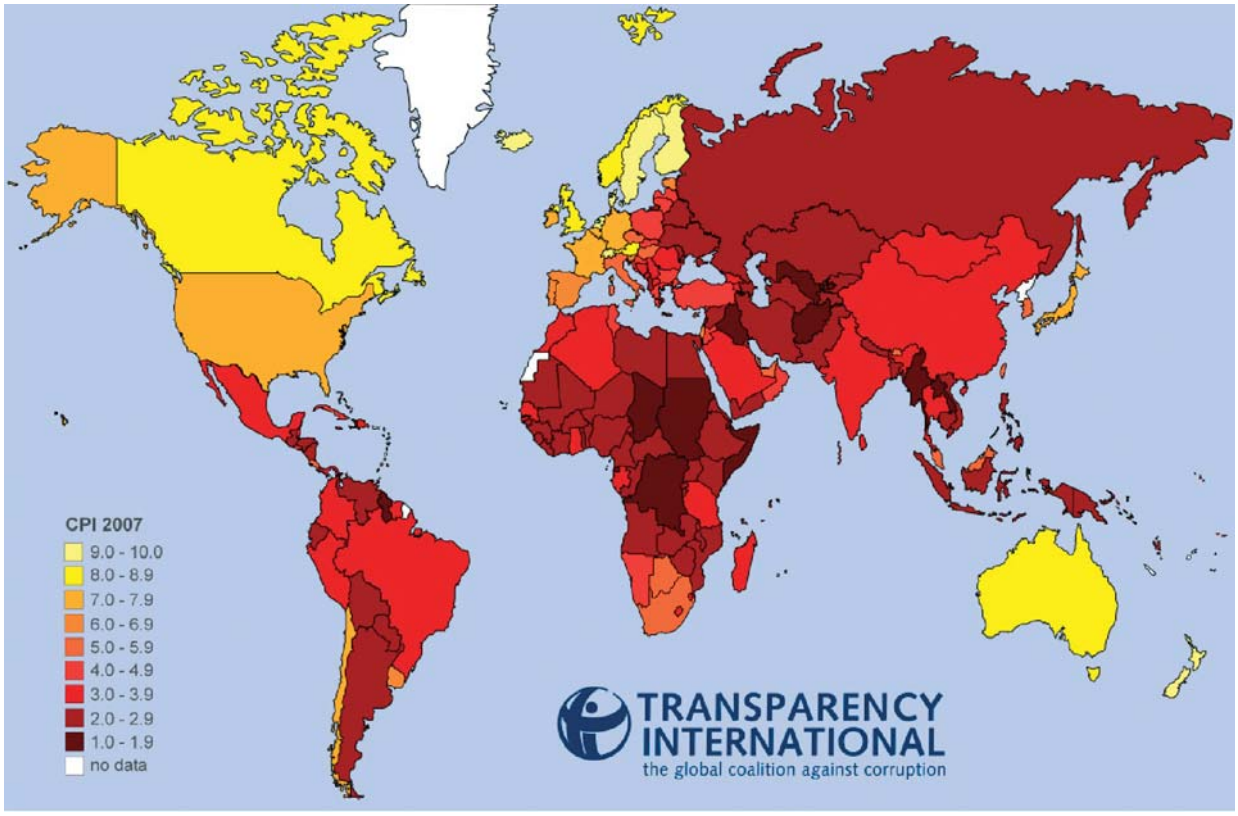
The CPI gathers data from sources that span the last two years (for the CPI 2007, this includes surveys from 2007 and 2006). In 2007 it was calculated using data from 14 sources originated from 12 independent institutions. All sources measure the overall extent of corruption (frequency and/or size of bribes) in the public and political sectors and all sources provide a ranking of countries, i.e., include an assessment of multiple countries.

For CPI sources that are surveys, and where multiple years of the same survey are available, data for the last two years are included to provide a smoothing effect. While for sources that are scores provided by experts (risk agencies/country analysts), only the most recent iteration of the assessment is included, as these scores are generally peer reviewed and change very little from year to year.

Evaluation of the extent of corruption in countries is done by country experts, non resident and residents. In the CPI 2007, the non resident evaluations were performed by the following organizations: Asian Development Bank, African Development Bank, Bertelsmann Transformation Index, World Bank - CPIA, Economist Intelligence Unit, Freedom House, Merchant International Group, United Nations Economic Commission for Africa and Global Insights. In 2007, resident business leaders evaluating their own country were part of surveys carried out by Institute for Management Development, Political and Economic Risk Consultancy and the World Economic Forum.

By combining the sources available through robust statistical methods, the CPI provides a rank of countries according to their level of perceived corruption. For more detailed information on the methodology please visit http://transparency.org/policy_research/surveys_indices/cpi/2007/methodology.

The CPI scores countries on a scale from 0 to 10, with 0 indicating high levels of perceived corruption and 10 indicating low levels of perceived corruption. In order to avoid the distorting effect on scoring that could be caused by recent events such as exposure of corruption scandals, the score combines expert assessments from the last two years. To qualify for inclusion in the CPI, data must be well documented, provide a ranking of countries and measure the overall extent of corruption. This condition excludes surveys mixing corruption with other issues such as political instability or nationalism. All countries with enough qualifying sources are included in the index.



CPI 2007 Results

The 2007 Corruption Perceptions Index looks at perceptions of public sector corruption in 180 countries and territories – the greatest country coverage of any CPI to date – and is a composite index that draws on 14 expert opinion surveys. It scores countries on a scale from zero to ten, with zero indicating high levels of perceived corruption and ten indicating low levels of perceived corruption.

A strong correlation between corruption and poverty continues to be evident. Forty percent of those scoring below three, indicating that corruption is perceived as rampant, are classified by the World Bank as low income countries. Somalia and Myanmar share the lowest score of 1.4, while Denmark has edged up to share the top score of 9.4 with perennial high-flyers Finland and New Zealand.

Scores are significantly higher in several African countries in the 2007 CPI. These include Namibia, Seychelles, South Africa and Swaziland. These results reflect the positive progress of anti-corruption efforts in Africa and show that genuine political will and reform can lower perceived levels of corruption.

Other countries with a significant improvement include Costa Rica, Croatia, Cuba, Czech Republic, Dominica, Italy, FYR Macedonia, Romania and Suriname. Countries with a significant worsening in perceived levels of corruption in 2007 include Austria, Bahrain, Belize, Bhutan, Jordan, Laos, Macao, Malta, Mauritius, Oman, Papua New Guinea and Thailand.

The concentration of gainers in South East and Eastern Europe testifies to the galvanising effect of the European Union accession process on the fight against corruption. At the same time, deeply troubled states such as Afghanistan, Iraq, Myanmar, Somalia, and Sudan remain at the very bottom of the index.

For more information

For more information on the CPI,
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Bribe Payers Index

by Transparency International

Aims and Objectives

The BPI assesses the supply side of corruption, targeting policy makers in developed countries and emerging market economies. By measuring the extent to which a state appears to engage in corrupt business practices, it helps identify where reforms and enforcement are needed. In turn, this helps advocates push for change.

The BPI results demonstrate clearly which countries are paying bribes, and where. It provides the views of the private sector (representatives of local and foreign companies) on foreign bribery, based on their experience in a particular country of operation. Given the criminalisation of bribery through laws and conventions such as that of the Organisation for Economic Cooperation and Development, the supply side of corruption in international business transactions implies a shared responsibility between companies operating abroad and their home governments. The BPI highlights achievements and failures of governments to control the corruption by companies headquartered within their national borders when they operate abroad, and indicates, for their part, whether companies have successfully ensured that their employees comply with the highest standards of business practice. Thus, it serves as benchmark for assessing enforcement.

The BPI Approach

The Bribe Payers Index 2006 (BPI) is a ranking of 30 leading exporting countries according to the propensity of their firms to bribe abroad. It is the most comprehensive survey of its kind, capturing the direct experience of business executives with foreign firms paying bribes in their country. It asks business executives about

the practices of foreign firms operating in their country, specifically their propensity to pay bribes or to make undocumented extra payments.

The BPI was first released in 1999, with further editions in 2001 and 2006. The first two editions of the survey scored 19 and 21 countries respectively through surveys in emerging market economies. The 2006 edition ranked 30 leading exporting countries by surveying respondents in more than 125 countries worldwide, the largest and broadest sample to date.

The BPI Method in 2006

The BPI 2006 is based on the responses of 11,232 business executives from companies in 125 countries to two questions about the business practices of foreign firms operating in their country. It was carried out as part of the World Economic Forum's Executive Opinion Survey 2006. The combined Gross Domestic Product of the 125 economies covered represents 98 percent of the world total.

The sample of respondents was representative of the national business sector, both in terms of the share of production by industry, the size of company and the range of company types (domestic, foreign and partly state owned). Respondents were asked to rate the countries of origin of foreign-owned companies doing the most business in their country on a scale of 1 (bribes are common) to 7 (bribes never occur). The answers were then converted into a 10 point scale, in which 10 represents the lowest propensity of companies to bribe abroad. The ranking reflects the simple averages of responses.

The countries ranked were: Australia, Austria, Belgium, Brazil, Canada, China, France, Germany, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, the Netherlands, Portugal, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, the United Arab Emirates, the United Kingdom and the United States.

The BPI 2006 results

The BPI 2006 shows a considerable propensity of companies from all states to bribe when operating abroad. Companies from the wealthiest countries rank in the top half of the index (indicating less perceived tendency to bribe), with Switzerland leading the ranking at 7.8. However, companies from these countries tend to behave differently when operating in OECD countries than in developing countries, where they still routinely pay bribes. Companies from emerging export countries are perceived to be the most likely to pay bribes in order to win contracts abroad, with India, China and Russia ranking among the worst.

For more information

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Please visit:
http://transparencyorg/policy_research/surveys_indices/bpi

Rank	Country / Territory	BPI Score	Number of respondents	Margin of error (at 95 % confidence)	% of global exports (2005)
1	Switzerland	7.8	1744	0.12	1.2
2	Sweden	7.6	1451	0.14	1.3
3	Australia	7.6	1447	0.14	1
4	Austria	7.5	1560	0.13	0.5
5	Canada	7.5	1870	0.12	3.5
6	UK	7.4	3442	0.09	3.6
7	Germany	7.3	3873	0.09	9.5
8	Netherlands	7.3	1821	0.12	3.4
9	Belgium	7.2	1329	0.15	8.9
	US	7.2	5401	0.07	3.3
11	Japan	7.1	3279	0.1	5.8
12	Singapore	6.8	1297	0.17	2.2
13	Spain	6.6	2111	0.12	1.9
14	UAE	6.6	1928	0.14	1.1
15	France	6.5	3085	0.11	4.3
16	Portugal	6.5	973	0.18	0.3
17	Mexico	6.5	1765	0.15	2.1
18	Hong Kong	6.0	1556	0.16	0.4
	Israel	6.0	1482	0.16	2.8
20	Italy	5.9	2525	0.12	3.6
21	South Korea	5.8	1930	0.13	2.8
22	Saudi Arabia	5.8	1302	0.17	1.8
23	Brazil	5.7	1317	0.16	1.2
24	South Africa	5.6	1488	0.16	0.5
25	Malaysia	5.6	1319	0.17	1.4
26	Taiwan	5.4	1731	0.15	1.9
27	Turkey	5.2	1755	0.15	0.7
28	Russia	5.2	2203	0.14	2.4
29	China	4.9	3448	0.11	5.5
30	India	4.6	2145	0.14	0.9

Global Corruption Barometer

by Transparency International

Aims and Objectives

The Global Corruption Barometer is an opinion survey of the general public that assesses the perceptions of corruption and experience with bribery. The Barometer provides information on the extent of corruption across government and private sector institutions based on the responses of ordinary people, supplementing the views of experts presented in other surveys. It can therefore show the credibility of anticorruption efforts as seen through the eyes of ordinary people. The Barometer is unique in the sense that is the only worldwide public opinion survey on perceptions and experience of corruption that allows trends to be established over time. It does not rank countries, but instead offers comparative results of countries, regions and institutions as well as information on trends in public perceptions of corruption. Thus, it is a complement to TI's other measurement tools, the Corruption Perceptions Index (CPI) and Bribe Payers Index (BPI).

The Global Corruption Barometer Approach

The Barometer survey is carried out for Transparency International by Gallup International as part of its Voice of the People Survey. It has been published annually since 2003. The TI Global Corruption Barometer is a public opinion survey. That means it is a poll of the general public across the world and in each country included, a representative sample of the general public has been polled. Respondents are men and women aged 15+ and all samples have been weighted to bring them in line with national and global populations. In 2006, the Barometer survey was carried out between July and September of that year in 62 countries and territories. Nearly 60,000 respondents were polled, including men and women.

The Barometer explores experience of citizens with petty bribery presenting which institutions and public services most affected by bribery, the frequency of bribery, and how much people pay. It also explores the public's evaluation of their government's efforts to fight corruption and assesses which institutions the public judge to be most corrupt and what aspects of their lives – political, personal or business – are most affected by corruption.

Global Corruption Barometer 2006 Results

The Barometer 2006 results indicate that experience of bribery is widespread outside Europe and North America, with the police being the institution most affected (See table 1 and figure 1). In Latin America for example, one third of respondents who had contact with the police had paid a bribe. Bribery for access to services is most common in Africa. The most commonly bribed sectors in Africa are the police, tax revenue and utilities.

Table 1 Countries most affected by bribery

Percentage of respondents that have paid a bribe in the last 12 months	More than 40 %	Albania, Cameroon, Gabon, Morocco
	16-40%	Bolivia, Congo-Brazzaville, Czech Republic, Dominican Republic, Greece, Indonesia, Kenya, Mexico, Moldova, Nigeria, Paraguay, Peru, Philippines, Romania, Senegal, Ukraine, Venezuela
	6-15 %	Argentina, Bulgaria, Chile, Colombia, Croatia, Hong-Kong, India, Kosovo, Luxembourg, Macedonia, Pakistan, Panama, Russia, Serbia, Thailand
	5% or less	Austria, Canada, Denmark, Fiji, Finland, France, Germany, Iceland, Israel, Japan, Malaysia, Netherlands, Norway, Poland, Portugal, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, USA

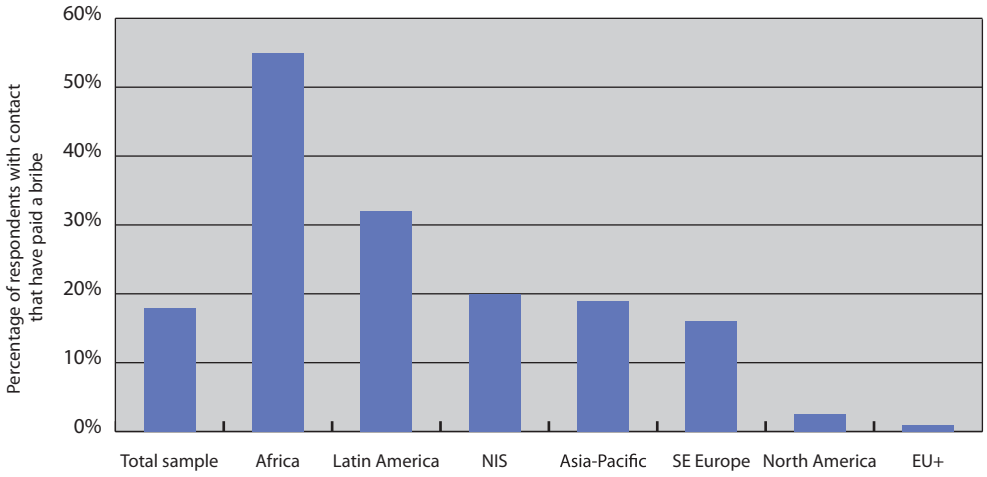
Source: Transparency International, Global Corruption Barometer 2006

As in past years, public perceptions are that political parties and parliaments are the most corrupt institutions, followed by business and police. The public regards governmental efforts to curb corruption inadequate in most countries. Only 22 per cent of respondents worldwide evaluated their government's actions as 'effective' or 'very effective'.

For more information

For more information on the CPI, please contact Juanita Riaño at the TI Secretariat at jriano@transparency.org or +49 30 34 38 20 417. Also please visit http://transparency.org/policy_research/surveys_indices/gcb

Figure 1 Worldwide bribery: respondents who have had contact and paid a bribe, by sector (%)



Source: Transparency International, Global Corruption Barometer 2006

National Integrity Systems (NIS) Scoring System

by Transparency International

What is the NIS scoring system?

The NIS scoring system is a new tool that is being developed by Transparency International. The NIS scoring system will provide a quick summary look at the strengths and weaknesses in a country and will facilitate comparisons within a country over time. It will not produce a ranking of countries, nor will it replace the NIS narrative Country Studies; instead, it will provide complementary information that, in conjunction with the narratives, will be an even more effective tool for advocacy and awareness raising.

Why create an NIS scoring system?

Since TI began producing NIS Country Studies in 2001, the TI Secretariat and many chapters have considered developing an NIS scoring system of some kind. While the current NIS Country Studies provide important benchmarks for the success of anti-corruption efforts, they offer only narrative analysis that can be specialised and cumbersome to absorb. Scores that rate the different NIS pillars in a country will provide clear, understandable information that will improve the use of narrative NIS studies.

Other organisations already produce quantitative indicators on governance at the country level. Examples include the World Bank governance indicators, Global Integrity's integrity indicators and Freedom House's Countries at the Crossroads. However, TI's network of National Chapters and our focus on anti-corruption gives us a unique niche in this field. We have the opportunity to produce a scoring system that

is generated by and for the countries under consideration, focused on the aspects of a governance system that make it most vulnerable to corruption.

In addition, TI will be responding to the interest among donors in governance assessments. NIS studies are already used by donors in their development work, but countries such as Britain and the Netherlands have recently been commissioning their own governance assessments to meet their own needs. Moreover, donors are increasingly interested in quantitative assessments that enable comparative work and help target reform programmes. In order to stay relevant in this changing landscape, TI needs to capitalise on our knowledge and experience to produce a useful tool that brings our important perspective to the governance debate.

Process for Development

The process for development of the NIS scoring system began in 2006 with consultation across the TI movement. Responses confirmed that Chapters have interest in such a tool, but that the scoring system should be limited to comparisons within a region and avoid a new international ranking. Chapters also stressed that the scores should not be divorced from the narrative reports; the scores and the reports should complement each other.

Building on this baseline, TI-S is working with National Chapters, external experts and a scoring consultant to design a robust scoring methodology that also reflects the priorities and needs of the TI National Chapters. In the latest stage of the process, consultants from the Madagascar office of Pact – an NGO based in Washington DC committed to capacity building of local leaders and organisations – worked with TI to produce the initial draft of the scoring model. The draft will be reviewed by a methodology committee, bringing together scoring and issue experts.

The model will then be piloted in Guatemala and Panama. Subsequent modifications will be made before the scoring system is launched in 2008.

Overview of the Scoring Model

Those who implement the scoring system will use the same methods to obtain the data that are used to prepare traditional NIS Country Studies: a combination of desk research, individual consultation and focus groups. Experience has shown that the very process of doing research in this participatory way can generate the kind of communication and cooperation that in itself can improve the system under evaluation. This process will be enhanced by the introduction of the scoring system, which presents an added opportunity for engaging stakeholders.

The scoring model under development will have two components. First, a standard model will be developed, comprised of broad categories (a derivation of the NIS pillars) that can be applied in any country. Second, a unique country (or regional) model will contain the individual questions for gathering data in the country under examination. Detailed guidelines will help Chapters to develop their own country model according to their national situation. The researchers will assess the country model questions, which in turn will provide the data points necessary to calculate scores in the standard model. Quality control will be done at the TI-Secretariat.

Chapters will also have the option of going further than the guidelines proposed and adapting the country model in a number of different ways. Chapters can include different information and local data sources in their country model, as well as different questions or even new NIS pillars.

The data collected from each country will be stored in an electronic database that will be made public upon completion. This can be utilised to present the data in different ways, such as charts or graphs. It will also facilitate exchange of information.

For more information

For more information on the NIS scoring system, please contact Sarah Repucci at the TI Secretariat at srepucci@transparency.org or +49 30 34 38 20 661.

Promoting Revenue Transparency Project

by **Sophie Buxton**, Transparency International

The Importance of Revenue Transparency in the Extractive Industries

Revenues from the extractive industries are an important source of income for the governments of many developing countries. However, much of this wealth does nothing to reduce high levels of poverty and improve the lives of citizens. Rather than fostering economic growth and development, high revenues from the extractive industries have often fuelled corruption, economic stagnation, inequality and conflict. This paradox has been labelled the 'resource curse'.

There is a growing recognition that the transparent and accountable management of revenues from the oil, gas and mining industries helps to ensure that natural resource wealth is translated into societal well-being and sustainable development. Corruption and mismanagement breed in opacity, and the resulting instability in countries of operation is bad for business, damaging companies' reputations and resulting in lower investor returns.

Transparency can help change the extractive resource curse into a blessing by facilitating and improving the accountability of companies and governments to their investors and citizens. Ensuring access to information about how much money governments are receiving from extractive industry revenues empowers citizens to hold their governments accountable, monitor how the money is spent and lobby for responsible public spending. Greater accountability should limit bad practices and the mismanagement of extractive industry revenues, which all too often fuel corrupt elites and deepen social conflict. If properly managed, revenues from natural resources provide a basis for poverty reduction, economic growth and sustainable development.

The Promoting Revenue Transparency Project makes clear that publishing key data on extractive industry operations on a country by country basis is both in the interests of corporations and supports sound accountability by host governments.

Promoting Revenue Transparency Project

The Promoting Revenue Transparency (PRT) Project supports the transparent and accountable management of revenues generated from the extractive industries as a step towards reversing the 'resource curse' and ensuring such revenues directly benefit society. The Project seeks to raise awareness in both government and the private sector of the various steps required for revenue transparency to be achieved, sustained and mainstreamed. By providing robust standards for revenue transparency and tools to measure progress in this field, companies and governments engaged in the extractive industries are encouraged to improve transparency and accountability to citizens and investors.

The Promoting Revenue Transparency Project has three specific objectives:

1. **To measure revenue transparency performance and diagnose areas for improvement.**
2. **To develop broad standards for revenue transparency.**
3. **To support the use of the revenue transparency standards and measures of performance** by companies, rating agencies, investors, government regulators and civil society.

The project will measure and compare the degree of revenue transparency among selected companies, host countries (resource rich) and home countries (where the companies are based) in the oil, gas and mining sectors. The PRT project will produce the following reports:

1) A Companies Report, covering 42 companies and their operations in 21 countries in 2007
2) A Host Governments Report, covering approximately 10 countries, expected in 2008
3) A Home Governments Report, expected in 2008

These reports will focus on the oil and gas industries. A feasibility study of extending these reports to the mining industry is planned for 2008.

The Project is part of a growing international multi-stakeholder movement of governments, companies, investors and civil society which seeks to

promote improvements in transparency and accountability in natural resource revenue management. Participants of this movement recognize that revenue transparency improves broader governance, strengthens the investment climate in which business operates, and provides a necessary condition for achieving sustainable development.

The Companies Report

The Companies Report 2007 applies a methodology which allows an assessment to be made of revenue transparency policies, practices and management systems of oil and gas companies in their upstream operations. The research is based on publicly available information. The method incorporates aspects of the context of operation that may support or hinder companies' performance on revenue transparency. The framework applied serves as a measurement tool which demonstrates the steps which companies can themselves undertake to further improve revenue transparency.

Multi-stakeholder engagement and consultation has been a crucial elements in the process of producing the report and is critical to the advocacy aspects of the project. The project incorporates multi-stakeholder input through the participants in its Working Group and its broader Reference Group, which include industry experts, company representatives, civil society activists and members of the EITI secretariat. The engagement of the companies covered by this research has been sought by:

1) Opening channels for communication and exchange on the PRT project and its progress, including ongoing opportunities for dialogue about changes needed and avenues to address issues and concerns.
2) Creating space for companies to provide their input from the earliest stages, including the methodology and framework revision.
3) Seeking participation of companies in the Working Group of the Project.
4) Providing an opportunity for companies to check the data gathered on them for accuracy.

The Companies Report covers 42 oil and gas companies and their operations in 21 different countries, as listed in full below. The year-long process of research and engagement with the companies concerned is now drawing to a close and the report is in the pre-publication stage.

Companies covered:

Amerada Hess (USA) • **Aramco** (Saudi Arabia) • **BG** (UK) • **BHP Billiton** (Australia) • **BP** (UK) • **Chevron Corporation** (USA) • **China National Petroleum Corporation** (China) • **CNOOC** (China) • **Conoco Philipps** (USA) • **Devon Energy** (USA) • **Eni SpA** (Italy) • **Exxon Mobil Corporation** (USA) • **Gazprom** (Russia) • **GEPetrol** (Equatorial Guinea) • **Inpex** (Japan) • **Kazmunaingaz (KMG)** (Kazakhstan) • **Kuwait Petroleum Corporation** (Kuwait) • **Lukoil** (Russia) • **Marathon** (USA) • **National Iranian Oil Company** (Iran) • **National Nigerian Petroleum Company (NNPC)** (Nigeria) • **Oil and Natural Gas Corporation Limited (ONGC)** (India) • **Nexen** (Canada) • **Pertamina** (Indonesia) • **Petro China Company Limited** (China) • **Petrobrás** (Brazil) • **Petrocanada** (Canada) • **Petróleos de México** (Mexico) • **Petróleos de Venezuela (PDVSA)** (Venezuela) • **Petroliam Nasional phd (Petronas)** (Malaysia) • **QatarPetroleum** (Qatar) • **RepsolYPF** (Spain) • **Rosneft** (Russia) • **Shell** (The Netherlands) • **Sinopec** (China) • **Société Nationale des Pétroles du Congo (SNPC)** (Congo) • **Sonangol** (Angola) • **Sonatrach** (Algeria) • **Statoil** (Norway) • **Talisman Energy** (Canada) • **Total** (France) • **Woodside Petroleum** (Australia)

Countries of Operation:

Algeria – Angola – Azerbaijan – Brazil – China – Congo Brazzaville – Equatorial Guinea – India – Indonesia – Iran – Kazakhstan – Kuwait – Malaysia – Mexico – Nigeria – Norway – Qatar – Russia – Saudi Arabia – US – (and Gulf of Mexico) – Venezuela

The Host Governments Report

The PRT Project is currently working on the initial stages of a *Host Governments Report* which will focus on government transparency regarding extractive industry revenues in countries where extraction is taking place. It is designed to create local ownership and to promote engagement and participation of local stakeholders, particularly governments.

Data gathering and analysis will be performed by country implementers (TI National Chapters, Publish What You Pay (PWYP) coalition members or other organisations) selected according to pre-established criteria in consultation with the Working Group of the project. A pilot project will be first be implemented in 2 countries. The full list of countries to be covered has yet to be confirmed.

History of the concept

Measuring Transparency was first conceived by *Save the Children UK* and developed in collaboration with investors, independent consultants, ratings agencies and other members of the *Publish What You Pay* NGO coalition. In 2005, Save the Children UK produced the first reports on revenue transparency, *"Beyond the Rhetoric: measuring revenue transparency in the oil and gas industry"*[1].

The two parts of the report measure company performance and home government regulation.

Promoting Revenue Transparency is the new phase of the project and is being implemented by Transparency International, in partnership with the Revenue Watch Institute. Building on the previous work in this area, the initiative also complements the efforts of the Extractive Industries Transparency Initiative (EITI). It includes those aspects of transparency and anti-corruption relevant to revenue transparency, and contributes to sustaining awareness of the responsibility of both companies and governments to implement EITI commitments and encouraging them to go beyond these.

For further information please refer to Promoting Revenue Transparency at www.transparency.org or address queries to prt@transparency.org

[1] See "Beyond the Rhetoric: Measuring Revenue Transparency -Company Performance in the Oil and Gas Industries". This assessed 25 companies and their revenue transparency performance in Angola, Azerbaijan, Indonesia, Nigeria, Timor Leste and Venezuela. "Beyond the Rhetoric: Measuring Revenue Transparency – Home Government Requirements for Disclosure in the Oil and Gas Industries" assessed the regulatory performance of Australia, Canada, France, Italy, the Netherlands, Norway, the UK, USA, South Africa and Russia. Both are available electronically at: http://www.transparency.org/policy_research/surveys_indices/promoting_revenue_transparency

Core Set of Indicators

by **Ove Caspersen**, European Environment Agency

The Core Set of Indicators

In 2004, the European Environment Agency (EEA) launched a **core set of indicators** http://themes.eea.europa.eu/IMS/CSI. This exercise was carried out with three main objectives in mind, namely to:

- Provide a manageable and stable basis for indicator-based assessments of progress against environmental policy priorities;
- Prioritise improvements in the quality and coverage of data flows -improvements that will enhance comparability and certainty of information and assessments;
- Streamline contributions to other indicator initiatives in Europe and beyond.

When establishing and developing the core set, the Agency was guided by the need to identify a small number of policy-relevant indicators that are stable, but not static, and that give answers to selected priority policy questions. These indicators should, however, be considered alongside other information if they are to be fully effective in environmental reporting.

The core set comprises 37 indicators covering six environmental themes (air pollution and ozone depletion, climate change, waste, water, biodiversity and terrestrial environment) and four sectors (agriculture, energy, transport and fisheries).

Criteria

The indicators in the core set were selected from a much larger set, on the basis of criteria widely used elsewhere in Europe and by the OECD. Particular attention was given to the relevance for policy priorities, objectives and targets, the availability

of high-quality data over both time and space, and the application of well-founded methods for indicator calculation.

Using the core set

The core set, and particularly its assessments and key messages, is targeted mainly at policy makers at the EU and national level who can use the outcomes to inform on progress with their policies. EU and national institutions can also use the core set to support streamlining of data flows at the EU level. Environmental experts can use it as a tool for their own work by using the underlying data and methodologies to do their own analysis. They are invited to look at the set critically, give feedback and so contribute to future EEA core set developments.

General users will be able to access the core set on the web in an easily understandable way, and use available tools and data to do their own analyses and presentations.

Decoupling from main reports

The core set is updated when data becomes available. This is linked to the cycles of the countries' data reporting rather than to the publishing timetable of the Agency's big reports (for more, see the reporting obligations database ROD, http://rod.eionet.europa.eu/index.html). This means that the EEA has access to an information base that is available for several purposes (e.g. speeches, other reports, briefings) and which can be used at short notice to underpin timely input into policy debates. It also means that the EEA member countries have access to comparative information when needed for their own state of the environment reporting cycles and policy needs.

The other benefit of maintaining an independent information base is that if the official review and acceptance of the data is separated from the assessment -the assessments have more impact as the discussion will tend to focuses on what might be causing the trends and results, rather than on whether the data are correct or not.

This was the main reason for the success and impact of the EEA scorecard comparing environmental country performance and progress that was published as part of the report The European Environment – State and Outlook 2005, http://reports.eea.europa.eu/state_of_environment_report_2005_1/en.

Information Management

The EEA takes its responsibility as an information provider seriously, emphasising quality assurance of the data used. We also ensure that users know about the uncertainties related to the data and indicators, both in terms of the rationale and concept behind the indicator and when it comes to the quality of the input data. This high degree of transparency enables users to judge the quality of the information. It also adds to the credibility of the assessments made on basis of the data, even when these are made by bodies other than the EEA.

The Agency strives to improve the quality and availability of environmental information and has an ongoing programme of developing tools and support to facilitate use of environmental information, by civil servants, researchers, policy makers and the public at large.

Two examples from the core set indicators

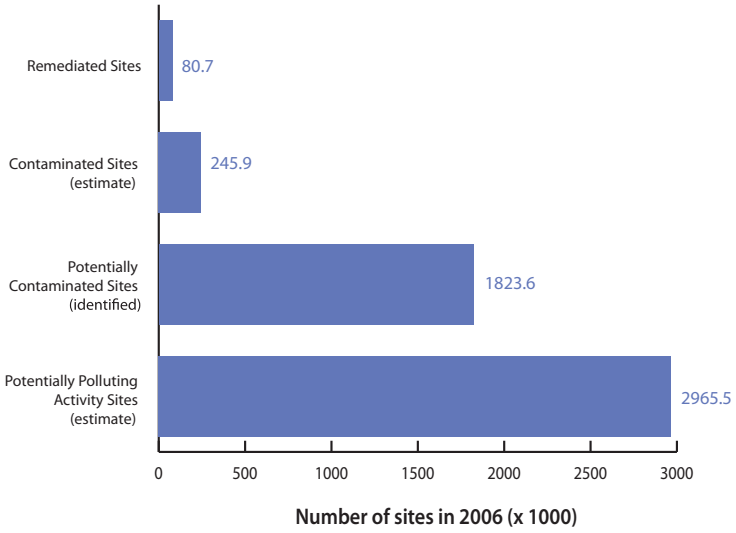
1. Progress in management of contaminated sites (CSI 015)

Key policy question: How is the problem of contaminated sites being addressed (clean-up of historical contamination and prevention of new contamination)?

According to recent estimates, there are presently approximately 250 000 sites with contaminated soil requiring cleanup in the EEA member countries - and this number is expected to increase. Potentially polluting activities are estimated to have occurred at nearly 3 million sites (including the 250 000 sites already mentioned) and investigation is needed to establish whether remediation is required. If current investigation trends continue, the number of sites needing remediation will increase by 50% by 2025.

By contrast, more than 80 000 sites have been cleaned up in the last 30 years in the countries where data on remediation is available. The range of polluting activities (and their relative importance as localised sources of soil contamination) varies considerably across Europe. However, industrial and commercial activities as well as the treatment and disposal of waste are reported to be the most important sources. National reports indicate that heavy metals and mineral oil are the most frequent soil contaminants at investigated sites, while mineral oil and

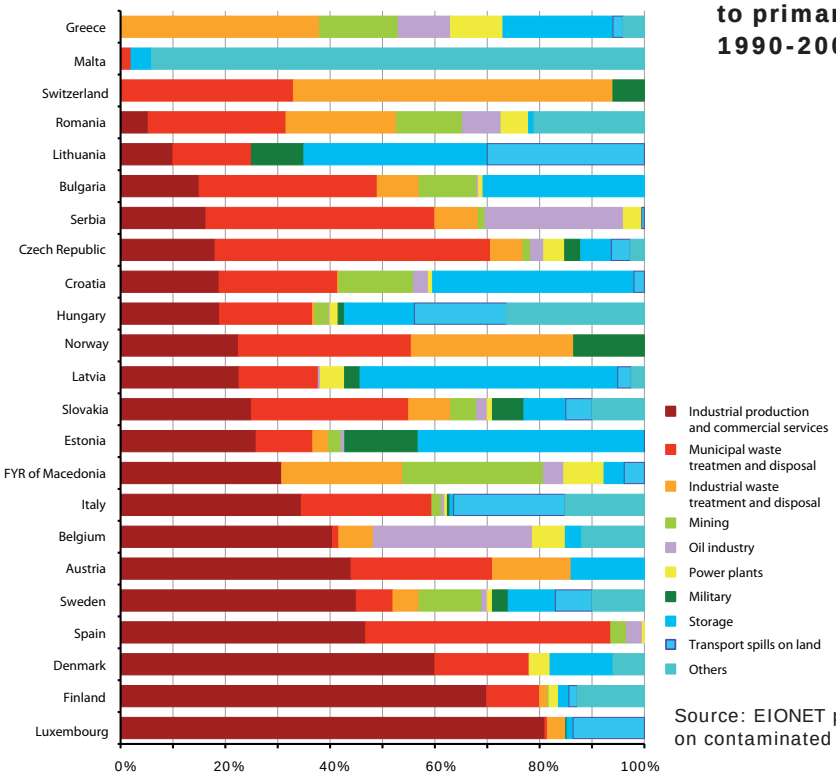
Overview of progress in the management of contaminated sites in Europe (Ver. 1.00)



Source: EIONET priority data flows on contaminated sites, Turkey: NATO/CCMS-Turkey, 2006; United Kingdom: Environment Agency of England & Wales, 2005.

chlorinated hydrocarbons are the most frequent contaminants found in groundwater. A considerable share of remediation expenditure, about 35% on average, comes from public budgets. Although considerable efforts have been made already, it will take decades to clean up a legacy of contamination.

Breakdown of industrial and commercial activities causing local soil contamination



Source: EIONET priority data flows on contaminated sites

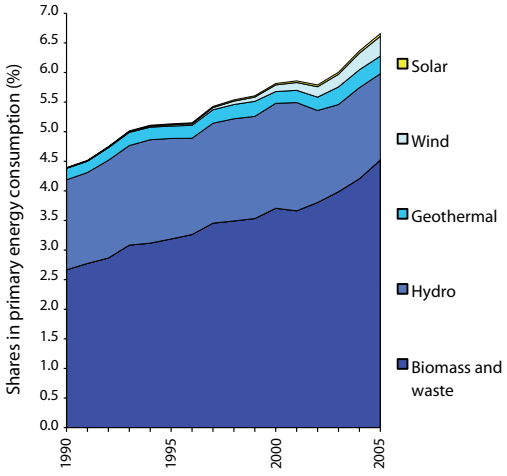
2. Renewable energy consumption (CSI 030)

Key policy question: Are we switching to renewable energy sources to meet our energy consumption?

The share of renewable energy sources in primary energy consumption is increasing slowly in the EU 27 – from 4.4% in 1990 to 6.7 % in 2007. This has helped to reduce otherwise higher greenhouse gas emissions. However, rising overall energy consumption in absolute terms is offsetting some of the environmental benefits from more use of renewables.

The strongest increase comes from wind and solar energy; although their combined share in renewable energy consumption still stands at less than 6%. In absolute terms, about 80% of the increase is accounted for by biomass, which takes a share of more than two thirds of all renewables. Hydropower has been falling in the past years as a result of lower rainfall and its share stands at about 22% of renewable energy consumption. Significant progress will be needed to meet the indicative target of a 12 % renewables share for the EU by 2010. The European Council of 8-9 March 2007 endorsed a binding target of a 20 % share of renewable energies in overall EU energy consumption by 2020.

Contribution of renewable energy sources to primary energy consumption in the EU-27, 1990-2005



Source: EEA, Eurostat.

Share of renewable energy in primary energy consumption (%) 1990-2005

	1990	1995	2000	2001	2002	2003	2004	2005
EEA	5.5	6.2	6.9	6.8	6.8	6.9	7.2	7.6
EU-27	4.4	5.1	5.8	5.9	5.8	6.0	6.4	6.7
EU-15	4.9	5.3	5.9	6.0	5.8	6.0	6.4	6.7
Belgium	1.4	1.4	1.3	1.5	1.5	1.9	2.1	3.5
Bulgaria	0.6	1.6	4.2	3.6	4.4	4.9	5.2	5.6
Czech Republic	0.2	1.5	1.5	1.7	2.1	3.4	4.0	4.1
Denmark	6.7	7.6	10.8	11.4	12.4	13.5	15.1	16.2
Germany	1.6	1.9	2.8	3.0	3.4	3.6	4.0	4.8
Estonia	4.5	8.8	10.8	10.4	10.3	9.5	10.6	11.2
Ireland	1.6	1.5	1.8	1.7	1.9	1.8	2.1	2.6
Greece	5.0	5.3	5.0	4.5	4.7	5.1	5.1	5.2
Spain	7.0	5.5	5.7	6.6	5.5	7.0	6.5	6.1
France	7.0	7.5	7.0	7.1	6.4	6.4	6.3	6.0
Italy	4.2	4.8	5.2	5.5	5.3	5.9	6.8	6.5
Cyprus	0.4	2.1	1.8	1.8	1.7	1.7	1.9	2.0
Latvia	13.1	27.5	34.3	34.1	34.5	33.1	36.0	36.3
Lithuania	2.0	5.7	9.2	8.4	8.1	7.9	8.0	8.8
Luxembourg	1.3	1.4	1.5	1.3	1.4	1.4	1.6	1.6
Hungary	1.8	2.4	2.1	1.9	3.4	3.4	3.7	4.2
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	1.4	1.6	2.4	2.4	2.6	2.6	2.9	3.5
Austria	20.2	22.0	23.2	22.2	22.2	19.3	20.8	20.5
Poland	1.6	3.9	4.2	4.5	4.6	4.5	4.7	4.8
Portugal	18.8	16.3	15.4	15.7	14.0	17.1	14.9	13.4
Romania	4.2	5.9	10.9	9.3	9.8	10.0	11.7	12.8
Slovenia	4.6	9.4	12.3	11.5	10.9	10.3	11.6	10.6
Slovakia	1.6	2.9	2.8	3.9	3.7	3.3	3.9	4.3
Finland	19.0	21.2	23.9	22.4	21.9	20.9	23.0	23.2
Sweden	24.9	26.0	31.4	28.3	26.3	25.3	25.8	29.8
United Kingdom	0.5	0.9	1.1	1.1	1.2	1.3	1.5	1.7
Turkey	18.5	17.4	13.1	13.2	13.4	12.7	13.2	11.9
Iceland	64.9	67.6	71.4	73.2	72.8	72.8	72.3	73.0
Norway	53.2	48.9	51.0	44.0	51.7	38.3	37.7	40.4

Source: EEA, Eurostat.

Other information available through the EEA to support assessments.

The EEA core set is highly structured around the DPSIR analytical framework (Driving forces, Pressures, State, Impact and Responses) and is supported by a large information base containing expert knowledge, as well as qualitative and quantitative information. This currently includes about 500 indicators, data viewers for greenhouse gases, ozone, water and air emissions. The Agency focuses on providing geo-referenced information that allows people to seek information from their local area, for example in the ozone and water viewers mentioned above and the recently launched environmental technology atlas, http://technologies.ew.eea.europa.eu/atlas_map.

The EEA has also developed tools to support environmental education and training, and is committed to developing, testing and communicating new and best practice approaches to creating environmental assessments.

For more information

http://themes.eea.europa.eu/IMS/CSI

European Benchmark Indicators (EBI)

by **Edward Vixseboxse**, Netherland's Environmental Assessment Agency (MNP)

Why we need the European Benchmark Indicators?

With the knowledge that there is a growing need for comparative indicators to measure Member State's environmental performance, MNP has developed the European Benchmark Indicators (EBI) to draw comparisons between Member States.

The indicator database is primarily meant for decision makers, but is also useful for the general public and scientists. Measurement of performance in this way, within an enlarged European Union, facilitates the improvement of policy effectiveness in a Member State and stimulates learning from the success of frontrunners.

To sum up, the EBI is a tool by which environmental performance within and between Member States can be measured and compared, on a 100+ indicator environmental indicator database. Datasources are many-sided and include among other organizations: Eurostat, World Bank, the European Environment Agency (EEA) and the World Resources Institute.

Description of the EBI

MNP has composed an indicator set of existing indicators that reflects the environmental performance on different themes and issues within the economic and social setting of a country. Especially within an European Union of 25 there is need for nuance. The environmental performance of countries can be very different because of differences in e.g. demography and economic structure.

Through the EBI the user is able to judge national environmental performance in a better way and within the proper country context. The air quality of the Netherlands is e.g. below average and heavily influenced by, among other things, the high car and population density. Performance judged by the deployment of clean air technology on the other hand gives exactly the opposite result: the Netherlands performs better than average.

Practically speaking, the EBI indicators have been divided into two parts. First a socioeconomic profile, that should put environmental performance into proper perspective. Indicators reflects e.g. countries' economic performance, -structure and social characteristics. Where possible, each indicator covers data on the present situation and a trend from the past.

Second, an environmental profile, that has been based on the OECD Pressure-State-Response (PSR) framework. Within themes as Air Quality and Climate Change, performance is measured on the basis of environmental pressures, – technology –quality and progress towards International Commitments.

Existing aggregated indicators, like the Growth Competitiveness Index (Xavier Sala-I-Martin, Columbia University) and the Ecological Footprint (Wackernagel and Rees) can be and are individual indicators in the EBI. Such composite indicators have the advantage that they provide an overall ranking of a country but also have quite a few disadvantages. The EBI individual indicator scores are not aggregated to a composite index as this is an area of methodological controversy.

Thus, the MNP indicator set is a product of a quite pragmatic method of working and finds its rationale in the creation of a collection of "environmental policy stories", like Climate Change, Air Quality and Biodiversity.

History of the EBI initiative

The first version of the EBI was published in 2006 after 1 ½ years of research in concepts, method's and existing indicators initiatives.

Information and downloads on the EBI webarticle, database (MS Excel) and background article (pdf) can be found at the following web addresses:
http://www.mnp.nl/en/publications/2006/EuropeanBenchmarkIndicators.html

Current successes and key challenges for the EBI

Since introduction the EBI tool is getting more and more popular. After media attention in Europe (Ends daily), the US (Crosslands Bulletin) and the Netherlands (Dagblad de Pers 2007, Milieu 2007) the database is increasingly being used by media, general public and scientists.

Foreseen in 2008 is the first major update and revision of the EBI. The EBI will also be integrated in MNP's environmental data-compendium through 7 environmental dossiers. That is to say: biodiversity, air-quality, water quality, climate change, waste, natural resources and 'government & enterprise'.

Future steps, needs and prospects

The main focus for the future is to keep the EBI updated, adjusted to changing environmental policy perceptions and adapted to new availability of environmental data on issues not covered before. A dynamic and challenging task as a structured availability, processing and publishing of environmental data has a far less long history compared to (socio) economic data.

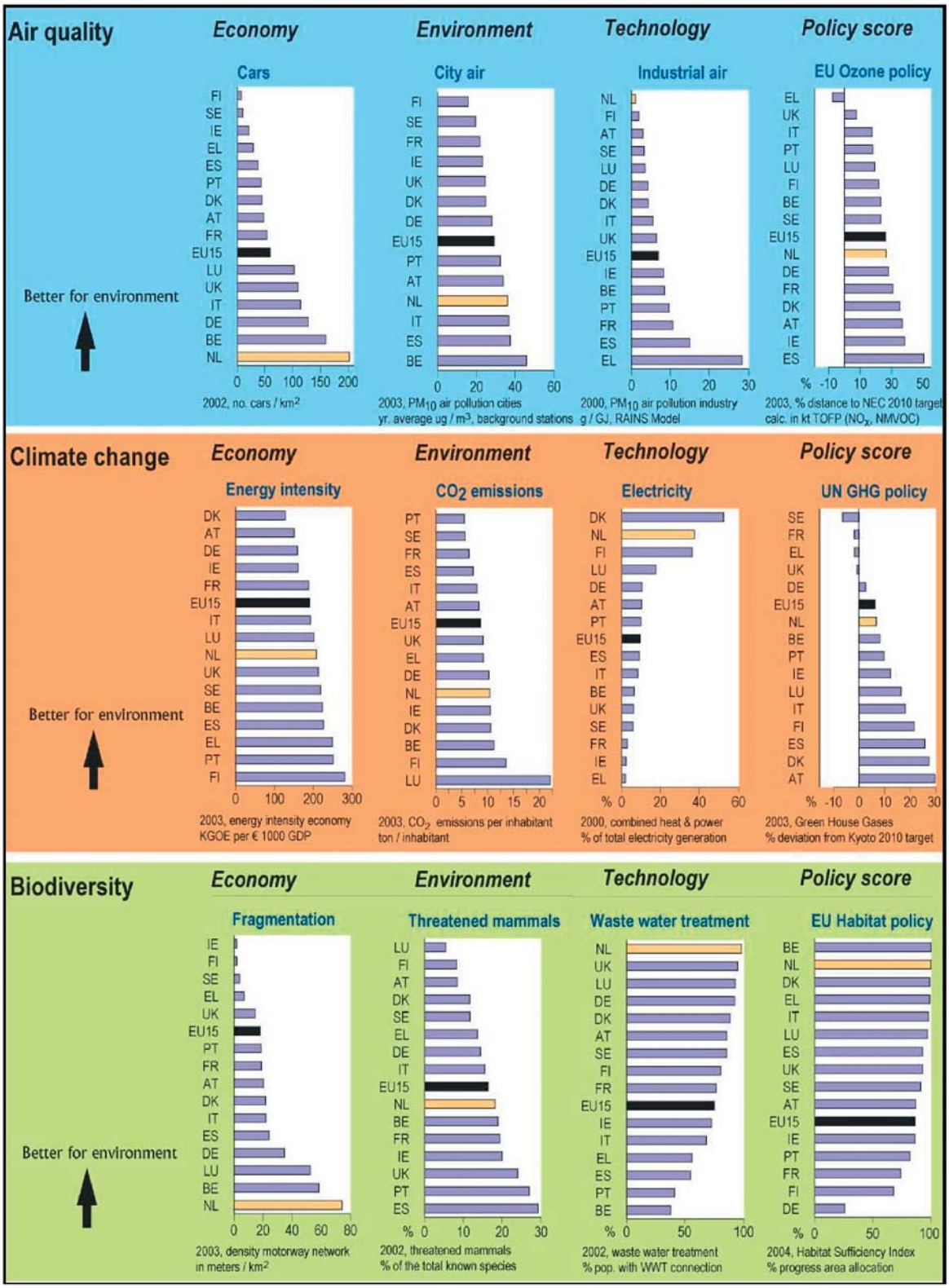
Part 1: Socio Economic Profile

1.1	**Economic performance**										
1.1.1	Welfare	**1.2**	**Economic Structure**								
1.1.2	Labour Productivity	1.2.1	Economy openness	**1.3**	**Human Capital**						
1.1.3	Annual Working Hours	1.2.2	Sector Structure	1.3.1	Education expenditure	**1.4**	**Socio Economic Drivers**				
1.1.4	Income distribution	1.2.3	Energy Structure	1.3.2	Unemployment	1.4.1	Population Size	**1.5**	**Fuel Prices & Taxes**		
1.1.5	R&D Intensity	1.2.4	Transport Str. Freight	1.3.3	Education Qualifications	1.4.2	Population Density	1.5.1	Diesel Price	**1.6**	**Law & Public Opinion**
1.1.6	Growth Comp. Index	1.2.5	Transport Str. Passeng.	1.3.4	Health - HALE	1.4.3	Household Size	1.5.2	Petrol Price	1.6.1	Public Policy Priority
		1.2.6	Energy Intensity Economy	1.3.5	Health - Expenditure	1.4.4	Livestock Density	1.5.3	Electricity Price Households	1.6.2	Public Env. Policy Priority
		1.2.7	Energy Supply Security	1.3.6	Ageing society	1.4.5	Cars per km²	1.5.4	Electricity Price Industry	1.6.3	EU infringement cases
		1.2.8	Direct Material Productivity	1.3.7	Health Risk - Obesity	1.4.6	Cars per population	1.5.5	VAT Rate Electricity	1.6.4	Eu Confidence index
						1.4.7	Tourism Expenditure	1.5.6	Gas Price Households	1.6.5	EU Council Country Votes
						1.4.8	Direct Material Input	1.5.7	Gas Price Industry		

Part 2: Environmental Profile

2.1	**Biodiversity**												
	Pressures	**2.2**	**Air Quality**										
2.1.1	Builtup area		***Pressures***	**2.3**	**Quality Water**								
2.1.2	Land fragmentation	2.2.1	Road Transp. NOx Emiss.		***Pressures***	**2.4**	**Climate Change**						
2.1.3	Ammonia Emissions	2.2.2	Road Transp. SO2 Emiss.	2.3.1	Fertilizer Consumption		***Pressures***	**2.5**	**Waste**				
	Quality	2.2.3	Road Transp. Ozone Emiss.	2.3.2	Pesticides sales	2..4.1	CO2 Emissions per capita		***Pressures***	**2.6**	**Natural Ressources**		
2.1.4	Threatened Mammals		***Technology***	2.3.3	Nitrogen Balance	2.4.2	GHG Emissions per capita	2.5.1	Municipal Waste		***Pressures***	**2.7**	**Government & Enterprise**
2.1.5	Protected Areas	2.2.4	Catalytic Converters	2.3.4	Organic Manure		***Technology***	2.5.2	Packaging Consumption	2.6.1	Meat Consumption		***Government***
	Policy Performance	2.2.5	Diesel Cars		***Technology***	2.4.3	Electricity from Renewables		***Technology***	2.6.2	Fish Consumption	2.7.1	Environmental Tax Revenues
2.1.6	Habitat Directive	2.2.6	Age Passenger Cars	2.3.5	Organic farming	2.4.4	Energy Efficiency Industry	2.5.3	Waste Landfilled	2.6.3	Paper Consumption	2.7.2	Public Env-Expenditures
2.1.7	Birds Directive	2.2.7	Industry Pollution, SO2	2.3.6	Waste Water Treatment	2.4.5	Heat & Power generation		***Policy Performance***	2.6.4	Final Energy Cons. H.-holds	2.7.3	Public Env. R&D Expenditures
2.1.8	Habitat Sufficiency Index	2.2.8	Industry Pollution, NOx		***Quality***		***Policy Performance***	2.5.4	Recycling Rate Packaging	2.6.5	Electr. Cons. H.-holds		***Enterprise***
2.1.9	Ammonia NEC Target	2.2.9	Industry Pollution, PM10	2.3.7	Rivers Nitrate	2.4.6	GHG Kyoto Target			2.6.6	Consumption Gas & Diesel	2.7.4	Business Env-Expenditures
			Quality	2.3.8	Rivers Phosphorus	2.4.7	Electr. from Renewables Target			2.6.7	Ecological Footprint	2.7.5	Eco-Management Companies
		2.2.10	Urban-PM10	2.3.9	Lakes Nitrate							2.7.6	Export of Green Products
		2.2.11	Urban Ozone	2.3.10	Lakes Phosphorus								***Policy Performance***
		2.2.12	Rural-PM10	2.3.11	Ground Water Nitrate							2.7.7	EU Env-Infringement Cases
		2.2.13	Rural-Ozone		***Policy Performance***								
		2.2.14	Premature Deaths	2.3.12	Organic Nitrate Target								
			Policy Performance										
		2.2.15	Ozone NEC Target										
		2.2.16	Acidifying NEC Target										
		2.2.17	Traffic Hotspots PM10										
		2.2.18	Traffic Hotspots NO2										

Member States' performance on the environmental dossiers: air quality, climate change and biodiversity through indicators taken from EBI



Ecological Footprint

by **Mathis Wackernagel**, Global Footprint Network

Why we need the Ecological Footprint

One fundamental requirement for sustainability is using renewable resources slower than nature can replenish them. Societies who do not meet this minimum condition run ecological deficits.

To know whether we meet this requirement, and to properly manage our ecological assets, we need to measure our use of nature. We need resource accounts that keep track of how much nature we have versus how much we use. Ecological accounting operates like financial accounting: it tracks available capital, revenues and expenditures. As with financial assets, it is possible to spend more of our ecological assets than are being regenerated – for some time. But such overspending depletes the natural capital and cannot be sustained in the long term. Continued ecological deficit spending leads to environmental bankruptcy, eroding economies, lessened quality of life and societal instability.

In short, like any successful business that keeps track of revenues and expenditures, society needs robust accounts of its demand on, and supply of, ecological assets. This is what Ecological Footprint accounts offer.

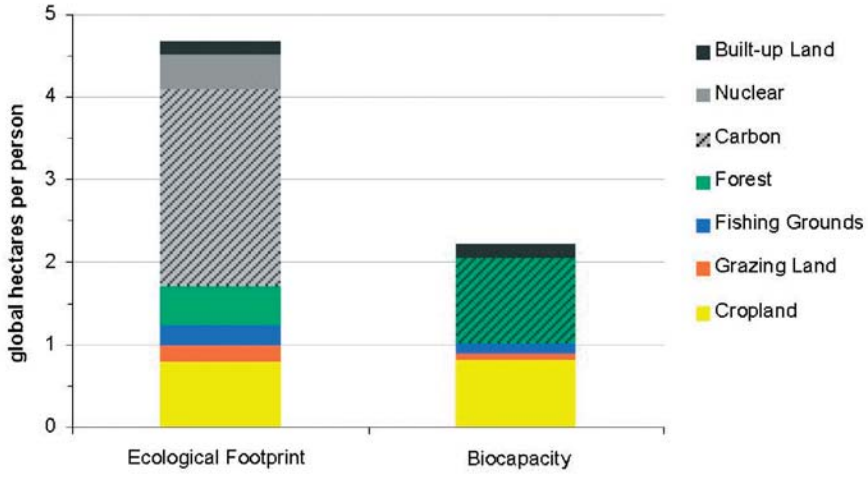
Description of the Footprint

The Ecological Footprint is an indicator that measures people's demand on nature. This demand includes both the resources we consume as well as the waste we produce. We obtain these resources from forests, cropland, fisheries, and grazing land, among other ecosystems. The built environment compromises the land's ability to provide biological resources. Additionally, ecosystems absorb and assimilate the waste we produce as a result of resource consumption. The Ecological Footprint adds up these ecosystem areas to measure total human demand on nature. In other words, Ecological Footprint analysis builds on "mass flow balance," and each flow is translated into the ecologically productive areas necessary to support these flows.

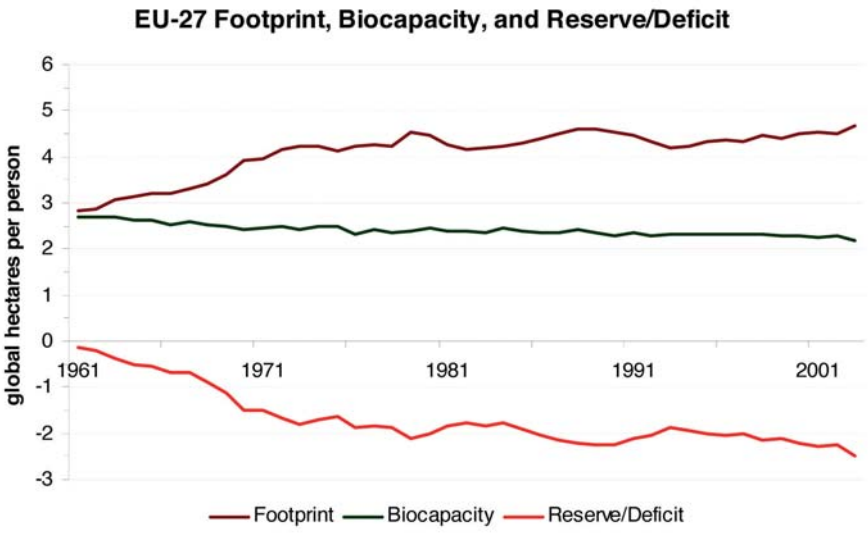
Ecosystems have a limited ability to supply us with natural resources (this is based on factors such as available water, climate, solar energy, technology and management practices). This is called biocapacity. When a population's Ecological Footprint exceeds its biocapacity, biological resource 'overshoot' occurs.

Global Footprint Network calculates the Ecological Footprint of nations on an annual basis. From this data we undertake global analysis. Overshoot measured on a global scale is an indicator of unsustainability. Data shows that humanity's resource demands and waste production began to exceed planet Earth's ability to meet this demand around 1986. Today humanity exceeds the planet's ability to provide biological resources by 30 percent – thereby dipping into the natural capital stock. While the world average capacity was 1.8 hectares per person, the world average Footprint was 2.2 hectares per person. In contrast, the average Footprint in EU-27 was 4.7 hectares per person against a biocapacity of 2.2 hectares per person.

EU-27 Footprint and biocapacity, 2003



National Ecological Footprint accounts can also inform us about local or regional ecological performance. An Ecological Footprint Assessment of the European Union sponsored by the European Environment Agency and published by *WWF International* shows, for instance, that Europe has an Ecological Footprint more than twice its biocapacity (http://www.footprintnetwork.org/newsletters/gfn_blast_europe05.html). This means that more than half of the ecosystem area on which Europe depends is outside of Europe. Europeans have about twice the Footprint of what is available per person world-wide (and this available biocapacity also needs to support wild species that are competing with people for food and space). All of the EU members have per person Footprints above what is globally available. All but three – Sweden, Latvia, and Finland – are running a national ecological deficit by using more than what is available within their boundaries. The Ecological Footprint of Europe has increased by almost 70% per person since the 1960s (see figure below).



As underlined in many publications, the Ecological Footprint measures merely one aspect of sustainability: the availability of, and the human demand on, Earth's regenerative capacity. Other measures are needed to complement this tool for assessing social well-being, depletion of non-renewable resources, inherently unsustainable activities such as the release of persistent pollutants, or the degradation of ecosystems.

History of the concept

The original Ecological Footprint methodology resulted from collaboration between Dr. Mathis Wackernagel and Dr. William Rees at the University of British Columbia in Vancouver, Canada. The publication of their book "*Our Ecological Footprint: Reducing Human Impact on the Earth*" in 1996 made the concept more widely accessible.

Global Footprint Network was founded in 2003 with the goal of advancing the scientific rigor and practical application of the Ecological Footprint, and making the Ecological Footprint as prominent a metric as the Gross Domestic Product (GDP). Global Footprint Network is made up of a 23-member advisory board of leading scientists and politicians, an office in Oakland, one in Switzerland, and, soon, one in Brussels. More than 75 organizations, spanning six continents, have become formal Global Footprint Network partners. The Ecological Footprint is now in wide use by governments, communities, and businesses to set targets and monitor their ecological performance.

The adoption of the Ecological Footprint as a trusted sustainability metric depends upon the scientific integrity of the methodology, consistent and rigorous application of the methodology across analyses, and on results being reported in a straightforward and non-misleading manner. To meet these goals, Global Footprint Network and its partners have created a consensus-based committee process for improving the method and for developing international Ecological Footprint Standards (www.footprintstandards.org).

Examples of current activities

The tool is getting increasingly popular: a simple Google search yields hundreds of thousands of websites discussing the Ecological Footprint. The effort of advancing this accounting tool is also increasingly recognized. For instance, Global Footprint Network is the recipient of a 2006 Skoll Award for Social Entrepreneurship. Global Footprint Network is one of only 10 organizations honoured with the USD 1,000,000 prize paid over three years, in recognition of the most innovative and effective approaches to resolving critical social issues.

The Footprint is also entering new arenas. For instance, work with the Swiss Agency for Development and Cooperation applies Footprint analysis to human development in Africa (www.footprintnetwork.org/africa).

New tools are available to calculate the Footprint. For businesses, for instance, www.footprinter.org or TBL3 (http://www.bottomline3.com), and for UK municipalities REAP (http://www.sei.se/reap/index.php).

A number of government organizations have active Footprint initiatives, for instance EPA Victoria in Australia (http://www.epa.vic.gov.au/ecologicalfootprint), the city of Calgary (http://www.calgary.ca/footprint), Wales (http://www.footprintwales.org) or Scotland (http://www.scotlandsfootprint.org). Various countries have initiated research collaborations with Global Footprint Network to strengthen the Footprint analysis of their country: Switzerland, Japan, Belgium, and the United Arab Emirates. DG Environment has commissioned a study on how to use the Ecological Footprint for policy assessments – the final report should be available by the end of the year.

WWF has committed to help humanity reduce its Footprint to the size of one planet Earth by 2050. If you think this is radical, you are absolutely right (because it will take significant investments), and you are absolutely wrong (because it is profoundly necessary).

Future possibilities

The method of calculating the Ecological Footprint continues to be refined under the scientific guidance of the National Accounts Committee, housed by Global Footprint Network. For detail regarding the key aspects of the methodology targeted for future work see Kitzes et al. (http://www.brass.cf.ac.uk/uploads/fullpapers/Kitzes_et_al_M65.pdf).

Updates to the first edition of Footprint standards are in the works and expected to be released in late 2008. The next step is to establish a certification system for standards-compliant applications.

In 2005, Global Footprint Network launched its "Ten-in-Ten" campaign with the goal of institutionalizing the Ecological Footprint in at least ten key nations by 2015. The aim of this program is to have ecological accounting be given as much weight as economic accounting and for the Ecological Footprint to become as prominent a metric as the Gross Domestic Product (GDP).

(environmentally) Sustainable National Income (eSNI)

by **Roefie Hueting**, Foundation SNI

The need for eSNI

Standard national income (NI) is in politics, newspapers and most economic literature identified with economic growth and economic success. However, according to economic theory economic success can solely mean increase in welfare (the satisfaction of wants derived from our dealings with scarce means). Welfare is dependent on more factors than the production and its growth as measured in NI. Examples are: labour conditions, income distribution, employment, and, of course, the possible uses c.q. environmental functions of our non-human made physical surroundings (the environment). The latter encompasses renewable and nonrenewable resources, including biodiversity and the life support systems of our planet. Humanity is completely dependent on these non-human made environmental functions. Since the use of functions is going more and more at the expense of other functions, environmental functions have become by definition scarce goods, indeed the most fundamental scarce goods humanity disposes of. Loss of one or more vital functions leads to a drop in production (see Figure 1).

In standard economic theory producing is defined as adding value. *This value is added to the non-human made physical surroundings*. Consequently, environmental functions that are indispensable for human life, including production, remain outside the measuring of standard NI. This is logical because water, air, soil, plant and animal species are not produced by humans.

So in view of the widespread perception that NI indicates economic welfare and success and even that production has to grow for financing environmental conservation, we greatly need an NI adapted for environmental losses, alongside the standard NI, in order to counter this wrong perception.

This is the (environmentally) Sustainable National Income (eSNI). The eSNI is the only indicator which (1) is directly comparable with standard NI because it is estimated in accordance with the conventions of the System of National Accounts (SNA), (2) relates the measurable physical environment ('ecology') with subjective preferences (economy) as shown in Figure 2, (3) provides the distance between the actual (NI) and sustainable (eSNI) production level in factor costs and (4) shows the development of this distance in the course of time and thus shows whether or not society is drifting further away from environmental sustainability defined as keeping vital environmental functions available for future generations. Therefore the eSNI is indispensable information for society and policy.

Description

Environmentally SNI in a given year is defined as the maximal attainable production level by which vital environmental functions remain available for future generations, based on the technology available at that year (the OECD has accepted

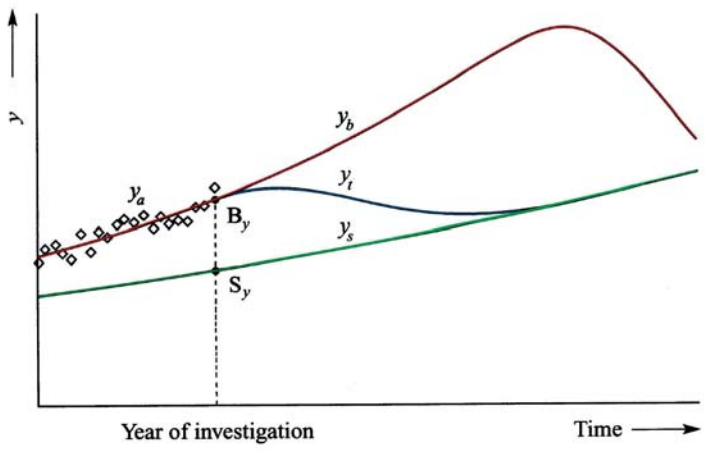


Figure 1 *Actual standard national income observations (y_a, fictitious example) compared with the net national income (y) on three optimal paths, calculated with a dynamic environmental economic model. The red path (index b, business as usual) approximates the actual path (index a) by assuming incomplete expression of preferences for the environment. These preferences are assumed to be completely expressed on the sustainable path (index s) and the transition path (index t). The point B_y indicates the level of national income y on path b in the year of investigation; S_y is the corresponding point on the sustainable path s. The path b drops dramatically because of the loss of one or more vital environmental functions, as happened already in some regions* (http://www.millenniumassessment.org/en/condition.aspx).

this definition http://stats.oecd.org/glossary/detail.asp?ID=6587). Thus the eSNI provides information about the distance between the current and a sustainable situation. The length of the period to bridge this distance, that is the transition period towards a sustainable situation, is limited only by the condition that vital environmental functions must not be damaged irreversibly. In combination with the NI, the eSNI indicates whether the part of the production that is based on *un*sustainable use of the environment is increasing or decreasing. Because of the precautionary principle, future technological progress is not anticipated in the calculation of eSNI. When constructing a time series of eSNI's, technological progress is measured after the event on the basis of the development of the distance between the eSNI and standard NI over the course of time. When this distance increases, society is drifting farther away from environmental sustainability, and vice versa.

In our physical surroundings, a great number of possible uses can be distinguished, which are essential for production, consumption, breathing, et cetera, and thus for human existence: environmental functions, or in short: functions. As long as the use of a function does not hamper the use of an other or the same function, so as long as environmental functions are not scarce, an insufficiency of labour, that is intellect or technology, is the sole factor limiting production growth, as measured in standard NI. As soon as one use of a function is at the expense of another or the same function (by excessive use), though, or threatens to be so in the future, a second limiting factor is introduced. The emergence of competition between functions marks a juncture at which functions start to fall short of meeting existing wants. Competing functions are by definition scarce and consequently economic goods. In a situation of severe competition between functions, in which we live today, labour is not only reducing scarcity, and thus causing a positive effect on our satisfaction of wants (welfare), but it is also increasing scarcity, thus causing a negative effect on welfare. The same holds for consumption. So today production not only adds value (viz. goods for consumption) but also nullifies value (by damaging environmental functions). Examples of competing functions are: the function 'air, water and soil as dumping ground for waste' with functions like 'air for physiological functioning', 'drinking water' and 'soil for raising crops'; the functions 'space for growing food crops' and 'space for natural ecosystems such as forests' with the function 'space for growing bio-fuel crops'; the function 'regulating the water flow of e.g. forests' (that prevents flooding) with the function 'forests for harvesting wood'.

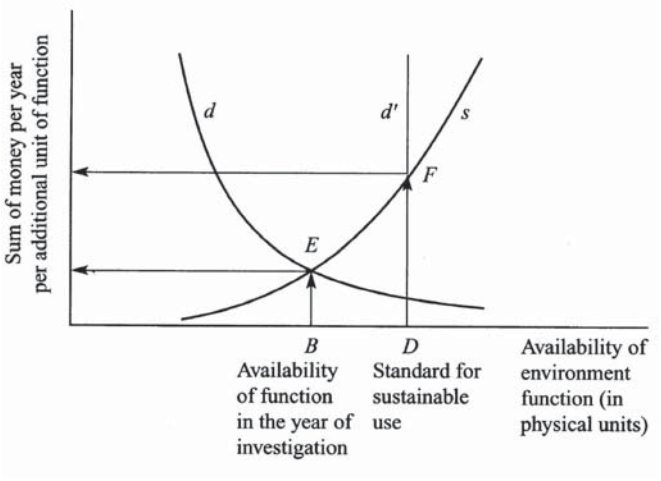
The availability of functions, or, in terms of the SNA, their volume, decreases from 'infinite' (abundant with respect to existing wants) to finite, that is falling short. As a result, the shadow price of environmental functions rises, and with it their value, defined as price times quantity, from zero to an ever-higher positive value. *This rise in value reflects a rise in costs*. To determine the extent of the loss of function, we must know the value of the function. Since environmental functions are collective goods that are not traded on the market, supply and demand curves have to be constructed. Without data on both preferences as well as on opportunity costs, determination of value is impossible.

The estimated costs of measures necessary to restore functions, that rise progressively per unit of function restored, can be seen as a supply curve, because the measures supply the availability of functions. We call this the cost-effectiveness curve or the elimination cost curve, because it refers to measures that eliminate the pressure on the environment. Except in the case of irreparable damage, this curve can always be constructed. The measures consist of technological measures, stimulating direct shifts such as from private car to bicycle and stimulating birth control. For non-renewables elimination measures take the form of developing and bringing into practice alternatives such as solar for fossil fuels.

Preferences for environmental functions, on the contrary, can only partially be determined, since these can be expressed only very partially via the market, while willingness to pay techniques cannot yield reliable data precisely for vital functions. Their expression via the market and budget mechanism is blocked by so called blockages or barriers (www.sni-hueting.info). Therefore it is not possible to construct a complete demand curve. In order to provide the necessary information, assumptions about preferences have to be made. In the physical environment these assumptions take the form of physical standards. See Figure 2. It follows from the previous sentences that (1) these standards have to be clearly distinguished from whether or not people are willing to at-

tain them and (2) they contain *information* and are by no means actual political target setting.

Figure 2 *Translation of costs in physical units into*



costs in monetary units: s = supply curve or marginal elimination cost curve; d = incomplete demand curve or marginal benefit curve based on individual preferences (revealed from expenditures on compensation of functions, on restoration of physical damage due to loss of function e.g. the 'hydrological regulation' function resulting in erosion, and so on); d' = 'demand curve' based on assumed preferences for sustainability; BD = distance that must be bridged in order to arrive at sustainable use of environmental functions; area BEFD = total costs of the loss functions, expressed in money; the arrows indicate the way via which the loss of environmental functions recorded in physical units is translated into monetary units.

One possible assumption is prevailing preferences for sustainable use of vital environmental functions, which takes the form of a rectangular, curve d' in Figure 2. This assumption is legitimate because governments and institutions all over the world have stated support for this.

The cost-effectiveness calculations and the standards are input in an economic model that has as output among other things the level of eSNI and the prices of products in a sustainable situation, with strongly changed price ratio's between environment burdening (much higher real prices) and less burdening products (about the same real prices).

A first rough estimate of the eSNI for the world in 1991 by Tinbergen and Hueting arrives at fifty percent of the production level of the world: the world income (www.sni-hueting.info). Estimates for The Netherlands by a co-operation of Statistics Netherlands, the Institute of Environmental Studies and the Netherlands Environmental Assessment Agency also arrived at about fifty percent of the production level or national income (www.sni-hueting.info).

This corresponds with the production level in the early seventies. *Consequently our production level is two times higher than the level that can be sustained for future generations*. In the period 1990-2000 the distance between NI and eSNI increased by thirteen billion euro. (http://ivm5.ivm.vu.nl/sat/?chap=14)

History

The concept of eSNI has been designed by dr. Roefie Hueting and has been worked on since the mid 1960's, since 1990 together with ir. Bart de Boer. Central in the theory is the concept of environmental function. A difficult problem has been to establish the value of these functions and consequently the costs of their loss in order to arrive at an NI adapted for loss of environmental functions. In his cum laude dissertation New Scarcity and Economic Growth (1974) and later publications Hueting arrives at the conclusion that this problem is insolvable, that consequently the correct prices of market goods are equally unknowable, but that the indispensable information for policy weighing can be given on the basis of estimates of factor costs and making assumptions about preferences. This 'solution' of the valuation problem holds true and is applicable for both not in GDP recorded environmental losses and other shortcomings of GDP. It is widely accepted, never disputed and can for instance be found in the article that he wrote together with Nobelist Jan Tinbergen for the Rio conference in 1992: 'GNP and market prices: wrong signals for sustainable economic success that mask environmental destruction' (Tinbergen is one of the founders of the GNP/GDP indicator in the 1930's and has strongly supported Hueting's efforts to estimate a figure *alongside* the GDP, right from the start in the mid 1960's).

The work on eSNI received the Global 500 Award, the royal honour Officer in the Orde of Oranje Nassau and a nomination by Jan Tinbergen for the Sasakawa Prize. International symposia on eSNI were organised at the Royal Academy of Art and Sciences in Amsterdam, by the OECD in Paris and by The World Bank in Washington D.C. At the latter occasion the book 'Economic Growth and Valuation of the Environment: a Debate', dedicated to eSNI and with comments on eSNI by the world's most outstanding environmental economists such as Daly, Pearce and Beckerman, was handed by minister Pronk to WB president Wolfensohn in

2001 (http://info.worldbank.org/etools/bspan/PresentationView.asp?PID=494&EID=235). In the SEEA manual of the UN Statistical Office is written: "Much of the initiative to look at an alternative path for the economy rather than a different measure of the economy came from the work of Hueting in the late 1960's and the early 1970's. He introduced the concept of environmental function referred to throughout this manual, explaining how pressure on functions leads to scarcity or competition for these functions (…)." (http://unstats.un.org/unsd/envaccounting/seea.asp).

An estimate of eSNI for the world was made in 1991. Estimates of eSNI for The Netherlands are made for the years 1990, 1995 and 2000. A multidisciplinary team of biologists, chemists, physicists, electrical engineers and economists worked for nearly forty years on the eSNI and the environmental statistics it is based on.

Future

Plans are elaborated in notes for (1) model improvements, (2) the set up of, among other things, defining the measures and estimating their costs to arrive at sustainable use of soil that prevents erosion, one of the serious problems in developing countries and (3) eSNI estimates in other countries e.g. Germany and some developing countries. Representatives of The World Bank and the OECD have insisted on this. Although the Dutch Parliament has asked for funding this and the Dutch government has promised to do so, subsidies have not been granted. The theory and elaboration of the eSNI has received international scientific recognition. It is the eldest and most complete environmental indicator as follows from e.g. the four points mentioned in the Section 'Need'. It provides information not given by any other indicator. However, because of lack of funding further development of the eSNI is hardly possible. Hopefully the European Union will help to change this situation.

EU set of Sustainable Development Indicators (SDIs)

by **Laure Ledoux**, European Commission, Eurostat

The need for a European set of SDIs

The renewed sustainable development strategy identifies seven key challenges which are seen as threats to achieving the overall long-term objective of improving the quality of life and well-being on earth for present and future generations. While it could be argued that there is some interest in having an aggregated measure of well-being, it is also important to measure the different elements that influence it over time, as they are not perfectly substitutable. Through identifying key challenges to sustainable development, the strategy implicitly identifies what are these key influences on well-being and the threats to long term development. The EU set of sustainable development indicators (SDIs) is designed to monitor the related objectives and targets.

Measuring progress towards objectives and targets is an integral part of the renewed strategy. Eurostat is foreseen to produce a monitoring report every second year, based on the EU set of SDIs, which underpins the European Commission progress report.

Historical context

In 1996, the United Nations Commission on Sustainable Development (UNCSD) proposed a list of indicators, linked to the thematic chapters of Agenda 21, to be tested, developed and used by governments. Eurostat contributed to the international testing phase and issued two publications drawing from the UN list of indicators.

Following the adoption of the EU sustainable development strategy in Gothenburg in June 2001, a task force was established to develop a common response from the European statistical system to the need for indicators on sustainable development. The Commission endorsed a first set of 155 indicators based on this work in February 2005. Some 98 indicators from this list formed the basis of the first monitoring report published by Eurostat in December 2005. Upon the expiry of the mandate of the task force at the end of 2005, a working group on sustainable development indicators (SDIs) was set up, composed of both statistical and policy representatives at national and EU levels. Following the mandate of the renewed strategy, the review of this first set was carried out by the Commission in close co-operation with the working group on SDIs, with the objective of adapting the 2005 SDI set to the renewed strategy, taking into account recent statistical developments.

Description of the reviewed SDI set

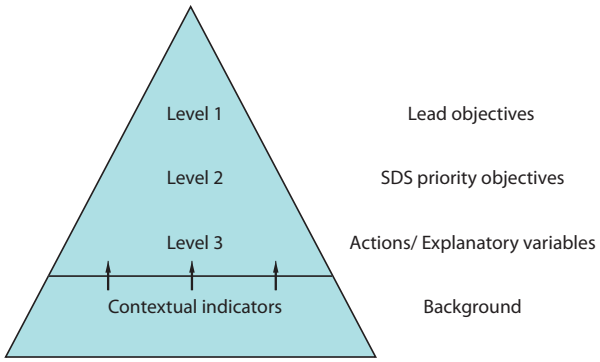
The purpose of the SDI set, as seen in the strategy, is to ensure an adequate assessment of progress with regard to each particular challenge. The reviewed set therefore specifically aims at measuring progress towards the objectives and targets of the sustainable development strategy.

The SDI framework is based on ten themes, reflecting the seven key challenges of the strategy, as well as the key objective of economic prosperity, and guiding principles related to good governance. The themes follow a general gradient from the economic, to the social, and then to the environmental and institutional dimensions. They are further divided into subthemes to organise the set in a way that reflects the operational objectives and actions of the sustainable development strategy (see table 1).

The reviewed set of SDIs retains the three-storey pyramid structure of the 2005 set. This distinction between the three levels of indicators reflects the structure of the renewed strategy (overall objectives, operational objectives, actions) and also responds to different kinds of user needs, with the headline indicators having the highest communication value (see figure 1). The three-levels are complemented with contextual indicators, which do not monitor directly the strategy's objectives, but provide valuable background information for the analysis.

The SDI set also describes indicators which are not yet fully developed but which would be necessary to get a more complete picture of progress, differentiating between indicators that are expected to become available within two years, with sufficient quality ('indicators under development'), and those to be developed in the longer term ('indicators to be developed').

Figure 1: The SDI pyramid



Current success and key challenges

National sets of sustainable development indicators in EU Member States and the rest of the world may differ from the EU SDI set, reflecting different policy priorities, and different levels of availability of statistics. There is however some added value in measuring the same objectives with the same indicators to allow for meaningful cross-country comparisons. The EU SDI set is already guiding this convergence process to a certain extent.

The Eurostat monitoring report provides a factual analysis of progress focusing on trends and distances to targets (figure 2). Evaluation is based on quantitative rules applied consistently across indicators, and visualised through weather symbols that illustrate whether changes are favourable in the context of sustainable development objectives (figure 3).

The first progress report on the sustainable development strategy has used sustainable development indicators extensively, demonstrating the usefulness of factual and objective assessment as a background for policy analysis. The combination of a policy relevant set of indicators with rigorous analysis based on independent statistics is key in this context.

Table 1: Themes, Sub-themes and headline indicators

THEMES	SUB-THEMES				HEADLINE INDICATORS
Socio-economic development	Economic development	Innovation, competitiveness, and eco-efficiency	Employment		Growth rate of GDP per inhabitant
Sustainable consumption and production	Resource use and waste	Consumption patterns	Production patterns		Resource productivity
Social inclusion	Monetary poverty and living conditions	Access to labour market	Education		At-risk-of-poverty rate after social transfers
Demographic changes	Demography	Old-age income adequacy	Public Finance sustainability		Employment rate of older workers
Public health	Health and health inequalities	Determinants of health			Healthy life years and life expectancy at birth, by gender
Climate change and energy	Climate change	Energy			Greenhouse gas emissions Consumption of renewables
Sustainable transport	Transport growth	Transport prices	Social and environmental impacts of transport		Energy consumption by transport
Natural resources	Biodiversity	Freshwater resources	Marine ecosystems	Land use	Common Bird Index Fish catches outside safe biological limits
Global partnership	Globalisation of trade	Financing for sustainable development	Global resource management		Official Development Assistance
Good governance	Policy coherence and effectiveness	Openness and participation	Economic instruments		.....

Figure 2: Example of individual indicator presentation in the 2007 monitoring report

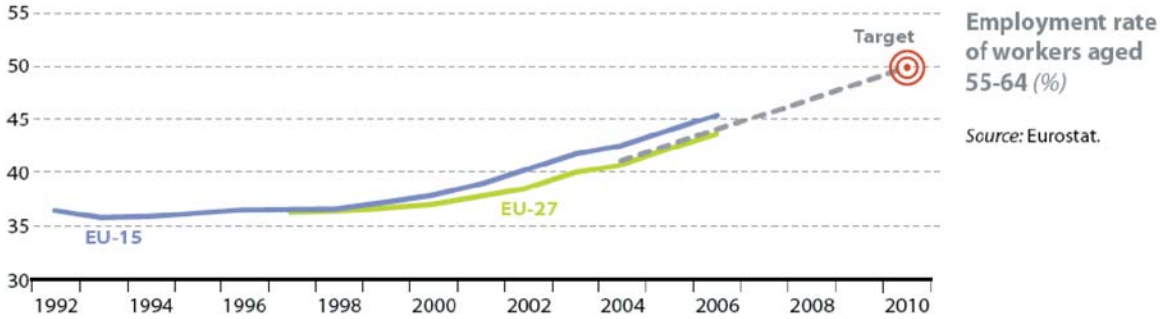


Figure 3: Conclusions table in the 2007 monitoring report
Evaluation of changes in the headline indicators (from 2000)

Legend:	
	favourable change/ on target path
	no or insufficient change
	unfavourable change/ far from target path
:	insufficient data/ EU aggregare not available
1	Evaluation based on EU-15
2	Usual EU aggregates not applicable

SDI theme	Headline indicator	EU-27 evaluation of change
Socioeconomic development	GDP per capita	
Climate change and energy	Greenhouse gas emissions	1
	Consumption of renewables	
Sustainable transport	Energy consumption of transport	
Sustainable consumption and production	Resource productivity	1
Natural ressources	Common birds	2
	Fish catches	2
Public health	Healthy life years	1
Social inclusion	Risk of poverty	:
Demographic changes years and over	Employement rate of older workers	
Global partnership	Official development assistance	1

Future developments

The Commission, with the assistance of the working group on SDIs, is committed to constantly review the situation regarding the development of new and better indicators. This development work will contribute substantially to further improve the homogeneity of the set of indicators.

A joint UNECE/OECD/Eurostat working group on statistics for sustainable development is currently assessing the use of the Capital approach to measure sustainable development, based on the rationale of maintaining stocks of financial, natural, human, and social capital to preserve opportunities for the well-being of next generations. This should yield useful insights for the selection and interpretation of sustainable development indicators.

In response to current policy needs, Eurostat is also in the process of launching a feasibility study on a well-being indicator, by reviewing the merits and shortcomings of existing approaches and examining the feasibility of selected indicators at EU level.

The Human Development Index (HDI)

by **Amie Gaye**, UNDP Human Development Report Office

Why an alternative measure to Gross Domestic Product (GDP)

Gross Domestic Product (GDP), which is the standard measure of a nation's total economic activity has been a dominant measure of a country's level of development for a long time and was assumed to translate directly into improved human well being. However, while growth-oriented policies may increase a nation's total wealth, whether or not growth enhances human development depends on how that growth is generated and used. The economic growth paradigm neglects important aspects of development, such as income inequalities, unemployment, and disparities in access to public goods and services like health and education. For economic growth to enhance human development, it should provide an opportunity to enhance workers' knowledge and skills along with opportunities for their efficient use, provide

better job opportunities and support greater democracy at all levels of decision-making. Thus, the growth paradigm does not capture adequately the multi-dimensionality of development.

What is the Human Development Index (HDI)?

The HDI serves as a frame of reference for both social and economic development. It is a summary measure for monitoring long-term progress in a country's average level of human development in three basic dimensions: a long and healthy life, access to knowledge and a decent standard of living. It sets a minimum and a maximum for each dimension, called goalposts, and shows where each country stands in relation to these goalposts, expressed as a value between 0 and 1.

The life expectancy component of the HDI is calculated using a minimum value for life expectancy of 25 years and maximum value of 85 years. This is because even with HIV/AIDS it is unlikely for life expectancy at birth to fall below 25 years.

The knowledge component of the HDI is measured by adult literacy rates and the combined gross enrolment ratio in primary, secondary and tertiary education, weighted to give adult literacy more importance (two-thirds). While at the national level it is unlikely for any of the knowledge indicators to assume a zero value, at disaggregated levels, it is possible for some population sub-groups to score very low on the indicators. For this reason, the lower end of the goalpost is set at 0 and the upper end at 100 per cent.

For a decent standard of living, which is measured by GDP per capita in purchasing power parity (PPP) US Dollar terms, the goalpost for minimum income is $100 (PPP) and the maximum is $40,000 (PPP). GDP per capita is converted into PPP terms to eliminate differences in national price levels in order to make standards of living comparable across countries.

In the calculation of the HDI, a logarithm of income is used to reflect the diminishing importance of income with increasing GDP. This is premised on the belief that people do not need an infinite amount of money for a decent quality of life.

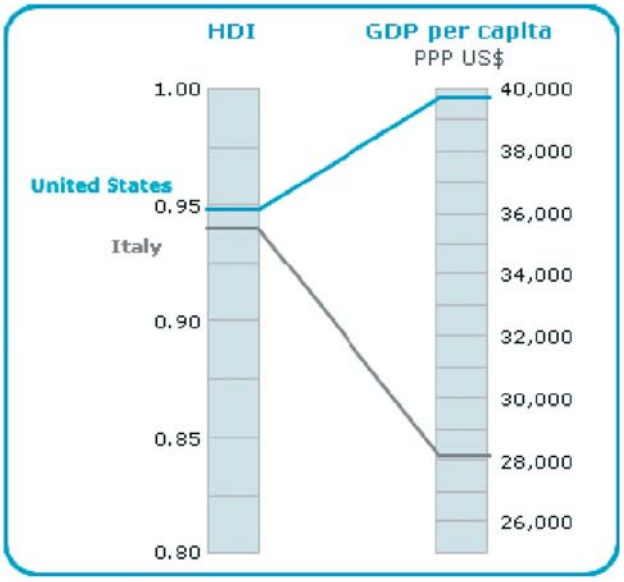
The scores for the three HDI components are then averaged in an overall index. The HDI is currently calculated for 177 countries and areas for which data are available.

While the concept of human development is much broader than this composite measure, the HDI offers a powerful alternative to GDP as a summary measure of human well-being. It provides a useful entry point into other rich information contained in the indicator tables covering a wide range of human development issues presented each year in the Human Development Reports.

What the HDI reveals

The HDI reveals that some countries do better on human development with relatively low GDPs per capita. For example, Italy's GDP per capita is only about two-thirds of that of the United States but the two countries have similar HDI values (see Figure 1).

Figure 1: GDP vs. HDI; comparing Italy and USA

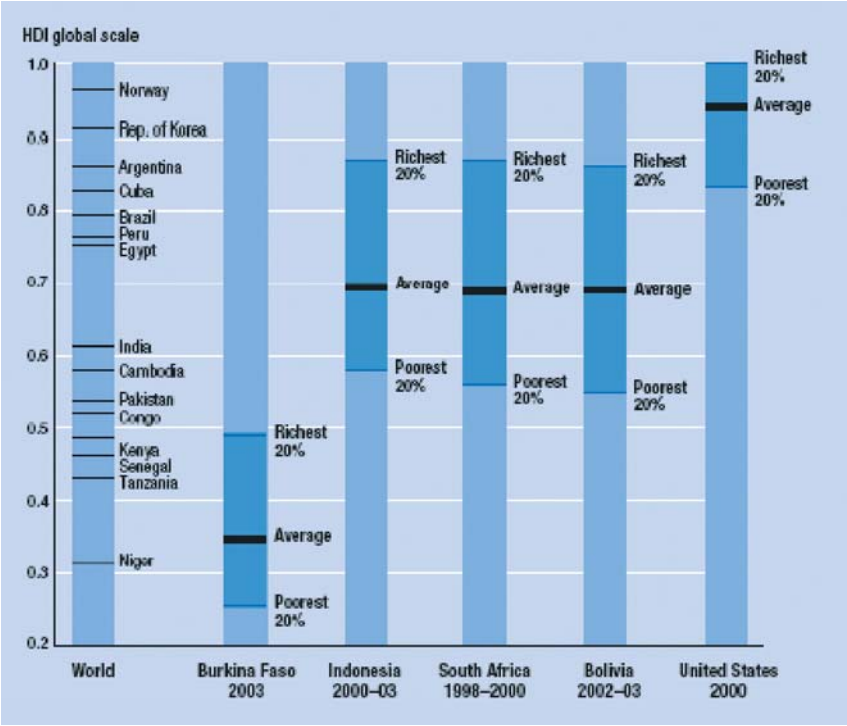


Source: HDRO web site http://hdr.undp.org

Disaggregating the HDI by income quintiles for countries for which representative data are available is also revealing. For instance, the gap between the value for the richest 20 per cent and the poorest 20 per cent of households in the United States is about 17 per cent. This is similar to the gap between average HDIs for the United States and Cuba respectively.

In other words, while the richest 20 per cent in the United States would be at the top of the HDI league table, the poorest 20 per cent would be at the same human development level as people living in Cuba (see Figure 2).

Figure 2: Human development index by income groups



Source: 2006 Human Development Report

The variation in HDI value marked by unequal opportunities and capabilities calls for public policies aimed at equalizing opportunities and choices. Apart from the moral imperative to overcome extreme inequalities in income, access to education and health, inequalities pose a threat to national and global securities.

History of the human development concept

For decades, the economic growth paradigm dominated the national development discourse. However, in the 1980s unemployment levels escalated; and access to social services deteriorated in many countries including some industrialised countries while at the same time, economic production was expanding. In other words, high rates of economic growth did not automatically translate into improved human well-being. During the same period, some countries were registering improvement in human well-being with modest economic growth. These raised questions around the nature, distribution and quality of economic growth. It became clear that economic growth alone is not an adequate yardstick for a country's level of development. The need for a conceptual shift and alternative policy options that create a balance between economic growth and protection of the interest of poor and marginalised members of society became imperative.

The HDI, which was introduced in the first Human Development Report published in 1990, was a response to this demand. The idea of a composite index that measures socio-economic progress was conceived by Mahbub ul Haq a renowned economist, whose vision was to come up with one measure which is as crude as the GDP, but "not as blind to social aspects of human lives as the GNP is".

Limitations of the HDI

Like any other composite index, the HDI suffers a limitation of not capturing all the different dimensions of human development. Data availability poses a major challenge to capturing other important dimensions of human development such as political freedom, environmental sustainability and degree of people's self respect.

Secondly, the HDI is not designed to assess progress in human development over a short-term period because some of its component indicators are not responsive to short-term policy changes. Thus, the index partially measures past achievements as the components are made up of both stock and flow variables.

Future Possibilities

Since its introduction in 1990, the HDI's analytical framework, methodology and data have been subjected to rigorous scrutiny. Some of the major criticisms have led to major refinements of the methodology and component indicators but the index continues to evolve. For example, the HDI by income groups, calculated for 15 countries (13 developing and 2 developed) with data and published in the 2006 HDR, points to a need for bringing out inequalities in HDI for evidence-based planning. This is one area that the HDRO

would like to extend to as many countries as data availability would allow.

Another future plan is to construct a separate HDI for women and for men to better present gender inequalities in human development. But this depends on reliable data on income for women and for men.

There are also discussions around capturing the environment dimension of human development either as part of the HDI or as a new index. However, these discussions are at a very early stage and data availability will inform any the final decision.

Index of Individual Living Conditions

by **Heinz Herbert Noll**, GESIS, Social Indicators Research Centre

The Index of Individual Living Conditions

The Index of Individual Living Conditions presented as part of the European System of Social Indicators (EUSI) is a composite index aiming to give a summary view of the quality of living conditions in a single measure. The Index allows to easily and unequivocally assess the living conditions of a population – which are multidimensional by nature – and to compare them across countries and across time. It measures progress in the improvement of living conditions of the European citizens beyond GDP. Since this index, contrary to others, is based on microdata on personal and household level, the Living Conditions Index can be broken further down and thus allows to compare the situation of subgroups (e.g. age groups, men and women, educational level) within a population.

Composition of the Index of Individual Living Conditions

The Living Conditions Index is supposed to condense and simplify the complexity of information provided by the multitude of single indicators in the European System of Social Indicators addressing the various dimensions of living conditions comprehensively. In order to present a representative measure of individual living conditions, the index is calculated as the mean score of seven subindices, all ranging from 1 to 5: Income and standard of living, housing, housing area, education, health, social relations and work. The Living Conditions Index thus also varies between 1 (worst) and 5 (best). Up to now, the calculation of the index is based on the data from the European Community Household Panel Study, which was established in 1995 and discontinued in 2001. However, the variables used to calculate the Individual Living Conditions Index have been selected with a view to be included into the EUSILC – the follow-up database to the ECHP – as well. Thus, depending on the availability and accessibility of the EU-SILC microdata sets, the index will be updated for years beyond 2001 and will also be calculated for EU member states not represented in the ECHP.

Development of Living Conditions in EU -Countries

The index currently allows to monitor the development of average individual living conditions for a number of EU member countries for the period from 1995 to 2001. Chart 1 shows the generally high level of living conditions in Europe (with scores between 3.4 in Portugal and 4.1 in Denmark), but also the discrepancy between northern and southern countries of Europe. The development across time displays a general slight improvement of living conditions, while the distance between the countries has decreased only marginally. As soon as the Living Conditions Index can be calculated on the basis of the EU-SILC data, the scope can be extended to all 27 EU member countries, which allows to monitor and assess the whole range of living conditions in Europe, i.e. not only differences between northern and southern, but also between eastern and western countries. Also, the change over time, including processes of convergence and divergence, and the success of EU cohesion policies can be further monitored and assessed.

Chart 1: Individual Living Conditions Index 1995-2001

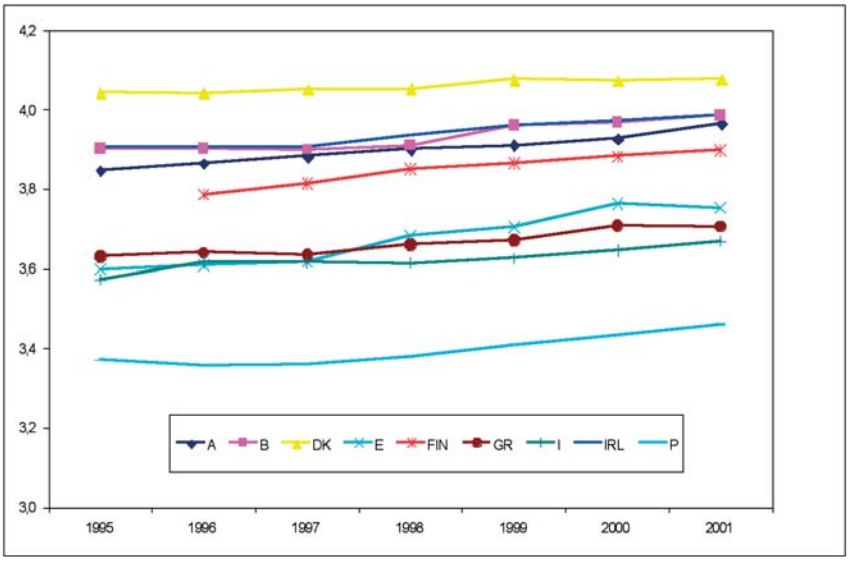
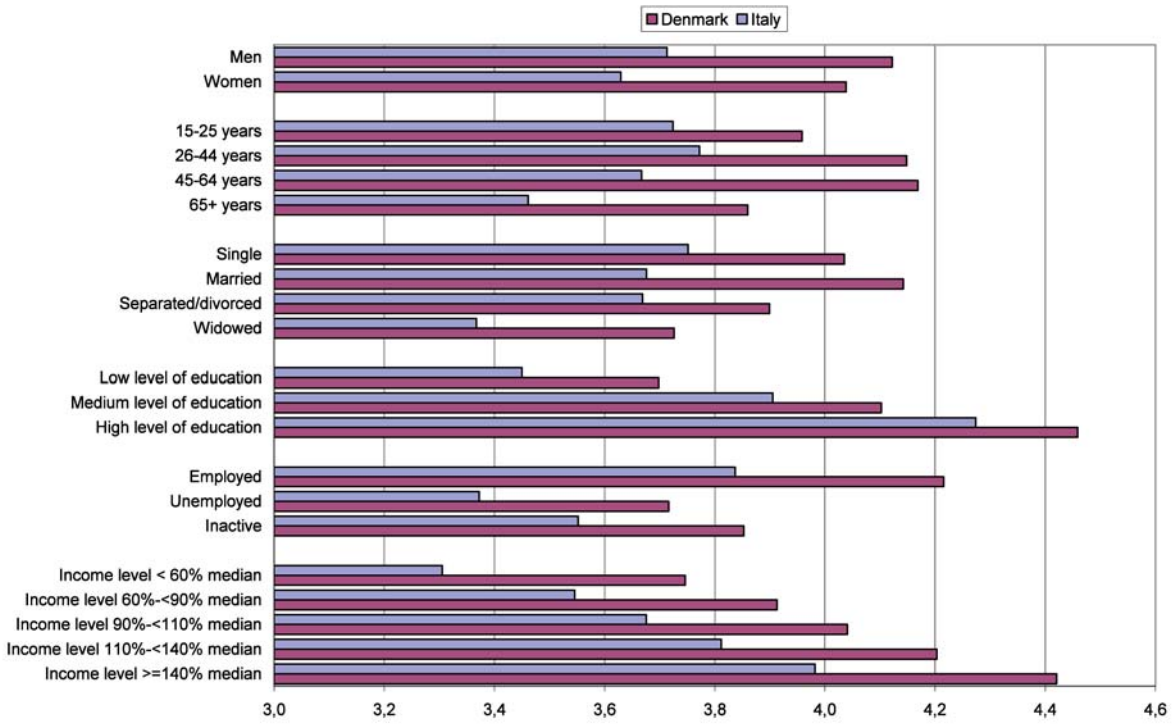


Chart 2 presents the index values for two countries, Italy and Denmark, in 2001, but broken down by a few socio-demographic characteristics. The possibility to do this is a major advantage of an index based on individual survey data. The chart shows very clearly that living conditions overall turn out to be better in Denmark, but the patterns of group differences in living conditions are pretty similar in both countries: In Denmark and in Italy the better educated and higher income groups are also enjoying better general living conditions than less educated and poorer people, the employed are better off than the unemployed or inactive, the middle aged are better off than the young and the elderly or the divorced and widowed are worse off than the married or

Chart 2: Index of Individual Living Conditions: Denmark and Italy, 2001



singles. Overall the figures seem to indicate that the index brings about plausible and reliable results. Of course one could also do all kinds of statistical analyses, e.g. calculations of correlations or regressions, which is another major advantage of an index based on individual survey data, like the Individual Living Conditions Index.

The European System of Social Indicators

The Index of Individual Living Condition is an integrated part of the European System of Social Indicators. Within this system it is considered as a summary measure of the objective living conditions for life as a total. The European System of Social Indicators has initially been developed as an EU-funded project (EuReporting) within the TSER program and was then institutionalised as part of the German Social Science Infrastructure Services (GESIS).

The European System of Social Indicators has been developed with a view to be used to continuously monitor and analyse quality of life, social cohesion and sustainability as well as changes in the social structure of European societies and the European Union. Since it is supposed to be a concept driven system, the selection of indicators is based on a conceptual framework that distinguishes eight principal dimensions of welfare measurement and general social change and covers 13 life domains:

- Population, Households and Families
- Transport
- Leisure, Media and Culture
- Social and Political Participation and Integration
- Income, Standard of Living, and Consumption Patterns
- Education and Vocational Training
- Health
- Housing
- Labour Market and Working Conditions
- Social Security
- Public Safety and Crime
- Environment
- Total Life Situation

The indicators system provides time series data for more than 30 nations: the EU member states, Switzerland, Norway, as well as Japan and the United States as two major reference societies. The primary focus of the indicators system is however defined by the member states of the European Union. Depending on data availability time series start at best at the beginning of the 1980s. Most of the indicators time-series are broken down by various sociodemographic variables. Also regional disaggregations at the NUTS-1 level are being offered whenever possible and meaningful. At its present stage the European System of Social Indicators offers time-series data for more than 600 indicators from 9 out of the projected 13 life-domains. The system will subsequently be completed and continuously be updated.

The European System of Social Indicators is based on data sources ensuring the best possible level of comparability across countries and time. The data sources used include international aggregate official data, e.g. from Eurostat, the OECD or the WHO, as well as microdata from crossnational surveys, e.g. from the European Community Household Panel (ECHP), the European Social Survey (ESS), the Eurobarometer studies or the International Social Survey Programme (ISSP). To some extent, the indicator system reverts to national data, too.

The European System of Social Indicators addresses social scientists, policy makers at the national and the supranational level, university and school teachers, students as well as journalists. The database is considered to be particularly useful for all kinds of comparative research on the development of quality of life, social cohesion, sustainability, social structures and value orientations within and across the countries covered. Moreover, the European System of Social Indicators constitutes an important database for the policy making processes as a tool to monitor progress in the achievement of national and international policy goals.

For more information see:

www.gesis.org/eusi

Genuine Progress Indicator (GPI)

by **John Talberth**, Redefining Progress

Sustainable Development and the Genuine Progress Indicator

An updated methodology and application in policy settings (http://www.rprogress.org/sustainability_indicators/genuine_progress_indicator.htm)

What is the Genuine Progress Indicator?

During World War II gross domestic product (GDP) accounts were introduced to measure wartime production capacity. Since then, GDP has become the world's most ubiquitous indicator of economic progress. It is widely used by policymakers, economists, international agencies and the media as the primary scorecard of a nation's economic health and wellbeing. Yet, as we know from its creator Simon Kuznets the GDP was never intended for this role. It is merely a gross tally of products and services bought and sold, with no distinctions between transactions that enhance well being and those that diminish it. Instead of distinguishing costs from benefits, productive activities from destructive ones, or sustainable ones from unsustainable ones the GDP simply assumes that every monetary transaction adds to social well-being by definition. In this way, needless expenditures triggered by crime, accidents, toxic waste contamination, preventable natural disasters, prisons and corporate fraud count the same as socially productive investments in housing, education, healthcare, sanitation, or mass transportation. It is as if a business tried to assess its financial condition by simply adding up all "business activity," thereby lumping together income and expenses, assets and liabilities.

Beginning with the seminal work of Daly and Cobb (1989) there have been several attempts to develop alternative national income accounting systems that address these deficiencies. Collectively, these systems measure what is commonly referred to as "green" GDP. Major objectives of these green GDP accounting systems are to provide a more accurate measure of welfare and to gauge whether or not an economy is on a sustainable time path. Two of the most popular green GDP systems are the Index of Sustainable Economic Welfare (ISEW) and the Genuine Progress Indicator (GPI). While methodologies differ somewhat, the ISEW, GPI, and other green GDP accounting systems all involve three basic steps. Computation usually begins with estimates of personal consumption expenditures, which are weighted by an index of inequality in the distribution of income to reflect the social costs of inequality and diminishing returns to income received by the wealthy. Additions are made to account for the non-market benefits associated with volunteer time, housework, parenting, and other socially productive time uses as well as services from both household capital and public infrastructure. Deductions are then made to account for purely defensive expenditures such as pollution related costs or the costs of automobile accidents as well as costs that reflect the undesirable side effects of economic progress. Deductions for costs associated with degradation and depletion of natural capital incurred by existing and future generations are also made at this stage. Table1 provides a line by line summary of these adjustments in 2004 for the U.S. GPI, the latest year for which data are available. By making these adjustments, the GPI corrects the deficiencies of GDP by incorporating aspects of the non-monetized or non-market economy, separating welfare enhancing benefits from welfare detracting costs, correcting for the unequal distribution of income, and distinguishing between sustainable and unsustainable forms of consumption.

What Improvements Were Made in 2006?

The GPI 2006 Update makes a number of improvements and additions to the basic GPI methodology first developed in the late 1990s. These improvements can be grouped under two broad headings: new data sources and new calculations. Examples of new data sources include the Bureau of Labor Statistics' American Time Use Surveys (ATUS) in 2003 and 2004. The new ATUS data was used to improve our calculations of the value of housework, parenting, and volunteering. As another example, we incorporated new research from the U.S. Forest Service on logging related erosion and deforestation. We also used new data as well as new valuation studies to assign costs to farmland, wetland, and forest losses.

The GPI 2006 update also includes calculations that did not appear in our previous GPI publications. One

calculation is the non-market benefits associated with higher education – benefits that amount to $16,000 per year per college educated worker. We expanded our deforestation estimates to include economic damages associated with loss of roadless areas, ancient forests in the Pacific Northwest and Alaska, and loss of loblolly pine forests in the Southeast. We also added carbon emissions damage to reflect the ever-increasing costs of global warming. A complete column by column explanation of these improvements appears in the full report.

Key Results from the 2006 Update

Figure 1 shows GPI account trends for the 1950 – 2004 period. The results are alarming. While per capita GDP has risen dramatically – from $11,672 in 1950 to $36,595 today, per capita GPI has stagnated in the $14,000-$15,000 range since the late 1970s. This implies that since the late 1970s, the benefits of economic growth have been entirely offset by rising inequality, deteriorating environmental conditions, and a decline in the quality of our lives. Key findings of our 2006 update include:

- Drought, floods, sea level rise, and severe storms exacerbated by global warming are taking their toll on the U.S. economy. Conservatively, we estimate the costs of our carbon emissions on existing and future generations to be just over $1 trillion per year.

- Income inequality is at its greatest level since 1950. The income distribution index – which measures income inequality – increased by 20% since 1968, the year the nation's income was distributed most equitably. When growth is concentrated in the wealthiest income brackets it counts less towards improving overall economic welfare because the social benefits of increases in conspicuous consumption by the wealthy are less beneficial than increases in spending by those least well off. So a dollar of economic growth today counts far less than it did when our income distribution was more equitable.

- Urban sprawl gobbles up prime farmland, increases commute times, exacerbates urban air, water, and noise pollution, and increases accident rates. We estimate the costs of urban sprawl to be over $1.1 trillion each year.

- Globalization has exported America's vast manufacturing infrastructure overseas and with it a source of productive investments. As a result, an increasing share of foreign investment in the U.S. today is used to finance consumer debt and government spending for tax breaks and the wars in Iraq and Afghanistan. This puts us in the position of being a net borrower. Net borrowing today is a record $254 billion, a cost overlooked by GDP.

- The GDP counts all $600 billion plus spent on wars each year as a benefit – despite the fact that over half of all Americans disapprove of the war and decry its daily toll on American families, our long term security, the environment, Iraqi and Afghanistan societies, and our international reputation. The GPI recognizes that this spending is defensive – at best it helps maintain the status quo, at worst, it is a liability on our future. In any case, it should not be counted towards progress.

- The increase in the number of college graduates in the population is increasingly paying off in the form of many non-market benefits such as increases in the stock of knowledge, worker productivity, civic participation, job market efficiency, savings, research and development activities, charitable giving, and health. These benefits amount to roughly $828 billion each year.

- Volunteerism is on the rise, and represents some of the most valuable work performed in our country. The GPI estimates the value of volunteer work in America to be over $130 billion. On a per capita basis, the value of work performed by churches and synagogues, civic associations, neighborhood groups, and non-profits rose from $202 in 1950 to $447 today, implying that over the past few decades, Americans have become more generous with their time.

Towards National Programs on Genuine Progress Accounts

RP is seeking government and NGO partners to launch national level Programs on Genuine Progress Accounts to make GPI a regular component of national and sub-national economic performance measurement, program and project assessment, higher education curricula, and economic media coverage. National and sub-

national GPI accounts would be supported by ongoing non-market valuation studies coordinated at major universities and NGO institutes. While national level leadership is important, as with climate change, it may well be that local government leadership will be the key driver of change. Thus, we seek partners who can help develop GPI adaptations at the local level and demonstrate GPI's relevance in multiple policy settings such as debates over land use, taxes, living wages, and localization.

Figure 1: GPI vs. GDP Time Trends

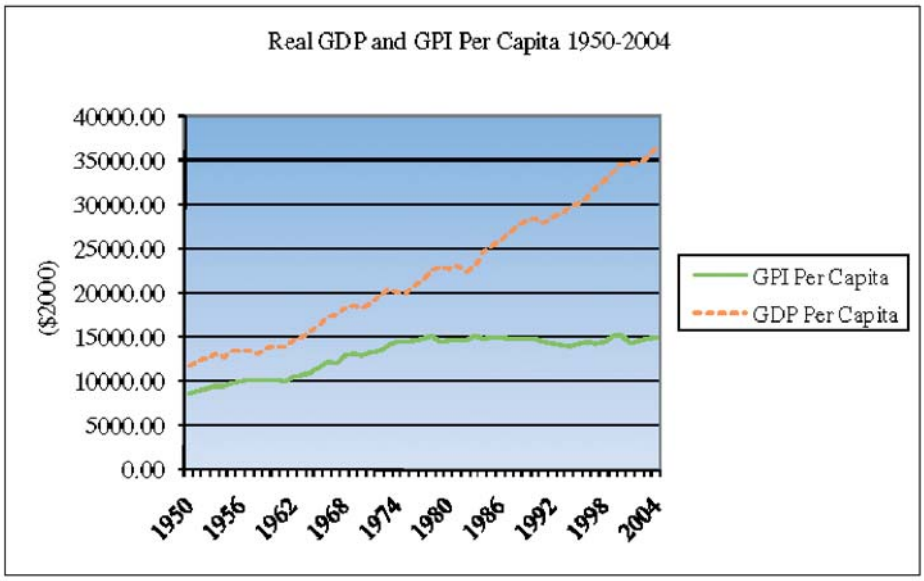


Table 1: U.S. GPI Contributions and Deductions (2004)

Contributions		Amount (Billions)
Personal consumption expenditures		$ 7,588.60
Weighted personal consumption expenditures (adjusted for inequality)	+	6,318.41
Value of housework and parenting	+	2,542.16
Value of higher education	+	827.98
Value of volunteer work	+	131.30
Services of consumer durables	+	743.72
Services of streets and highways	+	111.55
Net capital investment (positive in 2004, so included in contributions)	+	388.80
Total positive contributions to the GPI:		*$ 11,063.92*

Deductions		Amount (Billions)
Cost of crime	-	$ 34.22
Loss of leisure time	-	401.92
Costs of unemployment and underemployment	-	176.96
Cost of consumer durable purchases	-	1,089.91
Cost of commuting	-	522.61
Cost of household pollution abatement	-	21.26
Cost of auto accidents	-	175.18
Cost of water pollution	-	119.72
Cost of air pollution	-	40.05
Cost of noise pollution	-	18.21
Loss of wetlands	-	53.26
Loss of farmland	-	263.86
Loss of primary forest cover	-	50.64
Depletion of non-renewable resources	-	1,761.27
Carbon emissions damage	-	1,182.82
Cost of ozone depletion	-	478.92
Net foreign borrowing (positive in 2004, so included in deductions)	-	254.02
Total negative deductions to the GPI:		*$ 6,644.83*

Genuine Progress Indicator 2004	**$ 4,419.09**
Gross Domestic Product 2004	**$ 10,760.00**

Happy Life Years (HLY)

by **Ruut Veenhoven**, Erasmus University Rotterdam, The Netherlands

Need for a measure of quality of life in nations

How to assess how well a nation is doing? One way is to look at the quality-of-life of the people who live there. This view is gaining prominence, both among policy makers and the general public. This begs the question what quality-of-life is precisely and how that can be measured comprehensively.

Assumed quality-of-life

Quality-of-life in nations is commonly measured by taking stock of conditions that are believed to make for a better life, such as economic affluence, full employment and education. Measures of such conditions are added in an index, like the Human Development Index (HDI) or the Index of Social Progress (ISP).

Items in such indexes are typically things that are on the political agenda and as such these indexes inform about progress on the way chosen. Yet these indexes do not tell us whether we are on the right track, that is, whether these policy achievements really improved the lives of citizens. Still another problem is that such measures typically assume that more is better and do not inform us about an optimum, e.g. how many years of education is optimal for a good life.

Apparent quality of life

Another approach is to assess how well people thrive in a society. The focus is then on the outcomes of life, rather than on the preconditions. How well an organism thrives is typically reflected in its lifetime. In higher animals, thriving reflects also in affective experience and humans are moreover able to estimate how well they have felt over longer periods of time.

These estimates of how we feel most of the time are at the basis of the appraisal of how happy we are. Hence in the case of humans, thriving reflects both in how long and how happy they live.

Measure of Happy Life Years

How can we assess how long and happy people live in a country? This can be done combining data on average happiness assessed in surveys of the general population with data on longevity taken from civil registration.

Happiness
Happiness is how much one likes the life one lives. Since this is something people have in mind, it can be measured using single direct questions. An example of a survey question on happiness is:
Taking all together, how satisfied or dissatisfied are you currently with your life as a whole?
1 2 3 4 5 6 7 8 9 10
Dissatisfied Satisfied

Longevity
How long people will live in a country can be estimated on the basis of longevity of people who have passed away. Statisticians call this life expectancy.

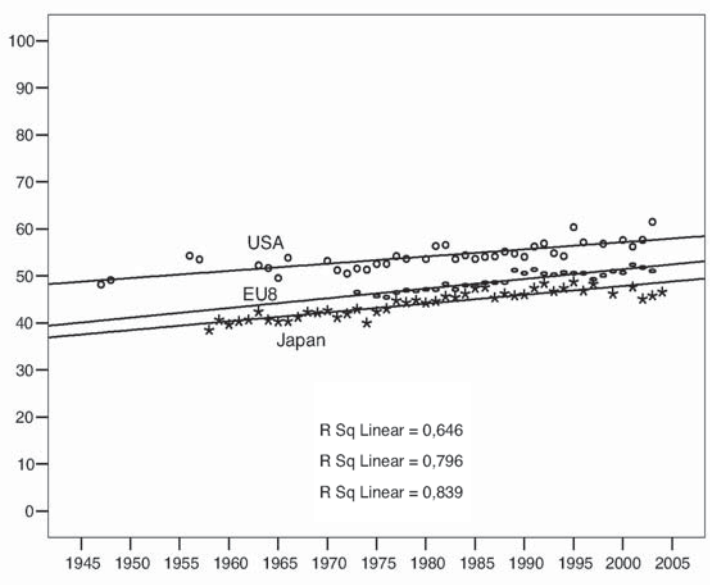
Happy Life Years = Life expectancy at birth x 0-1 happiness
Suppose that life expectancy in a country is 60 years. If everybody were perfectly happy in that country (average score 10), people would live 60 Happy Life Years in that country. If the average score is 5 the number of Happy Life Years is obviously lower, in this case 60 x 0,5 = 30. If life expectancy is also 60 years but average happiness 8, the number of happy life years is 48 (60 x 0,8).

Large differences in Happy Life Years across nations

Theoretically, this indicator has a broad variation; HLY is zero if nobody can live in the country, and will be endless if society is ideal and its inhabitants immortal. The practical range is about 50 years, the highest number of Happy Life Years is observed in Switzerland (63.9) and the lowest in Zimbabwe (11.5).

Gains in Happy Life Years over time in EU8, Japan and the USA

Happiness has risen in slightly in most developed nations since the second half of the 20th century and life-expectancy has grown substantially. As a result, the number of Happy Life Years has grown remarkably.



Trend lines for 16 nation available at:
http://worlddatabaseofhappiness.eur.nl/hap_nat/findingreports/TrendReport2007-2.pdf

Happy Life Years sensitive for things that policy makers can improve

There is a system in the differences in Happy Life Years across nations. About two-third of the large differences in HLY across nations can be explained by societal variation in economic affluence, freedom, equality, brotherhood and justice. The table below presents correlations with indicators of these matters.

All variables in the table are things over which policy makers have some control. So the data leave no doubt that policy matters for final quality of life and also indicate what matters most. Economic affluence still stands out as a mayor factor, but 'tolerance' and 'rule of law' appear to be quite important as well.

Yet not everything deemed desirable appears to go with more happy life years. For instance, income-inequality rather appears to be positively related to HLY and social security spending negatively. This illustrates the above difference between *assumed* quality of life and *apparent* quality of life.

Societal Qualities and Happy-Life-Years in 67 nations in the 1990s

Condition in nation	Correlation with HLY		
	Zero order	*Wealth Controlled*	*N*
Wealth			
• Purchasing power per head	+.73	-	67
Freedom			
• Economic	+.71	+.38	64
• Political	+.53	+.13	63
• Personal	+.61	+.31	45
Equality			
• Inequality in incomes	-.10	+.37	62
• Discrimination of women	-.46	-.12	51
• Inequality in happiness (SD)	-.64	-.37	54
Brotherhood			
• Tolerance	+.72	+.43	55
• Trust in compatriots	+.20	+.20	37
• Voluntary work	+.40	+.31	53
• Social security	+.34	-.27	34
Justice			
• Rule of law	+.65	+.20	64
• Respect of civil rights	+.60	+.20	60
• Corruption	-.73	-.32	40
Explained variance	66%		60

Source: Veenhoven, R. (2005)
Apparent quality of life: How long and happy people live

Happy Life Years in nations in the early 2000s

Top *> 60 years*		***Middle range*** *± 40 years*		***Bottom*** *<25 years*	
Switzerland	63,9	Philippines	44,1	Moldova	23,7
Denmark	62,7	South Korea	43,8	Uganda	23,3
Iceland	62,2	Iran	41,4	Angola	17,6
Austria	61,0	Hungary	40,0	Tanzania	15,2
Australia	60,7	Morocco	37,9	Zimbabwe	11,5

Full list of 95 nations available at:
http://worlddatabaseofhappiness.eur.nl/hap_nat/findingreports/RankReport2006-2b.htm

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  Available at: http://worlddatabaseofhappiness.eur.nl

The Happy Planet Index

prepared by **Sam Thompson**, **Nic Marks**, **Saamah Abdallah**,
nef (the new economics foundation); **Ed Matthews**, Friends of the Earth UK

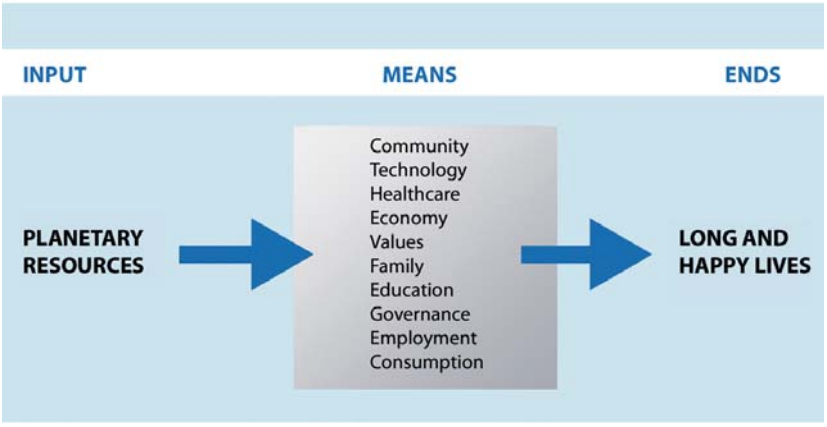
nef (the new economics foundation) a London-based think-tank, introduced the Happy Planet Index (HPI) in July 2006 as a means of comparing the progress of nations toward the goal delivering high levels of experienced well-being *within the constraints of equitable and responsible resource consumption*. Independently, at around the same time, the IUCN (The World Conservation Union) called for a metric capable of measuring "the production of human well-being (not necessarily material goods) per unit of extraction from or imposition upon nature" – the HPI does just that. The first HPI report, published by nef, with the support of friends of the earth UK in 2006 covered 178 countries across the globe. A second, in-depth report focusing exclusively on Europe, was released in 2007.

Background

Although GDP is routinely used as a proxy for standard of living, it was never intended to function as one and its founders explicitly cautioned against this interpretation. Two familiar critiques relate to: 1) insensitivity to income distribution, and thus potentially to extreme inequality, within a country; and 2) failure to distinguish expenditure that is incurred in correcting or compensating for undesirable events – both collective (e.g. natural disasters, wars) and personal (e.g. acute health problems, family breakdown).

However, a further two – equally important – limitations of using GDP as a measure of human progress need to be highlighted. Firstly,

such an interpretation implies that GDP should correlate with experienced well-being at the national level, such that – all else being equal – aggregate experienced well-being will increase as the economy grows. As first shown by Easterlin (1974) and repeatedly since, this is not generally true in practice. GDP thus seems to be flawed as a proxy for *experienced* welfare.



Secondly, GDP doesn't account for the natural environment; there are no internalised costs of environmental damage and pollution and it treats depletion of stocks of natural capital as income. To quote the economist Herman Daly, "it treats the earth as if it were a business in liquidation". In short, GDP is a very poor indicator of *sustainable* welfare.

Most attempts to refine GDP to take better account of both lived experience and sustainability have taken one of two approaches: adjusting and supplementing. In the former, GDP has been adjusted to take account of costs attributable to inequality, environmental damage and expenditure due to negative events, as well as the "hidden" value of unpaid and voluntary work. Probably the best-known example is the *Index of Sustainable Economic Welfare* (ISEW). The second approach has been to use GDP data "as is", but to combine it with explicit welfare measures such as health and education; the most widely-known example is the UN's Human Development Index (HDI).

Both approaches improve on GDP, but neither fully meet the challenge of reflecting both lived experience and environmental sustainability. And, it is increasingly clear that we are running up against very real environmental limits. Unless we are able to move towards a position where we begin to live within the environmental budget that the planet has to offer we face ecological bankruptcy in the form of crises like catastrophic climate change, and the loss of conditions on Earth that are convivial to human life. To avoid this we need a new compass to help navigate the extreme challenges of sharing a volatile world.

Introducing the Happy Planet Index (HPI)

The HPI is multi-dimensional and composed of distinct variables that each reflect a different aspect of the human condition. However, it differs from previous GDP alternatives in that it makes no use of income or income-adjusted measures. Rather, it treats the economy as just one amongst several mediating processes within a larger system.

HPI takes the stock of the planetary resources that sustains life and supports all human activities as the *fundamental input*. The *ultimate output* is the goal of all human endeavours – experienced well-being. To the extent that wealth, material possession, technology and so on are important, it is because they contribute to this ultimate goal. Conceptually, the HPI is a measure of input-output efficiency – it indicates well-being produced per unit of resource consumption.

$$HPI = \frac{Experienced\ Well\text{-}being}{Resource\ Consumption}$$

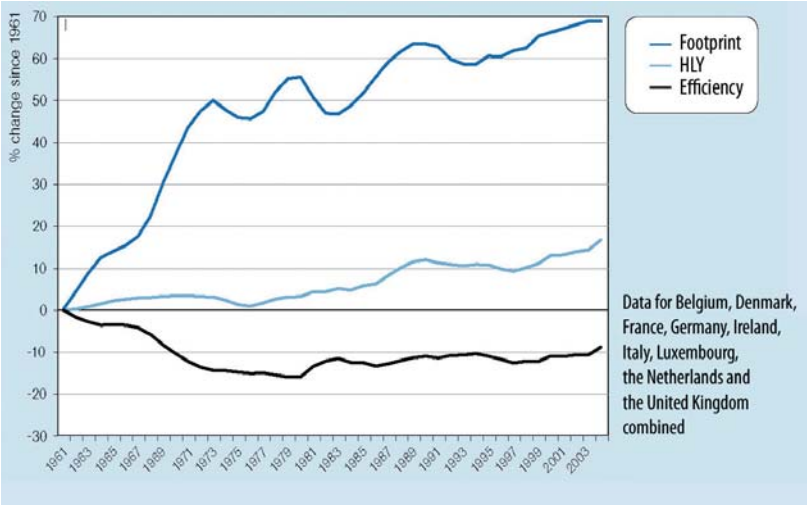
How the HPI is calculated

The HPI uses Dutch sociologist Ruut Veenhoven's concept of Happy Life Expectancy (HLE) – a combination of subjective life satisfaction and objective life expectancy (Veenhoven 1996) – for its measure of experienced well-being. To calculate a nation's mean HLE, ratings of subjective life satisfaction (on a scale of 0-10) are multiplied by mean life expectancy at birth and divided by 10. The resulting scores represent, in effect, happiness-weighted life expectancy. Veenhoven describes this as an "ultimate output measure", because it incorporates both "apparent" and "assumed" quality of life.

The bottom half of the equation, resource consumption, uses Carbon Footprint per capita. This is expressed in terms of the land area required to support the plant life needed to absorb and sequester CO_2 emissions from fossil fuels used by a country, given its levels of consumption. The mea-

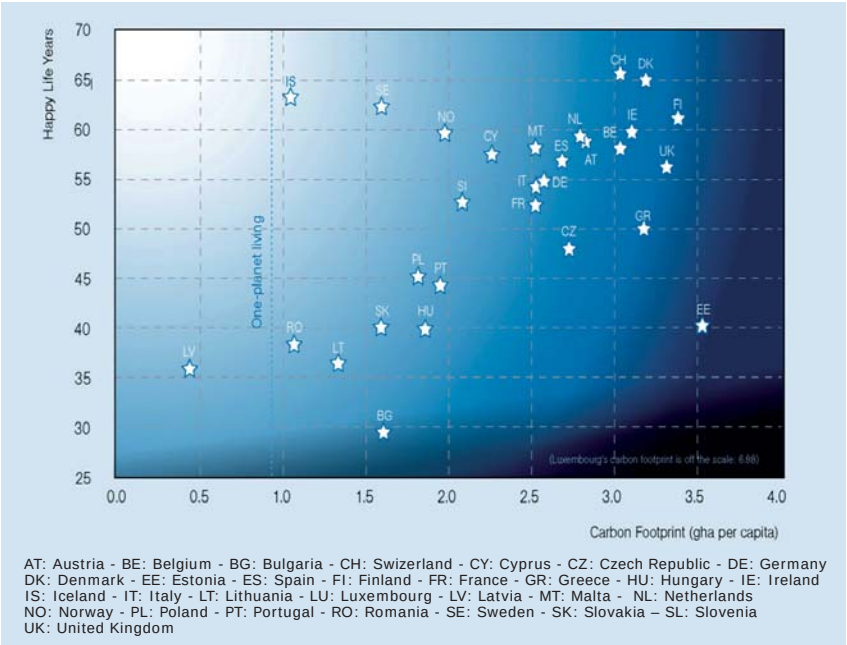
sure takes account of "embodied" carbon associated with the production of goods including imports.

Calculating the HPI requires three discrete steps. Firstly, the data is normalised so that the variances in the top and bottom halves of the equation are made equal. Then, experienced well-being is divided by resource consumption. Thirdly, to make interpretation easier, the resulting scores are transformed onto a 100 point scale, using a theoretical maximum score determined on the basis of plausible "ideal" performance on the three component variables.



What the HPI shows

To the right is a scatterplot of Happy Life Years against Carbon Footprint for countries of Europe. The top-left corner of the graph is where countries should aspire to be – maximising well-being and minimising footprint.



AT: Austria - BE: Belgium - BG: Bulgaria - CH: Swizerland - CY: Cyprus - CZ: Czech Republic - DE: Germany
DK: Denmark - EE: Estonia - ES: Spain - FI: Finland - FR: France - GR: Greece - HU: Hungary - IE: Ireland
IS: Iceland - IT: Italy - LT: Lithuania - LU: Luxembourg - LV: Latvia - MT: Malta - NL: Netherlands
NO: Norway - PL: Poland - PT: Portugal - RO: Romania - SE: Sweden - SK: Slovakia – SL: Slovenia
UK: United Kingdom

Strikingly, it is the Scandinavian nations who are closest to achieving this goal and hence score highest on the HPI. These nations have wellbeing outcomes that are amongst the highest in Europe, yet relatively low per capita Footprints. By contrast, many countries in Eastern Europe fail to provide good levels of well-being, whilst others in the West achieve good well-being outcomes but only at extremely high environmental costs.

As planetary resources have become increasingly constrained over the years, it might be hoped that this would have been accompanied by an upwards trend in HPI, reflecting increasing efficiency. In fact, as the graph on the left shows, this has not been the case in the countries of Europe for which reliable longitudinal data exists. Rather than increasing, the HPI scores of the nine oldest EU members are around 10 per cent lower now than in 1961 (the earliest point where adequate data is available).

Value of the HPI

As a metric of sustainable welfare, the HPI provides a radical alternative to existing GDP-based indicators. The first HPI report (**nef**, 2006) showed that some countries around the world achieve similar levels of experienced well-being whilst exerting much less environmental pressure. For instance, Costa Rica's per capita carbon footprint is less than a quarter that of the average European nation, and yet levels of subjective well-being and life expectancy are both higher.

Results of the European analysis – reviewed briefly above – demonstrate clearly that in a world of real environmental limits and climate

change, much of Europe is squandering the world's resources on drastically diminishing returns. Moreover, the trends over time are in the wrong direction.

Unlike a focus on ever increasing GDP growth, HPI provides a clear road-map to a sustainable and equitable future.

Impact

The first HPI report has been downloaded from www.happyplanetindex.org around a million times. It received extensive print and broadcast media coverage across the world, in countries as far afield as Japan, Denmark and Colombia. The European HPI report, released a year later, was widely covered in the European press. The HPI has been presented at a number of academic conferences and a paper based on elements of the HPI methodology will shortly be published in *Ecological Economics* (Abdallah *et al*, in press).

The HPI has also attracted considerable political interest. Earlier in 2007, the UK's Conservative party referred to the HPI in their *Quality of Life* report and came close to recommending it as a headline indicator for the UK government. Meanwhile, several Local Government Authorities in the UK and other regional/local agencies in Europe have expressed interest in calculating city-and region-level HPIs.

Future plans

In addition to updating and refining the Global HPI, we are currently exploring opportunities for estimating the HPI at a state-by-state level in the US and at a regional level in China.

More information

www.happyplanetindex.org
www.neweconomics.org
www.foe.co.uk

References:

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- **nef** (2006) *The (un)Happy Planet Index: An index of human well-being and environmental impact* (London: **nef**).
- **nef** (2007) *The European (un)Happy Planet Index: An index of well-being and carbon efficiency in the EU* (London: **nef**).
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JFS Sustainability Vision and Indicators

by **Kazu Kobayashi**, Japan for Sustainability

Why we need JFS Sustainability Vision and Indicators

In Japan, a number of environmental-related efforts and initiatives are underway by a Variety of players. Some say, as a whole, the level of activities in this field could be among the most advanced in the world. Yet regrettably, these positive endeavors are not strong enough to reverse the trends of global warming, environmental destruction and pollution, which steadily continue with no apparent end in sight.

To what degree do individual initiatives and achievements by each ministry, corporation, municipality, NGO and citizen contribute to a collective advancement towards an environmental sustainable society?

As a result of these efforts, is Japan closer to sustainability, compared to the year before? Have we moved forward and closer even by an inch? Or somehow have we moving backwards, farther from sustainability?

In order to make answers to these questions visible, we at JFS envision defining indicators and work little by little to draw a big picture of a "Vision of a Sustainable Japan" or "The shape of a sustainable country."

People do something only after they realize those problems. We aim at raising the people's awareness by visualizing and quantifying the "Vision of a Sustainable Japan." We hope the indicators will give an opportunity for many people to look at the "Overall Picture of Sustainable Japan".

Description

We have chosen 20 headline indicators for sustainability based on an analysis of over 200 data sets in several sustainability-related categories. This is the first ever numerical evaluation / trial calculation of national sustainability for Japan. Results show a score of 33.5 points for 2005 in relation to a hypothetical perfect score of 100 projected for 2050. Japan's score for 1990 was 41.3 points, meaning sustainability in Japan has declined about 19% since 1990.

Though these are still trial calculations, they delineate the gap between the ideal and the reality of sustainability in Japan. JFS's aims are to point out the problem, evoke a wide-ranging discussion on how to build a sustainable society in Japan, and specifically, promote the adoption of a comprehensive national sustainability strategy.

- Nature: 16.4 (1990) up to 24.0 (2005) Greater awareness still needs to be acted on.
- Economy: 37.6 (1990) down to 18.2 (2005) Worst decline; massive debt threatens future generations
- Society: 43.4 (1990) down to 35.4 (2005) SRI, women's participation up, traditional industry down.
- Well-being: 67.6 (1990) down to 56.4 (2005) Overall high figures tainted by high suicide rate.

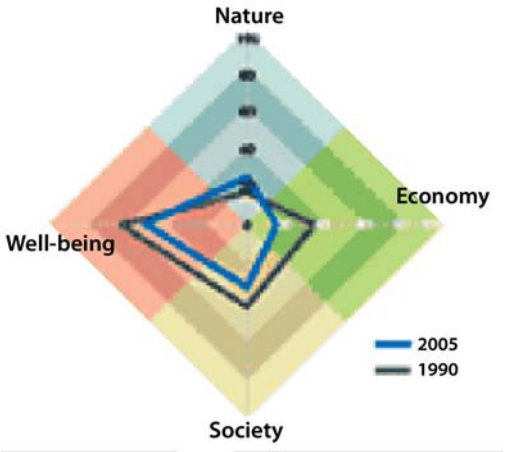
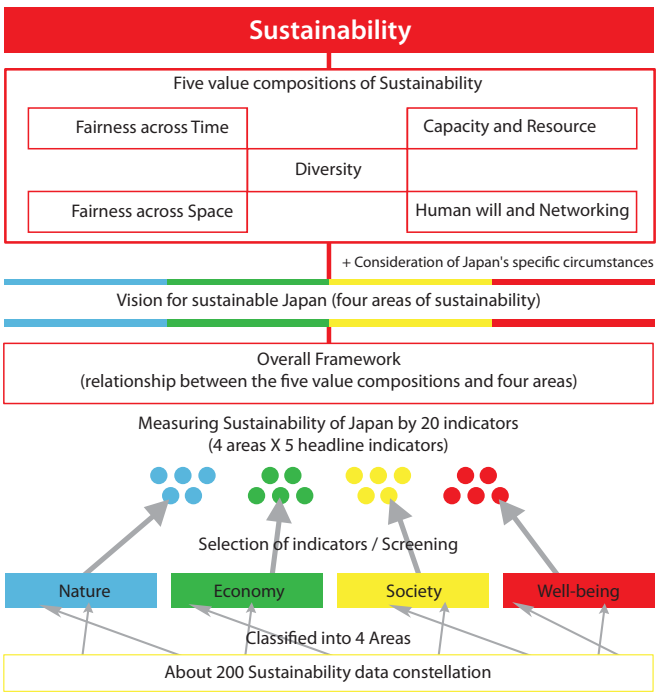


Figure 1: Overview of the Project



http://www.japanfs.org/en/view/index.html

MDG Dashboard of Sustainability

by **Jochen Jesinghaus**, European Commission

Why we need the Dashboard

The complexity of societies in the 21st century requires an adequate information system. As Europeans, we are proud of our democratic system. However, a functioning democracy needs citizens who **understand** what their governments are doing.

Currently, public debates on government performance are driven by two overwhelmingly dominant indicators: The GDP growth and the unemployment rates. Strangely enough, **GDP growth** is not even used in its original sense "*we got 2% richer, hooray!*" – in fact, practically all interpretations of GDP growth in the media relate to labour market prospects, i.e. economists and journalists interpret a high GDP growth rate as a chance to get lower unemployment in the next two or three years.

This media focus on GDP growth and unemployment is unhealthy for democracy. With the Dashboard software, we have developed a tool that makes a wealth of new indicators accessible. Today, some 250 "key indicators" can be downloaded from Eurostat's Sustainable Development and Structural indicators website. However, journalists and ordinary citizens will find it virtually impossible to get simple answers to their questions from the 250+ data tables found there.

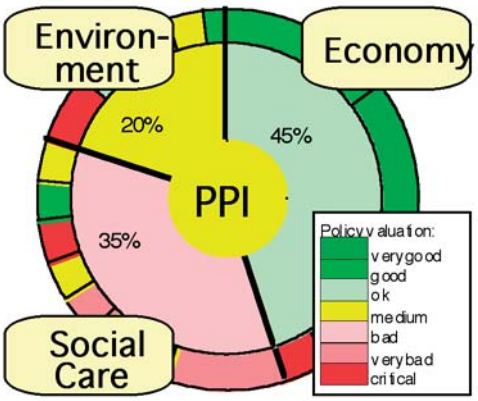
The Dashboard puts such "indicator batteries" into a meaningful tree structure, aggregates their scores in a simple, transparent way, and displays them in a user-friendly "street light colours" format; in addition, it gives the user at all times the option to "drill down" to the deepest level of detail. Here are the elements of the "Dashboard language" for presenting complex indicator sets:

1. *the size of a segment reflects the relative importance of the issue described by the indicator;*
2. *a colour code signals performance relative to other countries: green means "good", red means "bad";*
3. *the central circle (PPI, Policy Performance Index) summarizes the information of the component indicators.*

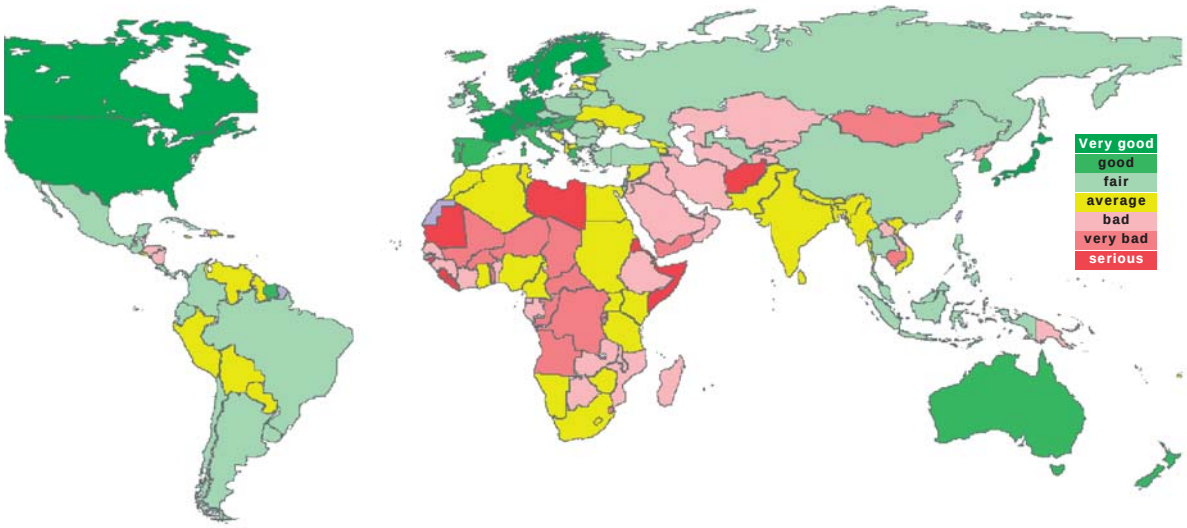
What exactly is the Dashboard of Sustainability?

Over ten years ago, in 1996, IISD convened the Consultative Group on Sustainable Development Indices (CGSDI[1]) with the "overarching goal .. to help arrive at an internationally accepted **Sustainable Development Index** (SDI)". After four years of intensive debate, the dashboard metaphor was adopted: Steering a society into the 21st century needs a dashboard, i.e. a panel of instruments that allows the "pilots" to monitor all essential trends. It took some more years to translate the idea into an operational instrument; the first prototype Dashboard was presented at the 2002 Johannesburg World Summit on Sustainable Development (WSSD). Since then, many new features have been added, and many indicator sets have been translated into the Dashboard format.

At present (November 2007), a Google phrase search for "Dashboard of Sustainability" (DoS) yields about 1,000 page hits, and about one-hundred for "MDG Dashboard". Most pages refer implicitly to the DoS as some kind of "Global Sustainability Index". Actually, the story is a little bit more complex: The DoS is both a software tool for displaying complex indicator sets, **and** the application of this tool to one particularly important indicator set, i.e. the **United Nations Commission on Sustainable Development** indicators. Below is a colour-coded map (green is good, red is bad) showing what happens when we aggregate the 60 UN CSD indicators to a "Global Sustainability Index".

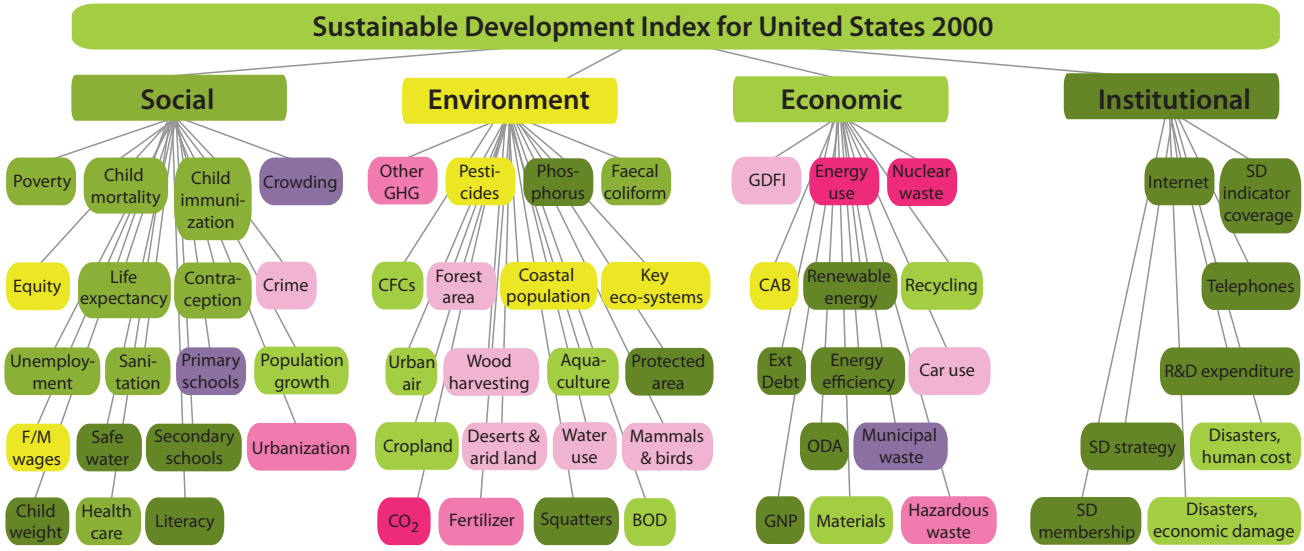


This "language" may seem a straight-jacket for many indicators; however, it is the only way to present very heterogenous indicators in a common format. The three SD pillars shown here are illustrative: the software is flexible and can accommodate other structures, e.g. the eight Millennium Development Goals.



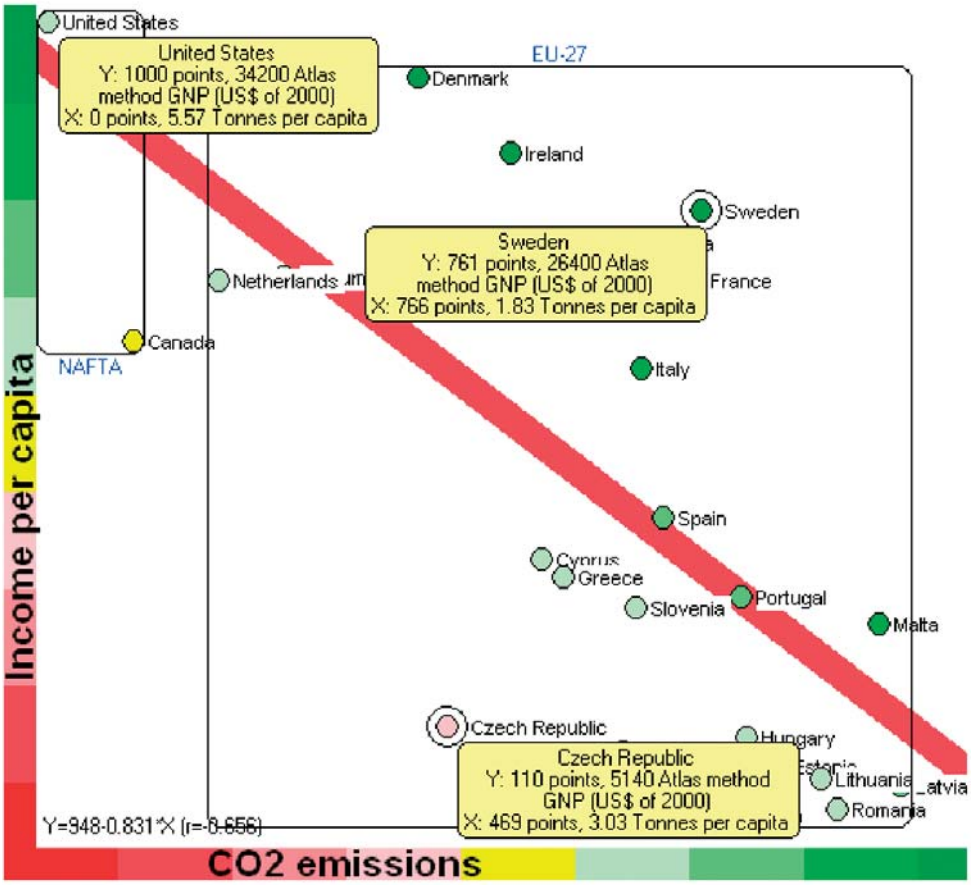
The colours shown on the map are obtained as follows: We calculate for each of the 60 indicators a score from 0-1000 points, using the formula **Score**=1000*(x-worst)/(best-worst). Example "Life expectancy in the U.S.": best=80.7 (Japan), worst=38.1 (Sierra Leone); for a value of 76.8 years, the U.S. receive 907 points: P=1000*(76.8-38.1)/(80.7-38.1). For each of the four SD pillars (economic, social, environmental, institutional), the sum of the scores is divided by the number of indicators. The overall score is the sum of the "pillar scores" divided by four.

The example of the UN CSD set demonstrates the difficulties that indicator experts encounter when trying to measure "Sustainable Development": Would you agree with the overall



Since the overall results shown on the map above may or may not meet the intuitive expectations of the audience, we show to the left the breakdown for the United States (with CO_2 and energy use as particularly weak issues).

1 Alan **AtKisson** (Redefining Progress), David **Berry** (Director of the Interagency Working Group on Sustainable Development Indicators, U.S. Government), Arthur L. **Dahl** (Coordinator, UN System-wide Earthwatch, UNEP), Edgar E. **Gutierrez-Espeleta** (Director of the Development Observatory at the University of Costa Rica), Allen **Hammond** (Director of the Indicator Program at the World Resources Institute, WRI), Peter **Hardi** (Director of IISD Indicators Program, CGSDI co-ordinator), Jochen **Jesinghaus** (European Commission, Eurostat & JRC), the late Donella H. **Meadows** (lead author of "*Limits to Growth*", the 1972 report to the Club of Rome), Bedrich **Moldan** (Chairman UN CSD-9 and former Czech Republic Environment Minister), Yuichi **Moriguchi** (Head, Resources Management Section, Social and Environmental Systems Division, National Institute for Environmental Studies, Japan), Adil **Najam** (Boston University, Associate Director of the MIT-Harvard Program on Public Disputes at the Program on Negotiation, Pakistan/USA), and John **O'Connor** (former Head of the World Bank's indicator team).



One key feature of the Dashboard is the analysis of linkages between indicators – for example between income and CO_2 emissions. Sweden scores "good" for "Income per capita" (Y axis, 761 points for 26400 Atlas method GNP (US$ of 2000)) and "good" for CO_2 (X axis, 766 points). In contrast, Czech Republic gets a "critical" for "Income per capita" (Y=110 points for 5140 Atlas method GNP (US$ of 2000)) and "average" for CO_2 (X=766 points). Note that Sweden, a country with pretty cold climate, manages to combine high wealth with low CO_2 emissions.

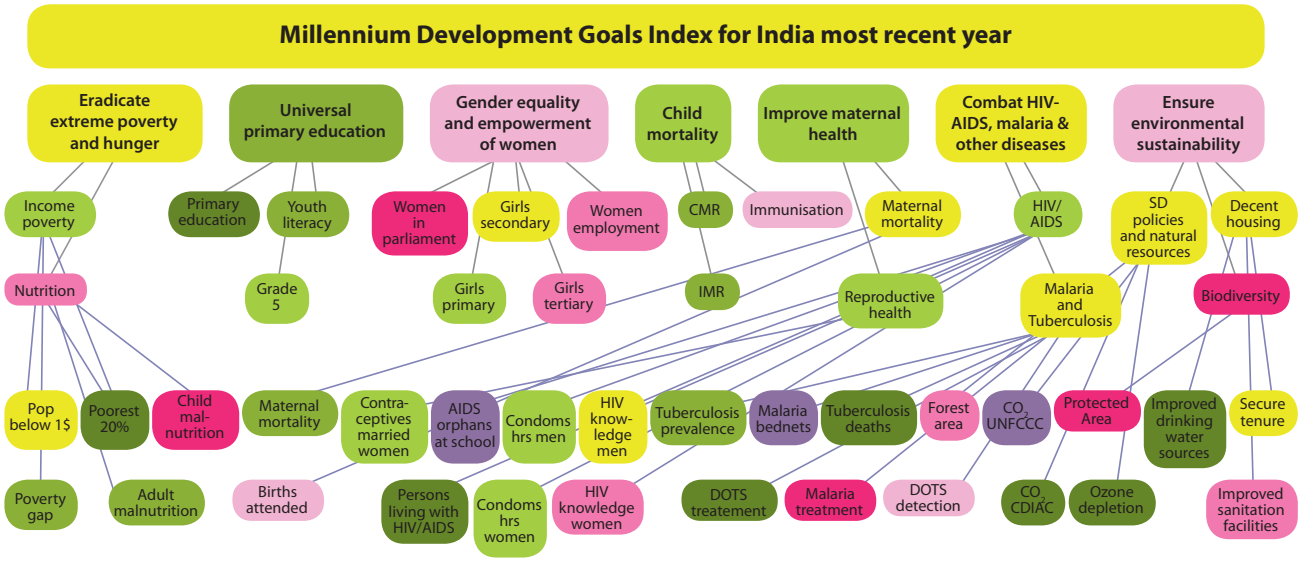
structure, i.e. the four pillars of SD? Would you agree with the indicator set (e.g. nuclear waste, recycling, energy use as "economic" indicators)? Do you trust the data – for example, would you have expected the U.S. in the green zone for "car use"? The Dashboard is a powerful tool, but it reveals merciless the weak points of indicator sets, simply by displaying them in a format that users can **understand**.

The graphs above have been created "on the fly" based on 2000 data compiled by John O'Connor, former Head of the World Bank's environmental indicators division. In the meantime, the data have become pretty stale, and UN CSD has adopted a new set of 50 "core" indicators structured by 14 themes: *1. Poverty, 2. Natural hazards, 3. Economic development, 4. Governance, 5. Atmosphere, 6. Global economic partnership, 7. Health, 8. Land, 9. Consumption and production patterns, 10. Education, 11. Oceans, seas and coasts, 12. Demographics, 13. Freshwater, 14. Biodiversity*.

There is little hope, though, that anybody will perform in the near future a data compilation based on the new CSD set; therefore, for didactic purposes we still keep the old CSD set online. After the 2000 Millennium Summit, a new set of indicators emerged as a global standard: The **Millennium Development Goals** indicators. Nowadays, the downloadable Dashboard package contains this new set of approx. 60 indicators for over 200 countries and 15 years. The data come directly from the MDG site of the United Nations Statistics Division, and we update them every one or two months. Apparently, the MDG Dashboard is a popular alternative to downloading an 8 MB Excel spreadsheet: a Google search for Millennium Development Goals Indicators puts the MDG Dashboard on rank 2, directly behind the official UN MDG site but before UNDP, OECD, WHO, World Bank and a number of other prominent institutions. On the next page an example from the MDG Dashboard:

State of play & next steps

The Dashboard's Wikipedia page lists over 20 translated indicator sets. New features are still being added to the software, e.g. an interactive



Not surprisingly, the MDG set differs a lot from the CSD set, with less focus on environmental and more focus on social and economic issues. The Dashboard displays detailed info for each indicator when hovering over the respective label. Example: *Births attended by skilled health personnel*: *42.5 %; Source: UNICEF estimates; 390 points for India 2000; Valuation: "bad", Rank 94 of 119; best South Korea, worst Ethiopia; Estimated*. The last word, "Estimated", is one of over 20,000 footnotes included in the MDG Dashboard.

browser interface for the MDG set. Currently, the team at JRC tries to translate most of Eurostat's 250+ Sustainable Development and Structural indicators into the Dashboard format, using a tree with four Agenda 21 style main pillars, each containing seven sub-indices, each hosting on average seven indicators. This structure will accommodate 4*7*7=196 indicators, and serve as a "Virtual Laboratory" for studying possible options for going "Beyond GDP", i.e. for challenging GDP growth with an adequately detailed "Societal Progress Indicator".

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The Natural Capital Index framework (NCI)

by **Ben ten Brink**, Netherlands Environmental Assessment Agency (PBL)

As any successful business that keeps track of revenues and expenditures, society needs robust accounts of its ecological assets. That is what the Natural Capital Index framework accounts for next to complementary indicators such as change in the extent of ecosystems, the Red list and the ecological footprint.

The Natural Capital Index framework (NCI), developed as a contribution to the implementation of the Convention on Biological Diversity (CBD), was designed to answer the questions "How much biodiversity remains?", "What are the causes of loss?" and "What can we do about it?" for policy-makers and public. NCI measures human impact on biodiversity and has been implemented in national, regional and global assessments. It is not so much one single –fixed-indicator but merely a flexible indicator framework which can be tailored to the specific scale, available data, and demand.

Which process to indicate?

The rate of biodiversity loss has been accelerating rapidly throughout the industrial era. According to the Global Biodiversity Assessment, species are now becoming extinct at 1,000-10,000 times the natural rate. However, extinction is just the final step in a long process of ecosystem degradation, in which a decline in the abundance of many original species is accompanied by the increase in the abundance of a few other, often human-favoured, species. This we call the homogenisation process.

This trend has two main components: i) loss of habitats, or "ecosystem quantity", resulting from the conversion of natural areas into agriculture and built up land and ii) loss of ecosystem quality due to factors such as climate change, pollution, habitat fragmentation and over-exploitation. In the figure below, the grey cutouts illustrates the habitat loss, while, in the remaining natural areas, the decline in ecosystem quality is shown by the decreasing abundance of many original species. Notice the initial increase in the species richness.

'Species abundance ' (number of individuals of a species) has turned out to be a far more sensitive, more measurable and a more accurate indicator of biodiversity loss than the more traditional species-richness indicator. The CBD has selected 'species abundance' as a key indicator to evaluate the progress towards the 2010-target.

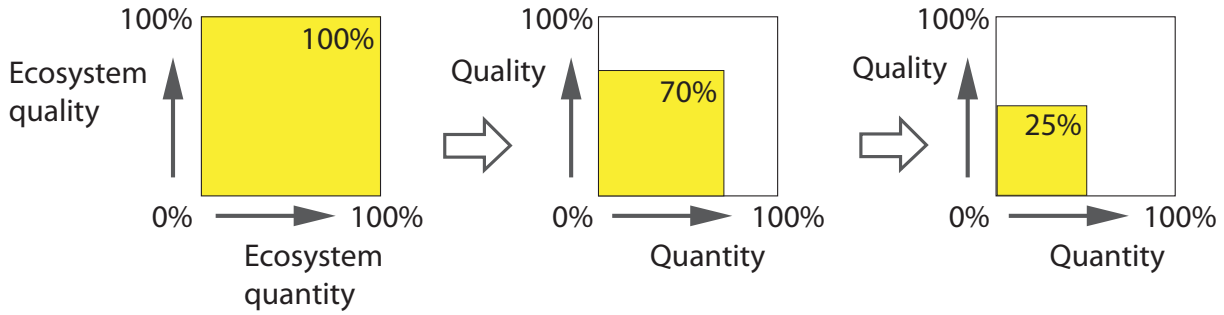
The Natural Capital Index framework (NCI)

The challenge is to create a tangible, powerful composite indicator that accurately describes the above process for meeting policy requirements. Furthermore, this indicator must be relevant and appealing for policy development, quantitative, sensitive, affordable, measurable and universally applicable. Finally, it should represent the entire ecosystem and must be linkable with socio-economic scenarios to make projections. *For these reasons NCI considers biodiversity as "natural capital", containing all original species with their corresponding abundance.*

Given its two main components, as mentioned above, NCI is defined as the product of the size of the remaining ecosystem (quantity) and its quality.

NCI = ecosystem quantity (%) x ecosystem quality (%)

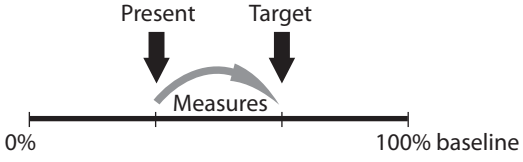
The NCI can be established for natural areas such as forests, inland waters and grasslands, as well as for man-made areas such as agricultural land and urban areas. Ecosystem quantity is calculated as a percentage of the total area (% area of the country or region). Ecosystem quality is calculated by counting the average abundance of a core set of characteristic animal and plant species. Quality is defined as the ratio between the current situation and baseline state (percentage



of the baseline). The three diagrams "ecosystem quantity and ecosystem quality" above show how the process of ecosystem degradation can be visualised using the Natural Capital Index. If for example 50% of the natural area remains, with a quality of 50%, than the NCI is 25%. This means that the average abundance of the original species is 50% of the natural or low-impacted state, and so on. To avoid masking, significant increased populations of original species are truncated at 100%, although they should actually have a negative score. Exotic or invasive species are not part of the indicator, but their impact is represented by the decrease in the abundance of the original species they replace. The NCI ranges from 0 to 100% representing an entire deteriorated and intact ecosystem, respectively. The dimension is 'mean species abundance of the original species' or briefly an species abundance' (MSA).

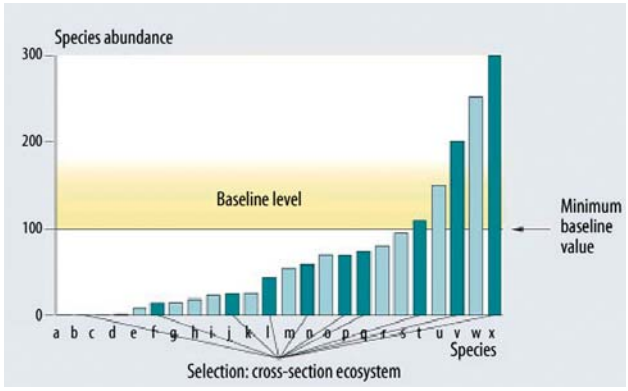
Baselines needed

Ecosystem quality cannot be determined without defining a baseline. Baselines are starting points for measuring change from a certain state or date. They are common practice for such items as medical care, economic development and climate change. Since there is no unambiguous natural baseline point in history, and all ecosystems are also transitory by nature, a baseline must be established at an arbitrary but practical point in time. Because it makes the most sense to show the biodiversity change when human influence was accelerating rapidly, the first CBD Liaison Group on Biodiversity Indicators recommends "a postulated baseline, set in pre-industrial times" or a "low-impact baseline" as being the most appropriate. The baseline i) allows aggregation to a high level, ii) makes figures within and between countries comparable, iii) is a fair and common denominator for all countries, being in different stages of economic development, and iv) is relevant for all habitat types. Similarly, agricultural ecosystems are compared with the traditional agricultural state as the baseline, actually before industrialisation of agricultural practices started.



It has to be stressed that the baseline is not the targeted state. Policy-makers choose their ecological targets somewhere on the axis between 0 and 100%, depending on the political balance between social, economic and ecological interests.

Smart sampling



How can ecosystem quality be determined in a practical and affordable way? It is neither necessary nor possible to monitor all species. A representative cross-section of characteristic species suffices to describe – the above mentioned-the uniformity process of the entire ecosystem. For each species, quality is calculated as the ratio between the current state and the minimum baseline value. Ecosystem quality is a function of the abundance of species relative to the baseline. Ecosystem structure

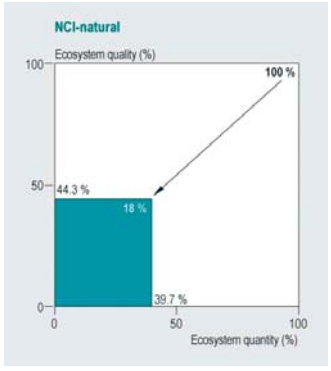
variables such as 'area coral reef and canopy cover' can be used as substitute in case of lack of data on species abundance. This selection and averaging method is similar to that for economic indicators, such as the retail price index, a representative selection of products monitored in a subset of stores, the so called "shopping bag". Subsequently, the changes in prices are also averaged and weighted; this is because a price increase in bread cannot simply be averaged with a price increase in cars.

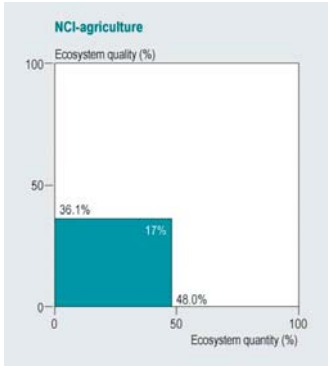
How much Natural Capital is left in The Netherlands?

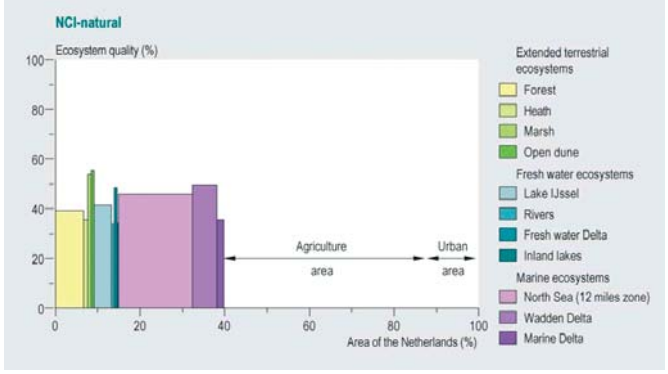
The quantity of natural aquatic and terrestrial ecosystems in the Netherlands has declined to 40% of its total territory, while the average quality of these ecosystems is estimated at a modest 44%. The resulting NCI is thus 18%, the product of quantity and quality. So roughly speaking, 18% of the average abundance of the original species remains in comparison with the baseline state. The NCI for agricultural land is 17%.

The contribution of the various natural ecosystem types to the Dutch Natural Capital is presented in the figure below. Quantity and quality are given for each ecosystem type. Marine and large fresh-water ecosystems are very important in the Netherlands, together covering more than 75% of the area of natural ecosystems and displaying medium quality. Forests, heath and inland lakes are examples of smaller areas with a lower quality. In the diagram alongside the x-axis has been enlarged in order to see the contribution of the smaller ecosystem types.

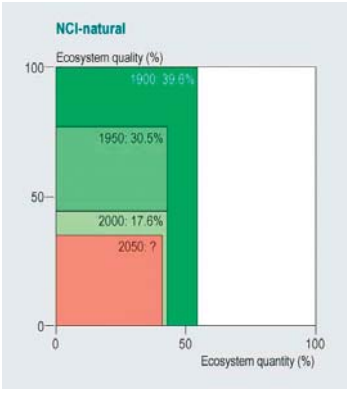
A snapshot of NCI values taken in the year 2000 does not provide sufficient information for policy-makers. What happened in the past, what were the main causes, what can be done to restore biodiversity in an efficient manner? The NCI for Dutch natural ecosystems has declined rapidly in the last hundred years. Much of the area was lost in the first half of the century, while ecosystem quality decreased, especially in the second half of the century. A scenario analysis shows that the Natural Capital Index may improve from 18% up to even 27% over a 30-year period, which represents a significant increase in natural capital.

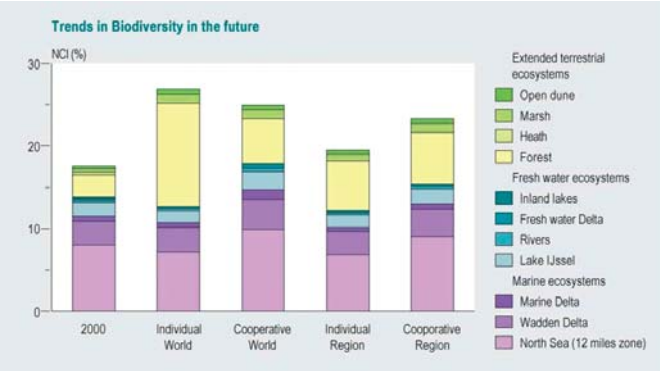






History of Natural Capital & Future trends in The Netherlands





How much Natural Capital is left in the World?

If there are no data on species abundance available a pressure-based NCI may be used as substitute. The underlying assumption is that the higher the pressure on biodiversity the lower the probability of a high mean species abundance of the original species (MSA). The GLOBIO model contains global cause-effect relationships between agriculture, forestry, climate change, N-deposition, fragmentation and infrastructure and MSA, based on more than 700 publications (Alkemade et al. 2007). For each grid cell the considered pressure values are added and calculated into a MSA value. The NCI at global and regional levels is the sum of the MSA of the underlying grid cells, in which each square kilometre of every biome is equally weighted (ten Brink, 2000). The GLOBIO model is a joint cooperation between the Netherlands Environmental Assessment Agency (MNP), UNEPWCMC and UNEP-GRID Arendal in conjunction with many partner institutes. GLOBIO has been implemented for example to UNEP's Global Environment Outlooks, the CBD Global Biodiversity Outlooks (GBO), and OECD's Environment Outlook and Strategy. The maps below show the calculated MSA in 2000 and 2050 and the global NCI over the period 1700-2050 (95% ->63%) (CBD technical series no. 31, 2007).

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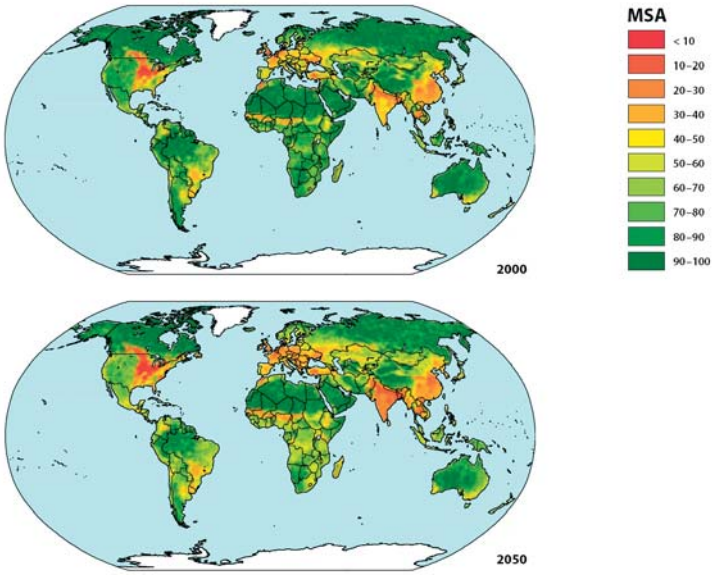
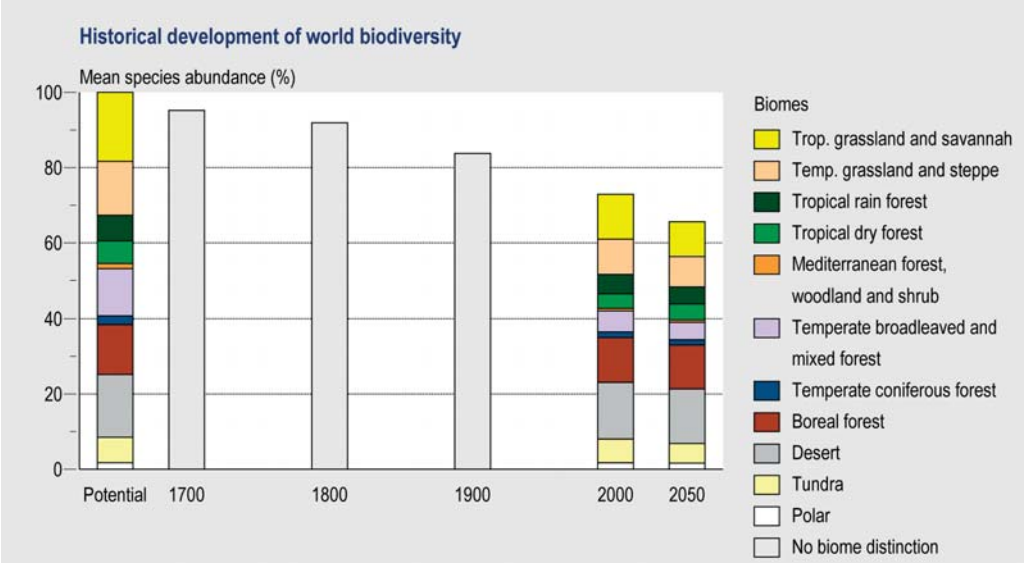




(Regional) Index of Sustainable Economic Welfare (ISEW)

by **Prof. Tim Jackson**, RESOLVE, University of Surrey, UK, **Nat McBride**, Independent Consultant, **Saamah Abdallah**, nef (the new economics foundation)

Few people would now disagree that we need to move beyond GDP if we are to make any meaningful assessment of society's overall well-being. In particular, we need measures which will account for changes in societal welfare and environmental impacts.

Clearly, any credible alternative to GDP will have to pass tests of rigour and objectivity. It will also probably be asked to impart a simple message about the direction of progress to a general audience. Delivering this simple headline trend must happen without losing focus on the constituent elements of the indicator. If the first question is "Are we *really* making progress?" then the second is: "*Where* are we doing well, and *where* do we need to try harder?"

What is the ISEW?

The Index of Sustainable Economic Well-being is an adjusted economic indicator which attempts to incorporate costs and benefits not traditionally measured in monetary terms. It brings together a wide range of economic, social and environmental issues into one analytic framework. Time series data are drawn from robust sources, typically from government statistics. Non-monetary statistics are converted to cash values based on unit costs from credible government or academic sources.

The basis for the index is consumer expenditure. Positive and negative adjustments are made to this basis to account for a series of social, economic and environmental factors. For example, the values of household labour and volunteering are added to the index, together with public expenditure on health and education. On the negative side, the ISEW subtracts environmental costs associated with habitat loss, localised pollution, depletion of nonrenewable resources and climate change; social costs associated with crime, divorce, commuting and unequal income distribution; and the health costs of accidents on the road and in the workplace. Some additional adjustments are made to account for net capital growth and net international position. These may be positive or negative depending on the particular economic situation in each year.

In summary:

ISEW = Personal consumer expenditure
– adjustment for income inequality
+ public expenditures (deemed non-defensive)
+ value of domestic labour & volunteering
+ economic adjustments
– defensive private expenditures
– costs of environmental degradation
– depreciation of natural capital

Why monetarise – and how?

There is a danger in replacing GDP with any other one-dimensional measure, even if the replacement is more in tune it with our current understanding of well-being. But replacing GDP with a suite of indicators covering a range of disparate factors also has problems. How do you compare different metrics? How do you balance the loss of 500 jobs against an increase of 10mg nitrates per litre of river water? Is it preferable to reduce 600 tonnes of carbon dioxide, or avoid 16 car accidents? Although there are problems inherent in monetarising certain social or environmental costs and benefits – establishing a unit cost sometimes involves subjective valuations – this does offer a coherent framework for the kind of holistic analysis needed to guide policy. For each component of the ISEW where unit cost estimates are required, we draw on the relevant literature to establish suitable working values. For instance, the costs of climate change are based on a Treasury / DEFRA meta-survey of the literature on the social cost of carbon. Air pollution costs are based on average costs taken from several studies which assess their impacts on health, buildings, crops and natural habitats.

A brief history of monetarised indicators

In 1972, Nordhaus and Tobin published a landmark paper entitled *Is Growth Obsolete?*, in which they constructed a 'measure of economic welfare'

(MEW) by adjusting GDP to account for certain economic and social factors. They concluded that GDP still represented a robust indicator of well-being. When Nordhaus re-examined the question from an environmental perspective in 1992 (*Is Growth Sustainable?*), he discovered that the new MEW began to diverge significantly from GDP.

The ISEW was first posited by Daly and Cobb in their 1989 book *For the Common Good*. They laid down the framework of consumer expenditure plus services from the informal economy, plus public expenditure on certain public goods; economic corrections to account for capital flows; and deductions for 'defensive' expenditures on social and environmental problems. The original model was revised a little in 1990 by Cobb and Cobb to address some criticisms of the original methodology. Since then, ISEWS have been produced for countries as different as the USA, Thailand and Chile. The ISEW has proven particularly popular for European researchers, and has now been constructed for a number of countries and regions. To date, the list includes Austria, Belgium, Germany, Italy, the UK, Wales, Scotland, Sweden and several English regions. An attempt at constructing an ISEW for Lombardia in Italy was made in 2006 by a Milanese research institute with **nef** assistance, but has now been put on hold due to limited data availability.

In each case, some revisions to the original Cobb and Cobb methodology have been made to tailor the indicator to specific national requirements or data sources. In Thailand for instance, an estimate of the social cost of sex tourism was included. In 1994, Jackson and Marks produced the first UK ISEW for **nef** (the new economics foundation) and the Stockholm Environment Institute. This was updated by Jackson and colleagues at the University of Surrey in 1997 and again in 2004 – when the updated version was released as the MDP (Measure of Domestic Progress).

Measuring regional progress: the R-ISEW

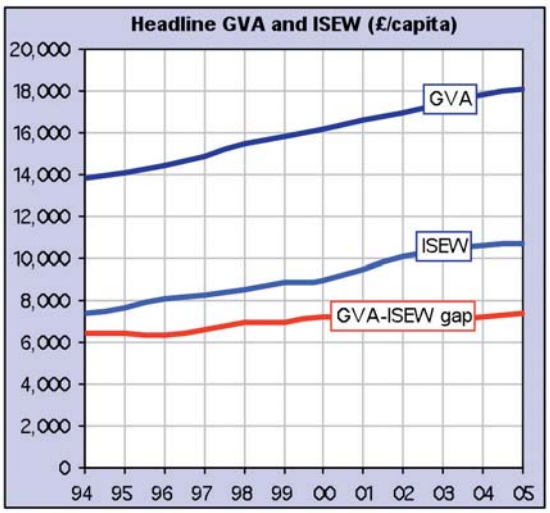
Together with the University of Surrey, **nef** has recently pioneered the development of a regional variant of the ISEW. The R-ISEW allows individual regions within a nation to monitor progress within the region and compare progress against other regions. The R-ISEW was developed with the backing of the UK Regional Development Agencies, with particular support from the East Midlands Development Agency (emda). emda commissioned a think piece from **nef** in late 2004, on the relationship between well-being, quality of life and regional development, which led to a pilot R-ISEW for the East Midlands in 2005, developed with the University of Surrey. emda incorporated the R-ISEW into their Regional Economic Strategy as the top level indicator of progress towards their vision of a "flourishing region". In the National Audit Office's 2007 performance assessment of emda, the development of the R-ISEW was welcomed as a positive and innovative step.

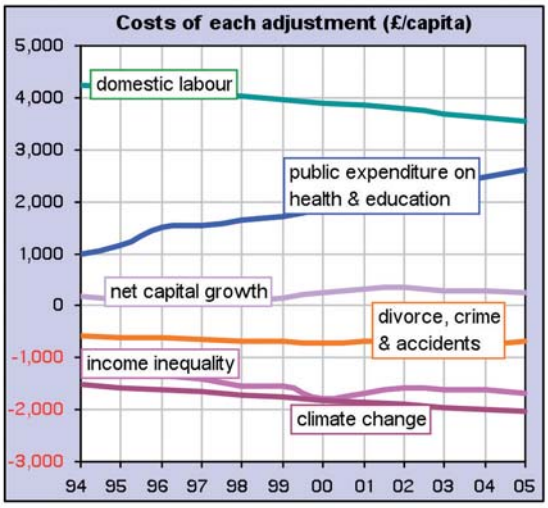
Over the next two years, **nef** and the University of Surrey constructed R-ISEWs for five other regions, and in 2007 a complete suite was calculated for all English regions, plus an ISEW for the whole of England on the same basis. For the first time, R-ISEWs were calculated for all the regions of one country, using exactly the same methodology, allowing direct comparisons to be made between them. The R-ISEW revealed that traditionally 'wealthier' regions are not always performing better than poorer ones in terms of sustainability. However, it did not simply reduce cross-regional differences. Some poorer regions perform much better than others.

Yorkshire Futures, the Regional Intelligence Network for Yorkshire and the Humber, are keen proponents of the index, noting that it would be "an opportunity missed… if the ISEW is not seriously incorporated into policy and planning procedures."

Results of the English ISEW

The structure of the ISEW allows two levels of analysis. In the first graph overleaf, the ISEW for England is plotted against GVA showing a simple headline trend: growth in both measures, but with a wide and growing gap between 'conventional' and 'real' progress. In the second graph, a more detailed story unfolds, in which some components of the ISEW are enjoying progress and others are deteriorating. This second graph also illustrates the relative importance of different components in the overall ISEW.





The future of the ISEW

In 2007, a seminar was hosted by the Sustainable Futures division of the Welsh Assembly to present a recent attempt to construct an ISEW for Wales. Economists and statisticians from the Assembly discussed the possibility of adopting the ISEW as an official Welsh Assembly statistic. Although they decided against this, it is worth noting that the only significant objection was the lack of methodological consensus amongst ISEW researchers. Herein lie the key challenges for the future development of the ISEW: collaboration and consensus-building around the assumptions used in the index. Firstly, what is the definitive set of economic, social and environmental factors to be included in the index? Then, how exactly do we value certain non-monetary factors included in the account? These are significant hurdles, but by no means insuperable: GDP has faced and overcome similar issues. Like the ISEW, GDP also makes potentially arbitrary exclusions of certain goods and services; and where the ISEW wrestles with subjective valuations of social and environmental factors, GDP simply refuses to address them. By recognising, and placing a value on social and environmental outcomes, the ISEW represents a significant advance on GDP as a measure of genuine progress. Its logic of adjusted economic well-being translates easily into the language of policy makers.

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economics as if people and the planet mattered

System of Environmental-Economic Accounting (SEEA)

by London Group on Environmental Accounting

Why we need the SEEA

Conventional national accounting does not fully account for the role of the environment in its measurement of economic activity. Recognizing this limitation resulted in the development of the System of Environmental-Economic Accounting (SEEA).

Environmental-economic accounting brings together economic and environmental information in a common framework to measure the contribution of the environment to the economy and the impact of the economy on the environment. The framework builds on concepts definitions and classifications consistent with economic statistics supplementing them with environmental data that reflect the environment in terms of the resource, sink and service functions it provides.

The SEEA can be used to analyze sustainable paths of development through a broad range of indicators. These indicators can be directly obtained from the accounts, such as, material flows and energy use by industries and households; or natural resource indicators can be derived, such as, energy efficiency and water efficiency by industry. In addition, indicators, such as, 'ecological rucksacks', 'virtual water' and 'total material requirement' can also be derived through the application of the accounts, for instance, by using input-output modeling.

History

Environmentally sound and sustainable socio-economic development has since the 1970s received increased attention from the international community. It was particularly stimulated by the report of the World Commission on Environment and Development (1987) and Agenda 21 of the United Nations Conference on Environment and Development (1992). During the 1980s and early 1990s, joint workshops, organized by United Nations Environment Programme (UNEP) and the World Bank, set out to examine the feasibility of physical and monetary accounting in the areas of natural resources and the environment. A consensus emerged supporting a satellite approach, in which the analytical capacity of the national accounts is expanded to include environmental data without overburdening the central framework of the System of National Accounts (SNA).

The *1993 System of National Accounts* (1993 SNA) also endorsed the link to the environment by including a chapter on satellite accounts (Chapter XXI), a large part of which is dedicated to environmental-economic accounting. In 1993 the United Nations also published the *Handbook of National Accounting: Integrated Environmental and Economic Accounting* (SEEA-1993) demonstrating how several environmentally-adjusted national accounts aggregates can be derived.

After the publication of the SEEA-1993, several developing and developed countries started experimenting with the compilation of the SEEA. These compilation experiences were shared in the London Group on Environmental Accounting, one of the City Groups established under the auspices of the United Nations Statistical Commission (UNSC) in 1994. As mandated by the UNSC, the London Group advances methodologies in environmental-economic accounting and provides a forum for practitioners to share their experiences in the development and implementation of the SEEA.

At its twenty-ninth session, in 1997, the UNSC requested the London Group to collaborate with the United Nations Statistics Division (UNSD) on the revision of the SEEA-1993. This eventually materialized in the revised *Handbook of National Accounting: Integrated Environmental and Economic Accounting, Rev. 1* (*SEEA-2003*). The SEEA-2003 was submitted to the 33rd session of the UNSC in 2002 and subsequently issued in 2003 by the United Nations, the European Commission, the International Monetary Fund, the Organization of Economic Cooperation and Development, and the World Bank.

Although the SEEA-2003 handbook is widely accepted as the reference for recording the

interaction between economic processes and the environment, it still falls short of being an international statistical standard. It does not provide unique guidance or a preferred treatment for various issues. The UNSC therefore, created the United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEA), with one of its main objectives to establish the SEEA as an international statistical standard.

Description of SEEA: modules and indicators

The SEEA is an integrated information system consisting of several modules. It can be used to respond to different types of policy questions concerning, for instance, the pollution of the atmosphere, water bodies or soil from production and consumption, and the sustainable use of natural resources and ecosystems; or to provide information regarding environmentally related transactions, such as taxes and subsidies to examine cost-recovery or polluter pays principles. The SEEA does not support particular schools of thought and can therefore be universally applied, underscoring its role as a multi-purpose for strategic planning and policy analysis.

Physical and hybrid flow accounts

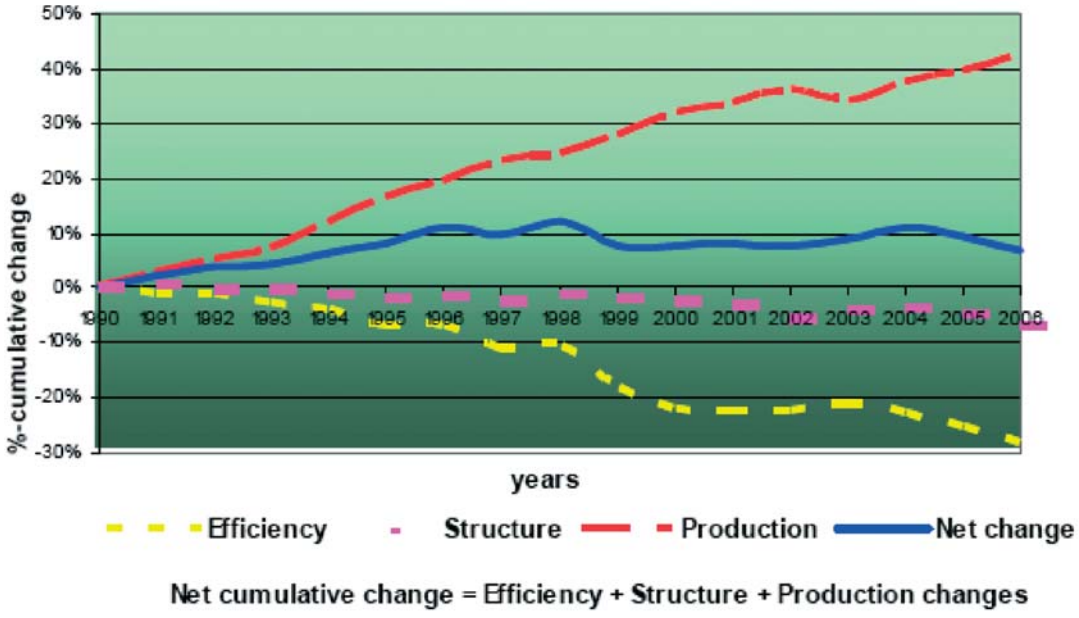
Physical flow accounts provide a systematic physical description of production and consumption processes, including their natural resource inputs, product throughputs and residual outputs, i.e. wastes.

The accounts also quantify the material dependencies of economies via imports and exports. When combined with monetary data they are called hybrid flow accounts. These accounts illustrate how economic growth is interrelated with natural resource use and pollution. By way of example, Figure 1 presents a decoupling indicator, which illustrates the effect of major economic determinants of pollution over time. Notwithstanding higher levels of production in the economy (read), emissions (blue) from the production processes have stabilized since the middle of the 1990s. This development can be attributed to improvements in the efficiency of the production processes (i.e. less emissions per unit of value added by industry) due to technological improvements (yellow), and structural changes in the production processes (pink) reflected by a greater share of the services industries in total value added.

Asset accounts

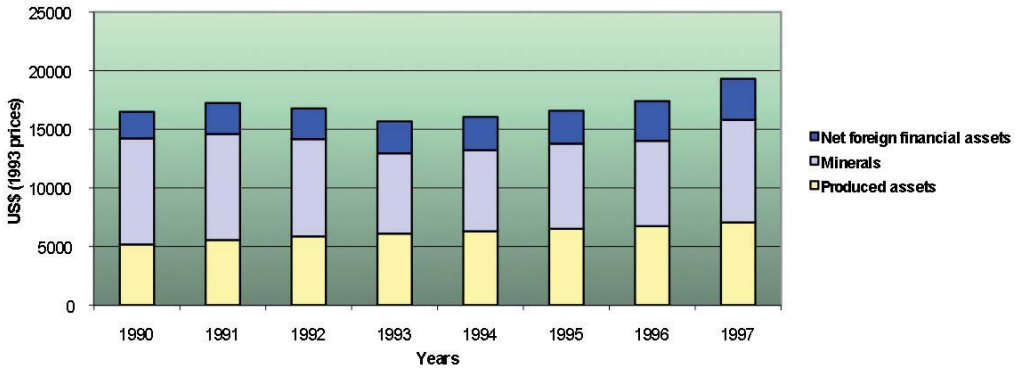
Asset accounts record stocks and changes in stocks (flows) of natural resources such as land, fish, forest, water and minerals for the accounting period. The SEEA include all environmental assets that provide option, bequest and existence benefits and combined with produced assets

Figure 1 Global warming emissions of CO_2, CH4 and N_2O in the Netherlands



Source: Statistics Netherlands

Figure 2 : Per capita wealth in Botswana



Source: G.M. Lange (2004), Environmental & Resource Economics, 29:257-283

provide a better indicator of the wealth of a country. Asset accounts can be compiled in both physical and monetary terms. Monetary asset accounts illustrate the changes in the value of environmental assets and whether they are being depleted. Asset accounts can be particularly relevant for countries which are economically dependent on the exploitation of natural resources. Figure 2 shows that Botswana has been successful in using its natural capital (primarily minerals) to build national wealth as evidenced by a rising per capita wealth in recent years.

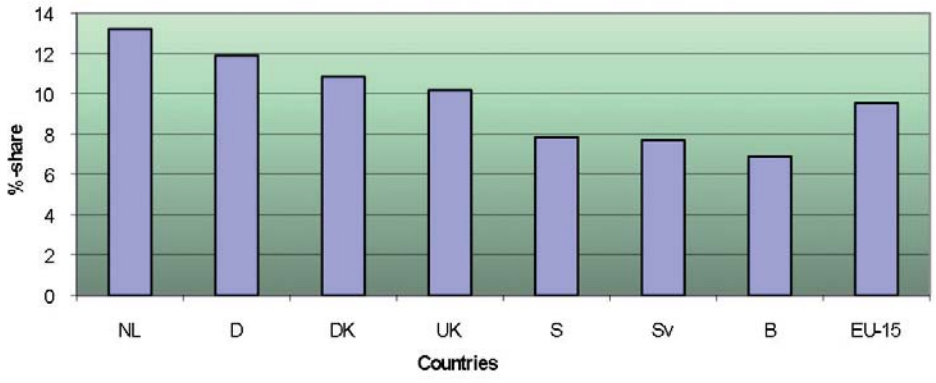
Economic accounts and environmentally related transactions

These accounts separately identify environmentally related transactions presented in the existing SNA flow accounts in order to make them more explicit for analysis. They cover both expenditures on the protection of the environment and resource use. Other monetary transactions connected with the environment are covered as well, specifically those economic instruments being used to manage natural resources, such as taxes, permits and licenses for extracting natural resources or using the environment as a sink. Such accounts can for example illustrate the importance of environmental taxes (and subsidies) in the total tax regimes of countries (i.e. 'greening of the tax system').

Environmentally-adjusted national accounts aggregates

As an integrated and multipurpose system serving different policy needs, information from the various modules of the SEEA can be combined to form a full-sequence of accounts from which aggregates such as an environmentally-adjusted gross domestic product ('Green GDP'),

Figure 3 : Environmental taxes as share of total tax revenues in 2003



Source: Eurostat

or environmentally-adjusted net saving ('Genuine Saving') can be derived. These adjustments could include depletion, defensive expenditures and degradation.

Future – SEEA as an international statistical standard

The UNSC, recognizing the SEEA as a mature framework for the analysis and policy formulation on environmental-economic issues, entrusted the UNCEEA to promote the worldwide implementation of environmental-economic accounting and to establish the SEEA as an international statistical standard. In this regard the UNCEEA has the challenging task to revise the SEEA-2003. The work of the UNCEEA will be carried out in close cooperation with national statistical offices, international organizations (UNSD, UNEP, Eurostat, World Bank and OECD) and expert groups like the London Group on environmental accounting and the Oslo Group on energy statistics.

The SEEA revision and implementation programme is expected to improve the accounting concepts, the international harmonization of the accounting guidelines and subsequently the policy relevance of environmental-economic accounting considerably. In this context it is important to emphasize that the SEEA is not an indicator list, but an integrated information system providing the underlying statistical framework for thorough analysis and policy formulation.

More information
on the SEEA is available on the website: http://unstats.un.org/unsd/envaccounting/default.asp

Sustainable Society Index (SSI): a new comprehensive index for world-wide use

by **Geurt van de Kerk**, Sustainable Society Foundation,
Arthur Manuel, Sustainable Society Foundation

Do you know how sustainable – or should we say unsustainable? – your country is? Probably not. The Sustainable Society Index shows you at a glance how far your country is on its way to full sustainability, what is going well and what needs urgent improvement.

Need for a new measurement tool

The notion of what is meant by sustainability differs strongly among people. Even among scientists there are numerous definitions of sustainability. However, to be able to adequately manage our efforts in achieving a sustainable way of living on our planet, a clear definition of sustainability is required. Since none of the numerous indexes that have been developed until now show at a glance the level of a country's sustainability, we developed a new measurement tool: the Sustainable Society Index, SSI.

Sustainable Society Index – SSI

The newly developed SSI is based on a solid definition: the world-wide respected Brundtland definition. In order to express that sustainability includes human well-being, we have extended the definition of Brundtland by adding a provision so that the qualitative aspects of human life are explicitly included. We have formulated the Brundtland+ definition as follows:

A sustainable society is a society

- *that meets the needs of the present generation,*
- *that does not compromise the ability of future generations to meet their own needs,*
- *and in which each human being has the opportunity to develop itself in freedom, within a well-balanced society and in harmony with its surroundings.*

Starting from this definition, 22 indicators have been determined, covering this comprehensive definition of sustainability in its broad sense. The 22 indicators are clustered into 5 categories as shown below.

I Personal Development

1 Healthy Life
2 Sufficient Food
3 Sufficient to Drink
4 Safe Sanitation
5 Education Opportunities
6 Gender

II Clean Environment

7 Air Quality
8 Surface Water Quality
9 Land Quality

III Well-balanced Society

10 Good Governance
11 Unemployment
12 Population Growth
13 Income Distribution
14 Public Debt

IV Sustainable Use of Resources

15 Waste Recycling
16 Use of Renewable Water Resources
17 Consumption of Renewable Energy

V Sustainable World

18 Forest Area
19 Preservation of Biodiversity
20 Emission of Greenhouse Gases
21 Ecological Footprint
22 International Cooperation

The most well-known indicator, GDP per capita (Gross Domestic Product per capita), is not included since economy is not explicitly included in the Brundtland+ definition. Only few people still consider GDP per capita to be a useful indicator for development towards sustainability. In that respect other indicators, the ISEW or the Dutch DNI (Duurzaam Nationaal Inkomen, Sustainable National Income), are far more indicative. Unfortunately they cannot be used for the SSI on a worldwide scale since these two indicators are available for no more than a couple of countries.

The Sustainable Society Index has been calculated for 150 countries. This offers the option for comparison between countries using various viewpoints: neighboring countries, more or less similar countries, regional comparisons, comparisons between rich countries like the OECD-members, comparison between “North” and “South” etc. 43 of the existing 193 countries had to be left out due to lack of data. The bigger of those are Afghanistan, Djibouti, Eritrea, Somalia and Surinam. But mostly it concerns smaller countries including small island states. For the calculation of the indicators of the SSI only data from public sources has been used.

Each indicator has been expressed on a scale from 0 to 10. A 10 expresses full sustainability; a 0 no sustainability at all. This quantitative approach requires that it should be defined what full sustainability for each indicator means. For some indicators this is very clear; for example the percentage of people with access to safe drinking water should be 100 to receive a score of 10. For some other indicators where this is not obvious, one can make an educated guess as to full sustainability and for some others even that is not possible. For the latter group the highest score in any of the 150 countries has received a 10 and the lowest score a 0. One has to bear in mind that the sustainability value of an indicator might be subjective to some extent. Moreover, it is likely to change over time. For instance population growth: now our planet seems overpopulated by human beings. However, it can very well be that in the future one has a different view on this issue.

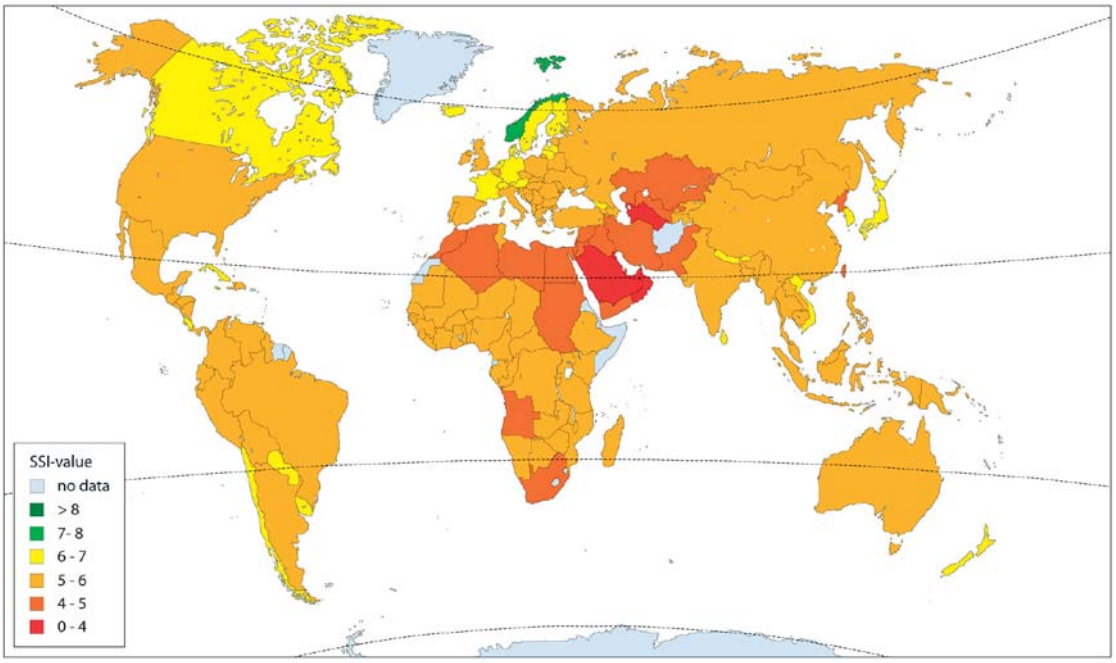
A more detailed description of the calculation methodology and all results can be found on www.sustainablesocietyindex.com.

Results

As could be expected, the world at large is far from sustainable. The average ISS score of all countries on our planet is only 5.5. See Figure 1. Does that mean half-way down or half-way up? When updates of the ISS become available in the coming years this question can be answered.

Norway is currently topping the SSI ranking list with a 7.0. Though being the best in class, even Norway is way below full sustainability.

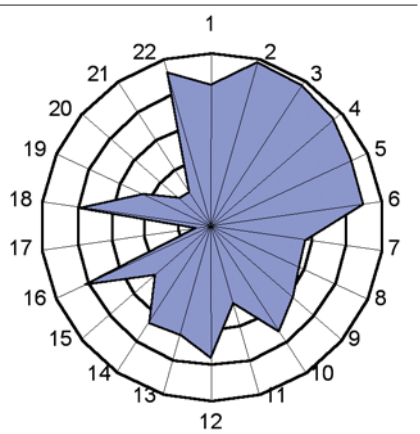
Figure 1 Overall SSI score for 150 countries



The average indicator scores for the 27 EU-member countries are shown in the spider web diagram in Figure 2. From this figure it is clear that in several areas there is much room for improvement. It concerns in particular the indicators of category IV (sustainable use of resources) and of category V (sustainable world). The scores for the indicators in category I (personal development) are relatively high.

These results show clearly that aggregation of scores for the individual indicators into one overall index entails a danger: it smoothes the differences between the individual scores. The final result, the score for the SSI, has less variation between maximum and minimum than the underlying figures, i.e. the scores of the indicators. So it is important always to look at the underlying figures as well.

Figure 2 Average SSI indicators for the EU-27



History of the SSI

The concept of the SSI has been developed by the Sustainable Society Foundation during the past three years. It was published late 2006 and presented in May 2007 at the Amsterdam Conference 2007. The SSI received a warm welcome, and at the same time, as could be expected, questions and criticism.

Research and further development of the SSI is a continuous process. In the meantime we are already working on the next biennial update of the SSI.

Examples of using the SSI

The SSI can be used in many ways:

1. To enlarge the awareness of people of the level of (un)sustainability of their own country.
2. As a policy instrument for all government levels. For instance at national level, each indicator can be assigned to a specific ministry. This ministry will then be responsible for the development towards sustainability with respect to this indicator. Frequent monitoring of progress will stimulate to reach the objectives set according to an agreed time schedule.
3. By NGOs to help them with their strategy towards Sustainability.
4. To compare the scores of countries in order to learn from, and to stimulate each other to make progress on the way to sustainability.
5. For educational purposes at all levels.

The SSI already has stimulated and supported various new developments.

- The international Peer Review of the Netherlands' sustainability policy used the SSI in its considerations.
- The SSI has played a role in the planning and monitoring of the sustainability policy of the Netherlands Government.
- Based on the SSI a sustainability index for greenhouse culture is now under development.
- Recently a project has started to introduce the SSI in Romania, both on national and regional level. It is the intention to use the SSI as tool for planning and monitoring sustainability policies in the country. Spreading to other countries is foreseen.
- The SSI is being used for educational purposes at colleges and universities.

We hope to present a – further developed and improved – Sustainable Society Index by the end of 2008, when the next update will be published. We welcome your comments and suggestions.

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Time Distance Method for Analysing and Presenting Indicators

by **Pavle Sicherl**, SICENTER

Why we need the time distance method for analysing and presenting indicators

The time distance methodology offers a very interesting new way of analyzing and presenting indicators and time series data in general. Well-being and development are multidimensional and long-term phenomena, people compare and assess over many dimensions and over time. Time, besides money, is one of the most important reference frameworks in a modern society. The time perspective, which no doubt exists in human perception when comparing different situations, has been with the S-time-distance method systematically introduced both as a concept and as a quantifiable generic statistical measure.

- *The new generic time distance approach offers a new view of existing data that is exceptionally easy to understand and communicate, and it allows for developing and exploring new hypotheses and perspectives.*
- *It can also make important contribution to better exploitation of information resources in new ways and to the visualization of findings; it is also well placed to be used jointly with other methods.*
- *Expressed in time units it is an excellent presentation tool easily understood by policy makers, experts, managers, media and general public, it can support decision-making as well as influence public opinion.*

Definition of S-time-distance and policy implications: different statistical measures may lead to different perceptions about the situation

Statistical measure S-time-distance measures the distance (proximity) in time between the points in time when the two series compared reach a specified level of the indicator X. The observed distance in time (the number of years, quarters, months, etc.) for given levels of the indicator is used as a temporal measure of disparity between the two series, in the same way that the observed difference (absolute or relative) at a given point in time is used as a static measure of disparity.

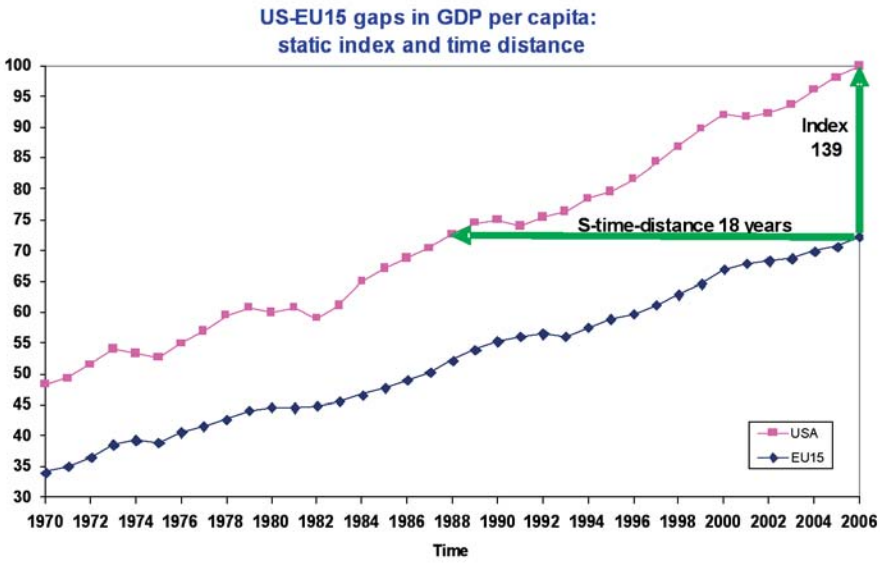
S-time-distance measure is a measure with clear interpretability that delivers a broader concept to look at data and to compare situations, including benchmarking and monitoring.

This innovation opens the possibility for simultaneous two-dimensional comparisons of time series data: vertically (standard measures of static difference) as well as horizontally (Sicherl time distance). In graphical terms, the usual way is to compare the time series in the ***vertical dimension***, i.e. for a given point in time. The time distance approach uses an additional perspective; it compares the respective time series in the ***horizontal dimension***, i.e. for a given level of the variable. Empirically, the degree of disparity may be very different in static terms and in time distance, which leads to important technical and policy consequences.

Benchmarking and gap analysis

Two time series can and should be compared in two dimensions:

1. **static gap for a given point in time**
2. **gap in time for a given level of the variable**



Comparing the EU15 for male-female differences in life expectancy in 2000 the female life expectancy was 6.3 years higher (absolute static difference), which amounted to about 8 percent difference (relative static difference) in relation to that of men. However, the S-time-distance was an astonishing 29 years. This means that women attained the value of male life expectancy for 2000 already in 1971, about three decades ago. The perception whether the gender difference in life expectancy in the EU15 is large or small depends on the measure used: static percentage difference is only 8 percent, while S-time-distance amounts to 29 years. For a more realistic conclusion all measures should be presented simultaneously.

This is important for analysis and policy debate for a single indicator and especially for comparisons across indicators with different growth rates in different fields of concern as needed for the Beyond GDP approach. The better the analytical framework the greater the information content provided to decision makers, experts, media and general public. If one does not use explicitly the broader framework outlined here, there is a possibility that in political debate and policy formulation various interest groups would intentionally look only at the measure which will suit their particular interest.

Monitoring and evaluation – how to present it better for public debate

A substantial effort of the international and national organizations as well as research organizations has been and will be channeled into collecting and analyzing the necessary data for the systems of indicators under discussion. However, the benefit for better decision making and wide participation of broad range of stakeholders will depend critically on the *human interface: understanding of the information and communication of that understanding* (Sicherl, 2006b). Monitoring and evaluation of the degree of implementation of policy targets are indispensable phases of the policy circle. The interpretation of the deviation of actual development from the line to target with S-time-distance measure is straightforward and intuitively understandable; it deals with lead or lag against their own target. It is like tracking the actual arrivals in comparison with the train or bus timetable, the difference being that the concept of geographical space is in our application replaced with the indicator space.

With EUROSTAT we agreed on a selection of sustainable development indicators to be tested using the time distance methodology. In a single table there is a wealth of clear information about being on or off the track to targets for 12 selected indicators from 7 themes of SDI for all years.

People will intuitively understand the lead or delay in time of actual implementation against the assumed time table to the proclaimed targets.

This type of analysis can be repeated in the EU case for all 27 countries across a selected number of available indicators with established targets. In the case shown it is easy to observe the large delays in the theme 5 Climate change and energy; as well as in the road share of inland freight transport and share of R&D in GDP.

The above analysis for one unit across many indicators can be also performed for a given indicator across many countries or regions or socio-economic groups. Tracking the time table to Lisbon for total employment rate is here shown against the EU overall target, for NRPs the individual country targets for indicators will be taken into account.

If the relevant EU and national bodies would care to assess the S-time-distance measure by the same eight criteria applied to the selection of structural indicators like 1. Easy to understand, 2. Policy relevant, 3. Mutually consistent, ... 6. Comparable between countries, etc. (Munoz 2004), then for this application in monitoring implementation of the Lisbon EU and NRP strategies by structural indicators as well as for sustainable development

Monitoring implementation of Lisbon 1 targets for EU 15 accross 7 thems of SDI (S-time-distance deviation from the linear hypothetical path to target)

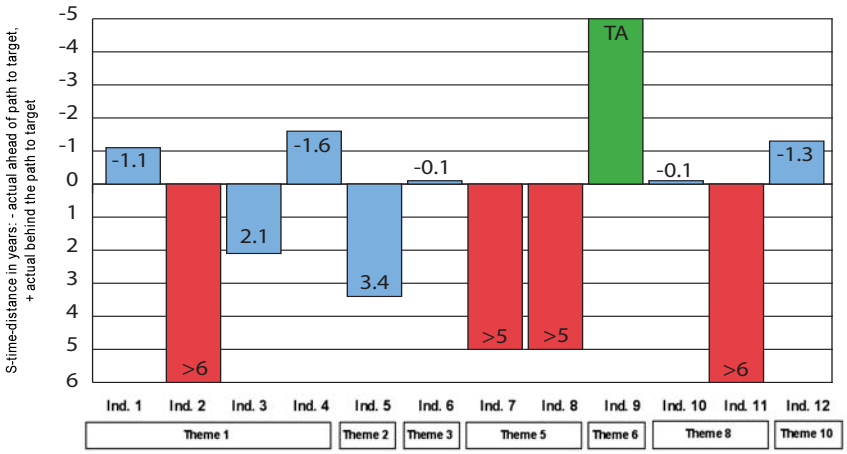
Theme		Proposed SDI	2000	2001	2002	2003	2004	2005	2006
Theme 1 - Economic development	1	Life-long learning, %	0	1.0	1.8	-1.0	-2.0	-2.1	-1.1
Theme 1 - Economic development	2	Share of R&D in GDP	0	0.8	1.7	2.9	>4	>5	>6
Theme 1 - Economic development	3	Total employment rate, %	0	0.1	0.8	1.6	2.0	2.1	2.1
Theme 1 - Economic development	4	Employment rate, females, %	0	-0.5	-0.5	-0.2	-0.6	-1.1	-1.6
Theme 2 - Poverty and socila exclusion	5	Early school-leavers, %	0	0.5	1.2	1.5	2.0	2.7	3.4
Theme 3 - Ageing society	6	Employment rate of older workers, %	0	0.2	0.0	-0.2	0.1	-0.2	-0.1
Theme 5 - Climate change and energy	7	Total greenhouse gas emissions	0	>1	>2	>3	>4	>5	
Theme 5 - Climate change and energy	8	Share of electricity from renewable sources	0	0.2	>2	>3	3.9	>5	
Theme 6- Production and consumption pattern	9	Municipal waste lanfilled, kg per capita	0	0.1	-0.9	-2.5	-4.2	TA	TA
Theme 8 - Transport	10	People killed in road accidents	0	0.5	0.9	0.4	-0.2	-0.1	
Theme 8 - Transport	11	Road share of inland freight transport	0	>1	>2	>3	>3	>5	>6
Theme 10 - Global partnership	12	Official development assistance, % of GNI	0	-0.1	0.4	0.9	0.9	-1.3	

S-time distance in years: - actual ahead of path to target, + actual behind the path to target

TA — Target already achieved

> x — Actual value is worse than the starting value, therefore S-time-distance is more than x

Visualisation for the latest available S-time-distance estimate for SDI for EU15



Lisbon 1 target of 70% employment rate in 2010 for all countries (S-time-distance deviation from the linear hypothetical path to target)

	2000	2001	2001	2003	2004	2005	2006
EU (25 countries)	0	0.5	1.5	2.3	2.8	3.2	3.0
EU (15 countries)	0	0.1	0.8	1.6	2	2.3	2.1
Denmark	TA	TA	TA	TA	TA	TA	TA
Netherlands	TA	TA	TA	TA	TA	TA	TA
Sweden	TA	TA	TA	TA	TA	TA	TA
United Kingdom	TA	TA	TA	TA	TA	TA	TA
Austria	0	1	0.7	0.3	0.0	4.3	TA
Cyprus	0	-3.9	-4.7	-5.1	-3.4	-1.5	-3.8
Estonia	0	0.4	0.3	0.4	1.3	0.8	-2.0
Finland	0	-2.2	-1.2	1.2	2.6	0.7	-1.5
Ireland	0	-0.2	1.4	2.4	1.7	0.0	-1.1
Latvia	0	0.1	-0.3	-0.4	0.2	0.4	-1.0
Spain	0	-0.1	0.4	0.4	0.5	-0.1	-0.2
Slovenia	0	-0.4	1.2	>3	0.5	0.6	0.7
Lithuania	0	>1	1.3	1.2	2.1	1.8	1.9
Germany	0	0.5	>2	>3	>4	>5	2.4
Greece	0	1.1	1.3	1.4	1.9	2.3	2.7
Italy	0	0.3	0.9	1.5	1.6	2.6	3.1
Slovakia	0	1	2.0	2.3	3.8	4.3	4.0
Luxembourg	0	0.5	1.0	>3	>4	3.8	4.8
France	0	0.1	0.9	1.5	2.7	3.7	4.9
Hungary	0	>1	>2	2.5	3.6	4.6	5.3
Czech Republic	0	1	1.2	>3	>4	>5	5.4
Belgium	0	>1	>2	>3	>4	4.4	5.5
Malta	0	0.9	1.9	3.0	>4	>5	5.6
Portugal	0	-2.7	-0.5	>3	>4	>5	>6
Poland	0	>1	>2	>3	>4	>5	>6

S-time-distance in years: - actual ahead of path to target, + actual behind the path to target.

strategies the S-time-distance measure would pass the test with flying colours.

Wide range of possible applications

In empirical research and in decision-making the art of handling and understanding different views of data is crucial. We need innovative perspectives also in statistical concepts and measures, not only in qualitative and other dimensions. The possibilities for S-time-distance analysis range from a simple analysis of monitoring implementation of targets to more complex benchmarking and to a very complex econometric analysis (Granger and Jeon used time distance as a criterion for evaluating forecasting models). The time distance approach can thus contribute a useful piece of the mosaic in building up an internationally supported methodology to measure and assess the overall "position" and "progress" among and within countries. Examples are available on www.sicenter.si and www.gaptimer.eu

UN Statistical Division decided to put the software to calculate the S-time-distance measure for monitoring the implementation of the Millennium Development Goals on its official MDG web site to enable countries and other stakeholders to take advantage of this complementary statistical measure for policy debate at various levels.

SICENTER is in the process of developing a web application which would allow a variety of interested users such as international and national organizations, NGOs, experts, managers, educators, students and media to monitor with S-time-distance the lead or lag in time from the Lisbon and NRP targets in the case of EU and for the UN Millennium Development Goals or other planned, budget, or aid disbursement targets at world, regional, national, sub-national and business levels. The first version of the free web monitoring tool for Lisbon targets is available at www.gaptimer.eu/content/view/25/34.

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Benefits of immediate operational uses of time distance

- **A new view in competitiveness issues, benchmarking , target-setting and monitoring** for economic, employment, social, R&D and environment indicators at the world, OECD, EU, country, regional, city, project, socio-economic groups, company, household and individual levels
- **A broader dynamic framework for interrelating strategy issues of growth, efficiency, inequality and convergence**
- **Enhanced semantics for policy analysis and public debate**
- **Additional exploitation of databases and indicator systems**
- **An excellent presentation and communication tool:**

  - among different levels of decision makers and interest groups
  - for describing of the situations, challenges and scenarios
  - for proactive discussion and presentation of policy alternatives to policy makers, media, the general public and mobilizing those participating in or being affected by the programs
  - for communicating the urgent need for change and reforms

World Happiness Index

by Pierre le Roy

1 – World Happiness Index: why?

- **Limits of GDP as an indicator** to assess the world or a country situation are widely acknowledged. As an example: **Equatorial Guinea**, thanks to oil production, shows a GDP per capita of **20,000 dollars** (in purchasing power parity), which is equivalent to **Greece,** but the **under-5 mortality rate is 204 in Equatorial Guinea and 5 in Greece…**
- More generally speaking, GDP is not a satisfactory index because **it ignores important things of daily life**: when a tree is cut down, GDP grows; traffic accidents increase GDP, and so do wars potentially! Conclusion by **Robert Kennedy: GDP "measures everything, in short, except that which makes life worthwhile".**
- The only significant progress to go beyond GDP has been the creation, in 1990, of the **human development index** (HDI), calculated and published yearly by the United Nations Development Program (UNDP). For each country and globally, HDI aggregates: **GDP, life expectancy at birth and education level.**

World Happiness Index (GHI) goes further!

2 – World Happiness Index: how?

- The first question to answer is: **what is a happy world? What is a happy country?** Answer: it's a world or a country:
  - > Where people live peacefully and safely;
  - > Where people live freely and democratically, and where human rights are respected;
  - > Where quality of life is good;
  - > Where research, education, information, communication and culture are shared by all.
- As a result the idea is to choose, for each of these **4 chapters**, **10 indices from reliable sources and published every year** (UNDP, World Bank, WHO, SIPRI, Amnesty, HCR…); **WHI is, for any given year, the average of these 40 indices.**
- Selected global indices are the followings :
  - > Peace and security : 1 – number of nuclear warheads, 2 – number of victims of major armed conflicts, 3 – military expenditures, 4 – number of violent deaths, 5 – number of refugees, 6 – number of victims of natural or technological disasters, 7 – corruption, 8 – economical and financial security, 9 and 10 – probability of dying before age 60.
  - > Freedom, democracy, human rights : 1 – number of people living freely, 2 – level of democracy in the world, 3 -press freedom, 4 – children rights: under-5 mortality rate, 5 – death penalty, 6 – women rights: gender development index, 7 – percentage of female parliamentarians, 8 – women's school enrolment, 9 – boys' and girls' school enrolment, 10 -child labour.
  - > Quality of life : 1 – GDP per capita, 2 – GDP per capita, disparities, 3 – life expectancy at birth, 4 -human poverty index, 5 – GINI coefficient, 6 – suicides, 7 – CO_2 rate, 8 – forest area per capita, 9 – water and hygiene, 10 – clean air.
  - > Research, education, information, communication, culture: 1 – Research and Development, 2 and 3 – boys and girls education rate, 4 – adults literacy rate, 5 – education disparities, 6 – number of copies of daily newspapers per capita, 7 – number of television receivers per capita, 8 – ICT: phones, PC, Internet, 9 – number of movies, 10 – international tourist trips.
- **We emphasize here the importance given to education in all aspects, disparities and women status.**
- **Initially calculated for the year 2000, which sets the basis 100, WHI evolves every year, increasing or decreasing, depending on the average of these 40 indices.**
- Results are published once a year on www.globeco.fr, section: **"GLOBECO, la revue"**, under the title: **"bonheur mondial, édition 2007" (*world happiness, 2007 edition)*,** for the last edition.

3 – Country ranking

- **Country ranking** is calculated on the same basis as the world happiness index, from the **20 following indices**:
  - > Peace and security : war and peace, violent deaths, corruption, economical security, human security;
  - > Freedom, democracy, human rights : democracy, press freedom, women rights, children rights, death penalty;
  - > Quality of life : GDP per capita, GINI coefficient, life expectancy at birth, suicides, clean air;
  - > Education, information, communication : education (coefficient 2), newspapers, TV, Internet.
- This ranking is done over **60 countries** which represent **85% of worldwide population and over 90% of global GDP.**

4 – «World happiness, 2007 edition» : the results

WORLD HAPPINESS INDEX

	2006 / 2005 (2005 = 100)	2006/2000 (2000 = 100)
Peace and security	100,95	90,50
Freedom, democracy, human rights	101,09	105,08
Quality of life	101,97	99,11
Research, education, information, communication, culture	101,80	114,44
RESULTS	**101,45**	**102,28**

COUNTRY RANKING 2007

1 – NORWAY
2 – SWEDEN
3 – NETHERLANDS
4 – DENMARK
5 – AUSTRALIA
6 – CANADA
7 – FINLAND
8 – GREAT BRITAIN
9 – IRELAND
10 – SWITZERLAND
11 – GERMANY
12 – AUSTRIA
13 – SPAIN
14 – BELGIUM
15 – FRANCE
16 – JAPAN
17 – ITALY
18 – GREECE
19 – PORTUGAL
20 – UNITED STATES
21 – CZECH REPUBLIC
22 – SOUTH KOREA
23 – HUNGARY
24 – BALTIC COUNTRIES
25 – ISRAEL
26 – POLAND
27 – CHILI
28 – ROMANIA
29 – BULGARIA
30 – MEXICO
31 – MALAYSIA
32 – ARGENTINA
33 – VENEZUELA
34 – BRAZIL
35 – COLOMBIA
36 – UKRAINE
37 – TURKEY
38 – TUNISIA
39 – THAILAND
40 – SOUTH AFRICA
41 – PHILIPPINES
42 – MOROCCO
43 – ALGERIA
44 – EGYPT
45 – CHINA
46 – SAOUDI ARABIA
47 – RUSSIA
48 – VIETNAM
49 – PERU
50 – INDONESIA
51 – SRI LANKA
52 – IRAN
53 – UZBEKISTAN
54 – INDIA
55 – PAKISTAN
56 – BANGLADESH
57 – NIGERIA
58 – DR OF THE CONGO
59 – ETHIOPIA
60 – UNION OF MYANMAR

For further information:
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Full text of "**Bonheur mondial, édition 2007**" will be online (in French) on www.globeco.fr by november 14, 2007, section **"Globeco : la revue".**

In the same section, you'll find another article on the issue, entitled **"Mesurer le bonheur, à quoi bon ? La réponse de GLOBECO et de quelques autres" (*Measuring happiness, what for? Answers from GLOBECO and a few others)*.**