

Goal 12 Ensure sustainable consumption and production patterns

(Updated on 3 March 2016)

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Target 12.1 Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.

Indicator 12.1.1: Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies

No metadata received on current indicator formulation.

Target 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.

Indicator 12.2.1: Material footprint, material footprint per capita, and material footprint per GDP

Indicator 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP

From UNEP (both indicators):

Indicators Domestic Material Consumption (DMC) per-capita Material Footprint (MF) per capita	
Goal and targets addressed	Goal 12 Ensure sustainable consumption and production patterns Target 12.2 By 2030, achieve the sustainable management and efficient use of natural resources
Definition and method of computation	Domestic Material Consumption (DMC) is a standard material flow accounting (MFA) indicator and reports the apparent consumption of materials in a national economy. It is calculated as direct imports (IM) of material plus domestic extraction (DE) of materials minus direct exports (EX) of materials measured in metric tonnes. DMC measures the amount of materials that are used in economic processes. It does not include materials that are mobilized the process of domestic extraction but do not enter the economic process. DMC is based on official economic statistics and it requires some modelling to adapt the source data to the methodological requirements of the MFA. The accounting standard and accounting methods are set out in the EUROSTAT guidebooks for MFA accounts in the latest edition of 2013. MFA accounting is also part of the central framework of the System of integrated Environmental-Economic Accounts (SEEA). Material footprint (MF) is the attribution of global material extraction to domestic final demand of a country. It is calculated as raw material equivalent of imports (RME_{IM}) plus domestic extraction (DE) minus raw material equivalents of exports (RME_{EX}). For the attribution of the primary material needs of final demand a global, multi-regional input-output (MRIO) framework is employed. The attribution method based on I-O analytical tools is described in detail in Wiedmann et al. 2015. It is based on the EORA MRIO framework developed by the University of Sydney, Australia (Lenzen et al. 2013) which is an internationally well-established and the most detailed and reliable MRIO framework available to date.
Rational and interpretation	DMC reports the amount of materials that are used that are used in a national economy. DMC is a territorial (production side) indicator. DMC also presents the amount of material that needs to be handled within an economy, which is either added to material stocks of buildings and transport infrastructure or used to fuel the economy as material throughput. DMC describes the physical dimension of economic processes and interactions. It can also be interpreted as long-term waste equivalent. Per-capita DMC describes the average level of material use in an economy – an environmental pressure indicator - and is also referred to as metabolic profile.

	<p>Material footprint of consumption reports the amount of primary materials required to serve final demand of a country and can be interpreted as an indicator for the material standard of living/level of capitalization of an economy. Per-capita MF describes the average material use for final demand. DMC and MF need to be looked at in combination as they cover the two aspects of the economy, production and consumption. The DMC reports the actual amount of material in an economy, MF the virtual amount required across the whole supply chain to service final demand. A country can, for instance have a very high DMC because it has a large primary production sector for export or a very low DMC because it has outsourced most of the material intensive industrial processes to other countries. The material footprint corrects for both phenomena.</p>
Sources and data collection	<p>Data is available from different national or international datasets in the domain of agriculture, forestry, fisheries, mining and energy statistics. International statistical sources for DMC and MF include the IEA, USGS, FAO and COMTRADE databases.</p>
Disaggregation	<p>The DMC indicator can be disaggregated into imports, domestic extraction and exports by a large number of material follow categories. At the highest level of aggregation biomass, fossil fuels, metal ores and non-metallic minerals are distinguished. DMC is usually reported for 11 material categories, DE for 44 material categories. The MF indicator can be disaggregated to four main material categories, a varying number of economic sectors whose expenditure require materials and to three domestic final demand sectors (household consumption, government consumption and capital investment) and foreign final demand (i.e. exports).</p>
Comments and limitations	<p>DMC cannot be disaggregated to economic sectors which limits its potential to become a satellite account to the System of National Accounts (SNA).</p>
Data for global and regional monitoring	<p>UNEP is publishing a global material flow dataset which includes the DMC indicator. DMC is available for about 180 countries, the seven UNEP world regions and the world for the time period 1970 – 2010. Data is available at the UNEP online data platform UNEP Live www.uneplive.unep.org on each country page in the section 'UNEP resources' under the category 'natural resources'.</p>
Supplementary information	<p>Material footprint is also referred to as Raw Material Consumption (RMC). The DMC indicator and MF indicator are used by EUROSTAT, the government of Japan, the UNEP Office for Asia and the Pacific and the OECD for monitoring their policy efforts in the domains of Sustainable Consumption and Production (SCP), resource Efficiency and Green Economy.</p>
References	<p>EUROSTAT (2013). Economy-wide material flow accounts. Compilation guide 2013. Wiedmann, T., H. Schandl, M. Lenzen, D. Moran, S. Suh, J. West, K. Kanemoto, (2013) The Material Footprint of Nations, Proc. Nat. Acad. Sci. Online before print. Lenzen, M., Moran, D., Kanemoto, K., Geschke, A. (2013) Building Eora: A Global Multi-regional Input-Output Database at High Country and Sector Resolution, Economic Systems Research, 25:1, 20-49.</p>

Target 12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

Indicator 12.3.1: Global food loss index

From FAO:

1. Precise definition of the indicator

The indicator measures the totality of losses occurring from the time at which production of an agricultural product is recorded until it reaches the final consumer as food.

While calculated on a quantity basis, it is subsequently transformed to dietary energy supplies (in kcal) per capita allowing consistent aggregation and then indexed.

The indicator will be calculated on an annual frequency broken down by country and commodity.

1. How is the indicator linked to the specific TARGET as worded in the OWG Report?

The indicator provides evidence on most aspects of the object of the SDG target above. However, in contrast to the objective of the SDG target, it does not take into account losses occurring at the consumer level. Specifically, it provides evidence on the amount which is lost from the food *available* to private households, rather than from the food *actually consumed* by them.

Therefore, the indicator is sensitive, for example, to enhancements in supply-chain infrastructure, while it is insensitive to changes in the private households' efforts to use food more efficiently or to their equipment with refrigerators.

2. Does the indicator already exist and is it regularly reported?

The indicator has been developed and compiled, but further testing and validation is required before public release.

The costs of measuring losses directly and regularly, for example in surveys, are prohibitive. Therefore, the indicator is primarily model-based. It will be compiled on a regular basis as part of the Food Balance Sheets in FAOSTAT.

The calculation of the indicator relies on primary data collected from government agencies in the Agricultural Production Questionnaire or harvested from official publications and other sources. The model parameters are retrieved from the World Development Indicators database of the World Bank.

The coverage with primary data is lowest in Sub-Saharan Africa, North Africa and the Middle East. For sugar crops, tree nuts and milk the data are more difficult to obtain than for other types of commodities.

The accuracy of the estimates could be improved by investments into the statistical capacities for the assessment of losses at national level, probably in the scope of the Global Strategy, as well as into work on further improvements of the model.

3. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

The accuracy of the indicator is difficult to assess, as the measurement error of the primary data collected from countries, which adds to the error made in the estimation by the model, cannot be quantified. Our preliminary comparison of predicted and observed losses makes us confident that our estimates are not systematically biased.

Coverage

The indicator can be compiled annually for the 177 countries for which Food Balance Sheets are produced.

Comparability

The indicator will be calculated on the basis of a standard definition and common methodology for each country in each year. However, the accuracy of the estimates will vary across countries as a result of differences in the availability and quality of the source data.

Sub-national estimates

Sub-national estimates will not be available.

Target 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

Indicator 12.4.1: Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

No metadata received on current indicator formulation.

Indicator 12.4.2: Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment

No metadata received on current indicator formulation.

Target 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Indicator 12.5.1: National recycling rate, tons of material recycled

No metadata received on current indicator formulation.

Target 12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

Indicator 12.6.1: Number of companies publishing sustainability reports

No metadata received on current indicator formulation.

Target 12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

Indicator 12.7.1: Number of countries implementing sustainable public procurement policies and action plans

No metadata received on current indicator formulation.

Target 12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

Indicator 12.8.1: Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

No metadata received on current indicator formulation.

Target 12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.

Indicator 12.a.1: Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies

No metadata received on current indicator formulation.

Target 12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.

Indicator 12.b.1: Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools

From UNWTO:

Definition

The indicator currently lacks a methodological framework but it is expected that it should be rooted in some form of linked tourism and environmental accounts (TSA-SEEA).
(see “Comments and limitations” below)

Method of computation

To be defined

Rationale

The target has several dimensions. The suggested indicator focuses on the dimension: “*sustainable development impacts for sustainable tourism*”.

(see “Comments and limitations” below)

Interpretation

(see “Comments and limitations” below)

Sources and data collection

Expected to be sourced from some form of linked SEEA-TSA accounts

(see “Comments and limitations” below)

Disaggregation

To be defined. It is expected that sub-national information is key. If based on and sourced from an accounting structure, information by tourism industries could be possible (as these industries’ productive activity make up Tourism Direct GDP).

(see “Comments and limitations” below)

Comments and limitations

While it is understood that the indicator is an attempt at presenting an indicator that could approximate for the “sustainable development impacts for sustainable tourism”, the indicator poses important challenges.

First, there is no conceptual framework that specifically caters to links between tourism and environmental accounts to base this indicator on. The framework for measuring tourism exists (*International Recommendations for Tourism Statistics 2008* and *Tourism Satellite Account: Recommended Methodological Framework 2008*) as well as the framework for environmental-economic accounts (*System of Environmental Economic Accounts 2012*), but a linking of the two is required. Even though this is something that UNWTO will embark on together with a number of countries, UNSD, and OECD and counting on the support of the UNCEEA, the production of internationally comparable data on (something that could approximate for) “sustainable tourism” in a significant number of countries still has some years to go.

Data availability is the second biggest challenge, even if a conceptual framework gets developed. While UNWTO is aware of a number of countries that have developed pilot exercises of linking tourism and environmental accounts to produce data for indicators relating key environmental aggregates (notably energy use, GHG emissions, and their intensities) to tourism activity, this is far from being an endeavour that, presently, more than a handful of countries could provide data on, let alone structurally incorporate it into their programmes of work over the medium term.

There is the added challenge that the concept of “sustainable tourism” as stated in the target is mainly a policy construct and not defined nor part of an established or internationally conceptual/statistical framework at this point.

If this indicator is kept it is proposed that, for the time being, it be interpreted in its broadest sense to consider as residuals not only solid waste but also emissions to air and water and wastewater. This would give some flexibility to, after analysis and testing, ultimately opt for the residual(s) that can best cater to the information need for this target. An example of one such candidates could be:

- GHG emissions related to tourism: possibly defined as “GHG emissions from the tourism industries” or a more ambitious “Direct GHG emissions from (selected) tourism industries” or possibly even “Direct GHG emissions intensity for tourism in terms of terms of number of (FTE) jobs” (which would unite several dimensions relevant to the target).

If testing shows that the indicator cannot be viably produced in a significant number of countries, other possible indicators relating tourism and the environment that could be sourced from linked SEEA-TSA accounts should be considered. A possibility could be to shift the focus away from residuals and towards SEEA accounts with wider (and more detailed) data availability. A priori a possibility to be considered could be:

- Energy use related to tourism: possibly defined as “energy use in the tourism industries” or a more ambitious “Direct energy use in (selected) tourism industries” or possibly even “Direct energy use intensity for tourism in terms of terms of number of FTE jobs” (which would unite several dimensions relevant to the target).

Last but certainly not least, it could be argued that the focus of the target is on “*Develop and implement tools to monitor [sustainable development impacts for sustainable tourism ...]*”.

Indeed, the Target itself acknowledges that “*tools to monitor [sustainable development impacts for sustainable tourism]*” need to be developed. If this is considered to be the main focus, then an indicator that tracks precisely this in countries would be more appropriate:

- “Stage of implementation of linked SEEA-TSA accounts in country” or, alternatively, “Stage of implementation of TSA in country”

An advantage of such an indicator is that it could be a powerful motivator to further the necessary statistical development in countries in order to better understand also the other dimensions of the target: “*sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products*”. An indicator focusing on developing the tools to monitor tourism in relation to sustainability also matches better the incipient stage of statistical development in this area (both conceptually and regarding implementation in countries).

Supplementary information and references

System of Environmental Economic Accounts 2012 (SEEA 2012)

Tourism Satellite Account: Recommended Methodological Framework (TSA: RMF 2008)

Responsible entities

World Tourism Organization (UNWTO)

Target 12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Indicator 12.c.1: Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as proportion of total national expenditure on fossil fuels

No metadata received on current indicator formulation.