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A Guide for
Civil Society Organisations

Measuring Performance towards Sustainable Consumption and Production

Types of Indicators and Indicator Sets



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Measuring Performance towards Sustainable Consumption and Production

– Types of Indicators and Indicator Sets

A guideline for Civil Society Organisations

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Summary

This booklet “Measuring Performance towards Sustainable Consumption and Production – Types of Indicators and Indicator Sets” has been published under the framework of the “Action Town – Research and Action for Sustainable Consumption and Production” project. The booklet is part of a series of three different guidelines: The Centre on Sustainable Consumption and Production (CSCP) prepared a guideline on policy instruments, the Sustainable Europe Research Institute (SERI) prepared this guideline on indicators and the Stockholm Environment Institute (SEI) prepared a third guideline dealing with assessment tools for SCP. By reviewing existing knowledge and the latest research on Sustainable Consumption and Production (SCP), these guidelines aim to provide

In terms of environmental impacts, we must acknowledge that global consumption of natural resources is increasing at an unprecedented pace that is unsustainable from both an ecological and socio-economic standpoint. In order to make these interconnections clearer, it is of key importance that the real magnitude and distribution of worldwide resource use is quantified. Transformation towards a more sustainable world will not be possible without reducing human demand on natural resources through enhanced resource productivity. Resource use is also closely linked to questions of distributive justice, an important issue, alongside labour standards and social development, in the social analysis of consumption and production. Using appropriate indicators to measure resource use and its environmental and economic impact is crucial for monitoring progress in relation to defined targets. Targets, in turn, can only be defined based on clear measurement systems and robust indicators.

a quick hands-on overview of selected instruments, assessment tools and indicators. Each guideline uses examples to illustrate how, by means of policy instruments, assessment tools and indicators, civil society organisations can take effective action to encourage more sustainable consumption and production practices. While measuring the environmental impacts of consumption and production processes has become relatively sophisticated with several tools already available, the social dimension of consumption and production has lagged behind. However, in measuring sustainable consumption and production, both environmental and social responsibility must be addressed as part of the economic system.

Global consumption not only impacts environmental systems; social systems are also affected. Beginning in the 1950s, enormous wealth creation in the Western world led to high living standards for many people but had significant unsustainable side effects. The increase of wealth was not distributed equally, both within and between societies, resulting in an ever-widening gap between rich and poor. At the same time, an increase in subjective wellbeing has not kept pace with the increase of wealth. In other words, above a certain threshold of material wealth, the rich have not become significantly happier. Despite the economic crisis in 2008/2009, global consumption is still increasing at an unparalleled pace. In order to ensure a sustainable future, societal goals need to be redefined with a stronger focus on wellbeing and a broader understanding of quality of life. Increasing the use of social indicators during decision making will be necessary to achieve this.

Indicators can create a sense of precision and attract interest making them valuable tools to help CSOs achieve their targets. The possible role of civil society organisations in promoting and enhancing the effectiveness of these indicators is described in the guidelines by using different identified strategies. These strategies are used to show how CSOs can contribute to positive environmental change by using one (or various) of the suggested indicators. The applicability of an indicator in a specific field depends on different criteria such as sensitivity to policy, reliability, comparability and communicability. The description of the different indicators in this booklet shows that there is a great variety of environmental as well as social indicators, which are appropriate for CSOs to use to sup-

port their work on sustainable consumption and production. However, while some of these indicators are available for immediate use (for instance the Ecological Footprint), others lack applicability due to their technicality and less 'user-friendly' concepts. Such indicators can nevertheless assist the work of CSOs, provided that they are adapted to the users' needs. This is one of the aims of the Action Town project – to present available tools and improve them in close cooperation with potential users. The first step is to analyse the 'reasons for success' learned from already utilised indicators and to apply these lessons to indicators which have so far been used in a mainly scientific context. In doing this, the quality of scientifically well-elaborated indicators can be enhanced.

Many of the indicators described in this text focus on one specific aspect of consumption and production – particularly in the environmental context (for instance the Footprint family). On the one hand, such a focus provides a detailed picture of the specific matter of interest while on the other hand it excludes aspects which may be equally important and need to be taken into account by politicians for example. To overcome this limitation, SERI has proposed a comprehensive set of environmental indicators that is explained later in the text. Based on existing

ecological indicators, the environmental categories covered in the SERI set of indicators refer to global environmental issues such as resource scarcity (non-renewable and renewable), water scarcity, global warming, rising intensity of land use, deforestation and waste. The strategies covered in this booklet are valuable for CSOs in their communication of SCP issues to policy makers and to the public. Close cooperation between CSO representatives and the scientific community will increase the potential and application of such indicators.

1 • Introduction – objective and content of this booklet

This booklet "Measuring Performance towards SCP – Types of Indicators and Indicator Sets" has been published under the framework of the "Action Town – Research and Action for Sustainable Consumption and Production" project. The booklet is part of a series of three different guidelines on policy instruments, indicators and assessment tools for SCP. The guidelines were prepared by the Sustainable Consumption and Production (CSCP), the Sustainable Europe Research Institute (SERI) and

the Stockholm Environment Institute (SEI) respectively. By reviewing existing knowledge and latest research on SCP, these guidelines aim to provide a quick, hands-on overview of selected instruments, assessment tools and indicators. Each guideline shows examples of how CSOs can take effective action through implementation of the tools. Each guideline also contains links to the other booklets in order to illustrate their interrelatedness and to better capture "the big picture".

The concept of sustainable consumption and production is based on an holistic view of these systems and seeks out ways to reduce their environmental impact. It involves critically reviewing current lifestyles and exploring alternative modes of consumption.

The key approaches for achieving SCP can be summarised by:

- Consuming less (the total expenditure for consumption is reduced, eventually leading to less economic output)
- Making better consumption choices (the total level of consumption is not reduced, but lifestyle changes instigate changes in consumption patterns)
- Producing and consuming more efficiently (consumption patterns are essentially unchanged, but the products and services consumed are produced with technologies that reduce the amount of resource use and emissions per unit of consumption)

Sustainable living refers to a lifestyle that attempts to reduce the use of natural resources while retaining at least the same level of well-being and it can be achieved in many ways. The consumption sectors with the highest environmental impact are food, mobility and housing (see Action Town guidelines on public policy instruments for more information). These three areas are responsible for 70-80% of the environmental impact of private households in the EU-25.^{1,2} It is therefore imperative to develop effective SCP strategies targeting these areas.

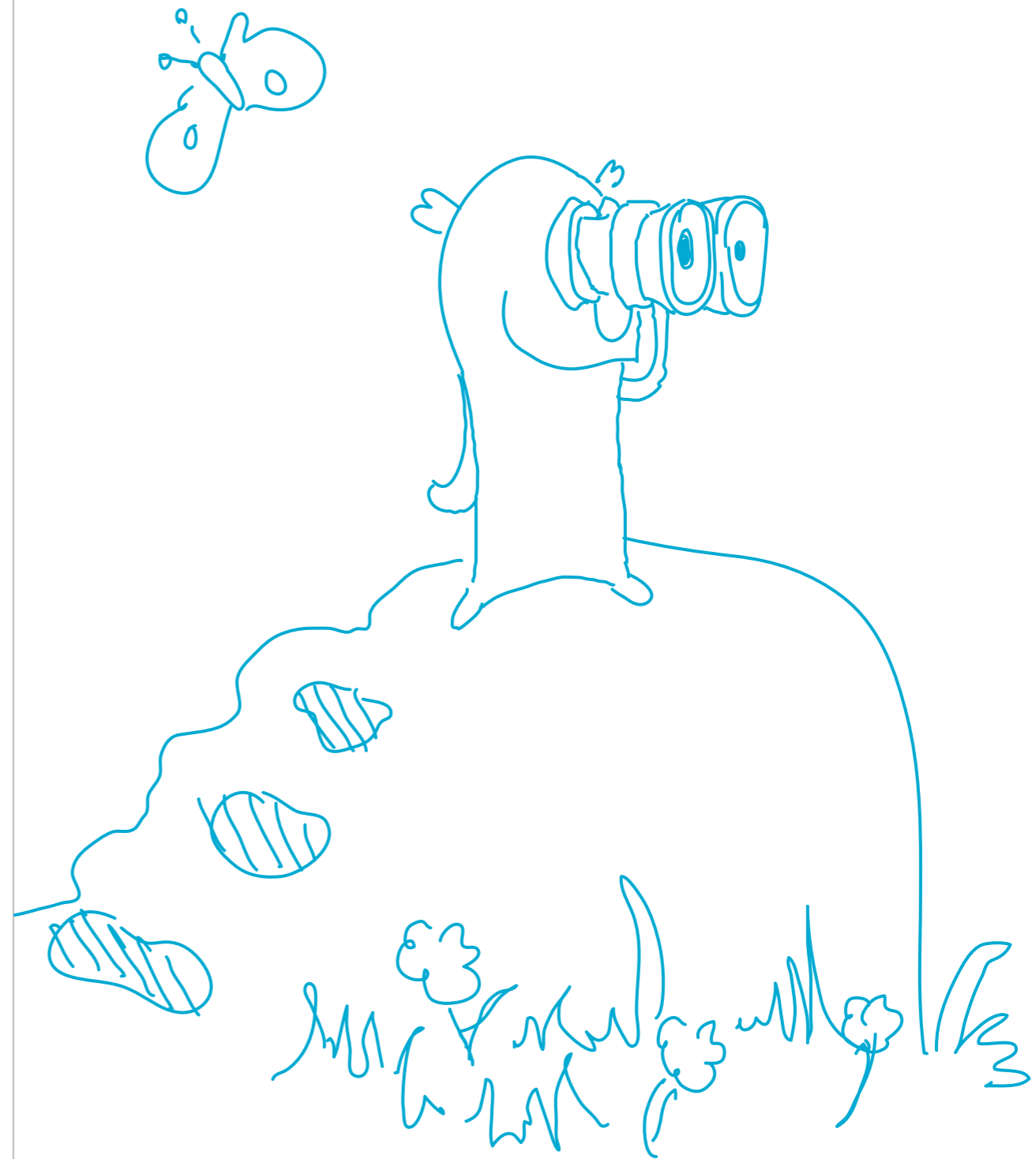
The first section of the present booklet describes the importance of measuring the environmental and social impact of production and consumption using reliable indicators. An overview of existing indicators is given and the different levels at which these indicators can be used are outlined. Following the initial introduction, the indicators that are identified for the use of CSOs in the field of sustainable production and consumption are described with illustrative examples and cases. The possible role of civil society organisations in promoting and enhancing the effectiveness of these indicators is discussed by using different strategies to show how CSOs can contribute to positive environmental change.



1.1 Core strategies of civil society organisations towards SCP:

SCP indicators – an overview

ACTION	Description	Example
Develop and publish challenging evidence	Identify and understand the issues of SCP, fill the knowledge gaps by conducting own research projects to develop and publish challenging evidence.	Finnish Association for Nature Conservation, FIN-MIPS Household project: (http://www.environment.fi/default.asp?contentid=194683&lan=en)
Undertake consumer focused campaigning	Run campaigns with a focus on consumers	Friends of the Earth campaign “Consume less, live more” http://www.foei.org/en/get-involved/livemore/
Lobby government	Lobby governments by playing an active role in political and research discussions, ideally to re-define or challenge the agenda (e.g. lobbying SCP National Action Plans, lobbying for new legislation, etc.).	EEB Blueprint paper for the EU SCP Action Plan: http://www.eeb.org/publication/general.html (May 2009)
Engage with communities	Engage at a grassroots level with community groups to achieve behaviour change and grow political pressure.	London 21, Mapping change for sustainable communities: http://www.london21.org/page/79/project/show/mcsc
Engage in business partnerships	Build CSO – business partnerships to create examples of best in class sustainability practices by business.	WWF Global Forest and Trade Network: http://gftn.panda.org/
Network and create coalitions	Network with other CSOs to create common opinions and get the message heard more effectively.	The Sustainable consumption network of Finnish NGOs has 20 member organisations and has already been active for more than 20 years. Website www.nukuusviikko.fi (in Finnish and Swedish)
Convene multi-stakeholder processes	Convene multi-stakeholder processes with a diverse group of stakeholders to create the space to develop, test and implement sustainable innovations.	The Finance lab of founded by WWF-UK: http://www.thefinancelab.org/index.html
Build alliances	Build political alliances with partners who share the same purpose and have aligned objectives in order to influence political or societal decision making processes for SCP.	Rainforest Alliance providing an eco-label: http://www.rainforest-alliance.org/



2.1 Why is measuring important?

Measuring sustainable consumption and production involves introducing environmental and social responsibility into the economic system. As described in this paper, measuring the environmental impacts of consumption and production processes is well underway – many indicators offering different approaches (e.g. MIPS, footprints, etc.) already exist. However, measuring the social dimension of consumption and production is not as well developed, as indicators are either (1) focusing

Global consumption of natural resources is increasing at an unprecedented pace, which is unsustainable from both an ecological and socio-economic standpoint. In order to make these interconnections clearer, it is of key importance that the real magnitude and distribution of worldwide resource use is quantified. Transformation towards a more sustainable

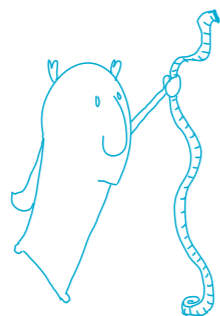
Using appropriate indicators to measure resource use and its environmental and economic impacts is also necessary for monitoring progress in relation to defined targets. Targets, in turn, can only be defined based on clear measurement systems and robust indicators. The EU traditionally sets binding targets in many policy areas; however, such targets often lack an analysis of resource use and resource productivity. To design appropriate policy responses that take these into account, various information is required. This includes, among

on societies as a whole and are not specifically linked to SCP (e.g. Human Development Index) or (2) focussing only on minimal standards (e.g. child labour). The latter can be compared with discussions from the 1970s, when emission and waste water standards were implemented in Europe's industries. In this way, it appears the debate regarding social indicators in the business sector is around 30 years behind the environmental debate but both dimensions need to be measured.

world will not be possible without reducing human demand on natural resources through enhanced resource productivity. Resource use is also closely linked to questions of distributive justice, an important issue, alongside labour standards and social development, in the social analysis of consumption and production.

other things, determining the main (economic and social) drivers for resource consumption; identifying the most resource intensive economic sectors; the contribution of different types of product consumption to overall environmental pressures; the quantification of potential increases in eco-efficiency and the costs involved, as well as the possibility of shifting environmental burden to other world regions through changes in international trade patterns.

In terms of quantifying resource consumption, the use of physical units of measurement is crucial given the numerous shortcomings, involved with using purely monetary approaches to measure the environmental consequences of human activities. Among others, these shortcomings include the fact that markets do not exist for many ecosystem services and that markets assume natural capital (such as ecosystems and resources) can be substituted by man-made capital (e.g. infrastruc-



ture, machines, etc.), which is not generally the case. As a response, alternative measurement systems have been developed, which use units of measurement other than money (these methods are also called “physical accounting” approaches). The most common units of meas-

urement for resource use are weight units (kilograms, tonnes), energy units (joules, watts), area units (square metres, hectares) and units which reflect the negative environmental impacts of resource use on human health (e.g. healthy life years).

As measurements revealed, in the past 20 years, Europe has achieved increased resource productivity (or eco-efficiency) in production and consumption processes. For each EURO, less and less energy and raw materials are required (this phenomenon is known as the ‘relative de-coupling’ of environmental pressures from economic growth). However, in many cases, increased efficiency has resulted in lower prices of products and services and in turn increased demand - a phenomenon known as the “rebound effect”. In the worst-case scenario, the related increase in production and consumption may more than offset the drop in demand from the original effi-

ciency gain. The above mentioned “rebound effect,” in addition to an increase in average income, has led to increasing environmental pressures related to the consumption of products and services in Europe. Measuring resource use is important for communicating the issues of environmental responsibility to the broad public and to emphasise that each European can make his or her personal contribution. High quality data relating to the environmental pressures of production are also the empirical basis for the implementation of comprehensive product labelling, which assists consumers in selecting the most environmentally-benign products.

But global consumption does not only impact environmental, but also social systems. Beginning in the 1950s, enormous wealth creation in the western world led to high living standards for many people while several unsustainable side effects arose. The increase of wealth was not distributed equally, both within and between societies and nations, resulting in an ever-widening gap between rich and poor. At the same time, the increase of subjective wellbeing did not keep pace with

the increase of wealth, meaning rich people did not get significantly happier above a certain threshold of material wealth. Global consumption is still increasing at an unprecedented pace. In order to ensure a sustainable future we need to redefine societal goals with a stronger focus on wellbeing and a broader understanding of quality of life. Increasing the use of social indicators in decision making will be necessary for achieving this.

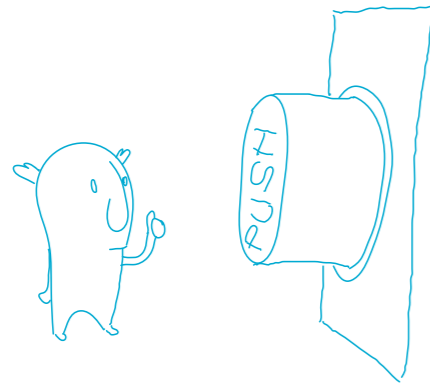
In summary - what gets measured matters!

Indicators create a sense of precision and attract interest, making them valuable tools to help CSOs achieve their targets regardless of the action area concerned. The following criteria have been identified for indicators that can be used by CSOs.

The indicator:

- offers depth of understanding
- can be related to policy
- is sensitive to policy
- is of high quality (grounded in theory, reliable)
- is valid, meaning it avoids relying on proxies
- is comparable across domains, between countries and population groups and over time
- is communicable
- provides an overall sense of direction³

2.2 Which SCP indicators are we talking about?



There are many indicators which can be applied in the field of sustainable consumption and production. However, their approaches are diverse and their applicability varies. The following figure shows a classification of the indicators taken into consideration in the ACTION TOWN project. As illustrated, indicators can be related to a specific topic, use a combined approach or be arranged as an indicator set. Each method has its advantages and disadvantages, which are discussed in the present guideline. The three boxes refer to both indicators measuring environmental aspects of consumption and production and indicator measuring social sustainability.

Single topic indicators	Combined approaches	Indicator sets
<ul style="list-style-type: none"> > Material TMR/TMC MIPS EMC > Area/land HANPP/LEAC > Others Carbon Footprint Water Footprint 	<ul style="list-style-type: none"> > Ecological Footprint > Happy Planet Index (HPI) > Environmental space > Sustainable Process Index (SPT) > National Accounts of Well-being > Standards based on ILO-convention > Copenhagen Psych. Questionnaire 	<ul style="list-style-type: none"> > SERI indicator set > Sustainability Performance Indicators (SPI) > Environmental Performance Indicators (EPI) > Genuine Progress Index (GPI)

2.3 Levels of SCP indicators

Over the past 15 to 20 years, there has been a rapid rise in the interest in quantitatively assessing the interconnections between society and nature. Research fields such as “industrial ecology” (an interdisciplinary field that focuses on the sustainable combination of environment, economy and technology) and “ecological economics” (a transdisciplinary field of academic research that aims to address the interdependence and co-evolution of human economies and natural ecosystems over time

and space) both placed the issue of natural resource use for production and consumption activities at the core of their research activities. Systems to quantify natural resource use within economic sectors and countries and national statistical systems were implemented in the EU. CSOs have contributed to the further development and application of such indicators – at the micro- (product), meso- (sector), and macro (national/regional) level.

At the macro level the impacts of total consumption, production and trade flows of a country are addressed. Key political questions that arise from this context include: How many greenhouse gas emissions are embedded in the resources a country produces, consumes, and trades? What is the carbon, water or ecological footprint of a country? What material flows are triggered worldwide by consumption in the European Union? What are the impacts, in situ as well as at a global level, of European and worldwide resource demand?⁴

At the meso level, individual sectors of an economy or aggregated product groups come into focus. Questions relate to industries with potentially high environmental impacts such as energy, steel making, agriculture or clothes manufacturing and ask how much environmental pressure is exerted by these sectors, especially through trade with other sectors or countries. International supply chains of large global corporations have been scrutinized for their fairness of payments and labour conditions and questions are increasingly asked about the environmental sustainability of supply chains spanning across a number of countries. Recent examples include clothes manufacturing for textile consumption in the Netherlands⁵ and agriculture for meat production in the UK⁶. Tourism is another consumption domain, alongside meat and clothing, that has a high impact on other countries or regions. and the demand for sustainable tourism is growing⁷.

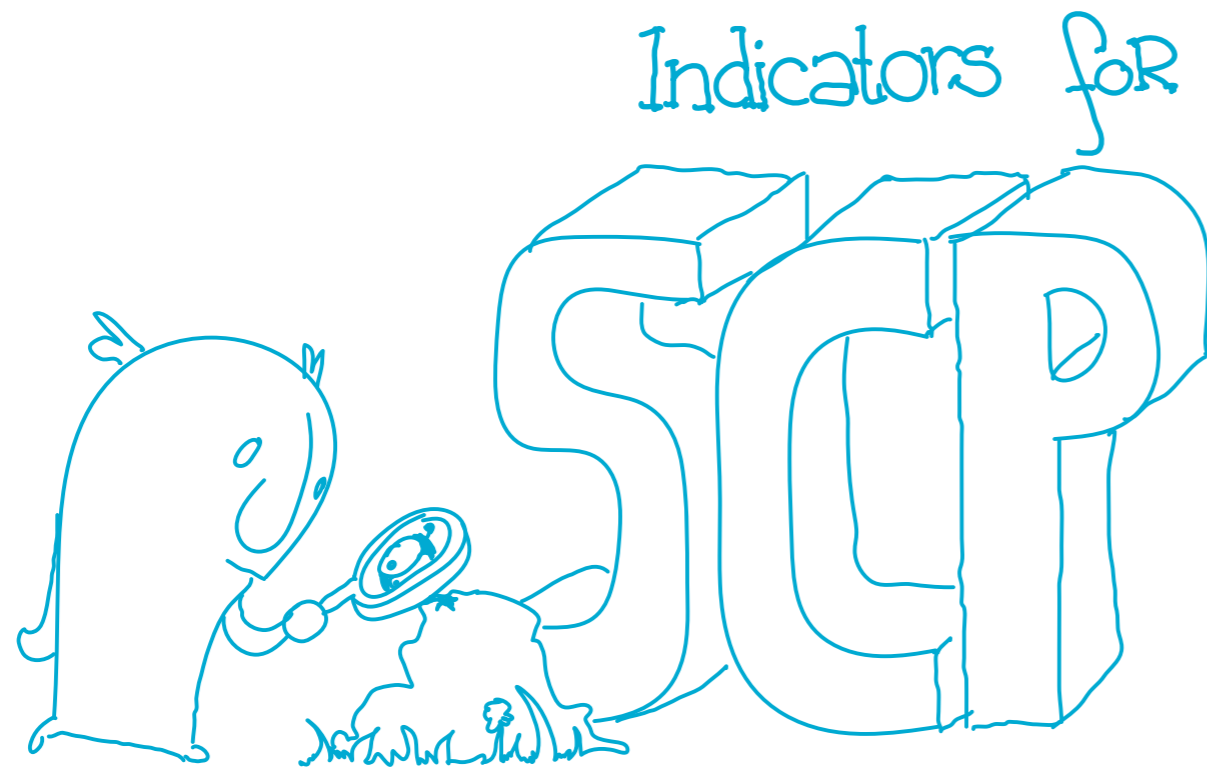
At the micro level attention is turned to individual products or product groups. The life cycle analysis (LCA) of a particular product requires the assessment of all relevant production processes, which due to globalisation, increasingly occur in foreign countries. Modern electronic products, for example, are assembled from parts originating in many countries and are delivered through multiple international supply chains. Tracing and quantifying environmental impacts associated with such complex multi-country processes is an incredibly challenging task for any indicator or methodology.⁸

A range of methodological approaches (and related indicators) exist that span across all economic levels⁹. The choice of method will depend on the policy or research question and the intended application of the results. However, currently there is not one single method that covers all three levels. At the macro and meso level, trade flows are analysed while products only appear on the micro level. While

the analysis of a single product requires a whole life cycle analysis, concepts related to product groups imply some form of aggregation. The development of an indicator applicable to all levels is a challenging task which is currently being worked on¹⁰.

3

Indicators for SCP



3.1 Single topic indicators

Relevant single topic indicators identified in the context of SCP are TMR/TMC, MIPS, EMC, HANPP/LEAC, the Carbon Footprint and the Water Footprint. These indicators will be de-

scribed in detail in the following pages. Each indicator (or set of indicators) will be analysed with regard to the following aspects:

- Definition, objectives and mode of operation
- Strengths and weaknesses
- How CSOs can use them to take action
- Case study

3.1.1 Material

TMR/TMC (Total material requirement/consumption)

Definition, objectives and mode of operation

TMC (Total Material Consumption) measures the total mass (in tonnes) of materials (fossil fuels, metals, minerals, and biomass) that are consumed by the domestic economic system. In comparison, TMR (Total Material Requirement) includes the primary materials which are used for the production of goods exported into other countries. TMC and TMR include the so-called “direct” flows which are used in the economic system as well as the “indirect” flows. The latter refers to materials which have been used along the whole production chain of imported products.

In addition, TMC and TMR comprise not only those raw materials that are extracted or (in

the case of agricultural products) harvested from the domestic environment and used in subsequent economic processing (e.g. fossil fuels, metals, biomass from agriculture, forestry, etc) but also those primary materials which are not further used in economic processing and hence are not valued economically (also called ‘domestic hidden flows’). This means that TMC and TMR account for both used and unused materials that have been required to produce a good which is domestically consumed or exported, often referred to as ‘ecological rucksacks’ of these products. The graph illustrates the relationship between TMC and TMR for the EU-15¹¹.

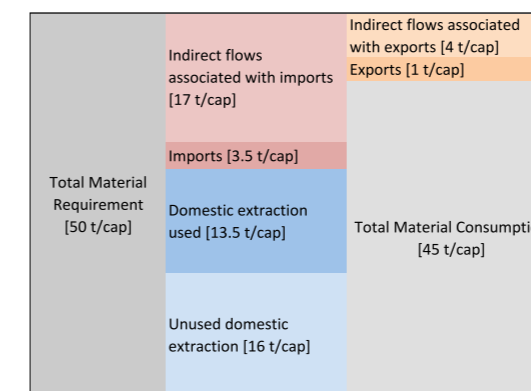


Figure: Resource use in European countries

(Source: Moll and Bringezu, 2005)¹¹

Two basic approaches can be used to calculate TMC and TMR: (a) economy-wide material flow accounting (EW-MFA)¹², or (b) input-output (IO) calculation (see the assessment tool guidelines for further information on MFA and IO). So far, TMC and TMR have been derived only via the EW-MFA approach (a). The underlying concept and framework is provided by Eurostat¹³ and recently also by OECD¹⁴.



Strengths

Uniqueness

TMC and TMR are the only indicators that account for the total consumption of global primary material resources within an economy. TMC indicates whether shifts of resource consumption to other economies have occurred. Such shifts could not be recognised through the direct indicator Domestic Material Consumption (DMC).

Identifying “Hot Spots”

As TMC and TMR can be calculated for an economy as a whole as well as for specific economic sectors, they allow for the identification of areas (or sectors) with the highest resource consumption (so-called “hot spots”) meaning that adequate (political) measures can be designed.

Weaknesses

Data availability and data quality

Particularly for indirect material flows associated with imports and exports. This is currently the main drawback of implementing TMC/TMR.

Lack of qualitative information

No qualitative information is taken into account. TMC and TMR do not provide any information on the environmental impact incurred by material extraction, transport, processing or deposition.



How you can take action:

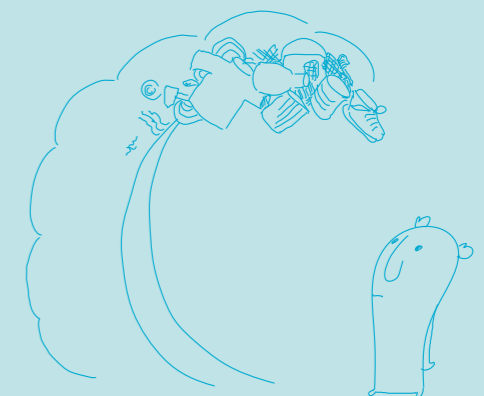
Our population and per-capita consumption of the planet’s natural resources are increasing rapidly. Despite how long this has been known and the fact that in the climate area there are signs of real policy responses, it is remarkable how little is happening in other areas. In terms of resource consumption, one of the major problems remains the lack of strong drivers for improvement. What is beginning to occur in the field of climate change (driven by measurements and emission targets) is yet to happen in the field of resource use. While climate benefits are now often assessed, resource use benefits (or costs) are not.

TMC and TMR data enable CSOs to realise what has been called for previously in the “Brundtland Report”, that “those making [...] policy decisions must be responsible for the impact of those decisions upon the environmental resource capital of their nations”. With regard to the strategies identified at the beginning of the guidelines, TMC and TMR help CSOs to quantify worldwide and national resource use and to directly address the issue of ecological limits. Indicators can be used at the consumer level – for instance to assist campaigning for a reduction of the personal use of natural resources – as well as at the national or European level. Here, TMR could be used to lobby for underlining the importance of a European approach to global resource use and setting a global example. If the EU measures its resource use and sets targets to reduce it, this will create a driver for better policies worldwide.

Case study:

“Tracking Europe’s Natural Resource Consumption”

This initiative, started in 2006 by academic and consulting institutions, measures material use by applying materialflow analysis (MFA) and TMR indicators and underscores the importance of standardising basic data on material flows at the national level. The initiative, led by the Sustainable Europe Research Institute (SERI), includes the Global Footprint Network, the Best Food Forward, the Wuppertal Institute for Climate, Environment, Energy and a number of other civil society organisations (see www.materialflow-consensus.net). Supporters of the initiative encourage government agencies to place materialflow analysis at the core of their natural resource use research and policy analysis, recognising its vital role in sustainability policy, research and communication. A robust and well documented statistical basis on material flows is essential for many core areas of sustainability science (e.g. carbon and greenhouse gas accounting, Ecological Footprinting, calculations of Environmental Space and assessments on the product level). Such a joint database for resource use indicator calculations should be as transparent and freely accessible as possible.



Learn more and get inspired:

- www.materialflow-consensus.net/
www.materialflows.net
- On DanWatch Eurostat – Environmental accounts: http://epp.eurostat.ec.europa.eu/portal/page/portal/environmental_accounts/introduction
- On DanWatch OECD MFA Guide: <http://www.oecd.org/dataoecd/46/48/40485853.pdf>



MIPS (Material Input per Service Unit)

Definition, objectives and mode of operation

Material Input per Service Unit (MIPS) is a method of calculating the natural resources used during the life cycle of a product or service and estimating its environmental impact. MIPS includes all materials that have been moved from their original place during the life-cycle (the so-called ‘ecological ruck-

sack’). MIPS is directly related to the assessment tool Life Cycle Assessment as described in the assessment tool guidelines. Five main types of material inputs are considered: biotic and abiotic resources, water consumption, air consumption and the movement of soil (all measured in tons moved in nature).

The five main objectives of the MIPS concept are:

- Aid in making decisions regarding material consumption
- Aid in the formulation of resource efficiency objectives
- Provide a measurement of resource efficiency
- Provide an indicator of sustainable production and consumption
- Enable stakeholders to evaluate the environmental impact of a product or service along its life cycle

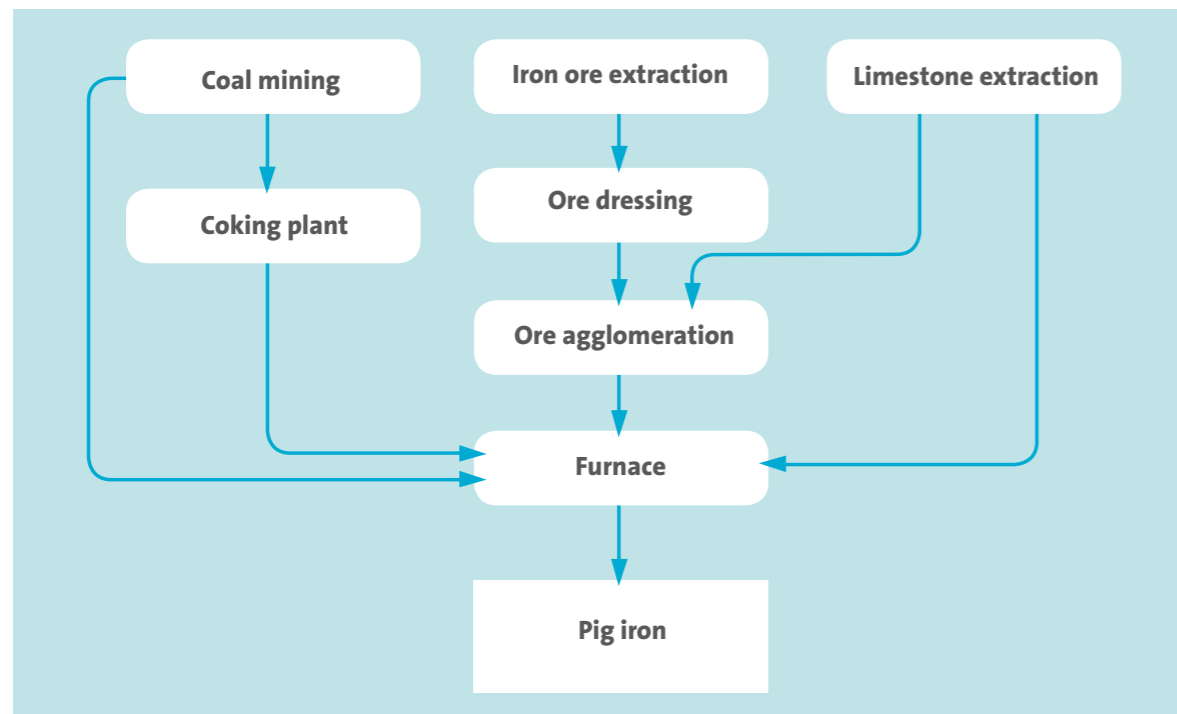


Figure: presentation of the pig iron process chain (Source: Ritthoff et al., 2002)¹⁵

Service units per unit of material input (the reciprocal calculation of MIPS) is a measure of resource efficiency, i.e. how much use can be obtained from a certain “amount of nature”. MIPS can be used to find ways of increasing resource efficiency and achieve more sustainable methods of production and consumption. There are two available options for reducing the material consumption per unit of service: reducing the material input of the product

(for example by using less energy or raw materials in the production phase), or increasing the amount of service units derived from a certain amount of material. For instance, the resource efficiency of a car can be increased either by decreasing the materials used for its production (decreasing material input) or by increasing the amount of passengers per car (increasing the amount of service units).

Strengths

Quantitative indicator

MIPS provides a quantitative assessment of the potential environmental impacts brought about by the use of a product or a service.

Enables comparison

MIPS can be used for comparing the environmental implications of products, processes and services.

Enables targeting

MIPS is a good target indicator to identify resource-conserving production methods.

Enables higher resource productivity

MIPS contributes to higher resource productivity throughout the entire life cycle of a product or at the overall economy level.

Enhances process innovations

Companies may use MIPS to identify potential for product and process innovations.

Weaknesses

No quality information

Focuses on quantity but not on the quality of materials, prohibiting a qualitative assessment of potential environmental impacts.

Effort of data collection

The calculation of MIPS of a specific product or service requires the collection of large amounts of data, which can be highly expensive and time-consuming for long life cycles.

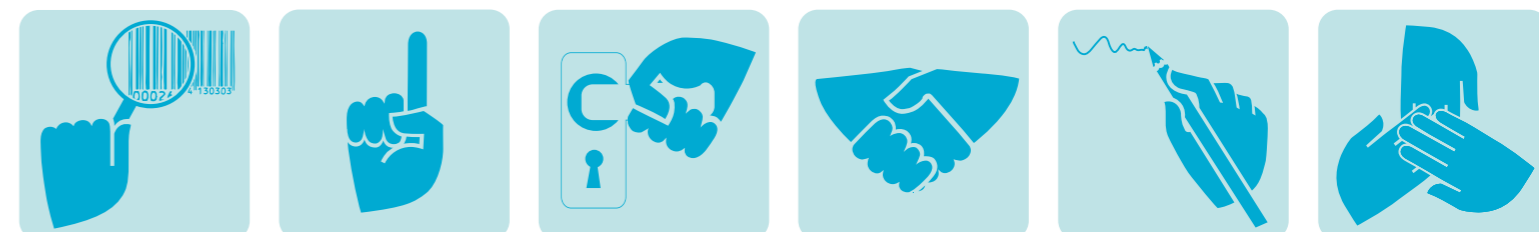
Lack of appropriate standards

to guarantee consistency and comparability of material flow accounts.

How you can take action:

Currently, most sustainable production efforts focus on the manufacturing phase of the value chain while the remaining stages of resource extraction, transportation, distribution, consumption and disposal or recycling receive comparatively less attention. CSOs can make use of the MIPS concept to highlight the importance of reducing material input throughout the value chain. Using the Material Input per Service Unit as a sustainability indicator of production and consumption allows companies to move from sporadic and ad-hoc management towards a more systematic approach in order to reduce their environmental impact.

With regard to the CSO strategies identified above, MIPS can serve as a tool for managing and promoting sustainability within policy making as well as in mainstreaming resource efficiency throughout supply chains. Furthermore, the indicator can be used to campaign for systematic assessments that lead to a reduction in the environmental impact of products and services and for increased cradle to grave resource efficiency. CSOs can take part in filling knowledge gaps by collecting data for MIPS and engaging in lifecycle discussions based on quantitative numbers. While the MIPS concept can be used for lobbying governments, it can also play an important role in networking with other CSOs, business and policy makers.



Case study:

SERI – ECR Austria

Currently, awareness surrounding material inputs of the services we consume is not high but issues of sustainability, environment and climate change have gained importance in the economic, public and political arenas. ECR Austria (Efficient Consumer Response) is a platform for producers and retailers aiming to optimise their value chains in order to satisfy customers' needs and is interested in addressing "sustainability".

Companies were unsure about the hot spots in their supply chains where sustainability could best be addressed. There was no coherent standard to compare the environmental impacts of different products.

SERI calculated the MIPS of different products and gave recommendations on how to improve resource efficiency along the supply chains.

The project raised awareness among companies about the environmental impacts of their products and helped them to identify hot spots for improved resource efficiency along their products' supply chains. Several suppliers have since expressed interest in improving resource efficiency. All partners expressed the need to establish an international database where data on resource intensity and other validated core indicators can be internationally harmonised, validated and periodically updated.



Case study:

FANC - Finland

The Finnish association for nature conservation (FANC) has used the MIPS method in a research and information dissemination project called FIN-MIPS household. The concept of the project was to calculate the ecological rucksacks of Finnish households using the MIPS method.²⁷ 27 voluntary households participated in the project, each one filling in a household survey for six weeks that covered the seven sectors of household consumption: mobility, tourism, food and drink, housing, household goods and appliances, and leisure time activities. Based on the household survey, the researchers calculated the ecological rucksacks of the households and formulated ways to

reduce resource consumption. A total of eight research reports were written on the project and the results were published and disseminated in many newspaper articles, poster exhibitions and two seminars. The main strength of the MIPS method was found to be its simplicity. It was possible to make extensive calculations with only a few researchers and a limited budget. The household participants were very interested to receive information regarding the impacts of their own lifestyles. The main critique was that MIPS measures material inputs instead of environmental impacts.

EMC (Environmentally Weighted Material Consumption)

Definition, objectives and mode of operation

EMC (Environmentally-weighted Material Consumption), as developed by van der Voet et al.¹⁶ ¹⁷ at CML in Leiden, is an indicator which aims to quantify the contribution of every considered material in relation to different environmental problems throughout its life cycle.

The methodology comprises three steps:

1. Establishing the total cradle-to-grave (from extraction to deposition) impact per kilogramme of each material
2. Establishing the number of kilograms of these materials being produced and/or used per year
3. Calculating impacts per material by multiplying the per-kilogram impact by the kilograms of every material produced and/or used.

EMC aims to combine the quantitative information on the resources used by an economy with the qualitative information concerning the environmental impact of a specific material. To achieve this, 13 different impact categories are identified, using an extensive LCA (Life Cycle Assessment) database, which contains more than 4000 industrial life cycle inventory (LCI) datasets of industrial, energy

generation, and waste treatment processes (from Ecoinvent). The 13 categories are then aggregated to create one indicator. The Figure below illustrates a product and at which stage MFA and LCA data is available. Note that the overall LCA approach is an assessment tool and as such is described in detail in the respective guidelines.

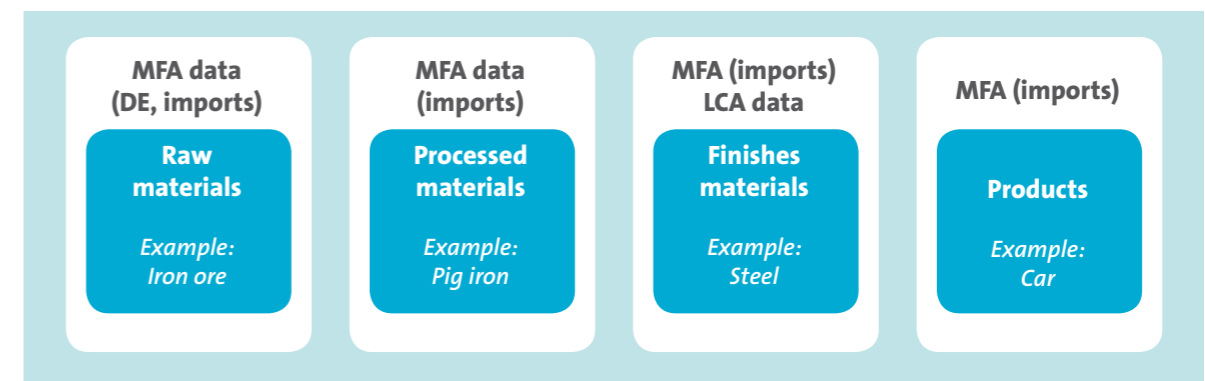


Figure: Production chain and data availability in MFA and LCA



Strengths

Consideration of qualitative aspects

EMC focuses not only on the weight of the consumed materials but also on the quality of the materials, e.g. human toxicity or ecotoxicity.

EMC is the first approach to combine quantity and quality of resource consumption

EMC is the first scientifically backed indicator to address the qualitative impact of resource consumption.

High potential for further development

Despite identified weaknesses, the EMC has high potential for further development – especially with the help of CSOs.

Weaknesses

Methodology of weighting

The impact of a certain material depends on the weighting chosen for the 13 different categories. Weighting all categories equally was considered controversial.

Difficulties in transforming MFA data into finished materials

This process is time-consuming and error-prone because data on material use along value chains are often incomplete and double counting cannot be excluded.

High degree of expert knowledge necessary

for using the databases (from ETH and Ecoinvent). The databases are only updated on a very irregular basis (approximately every eight years).

Uncertainties concerning data

Existing LCA data is not sufficiently comprehensive to establish time series and consist of geographical and temporal averages for Western Europe that do not consider country peculiarities.

Quality differences concerning data

Data quality differs between impact categories (e.g. global warming vs. toxicity). A stable scientific basis has been reached in some areas, while others are still insufficiently measured (e.g. resource depletion and land use).



Case study:

Dutch environmental policy of dematerialisation

The development of EMC was originally undertaken by CML, the Institute of Environmental Sciences, at Leiden University, to support the Dutch environmental policy of dematerialisation. Interpreting a public university as wider civil society, this initiative represents an effective use of this indicator as Dutch policy making has repeatedly referred to EMC results. Consequently, in 2007, the European Commission (DG Environment) funded an initial project, which evaluated different indicators of resource use and assessed each one's ability to illustrate the related negative environmental impacts.

The research team, including SERI, suggested a basket of four indicators to be further improved upon and integrated (all described in this chapter): Environmentally-weighted Material Consumption (EMC) and the Ecological Footprint to reflect the varying impacts of materials and products and the Human Appropriation of Net Primary Consumption (HANPP) and Land and Ecosystem Accounts (LEAC) to reflect the spatial impacts on land use, ecosystems and biodiversity¹⁸.

How you can take action:

As EMC provides detailed information regarding the different impacts of specific types of materials, CSOs can use EMC to highlight areas where action might be best focussed. For example, significant impacts can be expected from material sectors with a high ecological impact per unit weight or high levels of production. Endowed with this knowledge, CSOs can identify the main stakeholders in these 'critical areas' and develop specific strategies on how to address them. For CSOs, the EMC indicator is especially valuable for filling existing knowledge gaps, for instance by conducting research projects to gather cradle-to-grave data. It can also be used to campaign for the use of the cradle-to-grave approach when accounting for environmental impacts. Additionally, as the weighting of the different categories is yet to be decided, CSOs could use their voice to lobby governments and ensure their interests are represented.

Learn more and get inspired:

- On DanWatch www.materialflow-consensus.net/
www.materialflows.net
- On DanWatch Eurostat – Environmental accounts: http://epp.eurostat.ec.europa.eu/portal/page/portal/environmental_accounts/introduction
- On DanWatch OECD MFA Guide: <http://www.oecd.org/dataoecd/46/48/40485853.pdf>



3.1.2 Area/land

HANPP and LEAC

(Human Appropriation of Net Primary Production) (Land and Ecosystem Account)

Definition, objectives and mode of operation

HANPP (Human Appropriation of Net Primary Production (NPP)) is a measure of human use of ecosystems. It can be defined as the amount of biomass produced by the earth's ecosystems (not aquatic) required to derive food and fibre products consumed by humans. In comparison with the Ecological Footprint, which measures how much biocapacity a country utilises wherever it is located in the

world¹⁹, HANPP quantifies how much bioproductivity is appropriated in a specific territory. HANPP can thus illustrate the “depth” of the Footprint by tracking how intensively certain ecosystems are being harvested. It monitors the intensity of ecosystem and land use and establishes links to natural capital deterioration (e.g. soil erosion) and pressures on biodiversity.

This indicator draws attention to the risk that using biomass for energy production is likely to conflict with the increasing demand for biomass products to feed the steadily growing population. Apart from this more

recent competitor for biomass, HANPP primarily relates to the pressure applied by the ongoing conversion of valuable ecosystems (e.g. forests) to infrastructure, cropland or grazing land²⁰.

To complement HANPP it seems appropriate to use a database called **LEAC** (Land and Ecosystem Account), which aims to describe the geographical patterns of different land cover types across Europe, the manner in which they are changing over time and the types of processes that are driving these transformations. LEAC is being used to illustrate in detail which developments are driving land use changes. For example, in the past 15 years, urban land in Europe increased particularly due to land uptake by housing, services and

industrial/commercial sites. This increase was mainly triggered by the changes in the cost of arable land (almost 50%) and pastures (36%). LEAC allows for the analysis of the main socio-economic factors driving land cover change, in turn leading to changes in ecosystem functions and biodiversity loss. Using LEAC as a complement for HANPP is fitting as it links land cover change to socio-economic (sectoral) aspects of land use and can be used for monetary valuations of ecosystem services.

Learn more and get inspired:

HANPP Research Klagenfurt University:

<http://www.uni-klu.ac.at/socec/inhalt/1191.htm>

LEAC – European Environmental Agency:

<http://etc-lusi.eionet.europa.eu/LEAC>

DG Environment:

<http://ec.europa.eu/environment/natres/studies.htm>



Strengths

Qualitative indicator

HANPP and LEAC provide illustrative and spatially explicit information regarding human pressures on ecosystems, set an example, show commitment and leadership.

Enables alert

HANPP can serve as an early warning indicator for land degradation and pressure on biodiversity.

HANPP can be complemented with LEAC

LEAC links land cover change to socio-economic (sectoral) aspects of land use. This is valuable as it allows for monetary valuations of ecosystem services.

Serves as a decoupling indicator

HANPP is highly policy-relevant as it can assess policies aimed at decoupling economic growth from the intensity of ecosystem use by tracing increasing ecosystem exploitation through intensified agriculture and related loss of (forest) ecosystems.

Weaknesses

Lack of appropriate definitions

There is no stated definition of necessary benchmarks or sustainable levels of resource consumption.

Complexity

HANPP and LEAC are difficult to understand for people who are not overly familiar with the concept.

Lack of appropriate standards

Trade and trade-related demand on the biosphere are not considered at all.



How you can take action:

HANPP and LEAC can be valuable tools for CSOs to use within their strategies. Land-use change is being elevated on the political agenda, firstly due to the conflicts arising between agrofuel and food production and secondly due to the increasing deterioration of ecosystems brought about by human activities. The evidence provided by these two indicators could be used to **CAMPAIGN** for more consideration of qualitative changes made to natural areas and to highlight the high risk we are running by degrading our ecosystems and the services they provide. Additionally, the information provided would be valuable for engaging further in political discussions regarding land use planning at all levels (local, regional, global).



3.1.3 Others

CO₂ (Carbon Footprint, CF)

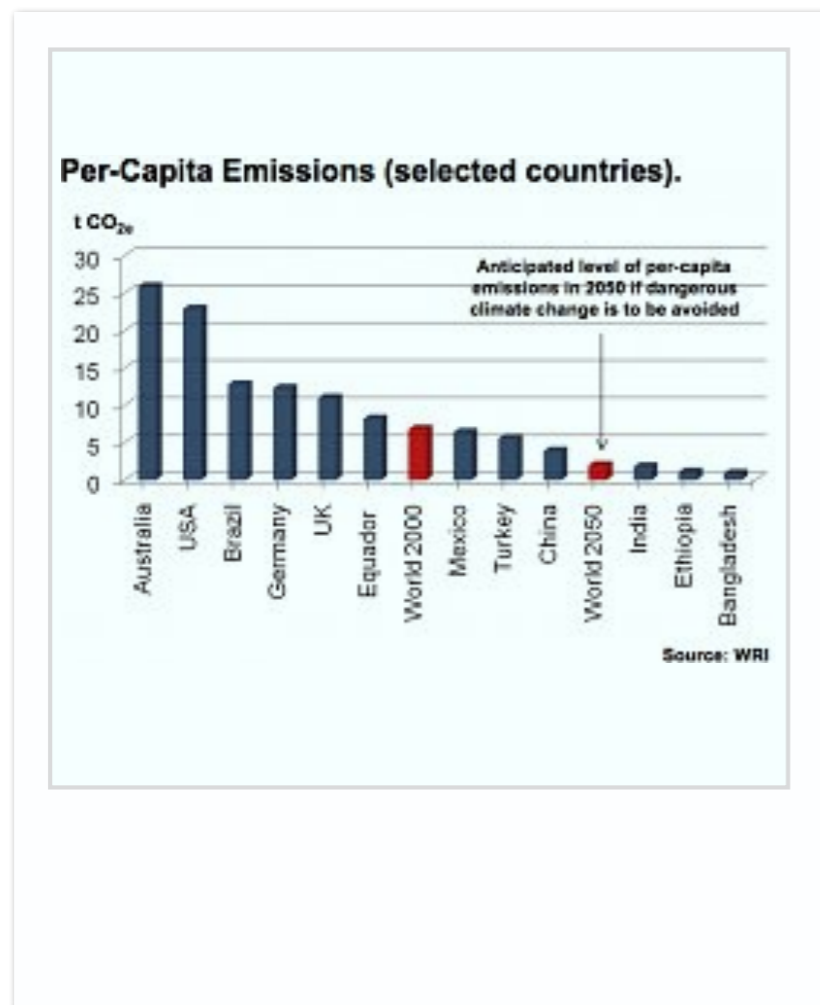
Definition, objectives and mode of operation

The Carbon Footprint (CF) provides quantitative information on the contribution that a product or service makes to climate change. The CF is defined as the overall amount of greenhouse gas emissions (GHG) - carbon dioxide (CO₂) and other GHG emissions (e.g. methane) - associated with a product or

service along its supply-chain²¹. The measurement unit is kilogram or gram of “CO₂- equivalent”, which enables the conversion of all GHG emissions into an aggregated value based on their Global Warming Potential (GWP) as defined in the Intergovernmental Panel on Climate Change (IPCC)²².

In contrast to the Kyoto National GHG Inventories, which measure only the emissions occurring at the production sites of a certain country, the objective of CF is to measure the greenhouse gas emissions along the global supply chain, enabling shared producer and consumer responsibility.²³ In this regard, the Footprint family is also related to an assessment tool called input-output (IO) analysis

(see respective guidelines). An IO-system filled with data of satisfactory quality would enable the calculation of the Footprint of at least an economic sector as a whole. The Carbon Footprint can help identify potential opportunities for reducing GHG emissions and improvements can be derived in close cooperation with the different agents along the supply chain.



The Carbon Footprint concept is currently being applied in a number of projects aiming to develop a new product labelling system informing the public about the climate impacts of consumption.²⁴ The concept has become very popular despite there being no common methodological standard yet available and different definitions and assessment methods in use. There is a great interest in harmonising the

Carbon Footprint assessment method given that different methodological approaches lead to different results. Companies want to compare the CF of their products to those of their competitors. The Carbon Footprint is also used as a communication tool so that consumers may be encouraged to consume in a climate friendly way. This means that CF data must be reliable and comparable.

The CF applies the lifecycle approach in accordance with the standards of the International Organization for Standardization in the ISO 14040/44, aiming for the inclusion of the whole product's life cycle in the analysis framework.²⁵ Based on the framework of ISO 14040/44, the British Standards (BSI) published the Publicly Available Standard (PAS 2050) in 2008, which was the first detailed methodological guide for the application of the Carbon Footprint. However, there is still demand for further international harmonisa-

tion. Thus, a working group ISO/TC207/SC7/WG2 “Carbon Footprints of Products” was established in 2008 by the International Organization for Standardization (ISO), which intends to publish results in 2011. Furthermore, the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI) are developing a “Product and Supply Chain Accounting and Reporting Standard” by means of an international stakeholder process, to be published in 2010.



Strengths

Quantitative indicator

The CF is the most prominent quantitative indicator of the direct and embodied climate impact of products or services.

Avoids CO²-Leakage

This approach avoids shifting the environmental burden to production sites in other countries, since it measures the greenhouse gas emissions along the global supply chain.

Enhance GHG emissions reduction

Measuring CF enables the identification of the most important emission sources along the product's life cycle so measures for reducing them can be adopted.

Encouraging climate friendly consumption

The labelling of CF informs consumers about the climate impact of their daily consumption decisions.

Shared consumer and producer responsibility

CF is a concept which applies to the responsibility of both producers and consumers to reduce GHG emissions in order to protect the climate.

Secondary data availability

The secondary data regarding embodied GHG emissions of production inputs are available in several LCA databases (such as Ecoinvent, GEMIS, ILCD etc).

Weaknesses

No quality information

The product's lifecycle is only partly addressed, depending on the definition of the functional unit.. No other qualitative information (such as organic production) is provided.

No information on other environmental categories

The CF does not consider any environmental categories other than GHG emissions and therefore cannot measure trade-offs between environmental categories, such as materials or water.

Lack of methodological standard

Methodological standards are still under development for CF at the product level.

Effort of data collection

Generating primary data on all emission-relevant inputs and processes along a global supply chain requires significant work.

Case study:

Carbon Footprint pilot project

Climate change is one of the most pressing, anthropogenic environmental issues of the 21st century, as stated in the IPCC assessment reports. The production and consumption of goods and services is a major cause of GHG emissions. In accordance with the Kyoto protocol, countries' GHG emissions are accounted for according to a territorial accounting approach. But to assess the global impacts of an environmental policy, international trade must

be considered. Furthermore, climate aware consumers need information on the GHG emissions of a product or service in order to make climate friendly purchasing decisions. Before 2007, some calculation methods for carbon footprints, climate inventories or product life cycle assessments with a focus on GHG emissions already existed but the results of such assessments were not communicated at the point of sale.

In 2007, the Carbon Trust, which was founded as an independent inspection authority by the British government, attracted attention with their Carbon Footprint pilot project, run in cooperation with the companies "Boots", "Walkers Crisps" and "Innocent Drinks". During this pilot study, the Carbon Footprint calculation method for products and services was developed and tested. The participating companies took it upon themselves

to reduce the measured GHG emissions in the following two years. The results of the Carbon Footprint calculation were communicated via the Carbon Trust Carbon Reduction Label. As the British retailer Tesco assessed and labelled its store brand products, there was considerable media coverage throughout Europe and the topic of climate change and its relation to our consumption behaviour gained awareness among both producers and consumers.

The definition of Carbon Footprint used by the Carbon Trust includes all GHG emissions produced from cradle-to-gate or cradle-to-grave. The experiences gained by the Carbon Trust were incorporated in the PAS 2050. The Carbon Trust built up a private database which allows for comparison between two products and benchmarking of product-groups. Since 2007 the Carbon Footprint of products

has become one of the most important and well-known product-level indicators to assess environmental sustainability. Carbon Trust now works with over 5000 companies all around the world and other national initiatives and companies have since followed the British example, with several different product-level carbon labels emerging throughout Europe.

How you can take action:

As is the case for the entire Footprint family, the Carbon Footprint's great value is its usefulness as an illustrative communication tool. Its use for **CAMPAIGNING** on climate change issues is indisputable. While the concept has already been developed and elaborated upon, CSOs can still contribute to further research and **FILL EXISTING KNOWLEDGE GAPS**. Given the size and visibility of the existing Carbon Footprint community (see the link to the Product Carbon Footprint – PCF – in Germany), value also lies in **NETWORKING** to create common opinions and get messages heard more effectively.

Learn more and get inspired:

- <http://www.carbontrust.co.uk>
- www.carbonfootprint.com
- Product Carbon Footprint: <http://www.pcf-projekt.de/main/news/?lang=en>
- WWF carbon and ecological footprint: <http://footprint.wwf.org.uk/>
- World Resources Institute: <http://www.safeclimate.net/>



Water (Water Footprint, WF; virtual water)

Definition, objectives and mode of operation

The Water Footprint (WF) illustrates the extent of water use related to human consumption. The Water Footprint of a country is defined as the volume of water needed for the production of the goods and services consumed by the inhabitants of that country²⁶. The concept of the Water Footprint is closely linked to the virtual water concept. ‘Virtual water’, introduced by Allan in the early 1990s²⁷, is defined as the total volume of water required in all production processes to produce a commodity or service (for instance, the water a plant needs to grow and produce fruits). The premise of the concept is that virtual water embedded in imported products becomes an alternative water source.

Thus, pressure on scarce domestic water resources could be relieved by increasing virtual water imports (associated with food imports). The WF concept highlights sectors of high water use, which serves as a starting point for political action. Moreover, different studies have revealed that many water scarce countries are acting against the economic principle of “comparative advantage” by exporting highly water intensive goods while importing goods requiring less water during their production. Consequently, instead of relieving pressure, water scarcity is exacerbated. The figure below illustrates the worldwide flows of ‘virtual water’ embedded in traded agricultural products.

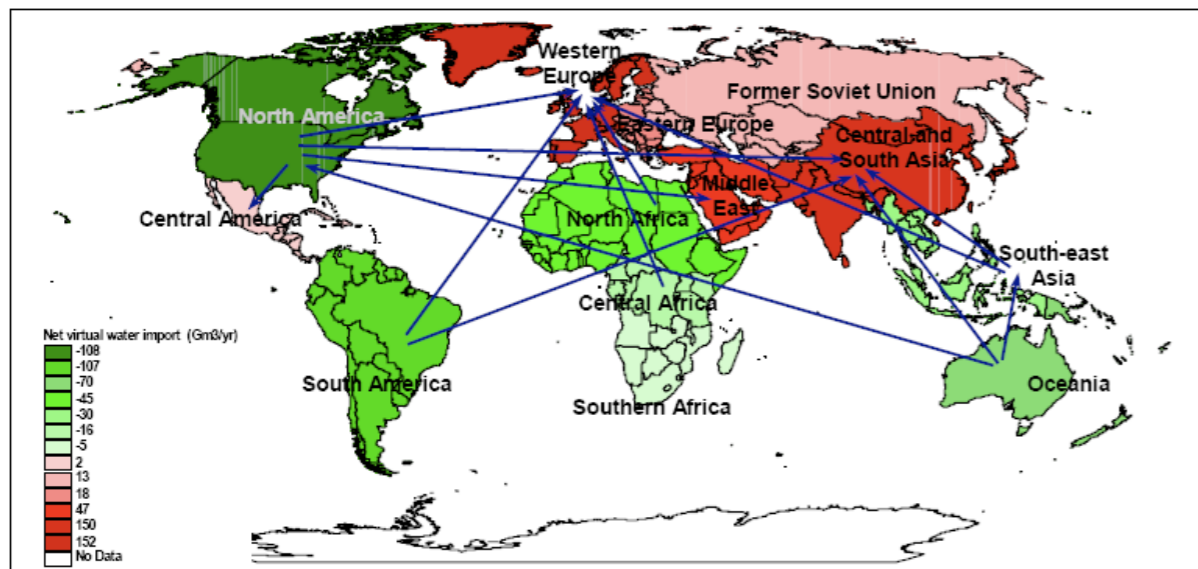


Figure: Regional virtual water balances and net interregional virtual water flows related to the trade in agricultural products. Period: 1997-2001. Only the biggest net flows (>10 Gm³/yr) are shown²⁸.

The WF concept is based on the biological water requirement of a specific plant. A crop’s water demand depends on the physiological properties of the species, the geographically specific climatic conditions and soil properties. The yield depends additionally on cultivation techniques and fertilizer application.

A crop’s water requirement is defined as the total water needed for evapotranspiration, from planting to harvesting for a given crop in a specific climate regime, when adequate soil water is maintained by rainfall and/or irrigation so that it does not limit plant growth and crop yield²⁹.



Strengths

Quantitative indicator

The WF is the most prominent quantitative indicator of water consumption. Despite methodological constrictions it is therefore valuable for quantifying the specific environmental pressure of water consumption.

Potential for combining qualitative and quantitative water data

in respective regimes at a European level. E.g. until now the Water Framework Directive focuses on qualitative rather than quantitative data. A combination of these two data sets would be a valuable task to undertake.

Continuous development

The WF concept is currently being further developed in order to enable the calculation of a more sector specific WF.

Solid data base enables comparison

The WF is based on a comprehensive database which enables the breakdown of water use according to different crop types. This in turn allows for direct comparisons between different countries.

Weaknesses

No quality information

Water quality is only partly addressed, as it is only represented indirectly by the inclusion of the amount of waste water produced. No information regarding pollution levels, or qualitative information such as the degree of pollution is given.

Lack of data for certain levels

For agriculture, the Water Footprint concept covers all levels: specific crop; agricultural sector; nation and the world. However, for the industrial and domestic sectors, only the sectoral, national and international levels are covered. This is due to the fact that detailed information on water use in industrial processes is scarce.

Conceptual drawbacks

By taking crop water requirements for actual crop water use, it is assumed that crop water requirements are fully met; this overestimates actual crop water use. Irrigation losses/drainage requirements are not counted, so water needed to grow crops is underestimated.



How you can take action:

A number of institutions have taken the initiative to establish a Water Footprint Network, to coordinate efforts to disseminate knowledge. The network brings together partners from diverse origins and aims to promote a transition towards the sustainable, fair and efficient use of fresh water resources worldwide. The Network provides a framework that can enable and motivate CSOs and other organisations to actively work in the area of sustainable water resource use. Similar to the Carbon Footprint, the Water Footprint stands out due its ability to simply communicate the issue of water consumption – especially when presented in relation to information on water availability or scarcity. In terms of CSO strategies, as the Water Footprint concept is still in its infancy there is high potential to conduct independent research projects in order to **FILL KNOWLEDGE GAPS**. Using information gained from such studies, CSOs can effectively **CAMPAIGN** on issues like water shortage and pollution. Through the existing **NETWORK**, CSOs can jointly develop the concept, build common opinions and get their voice heard more effectively. By means of **MULTI-STAKEHOLDER PROCESSES**, active **LOBBYING** of government bodies, international institutions, other CSOs, businesses and other organisations can be supported in implementing the WF and in developing sustainable and fair water policies.



Case study:

Water Footprints in Spain, South Africa and Austria

The WF concept was developed in 2002 by Arjen Hoekstra. Like the Ecological Footprint, interest in the concept by the research community and CSOs has been noticeable from the outset. However, being a relatively 'young' concept, its application has been mainly limited to scientific projects, calculating balances for certain products or for specific countries. Evidently, as the topic of drinking water supply,

water scarcity, growing of crops for foodstuff versus renewable energy sources and other water related issues are becoming more and more relevant, and discussed in public, the increased application of the WF concept by CSOs appears to be only a matter of time. This is especially due to the fact that the WF concept is able to clearly communicate the necessary messages.

Only recently has the WF concept been adopted by an EU member state: Spain is the first country to adopt the WF into government policy. The Spanish Water Directorate General, within the Ministry of the Environment and Rural and Marine Affairs, has approved a regulation that will include the analysis of the

Water Footprint as a technical criterion for the development of the EU River Basin Management Plans. EU Member States will be required to send these plans to the European Commission in 2009 and then every 6 years, according to the Water Framework Directive.

In 2009, SABMiller, a beer brewing company from South Africa, successfully applied the Water Footprint concept in a study carried out in collaboration with WWF-UK. In this study, the Water Footprint of the whole value chain of beer produced in the Czech Republic as well as in South Africa was calculated. The aim of the project was to get an insight into the quantity, efficiency and geographical context of water used to produce beer so as to enable better management of this resource throughout the brewing process. Both organisations have also used the Water Footprint

concept in other projects. SAB Ltd is working on the improvement of yields and water use in barley farming while WWF-UK is planning to use it for the protection of watersheds affected by crop production.

SERI used the virtual water concept for a study for Agrarmarkt Austria, an organisation promoting agricultural marketing. The aim of the study was to illustrate the intensity of environmental impacts of selected goods. Four different products were chosen; in each case the water rucksacks of the production abroad and in Austria were compared.



Learn more and get inspired:

- Footprint Network: www.waterfootprint.org
- WWF-UK / SABMiller project: http://ni.wwf.org.uk/what_we_do/press_centre/index.cfm?3257
- SERI-project: http://www.seri.at/index.php?option=com_content&task=view&id=494&Itemid=374

3.2 Combined approaches

Ecological Footprint (EF)

Definition, objectives and mode of operation

The Ecological Footprint has proven to be one of the most successful indicators for communicating the concept of environmental sustainability and the physical limits of our planet. The basic concept was developed by Mathis Wackernagel and William Rees in the early 1990s. The EF measures how much biologi-

cally productive land is required to provide the resources consumed, and absorb the wastes generated, by a population for a certain period of time (in most cases one year). It takes into account available technology, resource management conditions³⁰ and both land and water surfaces.

In order to calculate an EF, human consumption is divided into different categories (food, living, transport, etc.) and then converted into land use. The annual production of biologically provided resources, called biocapacity, is also measured as part of the EF concept. The resource and regeneration capacity of our planet can not be adequately calculated in monetary terms as climate stability and soil fertility for instance are not reflected in market prices.

Biophysical units, rather than money, are therefore used to measure the human consumption of materials, energy and land area. The standard unit of measurement used is a global hectare, which equates to one hectare of global average bioproductivity³¹. Humanity's Ecological Footprint can also be expressed in terms of the "number of planet Earths" theoretically required to support human resource use and waste generation.

Comparing Ecological Footprints with the real ecological capacity of the Earth allows assessments of whether, and by how much, humankind is overusing natural systems. If the EF of the residents within a region exceeds its biocapacity, the region is said to be in ecological deficit. Such a deficit at the global level is called ecological overshoot. In 2008 for instance, the so-called "World Overshoot Day"

was reached on October 6th. This date signified the point at which humankind's consumption of natural resources in 2008 matched those provided by ecosystems for the entire year. Consequently, from that day forward resources which could not be reproduced in the same year were used, leading to a reduction in the planet's biocapacity.

Strengths ^{32 33}

Easy to understand and communicate

The complex relationship between consumption and production across multiple types of resource use and at multiple scales can be demonstrated and communicated in an understandable way by a single number.

Enables comparison

The EF can be calculated and compared consistently at different levels (e.g. companies, cities, nations). Presently, it is the only resource-use indicator with global time series of comparative data for all countries.

High quality and consistency of calculation

The calculation method has been continuously advanced and the quality and consistency has improved as a strong stakeholder network has emerged.

High application in practice

Because of its numerous strengths, the EF has been applied by a large number of institutions from all continents for the evaluation of environmental impacts.

Weaknesses ^{32 33}

Not adequate as a stand-alone-indicator

The EF is a key measure for ecological sustainability but not an overarching sustainability indicator. It is crucial to consider it as one of a 'basket of indicators'.

High level of aggregation

The EF integrates different environmental categories such as the use of energy, land use and CO₂-emissions. The construction of such a highly aggregated indicator includes selection steps and calculation factors and a number of (highly criticised) assumptions that are often insufficiently transparent.

Methodological issues

Further improvements in data quality, methodologies and assumptions are required to generate an unbiased and reliable indicator.

How you can take action:

The Global Footprint Network, founded by the "inventor" of the Ecological Footprint, Mathis Wackernagel, in 2003, is an association of researchers and activists concerned with making the Ecological Footprint indicator popular as a measure for ecological sustainability, promoting its application and refining the method. The large network consists of more than 80 government, academic, corporate and CSO partners spanning six continents. Since 2003, it has made significant progress towards achieving its goals, namely by establishing the indicator as a basis for political decision-making. A key activity of the Global Footprint Network is the 'Ten in Ten Campaign,' which seeks to implement the Ecological Footprint at the national level in ten countries by 2015. To date, National Ecological Footprint Accounts have been calculated for more than 150 countries.

The Global Footprint Network has gone to great effort to establish long-lasting collaborations with CSOs and other organisations to collect data and improve data sources and the methodology of the Footprint concept. Partnerships with CSOs are essential in order to ensure a transparent and high-quality indicator. **TAKING PART IN SUCH RESEARCH DISCUSSIONS** is beneficial for CSOs as the further development of the EF can be modified to their specific needs. CSOs can use the Ecological Footprint to **MEASURE AND IMPROVE GLOBAL SUSTAINABILITY, RAISE AWARENESS** and **CAMPAIGN** for equitable global resource distribution. Many of the world's largest environmental organisations are already using the EF concept, including the European Environment Agency (EEA), the Finish Ministry of Environment, the nation of Wales, and large CSO's like NRG4SD (with 50 regional government participants), ICLEI (with 650 local government members worldwide), and WWF³⁴.

Case study:

The Living Planet Report

This report is published biannually by WWF and aims to document the continued disappearance of nature on our planet. It is the only existing report that draws comprehensive worldwide comparisons of countries' resource consumption. The first LPR devoted to the analysis of worldwide environmental developments was published in 1998. Since 2000, WWF has used not only the Living Planet Index but also the Ecological Footprint as a sustainability indicator. LPRs have been published in 2000, 2002, 2004, 2006, and 2008³⁵,

calculating the Footprint of all countries with more than 1 million inhabitants. Since 2004, the Global Footprint Network has served as an official partner of WWF. Using the Ecological Footprint developed by the Global Footprint Network, it is possible to analyse the Footprints of all world regions in a consistent and comparable way. This offers significant advantages for WWF in terms of communicating issues of global resource distribution and fairness³⁶ as highlighted in the figure below.

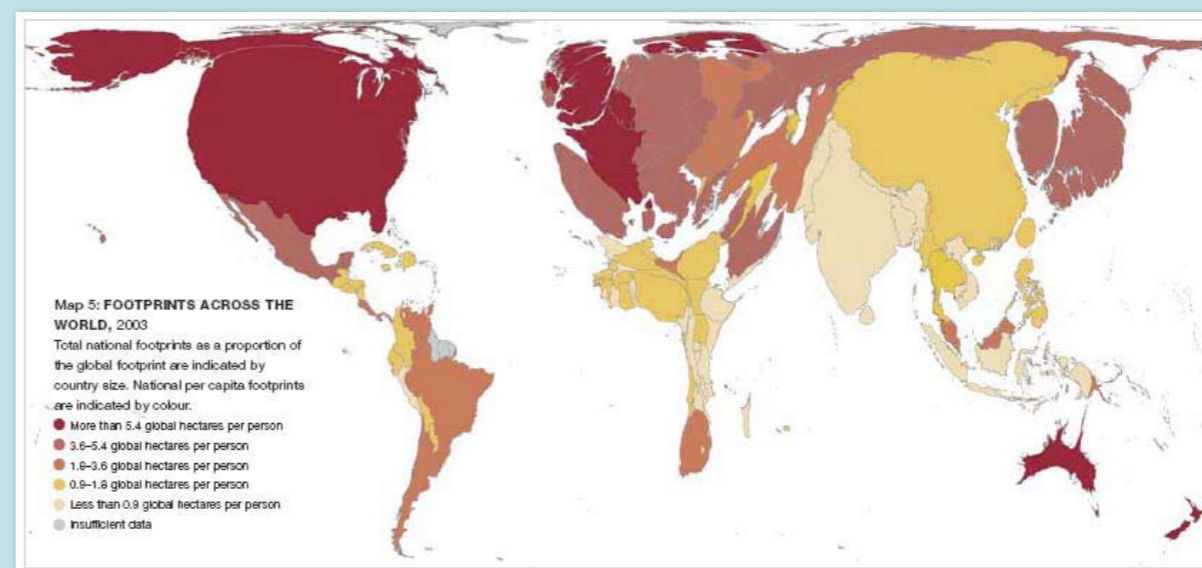


Figure: National Footprints as a proportion of the global Footprint³⁷



Happy Planet Index

Definition, objectives and mode of operation

The HPI was introduced in 2006 by the New Economics Foundation (nef), a London based think-tank. It is the first index created to combine human wellbeing and environmental impact. This indicator measures the ecological efficiency of achieving human wellbeing. In other words, it illustrates, country by country, to what extent people live long and happy lives within the Earth's environmental limits. The HPI incorporates three separate indicators: life satisfaction (a subjective indicator), life expectancy and ecological footprint per capita (two objective indicators). By multiplying life

satisfaction with life expectancy the "degree to which people live long and happily in a certain country at a given time"³⁸, also called Happy Life Years (HLY), can be calculated. HLY are seen as the ultimate end nation states should aspire to. The fundamental input comes from the stock of the planet's resources that sustain life and support all human activities. Conceptually, the HPI is therefore a measure of input-output efficiency – it indicates wellbeing produced per unit of resource consumption³⁹. The Figure illustrates this correlation.

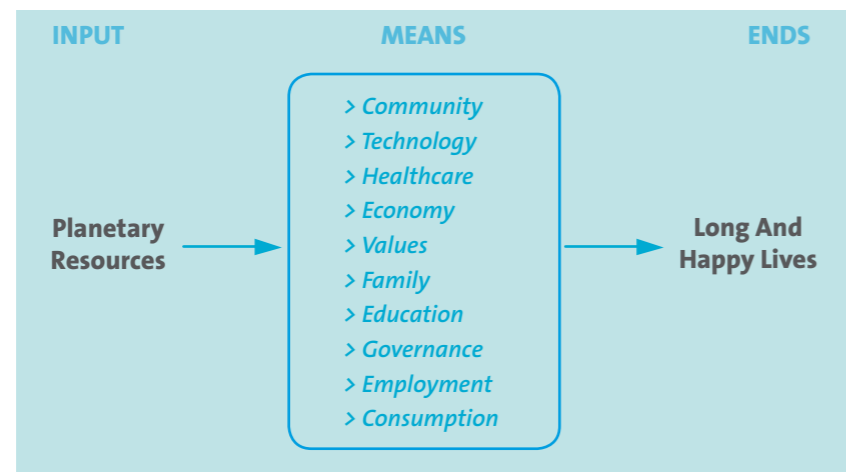


Figure: Fundamental inputs, means and ultimate ends. Source: Marks et al, 2006: 7.

The HPI is calculated as follows:

$$HPI = \frac{\text{Life satisfaction} \times \text{Life expectancy}}{\text{Ecological Footprint} + \alpha} \times \beta$$

Note: α and β are weighting factors

The first HPI report released in 2006 covered 178 countries across the globe. A second, in-depth report focusing exclusively on Europe was published in 2007⁴⁰ and a third one in June 2009⁴¹. On a scale from 0 to 100, nef set the global target for HPI at 83.5, based on

attainable levels of life expectancy and wellbeing and a reasonably sized ecological footprint. The highest average score was achieved in Central America while the G8 countries generally score badly in the index.



Strengths⁴²

Simple, easily understandable and innovative

The HPI combines wellbeing with environmental impacts. As the index is a mixture of subjective and objective criteria, it accounts for individual circumstances affecting people's wellbeing, while at the same time assessing countries' resource use.

Providing an alternative to GDP

Unlike focussing on ever-increasing GDP growth, HPI provides a roadmap to a sustainable and equitable future.

Enables comparability

The three indicators can be used for different countries.

Data availability

Data for life satisfaction, life expectancy and EF (partially) are available online.

Weaknesses⁴²

Measuring subjective aspects is difficult

'Happiness' and 'life satisfaction' are subjective and personal issues that are complex to measure.

Misunderstandings due of the title

as it implies an index that measures the pure happiness of nations. This is not the case: it is an index that shows the relative efficiency with which nations convert the planet's natural resources into long and meaningful lives for their citizens.

Data gaps remain

This is especially true in relation to the EF. In calculating the HPI, nef was forced to estimate data on the ecological footprint and life satisfaction for several countries.

Policy relevance

The policy relevance of targeting 'happiness' is debatable as the impact of political actions regarding happiness is complex and affected by many other factors.



How you can take action:

The HPI has much to offer in terms of addressing the success or failure of states to provide good lives for their citizens whilst respecting environmental limits. CSO interventions can emphasise the fact that HPI results show that high levels of resource consumption do not necessarily produce high levels of wellbeing (life-satisfaction), and that it is possible to attain very positive wellbeing scores without excessive resource consumption. Assessing HPI results can assist in moving towards a world in which both people's subjective wellbeing and the planet's wellbeing are met. On the contrary, the European analysis⁴³ shows that much of Europe is currently heading in the opposite direction. By addressing this problem in an easily understandable way, the HPI is an ideal tool for raising awareness. The high level of publicity the index already receives gives it an additional advantage. The first HPI report has been downloaded approximately one million times and has received extensive media coverage worldwide. Furthermore, the HPI has attracted political interest. In 2007, the UK's Conservative party referred to the HPI in their Quality of Life report and considered recommending it as a headline indicator for the UK government. Meanwhile, several local government authorities in the UK, as well as other regional and local agencies in Europe, have expressed interest in calculating city and regional level HPIs. CSOs can help to disseminate the HPI further, not only in the political arena but also in areas such as education both within schools and in local communities. With practical implementations such as these, CSOs can contribute to developing the index further.



Case study:

Friends of the Earth Galicia and Caerphilly Sustainability Index

Nef⁴⁴ describes the example of Friends of the Earth Galicia who received funds from the regional government to translate the HPI report into Galician and Spanish and to use it in education materials in schools all over Galicia. Unfortunately, details about this project are not available online and it was not possible to obtain further information from Friends of the Earth Galicia. Nef is unaware of any other CSO that has used the HPI. The index is common in conversation however, and may be used to emphasise certain messages more informally. The HPI has been used by the UK county borough Caerphilly in the Caerphilly Sustainable Development Strategy “Living Better, Using Less”. Together with nef, Caerphilly has devel-

oped a Caerphilly Sustainability Index inspired by the HPI to calculate how sustainable the borough is. It sets out a vision for a sustainable county borough where residents live longer, healthier, more fulfilled lives while consuming less resources so as not to compromise the quality of life of future generations or people living in other parts of the world. The average “Sustainability Score” for a resident within the county is 42.3 but the borough aims to increase that to 62.0 by 2030. By visiting www.caerphillysustainability.co.uk, people can complete a questionnaire and calculate their personal score on the Caerphilly Sustainability Index.

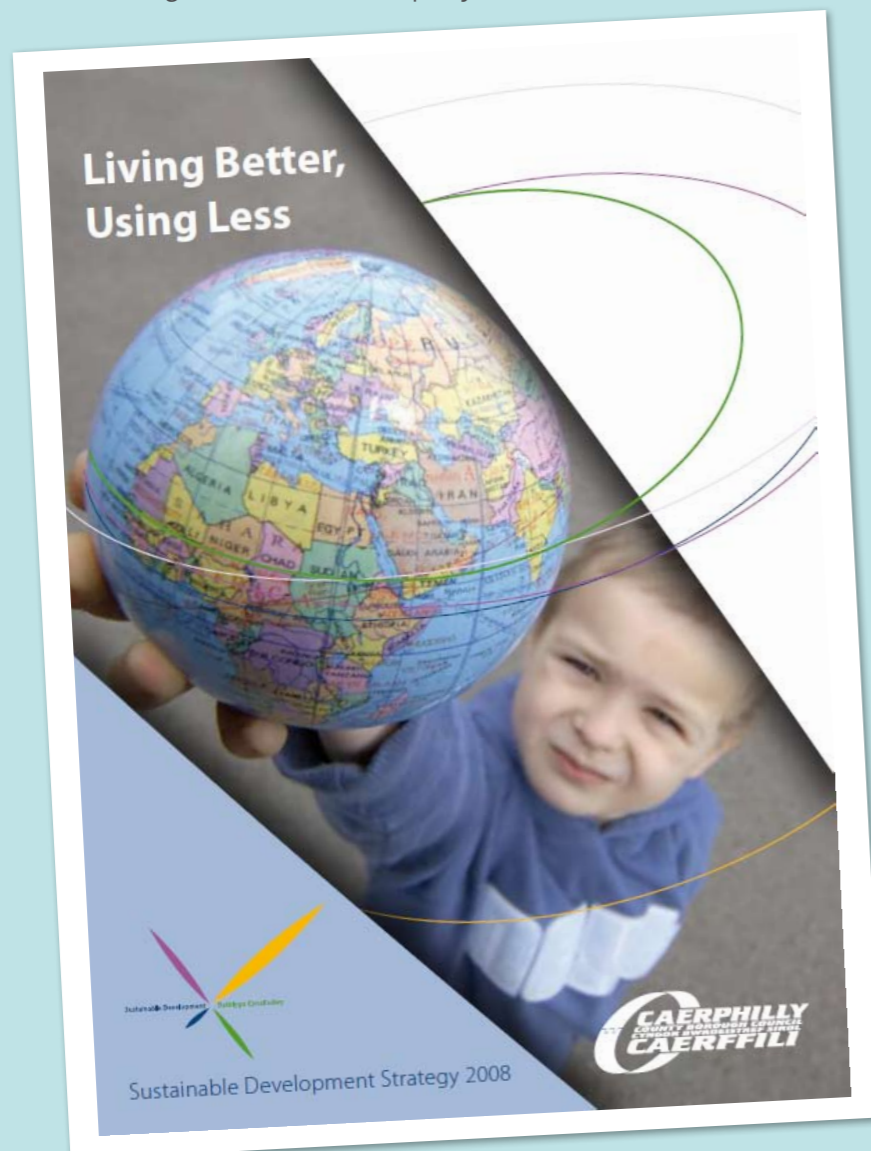


Figure: Frontpage of the Caerphilly Sustainable Development Strategy

Labels and standards based on conventions of the ILO

(International Labour Organisation)

Definition, objectives and mode of operation

Numerous enterprises and CSOs worldwide apply labels and standards based on the conventions of the International Labour Organisation – e.g. the Fair Trade label, the Ethical Trading Initiative, the SA8000 standard, the Global Reporting Initiative. These labels and standards focus on key issues such as child labour, compensation, discrimination, forced labour, working hours, health and safety, freedom of association and disciplinary practices. Most EU buyers’ social requirements, such as minimum working conditions, are also based on the conventions of international

labour standards of the International Labour Organisation (ILO).

ILO conventions and recommendations cover a broad range of 22 subjects including work, employment, social security, social policy and human rights. The international labour standards are made up of 188 conventions and 199 recommendations. Even though most ILO conventions are incorporated into institutional law in western democracies, there is a need to further promote ILO conventions within the globalised economy.

Strengths

High level agreements

The ILO-standards are backed up by international conventions.

Data availability

The required data is easily available and can be analysed in an uncomplicated way.

Support for policy-makers

The ILO has become actively involved in countries’ strategies for poverty reduction and works closely with Ministries of Labour and workers/employers representatives to influence work policies.

Intersection: gender and human rights

ILO capacity-building materials show how gender can be a major determinant of access to employment and the returns to labour, working conditions, benefits and security associated with it.

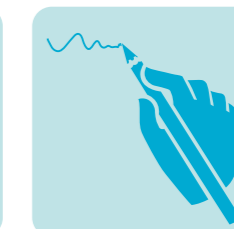
Weaknesses

Minimum requirements

The conventions only define minimal standards but not the overarching aims of society (wellbeing, etc.).

How you can take action:

Labels derived from ILO conventions reflect basic human rights standards and need to be monitored. As the ILO does not have sufficient monitoring capacity, the support of CSOs in **ASSESSING** companies’ adherence to ILO conventions is crucial. **CAMPAIGNS** can create **AWARENESS** regarding the implementation and respect of ILO standards and put pressure on national and international policy makers to incorporate them into policies. CSOs have an important role to play in improving and monitoring the standards and may also help in broadening? them - for example by promoting the idea of human wellbeing. To improve labour standards and ensure their quality, CSOs can build inclusive platforms involving politicians, unions, companies and other stakeholders. This can also provide good networking opportunities with scientific institutions and other CSOs.



Case study:

Ethical Trading Initiative (ETI)⁴⁵

The Ethical Trading Initiative (ETI) brings together CSOs, companies and unions to identify and promote best practice in the implementation of codes of conduct, including monitoring and independent verification. Companies such as Anchor Seafood, Body Shop, Chiquita, Levis, NEXT, Marks and Spencer, Safeway Stores, Brooke Bond Tea, Tetley Tea, and Twinings are members of the initiative.



The ETI has developed a multi-sectoral Base Code based on ILO standards. ETI member companies agree to adopt or incorporate the Base Code and must require that their suppliers meet the provisions of the Code within a reasonable timeframe. ETI members are currently participating in four pilot projects, testing various models of code verification. Further details of the initiative can be found at www.ethicaltrade.org.



Source: <http://www.ethicaltrade.org>

Learn more and get inspired:

- Ethical Trading Initiative: www.ethicaltrade.org
- List of ILO conventions: <http://www.ilo.org/ilolex/english/convdisp1.htm>
- Fairtrade Labelling Organizations International: <http://www.fairtrade.net/>

National Accounts of Wellbeing

Definition, objectives and mode of operation

The National Accounts of Wellbeing are a recent set of indicators, which promote the concept of wellbeing as a legitimate and useful aim of policy. They provide individuals, communities and organisations with the understanding and tools to redefine wealth in terms of wellbeing along with the belief that it is possible to live long and happy lives that do not cost the earth. The concept was developed by the New Economics Foundation (nef), founders of the Happy Planet Index (see above).

The report National Accounts of Wellbeing: bringing real wealth onto the balance sheet is probably the most comprehensive international analysis of wellbeing. The initial survey fieldwork was carried out across Europe and resulted in a cross-national dataset, released in autumn 2007. It contained detailed measures of the individual experiences of over 40,000 people surveyed in 22 European countries, measuring both personal and social wellbeing.

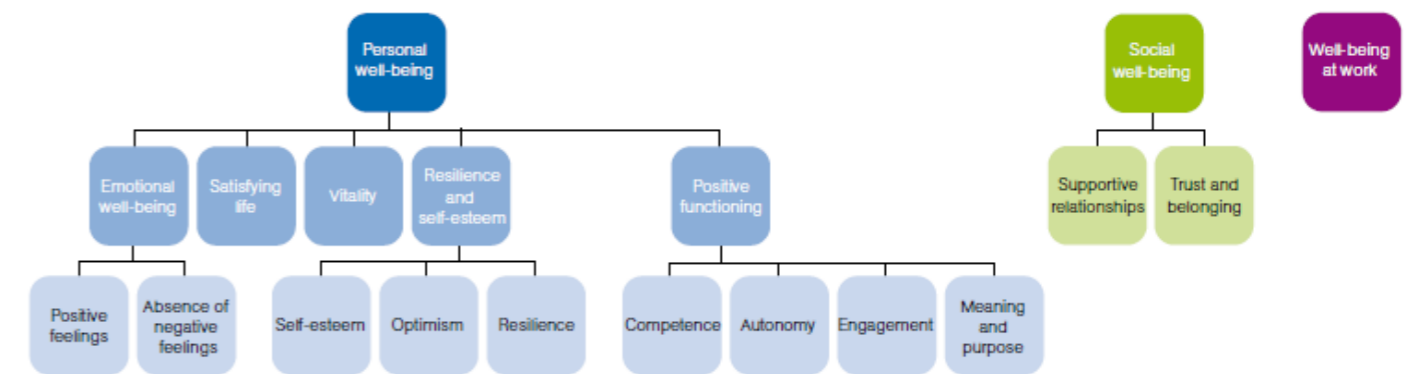


Figure: Indicator structure within the example national accounts framework (Source: nef, 2009)⁴⁶

Overall, wellbeing is assessed using two headline National Accounts of Wellbeing indicators: personal wellbeing (positive feelings, absence of negative feelings, satisfying life, vitality, resilience and self-esteem, positive functioning) and social wellbeing (supportive relationships, trust and belonging) – see figure below for details.

vitality, resilience and self-esteem, positive functioning) and social wellbeing (supportive relationships, trust and belonging) – see figure below for details.



Strengths⁴⁶

Integrated approach

The NAOw are a positive, holistic and integrated approach to reflect well-being. Economic indicators solely offer a very narrow view of human well-being.

A new way of assessing societal progress

By explicitly capturing how people feel and experience their lives, notions of national progress, success and what people value as a society can be redefined.

A cross-cutting and informative approach to policy-making

The NAOw provide policy-makers with a better chance of understanding the real impact of their decisions on people's lives.

Better engagement between national governments and the public

NAOw provide opportunities for governments to reconnect with citizens and to address the democratic deficit many European nations face.

Weaknesses⁴⁶

Lack of clear definition

A clear and precise definition of the indicator is still missing.

Rudimentary measurement

The measurement is not fully developed yet, it lacks consensus.

Loose linkage to SCP

The linkage between the National Accounts of Well-being and the concept of Sustainable Consumption and Production is rather loose.

Small explanatory power

It is good to know that someone is satisfied with his/her life, but the interesting question is why? What really causes someone to feel that life is going well or going badly?

Limited usefulness as a policy measure

Events leading to sustained rises or falls in life satisfaction (e.g. ill health, getting married or divorced) are distributed fairly evenly across the population.



Copenhagen Psychosocial Questionnaire (COPSOQ)

Definition, objectives and mode of operation

Copenhagen Psychosocial Questionnaire (COPSOQ) is a tool for assessing psychosocial working conditions, health and wellbeing. The tool can be used free of charge by all interested enterprises and organisations and is available in three versions: 1) a long version for research use (141 questions and 30 dimensions), 2) a medium length version for use by environmental professionals (95 questions and 26 dimensions), and 3) a short version to be used by workplaces (44 questions and 8 dimensions). The questionnaire was developed by the Psychosocial Department of the National Institute of Occupational Health, Copenhagen, Denmark. The COPSOQ aims to improve and

facilitate workplace evaluations making national and international comparisons possible. In many European countries, the COPSOQ concept has been applied successfully by a diverse range of enterprises, public services and CSOs. It is used to improve communication between researchers, environmental professionals and workplaces and to make workplaces more attractive, sustainable and viable.

This concept appears to have not yet resonated strongly within the field of sustainable consumption and production but shows significant promise in terms of going beyond minimal labour conditions towards a well-being based approach.

Case study:

Water Footprints in Spain, South Africa and Austria

There is no specific successful case documented yet in the field of SCP but several interesting surveys have been published. Recently, the city of Stuttgart conducted a survey to assess the psychosocial stresses and strains in the city's administration. All employees throughout all departments were interviewed. <http://www.stuttgart.de/item/show/273273/1/9/360983>

Learn more and get inspired:

- COPSOQ: <http://www.copsoq.de/>
- Stuttgart survey: <http://www.stuttgart.de/item/show/273273/1/9/360983>

How you can take action:

The National Accounts of Wellbeing are ideal for CSOs to use in **CAMPAIGNING** for the incorporation of wellbeing into policy processes. Encouraging politicians to develop measures to increase the wellbeing of all citizens will signify a fundamental step in advancing the SCP agenda. By engaging in nef's work, CSOs can take part in further developing the National Accounts of Wellbeing.



3.3 Indicator sets

SERI set of indicators

Definition, objectives and mode of operation

The SERI indicator set can be used to measure the amount of resources used and greenhouse gases (GHG) emitted throughout a product's⁴⁷ entire life-cycle⁴⁸. It consists of a well-selected set of ecological indicators intended to measure the use of renewable and non-renewable materials, water, land area and air⁴⁹. The overuse of these resources is strongly

correlated to global environmental problems such as resource scarcity, water scarcity, global warming, rising intensity of land use, deforestation and waste. The indicators selected by SERI include the input indicators - Biotic and Abiotic Material Rucksacks, the Water Footprint, and the actual land use, as well as the output indicator - the Carbon Footprint.



Figure: Environmental categories and the SERI indicator set (Source: Burger et al., 2009)

The SERI set of indicators provides information on GHG emissions and enables the measurement of a product's resource efficiency. In this way, it helps to highlight potential areas for improving efficiency and thus contributes to a total reduction in global resource use and related negative environmental effects. Trade-offs between different environmental concerns can be uncovered and analysed

using the SERI set of indicators. For example; a reduction of GHG emissions brought about by the use of biofuels may increase biotic material input, cause land use change and lead to a higher water footprint. Even though the SERI indicator set has been developed for the assessment of products, it can also be applied to companies and at the national level (see Table).

Resources use category	Product level	National level
MATERIALS > biotic > abiotic	Material Rucksack > biotic of products > abiotic	Material flow-based indicators of countries (including materials embodied in imports and exports) > biotic > abiotic
WATER	Water Rucksack / Water Footprint of products	Water Rucksack / Water Footprint of countries (including water embodied in imports and exports)
LAND AREA	Actual land use of products	Actual land use of countries (including land embodied in imports and exports)
GHG EMISSIONS	Carbon Footprint of products	National GHG emissions (including GHG emissions embodied in imports and exports)

Table: SERI's selected indicator set at the product and national level⁵⁰

Strengths

Usability

The questionnaire offers a generic usability across multiple professions and industries.

Combination of data

The COPSQ combines subjective and objective data.

Reliability of data

The data reliability is very high due to a standardisation of the surveys.

Data collection objectivity

The COPSQ is a standardised self administered survey instrument. Therefore, interviewer bias is not relevant.

Analysis procedure objectivity

The analysis procedure (scale construction, calculation of scale values) is given by the test author and cannot be altered.

Weaknesses

Time and resource use

Even the short version of the survey requires significant time and resources.

No comparison at the national level

The COPSQ is strongly focused at the level of enterprises but there is no comparison at the national level.

Content validity

Proving content validity is a task that cannot be achieved solely by statistical methods, more important is to ensure a complete coverage of the aspects of interest in the planning of the study.

How you can take action:

The Copenhagen Psychosocial Questionnaire can be used by CSOs to **ASSESS** the psychosocial indicators in their own organisation. CSOs can support or initiate campaigns that encourage the inclusion of the COPSQ into the management practices of enterprises and advocate that stakeholders of the SCP community use this tool. CSOs can also **TAKE PART** in further investigating best practice examples of the psychosocial questionnaire in use. Finally, the COPSQ provides opportunities to **NETWORK** with scientific institutions and other CSOs.



Strengths

Comprehensive environmental indicator

The indicator set covers renewable and non-renewable materials, water, land area and air as well as greenhouse gas (GHG) emissions.

Quantitative indicator

The SERI indicator set enables a quantitative assessment of the potential environmental impacts brought about by the land and resource use required for a product as well as by the GHG emissions produced.

Enables comparison

The SERI indicator set can be used to compare the environmental implications of various products and can measure possible trade-offs between resource concerns.

Enables targeting

The SERI indicator set enables the identification of measures to reduce resource use and GHG emissions.

Enables higher resource productivity

The SERI indicator set contributes towards enhanced resource productivity along the entire lifecycle of a product or within a company or country.

Weaknesses

No quality information

A focus on the quantity rather than quality of materials does not allow for qualitative assessments of potential environmental impacts to be made.

Lack of appropriate standards

Standards to guarantee consistency and comparability between the different indicators involved are missing. ISO 14040/44 is used as a methodological framework.

Lack of data for certain levels

To ensure the level of required data collection is reasonable, only primary data related to direct resource use are gathered. Data related to embodied resource use and GHG emissions are taken from a database.

How you can take action:

As the SERI indicator set provides detailed information on human pressures on the environment brought about by water use, land use, use of natural resources, and CO₂-emissions, it can be used to give a snapshot of the overall environmental effects of a product or company. In this context, CSOs can use their **CAMPAIGNING** experiences to motivate companies to measure their environmental effects based on a lifecycle approach and in a comprehensive way. Furthermore, the set can be used for **RAISING CONSUMER AND POLICYMAKER AWARENESS AND TO FOSTER PRODUCER-CONSUMER RESPONSIBILITY** in developed and developing countries. It can help to demonstrate that consumers are at least partly responsible for the resource use and greenhouse gases emissions in producing countries around the world. This comprehensive indicator set is particularly useful for highlighting and measuring shifts in environmental burden, such as a reduction in greenhouse gas emissions through the use of agro-fuels increasing the pressure on land use.

Case study:

SPAR Pilot Study – improving resource-efficiency and reducing greenhouse-gas emissions of a retailer

Since 2007, more and more European retailers, such as Tesco, Wal-Mart and Casino, have taken steps towards increased environmental and social sustainability. Progress towards sustainability has included the development of sustainability strategies, the measuring of status

quo and the setting of objectives. Since the core of retailer business is buying and selling products, a retailer's responsibility must cover the products' entire supply chains and thus extend beyond their immediate boundary.

The priority given to the three pillars of sustainability and the systems developed to measure each of them are not in balance. The economic system has the most advanced measurement system in place – accounting and controlling systems are perfectly implemented in companies. The social pillar of sustainability is often represented by a list of social responsibility activities or qualitative measures while the environmental pillar of sustainability is often not quantified or measured only in an output-oriented way. Some pi-

oneering companies, such as Tesco and Casino, measure the greenhouse gas emissions of products along the supply chain but a more comprehensive indicator set, oriented towards resource efficiency, such as the SERI indicator set, has not yet been applied by any retailer. The availability and quality of data is one of the main problems associated with measuring sustainability. Uncertainties remain regarding data availability and data quality in terms of both primary data (from the company) and secondary data (from data base or literature).

In Austria, the trading company SPAR has integrated environmental protection into company principles and aims to become the most sustainable retailer in Austria. SPAR's management wanted to quantify the environmental pillar in a more comprehensive way than simply focusing on the Carbon Footprint. Consequently, they conducted a pilot study in 2008-2009 in which SERI applied its

indicator set to measure and improve the resource efficiency and sustainability performance throughout the several divisions of SPAR Austria. Following the results of the status quo analyses, measures to improve resource efficiency were identified in the fields of store brands, fresh meat / cold cuts, logistics and construction / energy.

Learn more and get inspired:

- SERI ECR project: www.seri.at/ECR
- ECR Austria working groups: <http://www.ecr-austria.at/index.php?module=ContentExpress&func=print&ceid=109&mid=188>



Sustainability Performance Indicators, SPI

Definition, objectives and mode of operation

A Sustainability Performance Indicator (SPI) can be used to condense the large amount of environmental, economic and social information that many companies obtain down into a small number of key indicators. SPIs can be grouped according to the economic, social and

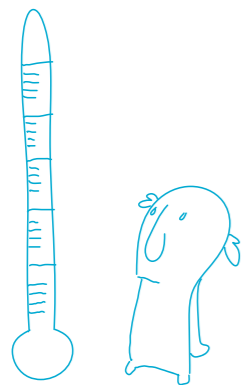
environmental dimensions of sustainability (the latter will be dealt with separately) and can be used by companies to measure their sustainability performance and guide decisions regarding further progress.

Economic performance indicators encompass all aspects of an organisation's economic interactions and focus on how the economic status of the stakeholders changes as a consequence of the organisation's activities. Examples of these types of indicators include

company turnover, profit, and the amount of products sold can be used. Economic accounting and reporting is well established and the data required for using economic performance indicators can be retrieved from a company's financial department.

Social performance indicators are concerned with an organisation's impact on the social systems it operates within. These would include labour practices, human rights and broader issues affecting consumers, the com-

munity and other stakeholders in society. Data for calculating social performance indicators may be retrieved from, among others sources, human resource and safety and occupational health departments.



Strengths

Economic performance indicators can be calculated from readily available information
This facilitates easy data collection.

Weaknesses

Economic performance indicators provide an incomplete picture of sustainability

Only distinct aspects of company performance are measured, potentially presenting an incomplete picture of sustainability. These need to be interconnected with other (social and environmental) dimensions.

Social performance indicators: lack of common definitions and measuring standards

It may be difficult to make comparisons between companies given the large number of different social performance measurements.

Social performance indicators: data validity

Problems with data validity are caused by insufficient independent monitoring.



How you can take action:

Sustainability performance indicators can help in **MONITORING** the overall activities of a company. Assessing the data these indicators yield over time can reveal to what extent the company's economic and social performance is sustainable. SPIs can also be used to assess the sustainability of CSOs themselves. Given that many small and medium sized enterprises lack the **AWARENESS**, time and resources required to implement sustainability performance measurements, CSOs could provide support and **GUIDANCE** on their usage. SPIs are also an effective tool for **CAMPAIGNING** and can be used by CSOs as the basis from which to encourage companies to improve their policies. CSOs are in a strong position to **GET INVOLVED WITH POLITICAL DEVELOPMENTS** by lobbying for laws and regulations that call for coherent indicators and reporting standards. Monitoring using SPIs provides an additional channel for **NETWORKING** with businesses and other CSOs.



Case study:

The Global Reporting Initiative

One of the most successful applications of a SPI is the Global Reporting Initiative (GRI), which pioneered the world's most widely used sustainability reporting framework. The GRI framework sets out the principles and indicators that organisations can use to measure and report their economic, environmental, and social performance. Started in 1997 by the non-profit CERES, the GRI quickly gained both support, from international organisations such as UNEP and Gesellschaft für Technische Zusammenarbeit (GTZ), and acceptance from companies around the world.



The number of organisations which have released sustainability reports based on these freely available guidelines has increased from 20 in 1999 to over 850 in 2006. Sustainability reports based on the GRI framework can be used to benchmark organisational performance with respect to laws, norms, codes, performance standards and voluntary initiatives; demonstrate organisational commitment to sustainable development; and compare organisational performance over time.

Learn more and get inspired:

- Global Reporting Initiative: <http://www.globalreporting.org/Home>
- World Business Council for Sustainable Development (WBCSD): <http://www.wbcsd.org>

Environmental Performance Indicators, EPI

Definition, objectives and mode of operation

Environmental Performance Indicators (EPI) measure an organisation's impact on living and non-living natural systems, including ecosystems, land, air and water. Some of the most commonly used measures are greenhouse gas emissions, water consumption and waste output. EPIs help to identify a company's most significant environmental impacts and by publishing special environmental reports, can be used to clarify and communicate a company's progress towards achieving its environmental goals. The main criteria used for selecting

appropriate indicators are environmental relevance, international comparability, and applicability of the information provided by the indicator. Data types commonly used include absolute data, trend data (e.g. total waste to landfill over the past ten years), and normalized data, the latter of which reveals the relationships between different measurements by relating two absolute measurements to each other (for example the proportion of recycled waste to total waste; total CO² emissions per unit of output).



Strengths

Enable careful analysis

Comparing EPIs over time and between different organisations makes identifying good and bad practices, highlighting best policy practices and suggesting priorities for action all straightforward.

Enable evaluation and implementation

EPIs provide a powerful tool for evaluating environmental investments and improving policy implementation.

Weaknesses

Lack of one consistent indicator set

Given the diversity in environmental problems, the variety of reasons they arise and their numerous potential solutions, there is no "correct" set of indicators to assess the overall environmental performance of a company. In some areas appropriate indicators are well established (e.g. air and water pollution) while this is not the case for others (e.g. biodiversity).

Cost and complication of data collection

Difficulties in this regard may lead to trade-offs in the information content and reliability of EPIs.

Challenge of interpreting EPIs

Since many EPIs vary substantially over time, it is often necessary to collect data for prolonged periods in order to ascertain trends.



How you can take action:

EPIs are central to environmental governance, both for the management of organisations and their activities (including CSOs and companies) and for products and policies. CSOs are encouraged to use EPIs to assess and improve environmental management systems and raise **AWARENESS**. EPIs can be used to support existing campaigns relating to a company or sector's impact on the natural environment but new **CAMPAIGNS** are also needed to illustrate the advantages of applying EPIs and to advocate for EPI measurement and publication to be a legal requirement for companies. CSOs should **TAKE PART** in further developing EPIs, **ENGAGING** with businesses and creating **AWARENESS** around them. **NETWORKING** with businesses and other CSOs regarding these indicators is also encouraged.



Case study:

DANTES and RAVEL

The EU project DANTES (Demonstrate and Assess New Tools for Environmental Sustainability) addressed and demonstrated tools such as Life Cycle Assessment (LCA), Environmental Risk Assessment (ERA) and Life Cycle Costing (LCC). The project website (www.dantes.info) provides information on the use of sustainability tools and methods, indicating the problems that can be addressed by the application of the tool as well as how and who can use the tool. The results from the project were translated into strategies for eco-efficiency evaluation based on existing tools.



Found on the DANTES website, a good example of the use of EPIs can be seen from the European project RAVEL (RAil VEicle eco-efficient design) which shows how EPIs can be used to evaluate environmental performance

of, for instance, hardware-design. RAVEL suggests a set of tools that enable designers to improve the eco-efficiency of railway vehicles over their entire lifecycle by at least 25 % (compared with older comparable products).



Learn more and get inspired:

- Project DANTES (Demonstrate and Assess New Tools for Environmental Sustainability): www.dantes.info

Genuine Progress Index

Definition, objectives and mode of operation

The Genuine Progress Index (also Genuine Progress Indicator – GPI) is a metric of economic growth that aims to provide a more comprehensive measure of a country's performance. It focuses on whether a country or

community's production of goods and services has contributed to the wellbeing of its citizens and to the sustainability of the planet. It uses a broad set of economic, social and environmental indicators (see table).

Economic	Social	Environmental
<ul style="list-style-type: none"> > Economic Growth > Economic Diversity > Trade > Disposable Income > Weekly Wage Rate > Personal Expenditure > Transportation Expenditure > Taxes > Savings Rate > Household Debt > Public Infrastructure > Household Infrastructure 	<ul style="list-style-type: none"> > Poverty > Income Distribution > Unemployment > Underemployment > Paid Work > Household Work > Parenting and Eldercare > Free Time > Volunteerism > Commuting > Life Expectancy > Premature Mortality > Infant Mortality > Obesity > Suicide > Drug Use > Auto Crashes > Divorce > Crime > Problem Gambling > Voter Participation > Educational Attainment 	<ul style="list-style-type: none"> > Oil, Gas Reserve Life > Oil Sands Reserve Life > Energy Use > Agriculture Sustainability > Timber Sustainability > Forest Fragmentation > Fish and Wildlife > Parks and Wilderness > Wetlands > Peatlands > Water Quality > Air Quality > Greenhouse Gas Emissions > Carbon Budget > Hazardous Waste > Landfill Waste > Ecological Footprint

Table: The Genuine Progress Index (GPI) uses 51 economic, social and environmental indicators

The GPI was developed in 1994 by Redefining Progress (a non-profit, non-partisan public policy institute) as an alternative to gross domestic product (GDP). GDP in relation to GPI is analogous to the relationship between the gross profit (GDP) and net profit (GPI) of a company. The GPI is one of the first alternatives to GDP to be vetted by the scientific community and used regularly by governmental and non-governmental organizations worldwide. The GPI can be used to measure the wellbeing and sustainable progress of economies and regions as well as that of communities and households. It considers not only how much money is spent on the consumption of goods and services, but also the non-monetary value of production and consumption including unpaid goods and services, such as

housework, parenting and eldercare, education and volunteerism. Additionally, the GPI takes into account the indirect damage and costs caused by unsustainable consumption and production, such as obesity, drug use, life expectancy and mental health. For instance, the GPI of a country would be zero if the financial costs of crime and pollution equalled the financial gains from the production of goods and services, all other factors being constant. At least 11 countries (including Austria, England, Sweden and Germany) and numerous provinces and regions (including Wellington, Alberta and Nova Scotia) have recalculated their gross domestic product using the GPI. The data for European countries and the United States show a steady decline over the last 30 years.

Case study:

Calculating the GPI of Nova Scotia

GPIAtlantic is a non-profit research organisation that is calculating the GPI for the small Canadian province of Nova Scotia. Over the past ten years, more than 80 reports on topics related to the six main GPI categories (living standards, population health, time use, community vitality, education and environmental quality) have been produced.

The ongoing project has analysed Nova Scotians' working hours, obesity, tobacco use, and gambling habits and provided insights into the

real costs and benefits of the province's energy consumption, transportation system, solid waste disposal and air quality. For example, volunteerism in Nova Scotia adds \$1.9 billion to the provincial economy while obesity and poor nutrition costs the province \$250 million annually due to health care costs and productivity losses. Findings such as these have shifted the way that thoughtful Nova Scotians view their province.

Learn more and get inspired:

- GPI Atlantic: <http://www.gpiatlantic.org/>
- Redefining progress: http://www.rprogress.org/sustainability_indicators/genuine_progress_indicator.htm

Strengths

Holistic view

Enables a holistic view of progress for countries, communities, regions, households etc.

Trustworthy

Numerous empirical experiences have already been made.

Regular use by governments and NGO's

The GPI is one of the first alternatives to GDP to be vetted by the scientific community and regularly used by governmental and non-governmental organisations worldwide.

Weaknesses

Amount of data, time and resources

Calculating the index needs a significant amount of data, time and resources.

Combination

There is some discussion as to whether it is possible to combine indicators of welfare with indicators of sustainability.

Arbitrary

To some extent, the GPI is arbitrary in what it includes and excludes as contributing to or detracting from welfare.

How you can take action:

CSOs can use the Genuine Progress Index to **MEASURE** the net product of societies and communities in regard to well-being and sustainability. As awareness surrounding the GPI is still limited, CSOs are encouraged to **CAMPAIGN** for its application at the national and international level and **SUPPORT** politicians in disseminating the idea of the GPI. CSOs can make use of opportunities to **TAKE PART** in further developing the GPI and network with scientific institutions and other CSOs.

4. Concluding remarks

The purpose of these guidelines is to review existing knowledge and the latest research on SCP, aiming to provide a quick, hands-on overview of selected instruments, assessment tools and indicators. They provide examples of how, by means of policy instruments, assessment tools and indicators, CSOs can take effective action to encourage more sustainable consumption and production practices. By outlining different indicators in this booklet,

it is evident that there are many environmental and social indicators that are appropriate for CSOs to use to support their work on sustainable consumption and production. Their applicability, however, depends on how user friendly the related concepts are. While some of the indicators are available for immediate use (for instance the Ecological Footprint), others require further development to enable them to be readily used by CSOs.

Consequently, one of the aims of the Action Town project is to present the tools available and to improve upon them in close cooperation with potential users. Analysing the reasons for success learned from indicators already in use and methodically applying these lessons to indicators which have so far been used in a mainly scientific context methodically will increase their quality.

This booklet intends to provide a foundation for the future work undertaken by CSOs regarding indicators in general and for ongoing work on the Action Town project. It can, however, only provide a snapshot of the work underway on the development of indicators to be used in the field of sustainable consumption and production. The different specific guidelines associated with the Action Town project as a whole will advance upon this.



5. List of abbreviations

BSI: British Standards
CF: Carbon Footprint
CML: Institute of Environmental Sciences, Faculty of Science, Leiden University
COPSOQ: Copenhagen Psychosocial Questionnaire
CSCP: Centre on Sustainable Consumption and Production
CSO: Civil Society Organisation
DANTES: Demonstrate and Assess New Tools for Environmental Sustainability (research project)
DG Environment: Directorate-General for the Environment of the European Commission
DMC: Domestic Material Consumption
ECR: Efficient Consumer Response
EEA: European Environment Agency
EEB: European Environmental Bureau
EF: Ecological Footprint
EMC: Environmentally Weighted Material Consumption
EPI: Environmental Performance Indicators
ERA: Environmental Risk Assessment
ETH: Eidgenössische Technische Hochschule (University of Technology in Switzerland)
ETI: Ethical Trading Initiative
EUROSTAT: Statistical Office of the European Communities
EW-MFA: Economy-wide Material Flow Accounting
FANC: Finnish association for nature conservation
FIN-MIPS household: project to calculate the ecological rucksacks of Finnish households using the MIPS method
GDP: Gross Domestic Product
GHG: Greenhouse Gas
GPI: Genuine Progress Index
GTZ: Deutsche Gesellschaft für Technische Zusammenarbeit
GWP: Global Warming Potential
HANPP: Human Appropriation of Net Primary Production
HLY: Happy Life Years
HPI: Happy Planet Index
ICLEI: Local Governments for Sustainability (CSO)
ILO: International Labour Organisation
IPCC: Intergovernmental Panel on Climate Change
ISO: International Organization for Standardization
LCA: Life Cycle Analysis/Assessment
LCC: Life Cycle Costing
LCI: Life Cycle Inventory
LEAC: Land and Ecosystem Accounts
LPR: Living Planet Report
MFA: Material Flow Analysis
MIPS: Material Input per Service Unit
NAWB: National Accounts of Wellbeing
NEF: New Economics Foundation

NGO: Non-Governmental Organization
NPP: Net Primary Production
NRG4SD: Network of Regional Governments for Sustainable Development
OECD: Organisation for Economic Co-operation and Development
PAS 2050: Public Available Standard
PCF: Product Carbon Footprint
RAVEL: RAil VEicLe eco-efficient design
SCP: Sustainable Consumption and Production
SEI: Stockholm Environment Institute
SERI: Sustainable Europe Research Institute
SPI: Sustainability Performance Indicators
t/cap: tonnes per capita
TMC: Total Material Consumption
TMR: Total Material Requirement
UK: United Kingdom
UN: United Nations
UNEP: United Nations Environment Programme
WBCSD: World Business Council for Sustainable Development
WF: Water Footprint
WRI: World Resources Institute
WWF: World Wide Fund for Nature

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