Statistics Netherlands

P.O.Box 24500
2490 HA Den Haag
The Netherlands

A brief introduction to the measurement of progress of societies at Statistics Netherlands

Rutger Hoekstra and Jan Pieter Smits[1]

[1] Email correspondence can be sent to: r.hoekstra@cbs.nl and jp.smits@cbs.nl. The authors lead the UNECE/Eurostat/OECD Task Force for Measuring Sustainable Development. Nevertheless, the comments in this paper are made in our capacity as project managers of the Dutch Sustainability Monitor.
The views expressed in this paper do not necessarily reflect the views of Statistics Netherlands.
We are grateful for comments made by Remco Kaashoek. The usual disclaimer applies.

Remarks:
The views expressed in this paper are those of the author and do not necessarily reflect the policies of Statistics Netherlands.

Project number: *CBO-*
BPA number: *-CBO*
Date: *7 July 2010*

A BRIEF INTRODUCTION TO THE MEASUREMENT OF PROGRESS OF SOCIETIES AT STATISTICS NETHERLANDS

Summary: Recently the attention of the statistical community has again focussed on the measurement of societal development from a broader perspective than GDP. A plethora of initiatives have been initiated, including the seminal Stiglitz-Sen-Fitoussi report, to tackle this measurement issue. In this paper we introduce the approach of Statistics Netherlands.

We argue that three dimensions of "progress" are of concern to society: measurement, communication and policy. These are related, but separate, questions that should be answered in a single consistent system.

At the core of the system is the monitoring of societal progress. We introduce a conceptual approach which is based on economic theory and other social science literature. The framework is consistent to the Stiglitz and Brundtland reports and defines and links the concepts of quality of life, welfare, wellbeing capital, and sustainable development.

Based on the theory an indicator set has been created which will be published in the "Sustainability Monitor of the Netherlands" (February 2011). The system has separate dashboards for 1) current quality of life 2) quality of life of future generations (capital) 3) the impact on the quality of life of people in other countries.

Admittedly the monitoring system is more advanced than the work on the communication and policy dimensions. Nevertheless we provide an insight into the direction we are taking by discussing several examples in the appendixes.

Keywords: Sustainable development, progress of societies, welfare, wellbeing, capital,

Table of Contents

1. Introduction

There is a wide-spread feeling that society needs a better statistical 'compass'. It is argued that in defining societal progress we should go "beyond GDP" and that statistical tools need to be developed that address a broad range of issues relating to quality of life and sustainable development. The renewed attention is illustrated by the variety of projects/working groups that have created.[2] Particularly after the publication of the Stiglitz-Sen-Fitoussi (SSF) report the call for such a new statistical framework is stronger than ever. An important European follow up of the SSF report is the *Sponsorship group measuring progress, well being and sustainable development* which is lead by Eurostat and INSEE.

Since 2007, Statistics Netherlands has also intensified its work in this field through the development of the *Sustainability Monitor for the Netherlands*. The first version was published in February 2009 (CBS et al., 2009) with the second being scheduled for February 2011. The project was carried out in conjunction with the Dutch government's policy institutes for economy, environment and social issues.[3]

In this paper we will present the state of play of the *Sustainability Monitor*. It is therefore the culmination of three years of thinking and cooperation with policy institutes, government and academia. Most of the work is well advanced but there is still, even after a substantial process, still areas which require further development.[4]

2. The progress of societies

The progress of societies, in its most broad sense of the word, is being discussed in many parts of society. The character or goals of these discussions differ widely. To characterize the nature of these discussions it is helpful to distinguish three dimensions:

1. *Measurement*. How is society doing? What is the "state of the nation"? Clearly one of the key measurement issues of our time is the assessment of where we stand in the various areas that underlie societal progress. Social scientists have investigated this for decades and even centuries (see Appendix A and the reference list). Many of these measurements methods which have created have been internalized by NSIs which have refined the measurement to adhere to the system of official statistics.

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[2] To name but a few: "GDP and Beyond" (European Commission), "Measuring the progress of societies" (OECD) and the "Task Force for Measuring Sustainable Development" (UNECE/ Eurostat/ OECD).

[3] The Netherlands Bureau for Economic Policy Analysis (CPB), the Social and Cultural Planning Office of the Netherlands (SCP), and the Netherlands Environmental Assessment Agency (PBL).

[4] This paper is a very brief summary of the work that is done by Statistics Netherlands and its partners. An extended version will be published in the fall. Due to its brevity we have not annotated the text with references to the literature. Nevertheless we have included a list of consulted literature at the end of the document.

2. *Communication*. Apart from the measurement of full breath of societal developments it is important to communicate the most important findings to society at large. What is the "bottom line": is society doing well or not? What are the greatest challenges to society? To reach these conclusions some form of aggregation or visualisation of the sub domains of progress is necessary. Often these aggregated composite indices, such as the ecological footprint, are very effective at communicating important problems to a large audience.

3. *Policy*. Governments, and society in general, will want to take action when certain problems arise or opportunities for improvements are evident. Of course the question of *how* to tackle the problems is up to the policy makers. Nevertheless, an NSI can help to monitor the policies once a government sets its targets.

Trying to partition the societal discussion in these three dimensions is helpful to categorize the main aims of various initiatives. However, in reality, many initiatives will focus on two or even all three areas simultaneously. Ideally, one would want a system that could tackle all three areas in a common system since all dimensions are related. However, it is important to realize that each of the fields has different requirements and the role of the NSI also varies in each area.

In the remainder of this document we will describe the progress that Statistics Netherlands has made towards an overall system that facilitates all three dimensions. In sections 3, 4 and 5 the issue of measurement, communication and policy are discussed. Finally, Section 6 presents the main conclusions and future research.

3. Measurement: Three dashboards of indicators

At Statistics Netherlands a conceptual approach has been adopted that is based on a broad range of economics and other socials sciences literature (see appendix A for details). The framework is consistent to the Stiglitz report and the Brundtland definition of Sustainable Development. It links, in a consistent framework, the concept of quality of life, wellbeing, welfare, sustainable development and capital.

From the recommendations of the Stiglitz report we have come to the conclusion that progress should be measured using three separate dashboards:

1. Quality of life. The welfare or wellbeing of life of the present generation.

2. Capital. The opportunities of future generations to pursue their welfare goals (based on the amount of capital that the present generation leaves behind).

3. The international dimension. Here the impact of the Netherlands on the quality of life and future growth possibilities of the least developed countries is charted.

For the upcoming *Sustainability Monitor* the indicators for these three dashboards have been collected from various international databases (see appendix B for a preliminary version of the dashboards). The databases include Eurostat's structural indicators (SI) and sustainable development indicators (SDI) database; the World Bank's World Development Indicators (WDI); and various OECD databases. Given the excellent work that these institutes have done in this field, the data availability does not seem to be a major problem when it comes to producing an international database to measure the progress of societies (at least for European countries).

4. Communication: Aggregation and visualisation

The three dashboards for the *Sustainability monitor* consists of about 15-30 indicators per dashboard. This provides a valuable source of detailed information with which society can monitor its progress. However, it doesn't answer the important question: is society doing well or not? Or: what are the most important problems facing society?

To answer these questions the messages for the dashboards have to be simplified. One of the most obvious ways to aggregate the different dimensions is by using a common unit. These lead to "composite" indicators use a variety of units: genuine savings" (money), "ecological footprint" (land area) and "human development index" (harmonized unit). Usually the different dimensions are monetized. However, Statistics Netherlands supports the Stiglitz report in its conclusion that monetized composite indictors, which cover all dimensions of the progress of society, are not currently feasible. We have therefore chosen to adopt a set of indicators.

This implies that we need to look for other types of aggregation and visualisation. We are reviewing the state of the art in other countries (e.g. Switzerland, New Zealand). Also we are using the expertise that Statistics Netherlands has amassed over the past couple of years, since the development of communication tools for our statistics has been a priority recently. In appendix C we discuss a couple of alternatives which we are now seriously considering and developing.

5. Policy: Policy-relevant indicators

Measuring and communicating societal progress is an important input for society. It helps to educate the general public and policy makers about the trends and problems of our society. However, when governments want to take action the system can even be extended for monitoring of policy. For example, the dashboards include indicators about the health status or educational attainment of the population. For policy makers it is important to have "levers" with which these headline indicators can be influenced. This may lead to a number of sub indicators (e.g. education: education expenditures, school-leavers etc.; health: health expenditures, number of doctors, number of citizens with health life styles).

In appendix D we show a couple of examples of policy relevant sub-indicators for various areas. To define the sub-indicators we plan to work closely together with the government. Currently we are in the process of discussing the policy indicators with the Ministry of the Environment, Ministry of Finance and the Ministry of Economic Affairs.

6. Conclusions and future work

In this paper we have briefly presented the experiences of Statistics Netherlands in the area of societal progress. In the *Sustainability monitor for the Netherlands* we have adopted a conceptual approach which is based on a broad range of economic and other social science literature. The resulting framework is consistent to the Stiglitz and Brundtland reports and links the concepts of quality of life, welfare, wellbeing, capital and sustainable development.

Currently Statistics Netherlands has about 12 fte working on the Sustainability Monitor as well as a wide variety of statistics for sustainable development. In the upcoming two years of the program our main aims are:

1. *Long time series*. Society changes day by day, but to really understand structural shifts one has to look at the long term developments. We have therefore already created long time series for energy, emissions and input-output tables from 1960 and will expand the range of indicators and time periods.
2. *International dimension*. In our globalising world, where countries are so interrelated, the actions in one country can affect the sustainability of another. A well known example is that by importing energy intensive products a country may "export" its CO_2 emissions. We therefore want to expand our range of indicators to reflect the "footprint" of our consumption, imports and exports.[5]
3. *National accounts*. The indicators in our dashboards have many different sources. The methods and concepts with which they have been measured may vary significantly. The system of national accounts provides a wonderful opportunity to create a measurement system in which indicators are produced using a consistent methodology. Already our national accounts have a number of very elaborate satellite accounts (such as environmental accounts, R&D accounts and labour accounts) but we are also developing new ones such as time use modules, human capital accounts. These satellite accounts can also be coupled to the input-output of the national accounts which makes modelling possible.
4. *Households.* As the Stiglitz report stressed it is not enough to look only at national averages because many indicators for progress such as health,

[5] We wish to develop methods that are based on the EU-funded WIOD project.

education, income can be distributed in the population very differently. We will therefore be splitting the indicators according to various demographic groups.

5. *Companies.* Finally, we are also interested to see whether the indicator set for progress can be translated to the company level. Ideally it may be possible to link the system to company reporting standards such as the global reporting initiative (GRI).

Appendix A. Measurement: Theory

In this section the theoretical underpinnings of the Sustainability Monitor of the Netherlands are discussed briefly. A full length paper on the conceptual approach will be published in the fall of 2010. Given the brevity of the discussion here, we have not provided all scientific references in the text. Nevertheless we do provide a reference list of the literature that has been consulted at the end of this report.

Our discussion of the progress of societies starts with figure 1. A society has a number of resources (economic capital (machines and buildings), human capital (labour, education and health); natural capital (natural resources, biodiversity and climate) and social capital (social networks and trust) that are available to it. These resources are necessary to maintain the quality of life of the population.

In our conceptual approach we make a distinction between the objective and subjective dimensions of the quality of life. The difference is that welfare (objective) is only influenced by scarce goods, while wellbeing is related more to the perception that the population has with respect to their welfare. This is important because it can be observed in many western countries that the objective situation and the subjective assessment thereof are not always consistent. For example, in certain countries it can be seen that crime rates are dropping while the fear of victimisation grows.

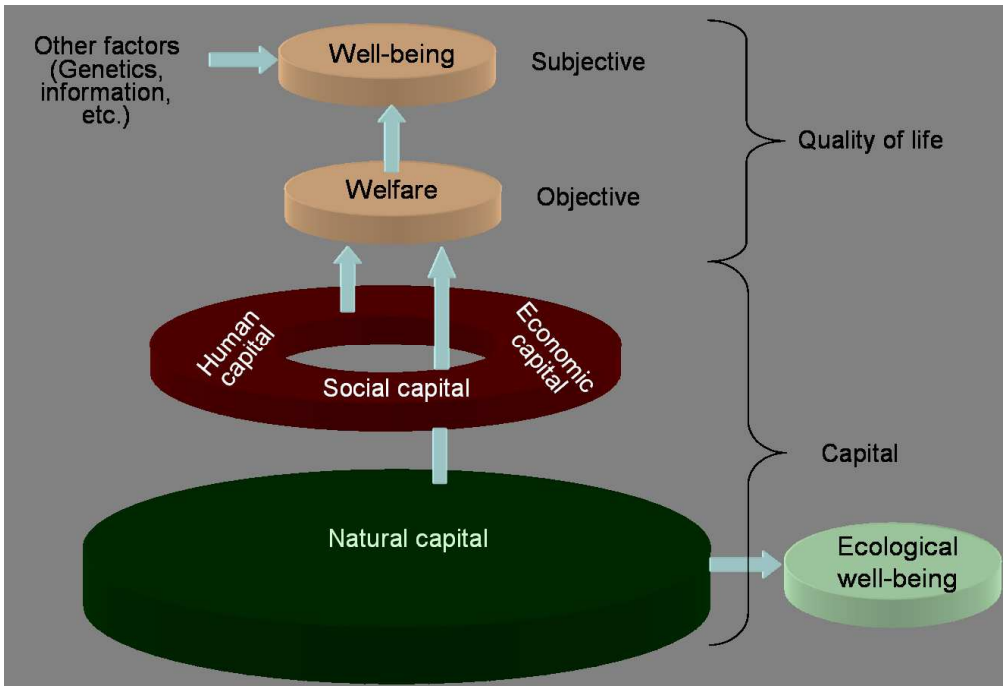


Figure 1. Quality of life

Natural capital is a special type of resource because it is a *critical capital stock*. Without it humans could not exist. It is also important to note that the above

discussion of welfare/wellbeing is very anthropocentric: natural capital is only of value to society if it provides ecological services that benefit humans. In the literature many authors argue that certain types of natural capital, such as biodiversity, have an existence value, irrespective of its use by society. This aspect is represented by introducing the term “ecological wellbeing” in figure 1.

Figure 1 is a static representation of the quality of life. However, it does not show whether the quality of life can be maintained towards the future. In other words: are developments sustainable in the long term? In figure 2 we have added the time dimension to complete the conceptual model.

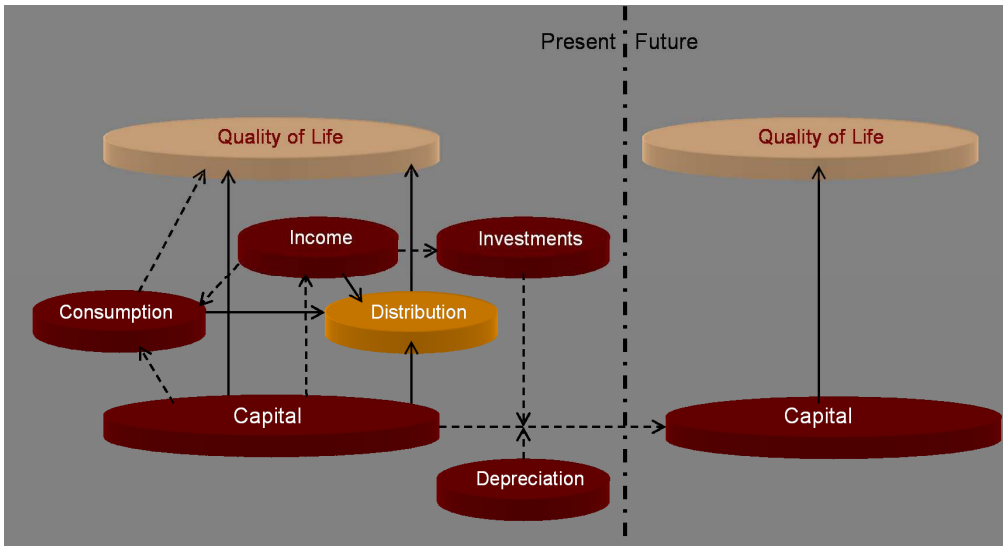


Figure 2. Progress of societies

Figure 2 shows that in the quality of life of future generations will be determined by the capital stocks that are available. There is obviously a clear link with the Brundlandt definition here which states that ‘Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (WCED 1987). In the context of figure 2 this implies that the quality of life of future generations must be safeguarded by making sure that they have sufficient resources, while at the same time securing the quality of life of the current generation. The issue of sustainable development thereby becomes a matter of intergenerational equity which is determined by the distribution of capital over time.

Let us now go into a little more detail. Figure 2 shows that, through the production process, the capital stocks lead to goods and services that are consumed and also generates income which is required to buy these commodities. In economic terms, the goods and services that are produced lead to “utility” and thereby enhance the quality of life.

Not all of the income is consumed. A portion is reserved for investments. Together with the depreciation, this leads to new levels of capital in the future. Societies can

therefore influence the intergenerational sustainability by the investments and depreciation in capital stocks as well as the efficiency with which these capital stocks are used.

The above is clearly inspired by economic theory and the statistical system which was been created to measure macro-economic developments: the national accounts. These conventional economic relationships are represented by the dotted lines in the figure. However, as the SSF report correctly points our there are a number of areas in which standard economic theory does not provide an adequate picture.

Firstly, economic mainstream literature and the system for national accounts is not used to taking natural and social capital on board. Similarly, the definition of commodities should be broadened far beyond the market based set that is observes in the system of national accounts.

Secondly, the causal relationships that are related to the quality of life are very simplistic in mainstream economics. It is assumed that "utility" is only achieved through the consumption of goods and services. A wide range of social sciences literature (Sen's capabilities, happiness literature, Maslov's pyramid, experimental economics and social production literature) convincingly shows that quality of life of humans are affected by a greater range of factors than consumption (and most certainly when the narrow definition of the national accounts is used). We have indicated two main additional causal links in figure 2 (full lines). The first line indicates that capital may have a direct effect on the quality of life. For example, it has often been shown that persons with a higher educational level achieve a higher level of wellbeing, even when corrected for other factors. The second line shows that the distribution of income, consumption and capital may influence the wellbeing of individuals.

Based on the Stiglitz recommendations and the Brundtland report we conclude that the progress of societies should be measured using three dashboards:

1. Quality of life. The objective and subjective drivers of the welfare and wellbeing of current generations.
2. Capital. This dashboard has capital indictors which reflect the ability of future generations to achieve their own quality of life standards.
3. International dimension. In this dashboard the impact of the Netherlands on other countries is monitored.

The indicators for these 3 dashboards are found in a variety of databases such as Eurostat's SI and SDI databases, various OECD databases and the World Bank's WDI database.

Appendix B. Measurement-Indicators

In this appendix the preliminary version of the dashboard of the Sustainability Monitor 2011 (due in February 2011) is shown. Indicators, themes may change in the fall of 2010.

Dashboard 1: Quality of life

Theme		Indicator	Development (from 2000 onwards)	Rank in EU
HEADLINE INDICATORS				
Wellbeing	S	Satisfaction		
Material welfare	O	Household consumption		
PERSONAL SPHERE				
Health	S	Self reported health		
	O	Healthy life expectancy		
Housing	S	Satisfaction with housing		
	O	Quality of housing		
Education	S	Satisfaction with education level		
	O	Education level		
Leisure time	S	Too little time for hobbies etc.		
	O	Traffic jams (time loss)		
	O	Leisure time		
Income security	S	Satisfaction with financial situation		
	O	Long term unemployment		
	O	Pensions		
SOCIAL AND ENVIRONMENTAL SPHERE				
Security	S	Feelings of insecurity		
	O	Reported crime		
Inequality	S	Satisfaction with inequality		
	O	Income inequality		
	O	Gender inequality		
Family and friends	S	Satisfaction with family life		
	S	Loneliness		
	O	Contact with family/friends		
Social participation	S	Satisfaction neighbourhood		
	O	Volunteer work		
Institutions	S	Trust in democracy		
	O	Turnout elections		
Environment	S	Satisfaction with green areas		
	O	Protected nature		
	O	Air quality		

S- Subjective indicator O-Objective indicator

Dashboard 2: Capital

Capital type	Theme	Indicator	Development (from 2000 onwards)	Rank in EU
Natural capital	**Land**	Area per person		
	Biodiversity	Biodiversity index		
	Climate	Historic CO_2 emissions		
	Energy	Energy reserves		
	Non-energy resources	Mineral reserves		
	Soil	Soil quality		
	Water	Water quality		
	Air	Air quality		
Human capital	**Labour**	Labour force		
		Hours worked		
	Health	Healthy life expectancy		
	Education	Educational attainment		
Social capital	**Citizens**	Generalised trust		
		Shared norm and values		
	Companies	Knowledge networks		
	Institutes	Trust in institutions		
Economic capital	**Physical capital**	Capital stock		
	R&D Knowledge	Capital stock		
Financial capital	**Debt**	Net external debt		

Dashboard 3: International dimension

Theme	Name	Development (from 2000 onwards)	Rank in EU
Non-energy resources	Import non-energy resources		
	Export non-energy resources		
	Non-energy resources footprint of imports		
	Non-energy resources footprint of consumption		
	Non-energy resources footprint of exports		
Energy	Import energy		
	Export energy		
	Energy footprint of imports		
	Energy footprint of consumption		
	Energy footprint of exports		
Climate	*GHG footprint of imports*		
	GHG footprint of consumption		
	GHG footprint of exports		
Land	*Land footprint of imports*		
	Land footprint of consumption		
	Land footprint of exports		
Water	*Water footprint of imports*		
	Water footprint of consumption		
	Water footprint of exports		
Knowledge	High tech exports		
	High tech imports		
	FDI outflows		
	FDI inflows		
	R&D exports		
	R&D imports		
Global partnership	ODA		
	Remittances		
	Imports from LDC's		

Indicators in italics are provisional. We are currently investigating the feasibility of calculating these indicators using the WIOD database (A European funded project on collecting input-output data and environmental accounts data).

Appendix C. Communication-Examples

One of the most daunting challenges in the field of "progress of societies" is communicating the outcomes of the indicator sets to a broader public. The issue is to summarize or simplify the results into a coherent narrative that summarizes the "bottom line" of the developments. We are currently testing two options.

Option 1 shows that for each theme of quality of life, capital and the international dimension we have defined what percentage of the indicators that are moving in the "right" (green) or "wrong" (red) direction or are remaining constant ("orange"). We have also added a column with a final "verdict". Note that the colours shown here are not based on actual data.

Option 1

Translations:

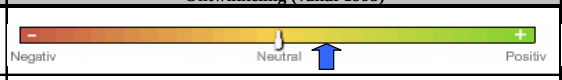
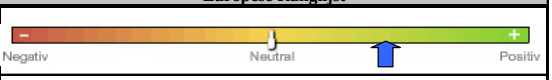
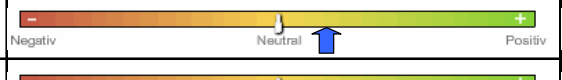
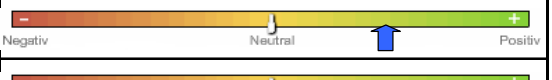
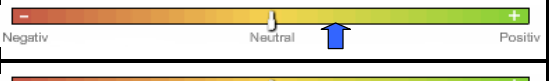
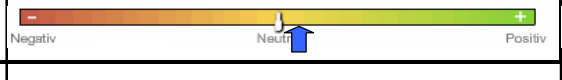
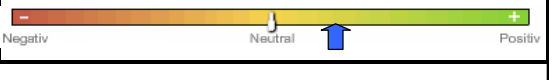
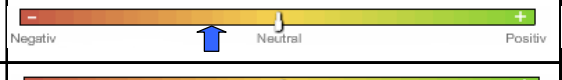
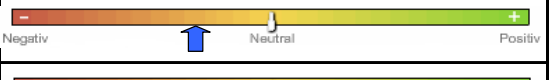
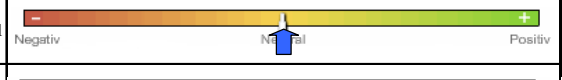
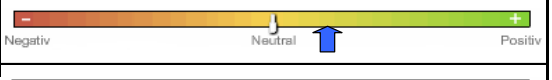
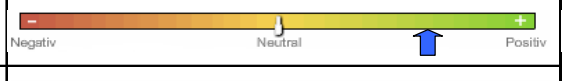
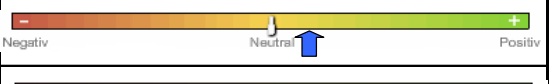
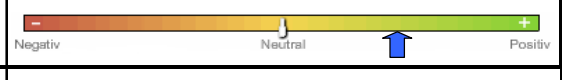
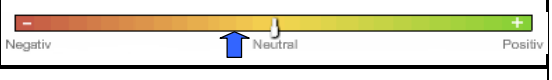
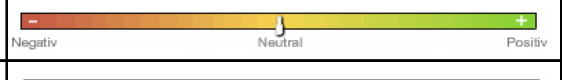
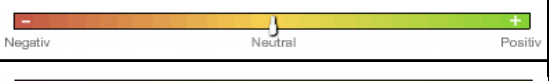
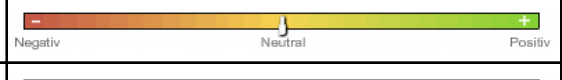
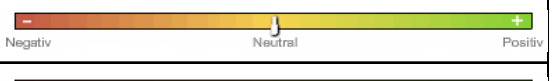
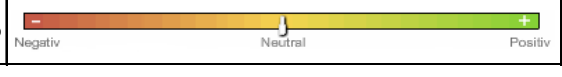
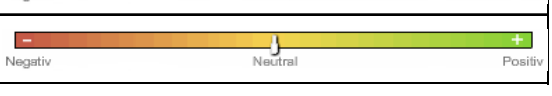
Ontwikkeling (development); Stand ten opzichte van Europa (Rank with respect to Europe); Oordeel (Verdict)

Kwaliteit van leven (Quality of life); Hulpbronnen (capital); Internationale dimensie (international dimension).

Welzijn (Wellbeing); Material welvaart (Material welfare); Persoonlijke kenmerken (Personal sphere); Leefomgeving (Social and environmental sphere); Natuurlijk kapitaal (Natural capital); Sociaal kapitaal (Social capital); Economisch kapitaal (Economic capital); Menselijk kapitaal (Human capital); Milieu (Environment); Kennis (Knowledge); Handel and hulp (Trade and aid).

Counting the number of indicators provides a good and transparent summary of the developments. Taking it one step further would give us Option 2 shown below. Here the positive and negative developments are added up using a simple aggregation. This example was modified from the Swiss Federal Statistical Institute website which is one of the most advanced in this field.

Option 2

		Ontwikkeling (vanaf 1995)	**Europese Ranglijst**
Kwaliteit van Leven	persoonlijke kenmerken (objectief)		
	persoonlijke kenmerken (subjectief)		
	Sociale en leefomgeving (objectief)		
	Sociale en leefomgeving (subjectief)		
Hulpbronnen	Natuurlijk kapitaal		
	Sociaal kapitaal		
	Economisch kapitaal		
	Menselijk kapitaal		
Internationale dimensie	Milieu		
	Kennis		
	Handel en Hulp		

Appendix D. Policy: Examples

The indicators presented in appendix B already provide a "state of the nation" which is very useful to society. However, policy makers will also want to monitor indicators that affect the headline indicators of the monitoring system

For example, think of the theme "Education" which was monitored by the indicators educational attainment (in the quality of life and capital dashboards). There are a number of ways in which policy makers can raise education levels. These are shown as sub-indicators in the dashboard below. The sub indicators are meant to give policy makers tools as to how they can *influence* changes in stocks (i.e. the headline indicators). Most of these sub-indicators relate to data on (i) investments, (ii) the efficiency with which capital is used (in other words, if we increase the efficient use of capital it might be possible to generate more welfare even if the amount of capital does not increase) and (iii) structural data (for example for energy the share of renewables is added).

Education	**Educational attainment**	**Headline indicator**
	Education expenditure	Sub indicator
	Early school leavers	Sub indicator
	Life-long learning	Sub indicator

Sometimes, themes are best taken together e.g. Energy and Climate. The headline and sub indicators could look something like this.

Climate	**Historic CO2 emission**	**Headline indicator**
	Total greenhouse gas emissions	Sub indicator
	Greenhouse gas intensity of energy consumption	Sub indicator
	CO2 emissions per capita	Sub indicator
	CO2 intensity (kg per kg of oil equivalent energy use)	Sub indicator
Climate (International)	GHG footprint of imports	Sub indicator
	GHG footprint of consumption	Sub indicator
	GHG footprint of exports	Sub indicator
Energy	**Energy reserves**	**Headline indicator**
	Energy extraction	Sub indicator
	Renewables	Sub indicator
Energy	Import energy	Sub indicator

(International)	Export energy	Sub indicator
	Energy footprint of imports	Sub indicator
	Energy footprint of consumption	Sub indicator
	Energy footprint of exports	Sub indicator

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