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SUSTAINABLE CONSUMPTION INDICATORS

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Contents

Glossary of Terms

Agenda 21
Consumption clusters
Global Consumer Class
Global consumer culture
Global consumer market
Gross Domestic Product (GDP)
Human Development Index (HDI)
Organisation for Economic Co-operation and Development (OECD)
Rio Earth Summit (1992)
Sustainable Consumption (SC)
Sustainable consumption indicators
United Nations Commission of Sustainable Development (UNCSD)
United Nations Environment Programme (UNEP)
World Business Council for Sustainable Development (WBCSD)
World Resources Institute
Wuppertal Institute

SUMMARY

There is wide recognition that current patterns of consumption and production, particularly those in the highly industrialized regions, are one of the main causes of global environmental degradation. In recent years, the spotlights on the environmental consequences of economic growth and the adoption of sustainable practices have grown in intensification.

Originating from the Earth Summit in Rio de Janeiro in 1992, chapter 4 of Agenda 21, “Changing Consumption and Production Patterns”, focuses attention on the need to influence consumption and production patterns towards greater sustainability.

In response to such a calling, the United Nations Environment Programme (UNEP) has extended its successful production process-orientated activities, such as Cleaner Production and Industrial Pollution Management, with a new Sustainable Consumption initiative[1]. Production and consumption policies are two sides of the same sustainability “coin” and UNEP is addressing them in an integrated manner. This article focuses on sustainable consumption with a clear eye on the inter-linkages with production activities.

Measuring changes in consumption patterns, by establishing indicators, presents all stakeholders with tangible reflections of current and potential future trends and provides information necessary to help develop appropriate policy responses.

The comparable nature of the indicators also provide a powerful analytical tool to national and global governments/organizations intent on demonstrating inherent differences between cases (nations/regions), that may present the opportunity of practice and/or policy transplantation.

Formulating sustainable economic and social policies require an interaction with stakeholders and the public. Therefore, sustainable consumption indicators need to be scientifically

grounded and also uncomplicated and attractive to all interested parties.

Sustainable consumption indicators are capable of assisting in the optimization of resource use, minimizing negative environmental and social impacts of consumption and production patterns, while stimulating and facilitating trends towards more sustainable patterns.

This article will in part provide a synthesis of existing knowledge – highlighting current understanding and interesting work completed in the area of sustainable consumption indicators. Specifically, summarizing and building upon the seventeen provisional core-set of indicators identified by a process facilitated by the United Nations Commission on Sustainable Development (UNCSD) in 1998.

1. THE BUILDING BLOCKS…

1.1. An Evolving Global Consumer Culture

The ensuing augmentation of the global village, and the integration of the global consumer market, have brought rapid changes in consumption patterns. And as the spread of human existence approaches the extremities of the available living space and the revolution in information technology simplifies the flow of common messages and practices, there exists an emergence of a sub-culture displaying convergent behavior.[2]

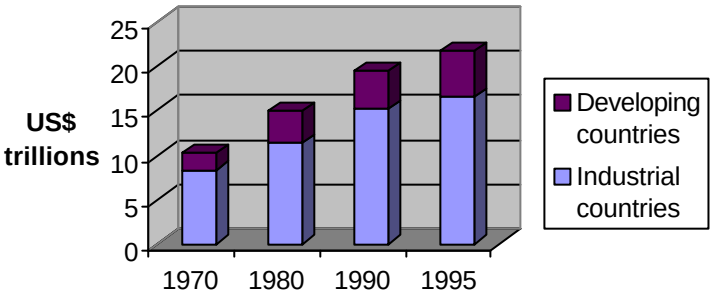
This wave of globalization has undoubtedly intensified the linkages between consumption patterns in various regions of the globe, fostering the development of a global consumer class.

And although, the expanding global consumer class may seem to pose further obstacles to those intent on promoting more sustainable patterns of consumption, it may rather present an opportunity for national and international policy-makers to

formulate global approaches and campaigns for a global concern.

This new global consumer culture can be partly characterized by a growing emphasis on the individual, a search for wider opportunities and experiences (professional and leisure), a desire for comfort and autonomy, and personal material accumulation.[3] The ultimate summation of such changes and convergence of behaviors is that the globe has witnessed an unprecedented explosion in the consumption of goods and services in the past twenty years.

Total Consumption Expenditure[4]



The ongoing evolution in consumption patterns will ultimately be fueled by a variety of forces. Hopefully while keeping in mind that, "a lifestyle that excludes one-third of the world's population, however dominant it may appear at the moment, should not be regarded as the supreme achievement of 20th-century civilization."[5]

1.2. What is the Problem with Consumption?

World consumption expenditures, private and public, have expanded at an unprecedented pace, doubling in real terms in 25 years to reach $24 trillion in 1998. This expansion has propelled considerable advances in human development.[6] The changes in global consumption patterns have resulted in substantial improvements in health care, communication, and education.

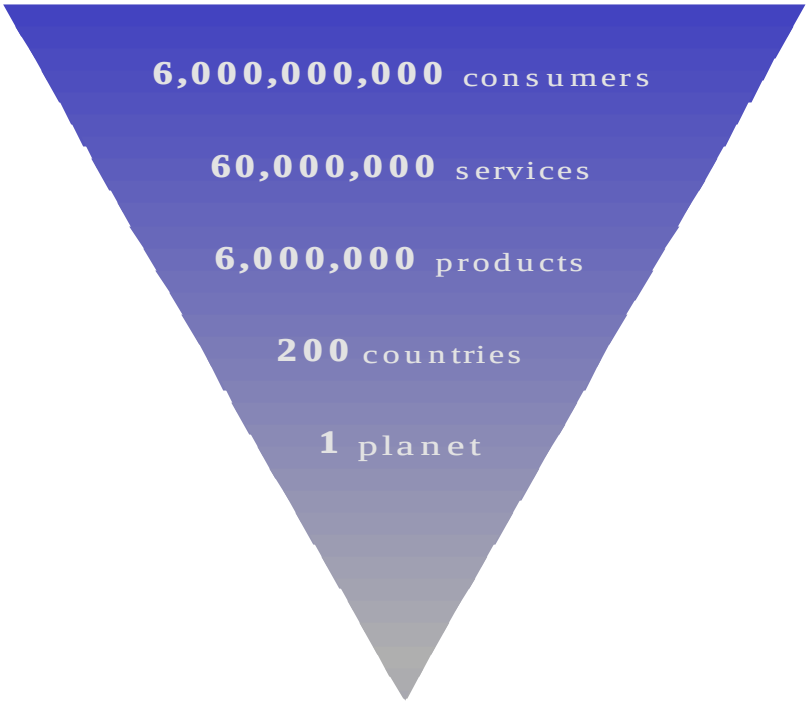
Unfortunately, however, the negative impacts have been similarly resounding. The problems include:

- The expansion of consumption has left about a fifth of the world's people out;
- Consumption is environmentally damaging. Thus the consumption of some harms the well-being of others, in both present and future generations;
- Consumption growth and patterns have social impacts that deepen inequalities and social exclusion; and
- Consumer rights to information and product safety are difficult to defend in the context of the global consumer market.[7]

A greater emphasis on the application of the practice of sustainability seems to be the most appropriate answer. In terms of 'modern' consumption, the avocation of simply consuming less is not necessarily the most suitable reaction. What is required rather, is a fundamental shift in consumption thinking and its associated behavior. All stakeholders must contribute to the process and support those mandated to achieve the ultimately desired outcome – implementing legitimately sustainable consumption patterns.

1.3. Getting to the Point…

The nature of today's global consumer market is particularly complicated. The estimated figures below highlight the underlying challenges facing the global community. The enormity of the situation may be best illustrated by such a graphic.



Source: *Global Consumer Class* report; M. Bentley (2000)

The point, in this context, is that there is certainly a need to develop approaches and tools that are both scientifically grounded and also uncomplicated and attractive to policy makers and the general public. Thus, any measure of consumption patterns should have strong communicative value – similar to the Gross Domestic Product (GDP) and the Human Development Index (HDI).[8]

1.4. What is Sustainable Consumption?

There have been many attempts to render precise notions of sustainable consumption since its adoption at the Rio Earth Summit in 1992. Possibly the most practical way to approach the concept is by being flexible and allowing for differences of method and opinion.

The 1994 Oslo Ministerial Roundtable produced the following working definition: 'the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life-cycle so as not to jeopardize the needs of future generations.'[9]

It is clear that meeting the needs of people and at the same time improving environmental outcomes requires more efficient consumption. Using fewer resources and causing less pollution will assist human development in all parts of the world. Furthermore, a fundamental shift in how to improve quality of life means that social and cultural elements should be taken into account as well.[10]

UNEP Division of Technology, Industry and Economics (DTIE) Director, Ms. Jacqueline Aloisi de Larderel, suggests that "sustainable consumption is not about consuming less, it is about consuming differently, consuming efficiently, and having an improved quality of life. It also means sharing between the richer and the poorer."[11]

Although it is possibly by definition impossible to ever create a precise, operational definition, the direction in qualitative terms has been inspiring enough for various stakeholders - industry consumers and consumer groups, business and governments - to take action.

Consumers are being increasingly made aware of the fact that they have significant power to influence what happens in the market. When the consumer purchases a particular item he/she are indirectly approving the company's image and behavior towards its consumers, employees and the environment.

In fact, sustainable consumption boils down to attempting to find a balance between the rights as free consumers and the responsibility towards others and the earth.[12]

"Consumers are increasingly interested in the world that lies behind the product they buy. Apart from price and quality, they want to know how, where and who has produced the product. This increasing awareness about environmental and social issues is a sign of hope. Governments and industry must build on that."[13] (UNEP Executive Director, Klaus Toepfer)

It is essential to distinguish sustainable consumption from broader issues of sustainable development.[14] Sustainable consumption, considered as the demand-side of the consumption/production sustainability coin, should be flexible enough to allow for potential changes in consumer behavior, including greater efficiency of consumption of goods and services and the enhanced re-use and recycling of products.

Sustainable consumption must not be confined within the realm of formal technical terminology. It should be molded and adapted, under appropriate circumstances, to best fit the challenge at hand. It resonates practicality and should thus be understood in terms of finding out what drives people, thinking in concepts, and locating new forms of communication.

1.5. Why Develop Indicators?

Measuring changes in consumption and production patterns, by establishing indicators, presents all stakeholders with tangible reflections of current and potentially future trends, such as the volume and intensity of resource use, and provides information necessary to help evaluate current and develop future policy initiatives.

In order to guarantee the development and implementation of sound environmental policies, these instruments should be based on appropriate factual information. Moreover, the general public has a right to be informed about the impacts of their habits and the results of the policies employed to initiate change.

In a general nature, sustainable consumption indicators are capable of:

- Highlighting the interface between consumption patterns and environmental issues, and in particular help to better understand how different driving forces and policy instruments interact and affect the environmental sustainability of consumption;

- Contributing to the further integration of environmental and sustainability concerns into decision-making and to provide a basis for monitoring related policies; and

- Stimulating discussions and initiatives concerning sustainable consumption.[15]

Indicators are not necessarily designed to provide a full picture of relationships between phenomena – in this case consumption patterns and sustainability issues – but rather to help reveal trends and draw attention to occurrences that require further analysis and possible action. They certainly need to be supplemented with additional information and interpreted in context to acquire their full meaning.[16] Moreover, evidence of successful modifications in practices can be easily recognized and potentially transported to other geographical locations. When indicators are used for policy analysis or evaluation, one should keep in mind the other available assessment tools, and balance the sources appropriately.

1.6. Integrating the Two Themes

The UN General Assembly Special Session on Sustainable Development (New York, June 1997) adopted a Programme for the Further Implementation of Agenda 21, identifying sustainable consumption and production as a cross-sectoral, overriding issue that required greater attention. The UN's Commission on Sustainable Development (UNCSD) International Work Programme on Changing Consumption and Production Patterns has since concentrated some efforts on the

development of indicators to measure changes in consumption and production patterns.

A workshop - supported by UNEP's Sustainable Consumption Programme - discussing a first set of indicators was organized by the UNCSD in March 1998 in New York. It resulted in the selection of a provisional core-set of 17 indicators covering key resources and major consumption clusters and in a report published for the 7th session of the UNCSD in 1999, which reviews chapter 4 of Agenda 21 "Changing Consumption and Production Patterns". The report acts as a primary source for this article. This core-set will be further integrated into the Core-Set of Indicators of Sustainable Development, which is being facilitated in part by the UN Commission on Sustainable Development.[17]

The Organisation for Economic Co-operation and Development (OECD), the World Business Council for Sustainable Development (WBCSD), and the United Nations Environment Programme (UNEP) are other international organizations participating in the initiative. The overview of current and future participant contributions will be covered in greater detail in Section 4 – 'On the Horizon.'

2. IN THE BEGINNING, THERE WERE SEVENTEEN…

The provisional core-set of seventeen indicators for changing consumption and production patterns, formalized by the United Nation's Department of Economic and Social Affairs in 1998, covers all key resources and consumption clusters. The set relating to key resources focus on the resources that should be used more sustainably, while those relating to consumption clusters consider the consumer 'needs' or functions that should be satisfied through the use of these resources.[18] Understandably, because of the nature of close interaction between consumption and production, it is often necessary to research and display trends in a combined fashion. Consumption patterns directly impact the resources sector. Therefore, key resources should be evaluated for links to the

consumption equation. Today, expanding global consumption is responsible for depletion of the stock of non-renewable resources such as metals and fossil fuels, and is also inflicting increased pressure on renewable resources such as water, fisheries, and agricultural land. In addition, waste generation and disposal related to consumption affects land and water resources.

The consumption cluster indicators relate explicitly to the theme of sustainable consumption indicators.

The two categories of consumption and production indicators, those monitoring trends in resource use and associated consumption patterns and environmental impacts, and those reflecting consumer behavior, are both valuable tools for policy makers concerned with policy development, implementation, and evaluation. Furthermore, the knowledge gained from indicator exploration and comparisons may provide international organizations, NGO's and researchers with substantial insights into the patterns that currently demonstrate a reality of unsustainable levels of consumption and production. Undoubtedly, any advancement in the statistical evaluation of this concern should provide greater exposure and thus be considered as a positive tool for change.

The CSD provisional core-set of indicators (numbered '1; 2; etc' in the tables following each sub-section) have been supplemented by other indicators (numbered 'A; B; etc') that are potentially demonstrating sustainable consumption patterns. The later indicators, many of which were discussed within the CSD indicator framework, may help stimulate discussion and further scientific research and testing.

The core indicators were selected by focusing on those key resources and consumption clusters that have significant environmental impacts and seem particularly susceptible to public policy intervention.

Industrialized countries could benefit from the indicators as they may help their policy makers choose appropriate policy

measures aimed at eco-efficiency improvements and the achievement of more sustainable consumption practices and lifestyles world-wide. Developing countries and economies in transition, supported by the industrialized world, could use the indicators to monitor the development of consumption and production patterns, while promoting the development process. Depending on the desired objectives, the suggested indicators can in most cases be applied at a global, regional, national, and local level.[19]

Finally, the indicators selected are not by any means an exclusive or concluding set and should develop over time, reflecting changes in priorities related to sustainable consumption and production.

2.1. Indicators for Key Resources

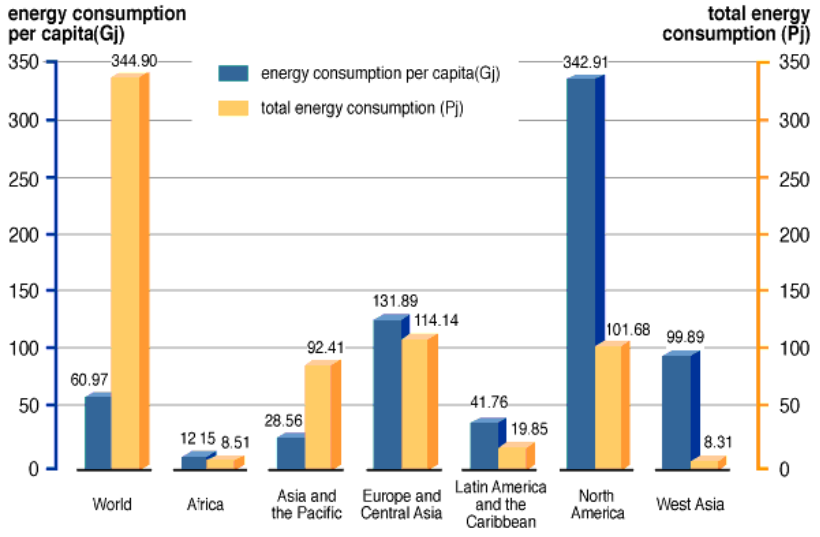
This section will focus on key resources, including energy, materials, water and land. Indicators are suggested for monitoring the use of those resources and for reflecting related consumption patterns and environmental effects caused by the use of those resources. The indicators displayed at the end of each section include those that have been selected to be accounted for within the UN CSD's provisional core-set of indicators, and have also been supplemented by other critical measurements.

2.1.1 Energy

History has observed successive waves of energy sources powering development: first wood and water, then coal, later petroleum and natural gas, and finally, to a significant extent, nuclear power.[20] Energy is inextricably linked to the consumption of goods and services.

Although the world's energy intensity (i.e. energy use per unit of GNP) has contracted – particularly in OECD countries, and annual growth rates have decreased, world energy production and consumption has continued to swell.[21]

Total and Per Capita Energy Consumption, 1995



Source: UNEP Global Environmental Outlook 2000

The developed countries are responsible for the majority of global carbon dioxide emissions – the United States, Japan and the European Union alone produce more than 40 per cent of the total. In addition, the past twenty-five years have demonstrated unprecedented rates of economic growth in many developing countries, particularly the populous economies of east and south Asia. The developing world is now home to the highest consumption growth rates, largely because of the immense populations in these regions. As a result their total consumption is catching up with the industrialized world. Total carbon emissions from China now exceed those of the European Union, although China's per capita emissions are much lower.[22] Although the issues of climate change and air pollution have driven energy efficiency in all sectors – particularly in manufacturing, construction and transportation – improvements have been certainly far from resounding.

Today, developed countries, and more specifically industry, are the major contributors to energy consumption. In 1995, the

high-income countries, home to 20 per cent of the world's population, accounted for about 60 per cent of commercial energy use.[23] The prominent sub-sectors include, iron and steel, chemicals, petroleum refining, pulp and paper, cement, agriculture, construction and transport – albeit, household consumption is also substantial. The global community seems to somewhat acknowledge that the energy sector should move towards a much greater use of renewable energy. And although, privatization and competitiveness are changing the electricity business by bringing new opportunities for small-scale generators and distributors, they are also making it exceedingly difficult for renewable energy technologies to compete.[24]

Energy is also an essential component of development. Developing countries are however often unable to satisfy demands with commercial energy sources. These countries are therefore in a continuous search for substitutive energy sources – including fuel-wood or animal dung, the results of which are often more damaging than the alternative. The expansion of the energy sector in the developing world has and will continue to have serious impacts on the local and global environment. The connection of energy and consumption trends needs to be clearly defined.

The following indicators (labeled '1-4') were selected for the CSD provisional core-set. The indicators (labeled 'A-B') demonstrate further potential measurements:

ENERGY		
1	Annual energy consumption per capita	*Monitors energy consumption.*
2	Intensity of energy use	*Monitors energy use per unit of production/service for selected sectors.*
3	Share of renewable energy in total energy consumption	*Monitors the development of renewable energy sources.*
4	Energy prices	*Monitors energy prices in relation to GDP and disposable income.*

Other Indicators: Energy and Consumption		
A	Total final energy consumption (TFC) by sector	*Can be used to reflect the contribution of residential/ business/government energy use to TFC.*
B	Sector energy consumption by type of use	*Reflects trends in the level and structure of energy use by each sector (e.g. cooking, heating, etc.).*

2.1.2. Materials, Material Flows and Waste

Much time has passed since the days of rising speculation of the inevitable and imminent depletion of global resources. And although new reserves of the majority of essential materials are continuously located, consumption levels have continued to climb. Thus, again highlighting their finite nature.

Information about material flows is rather limited for most countries, however, the intensity of use of relatively unprocessed commodities (e.g. lumber, concrete, and iron) seems to have declined, with a shift towards materials with a higher added-value (aluminum, plastics, and composites). Furthermore, the quantity of materials in circulation has expanded dramatically. As an example, there is currently an estimated 90,000 chemicals being used.[25] The health and ecological effects of this large number and variety of materials are of growing concern.[26]

Finally, waste generation figures also highlight other future challenges. The volume of municipal wastes in OECD countries has grown from 347 million tonnes in 1980 to 484 million tonnes in 1995.[27] The factors responsible for this trend include changing consumer behavior, economic growth, and the break-up of extended-family households.

Recently, discussions about materials have focused on material flows and "throughputs". Research institutes, such as the Wuppertal Institute and the World Resources Institute, consider

the total material flow as a gauge of environmental disturbance.[28] Therefore, the reduction of material flows can be seen as a means for reducing the pressure of human activities on the global environment, while the measurement of such a phenomenon highlights trends relating directly to consumption patterns.

The indicators for this key resource include:

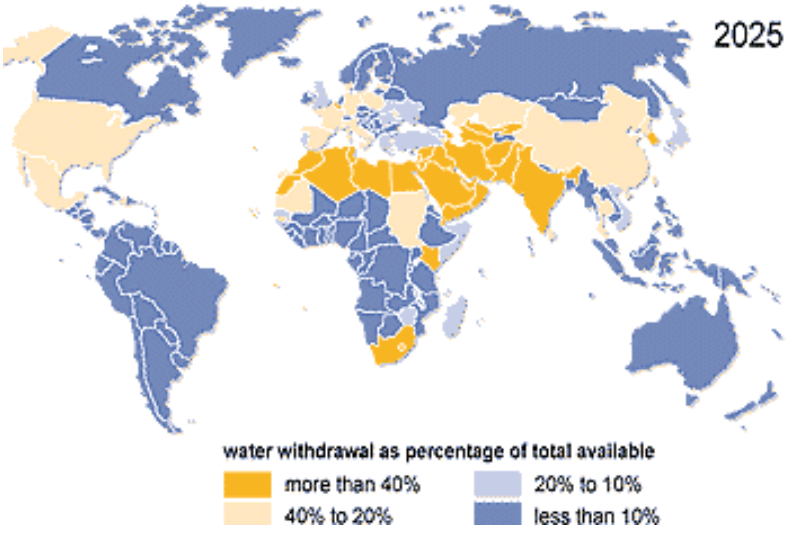
MATERIALS		
5	Total material requirement	*Monitors total material throughput, including hidden or indirect material flows required for a national economy.*
6	Intensity of material use	*Monitors material use per unit of production/service (for selected sectors).*
Other Indicators: Waste, Air Emissions and Consumption		
A	Generation of waste by sector	*Reflects the waste generation intensity of various sector's consumption activities.*
B	Waste recycling rates (paper, glass, etc.)	*Can reflect recycling rates by sector or by country.*
C	Air emissions from sector energy use	*Reflects the contribution of sector activities to national emissions.*

2.1.3. Water

This resource, on which all life depends, has been under widening pressure in recent decades. Since 1950 annual water withdrawals have nearly tripled, from 1,365 cubic kilometers to 3,760 in 1995. While, per capita availability of worldwide freshwater fell from about 16,800 m3 in 1950 to 7,300 m3 in 1995[29]. Although population growth is often considered as the major causal factor, other issues, including intensity of use, are also involved.

There is serious overuse of global groundwater, an effect that adversely impacts natural ecosystems. Furthermore, the quality of this contracting freshwater supply continues to be depleted, through such practices as the improper use of pesticides and fertilizers, poor management of animal manure, as well as inefficient practices in the food processing industry.

Global Water Stress, 1995 and 2025



Source: UNEP Global Environment Outlook 2000

The irreversibility of the effects on nature may have yet to be fully communicated or appreciated, however, encouragingly, growing attention has recently been paid to the fragility of global water reserves.

Water scarcity in many regions of the globe provides a growing potential for conflicts and further suffering for marginalized peoples.

Alarmingly, 132 million people representing 20 countries suffer from water scarcity, having less than 1,000 cubic meters per

capita yearly, a benchmark below which lack of water is considered to constrain development and harm human health. If present trends continue, twenty-five more countries would be in this predicament by 2050, and the total population of all affected countries would grow to 1-2.5 billion. [30]

Hence, there is an essential need to indicate trends in water consumption, particularly focusing on consumer's needs for such a vital resource.

The indicators for this key resource include:

WATER		
7	Intensity of water use	*Monitors water use per unit of production service for selected sectors.*
Other Indicators: Water and Consumption		
A	Water consumption by sector	*Reflects the contribution of households/businesses/ Governments to freshwater consumption.*
B	Water consumption by type of use	*Can be used to reflect the actual needs that water fulfills (e.g. drinking, cooking and toilet-flushing).*

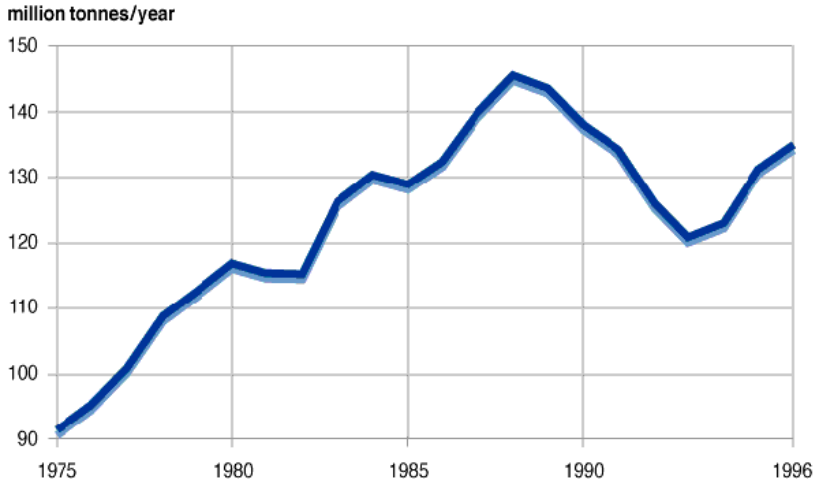
2.1.4. Land

The value of the land on which we all reside should never be underestimated. It has become an increasingly scarce resource on which many competing forces battle for the right to control and manipulate it. Land provides the capacity for agricultural and forest production and renewable energy, while also maintaining biodiversity and water stocks. Furthermore, land ensures food security. This phenomenon is seriously threatened when considering shifts of land classifications towards urbanization, infrastructure and desertification.

As populations enlarge, the area of arable land available per head of population shall continue to fall in all regions. Over the past two decades, the global availability of cropland has declined by some 25 per cent, from 0.32 hectares per capita in 1975 to 0.24 hectares in 1995.[31]

As the human race fast approaches the extremities of the available living space, opportunities to meet the increasing demand for agricultural output are becoming limited. The emphasis has moved from clearing and ploughing new land to increased efficiency of production. Hence, the expanded popularity of such issues as bio-technology. Moreover, the use of fertilizers continues to rise in many developing countries, though there is concern about diminishing returns from increased applications and the threat of nitrate pollution of freshwater supplies.[32]

Global Fertilizer Consumption



Source: Global Environment Outlook 2000

There are a multitude of discouraging signs available, including the continued conversion of land from forest to agriculture, and particularly rapid rates of global deforestation. Ultimately, the

impacts on land resources of expanding global consumption patterns must be further understood.

The indicators for this key resource include:

LAND		
8	Land use	*Monitors land use (forestry, agriculture, settlements, infrastructure, and recreation).*
Other Indicators: Land, Biodiversity and Consumption		
A	Land use for recreation	*Reflects the impact of leisure and tourism activities on the consumption of land.*
B	Protected areas	*Reflects willingness of governments to promote environmental protection.*

2.2. Indicators for Consumption Clusters

The method of grouping consumption behavior is ultimately targeted at providing insights into consumer spending habits, while simplifying the statistical framework. Consumption clusters provide a structure for analyzing the network of infrastructure, actors, and driving forces behind the satisfaction of certain basic needs.

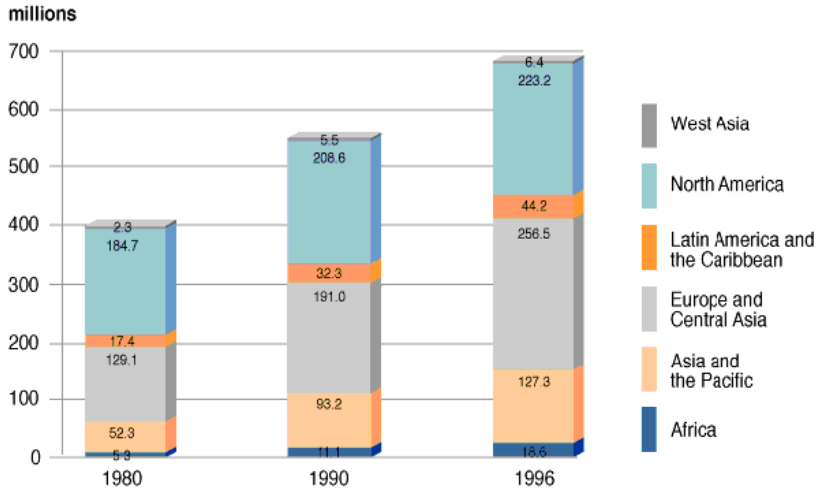
The intention is that the indicators provide a potential for generating changes in consumption patterns (lifestyles) in these domains, without disturbing the perceived satisfaction or standard of living of the consumer. The development of such measurements of consumption patterns allows interested parties the opportunity to observe particular trends and hence target specific groups that require improvement. The provisional core-set of indicators has identified five initial consumption clusters that can provide indications of consumption patterns: mobility, consumer goods and services, buildings and housekeeping, food and recreation. Further consideration should also be given

to other factors such as the evolution of communication and the growing homogeneous nature of the global consumer.

2.2.1. Mobility

Certainly one of the most noticeable changes in human infrastructure in the past fifty years has been the evolution in global transport. The desire of consumers, initially in developed countries, to control their own mobility has guaranteed a movement away from water and rail transport to that of road and air. Since the Second World War, the number of vehicles on the road has risen from about 40 million to some 680 million.[33] However, the developing world is now responsible for the fastest growth – a scenario that is echoed in a number of significant sectors.

Number of Motor Vehicles



Source: UNEP Global Environment Outlook 2000

Disturbingly, if current trends persist, there will be more than 1,000 million vehicles on the road by 2025. The transport sector can be seen as a major contributor to environmental imbalance. At the dawn of the new millennium, the sector

accounted for one-quarter of world energy use, and about one-half of the world's oil production. The consumers of motor vehicles should understand the associated impacts. The infrastructure related to transport, including airports and roads, is occupying vast amounts of land, which increases the likelihood of such factors as habitat destruction.[34] Finally, transport is a major obstacle in the global battle against air pollution and the greenhouse gas problem.

For decades, the transport sector, and more precisely the motor vehicle industry, has ‘successfully’ protected its market, proving highly resistant to attempted policy reforms. Improvements in fuel efficiency and vehicle emission reductions have consistently been offset or outpaced by volume growth. However, the economic costs of urban traffic congestion and pollution, in terms of lost production and health care, are increasingly documented and recognized.[35]

There is major potential for new modes of transport, including high-speed trains, due to both highway and airway congestion. In addition, the evolving wave of high-tech communication platforms (e.g. teleworking, teleconferencing and teleshopping) may encourage a revolution in mobility practices. Furthermore, there is a growing need to understand the linkages between new communication devices, the consumption of goods and services (including of such devices) and the associated affects on the global environment.

There are many possible indicators available that can provide interesting data. Other indicators not included in the core-set range from frequency of travel, number of computers and connection rates to the Internet (namely communication indicators), and freight traffic by mode of transport.

The indicators for this consumption cluster include:

MOBILITY		
9	Distance traveled per capita by mode of transport	*Monitors the use of different modes of transport (foot, bicycle, train, boat, car, bus, plane).*
10	Number of road vehicles	*Monitors the total number of vehicles (possibly by type and fuel efficiency).*
Other Indicators: Mobility, Communication and Consumption		
A	Freight traffic by mode of transport	*Reflects changes in the area of freight transport.*
B	Energy consumption by transport sector	*Measures the intensity and structure of the energy consumed by transport activities.*
C	Circulation of newspapers/periodicals/& Other materials	*Reflects changes towards electronic media and the associated changes in paper consumption.*
D	Electronic communication tools used by business	*Measures changes from conventional methods of doing business to 'modern' alternatives (teleworking, teleconferencing, etc.).*
E	Electronic communication devices per capita	*Measures changes in national per capita usage of internet, mobile phones, computers, etc.*

2.2.2. Consumer Goods and Services

Overwhelming, as it may seem, the global consumer market's 6 billion current and potential consumers, 60 million services and 6 million products should not be simply characterized in a pessimistic light.[36]

Although the environmental impacts of today's consumer culture are real and rather daunting, focusing on the potential for change may be somewhat more appropriate.

An element of the consumer market that should be recognized is that the world's vast array of cultures provides plenty of potential for different approaches. Many traditional cultures are more respectful of the environment, and provide options worth considering in the move towards more sustainable forms of society.

In addition, those goods and services demonstrating features of sustainability must be given appropriate access to markets and be given favorable treatment where possible. Thus, an indication of the market share of such goods and services could serve to highlight their popularity, along with their benefits.

The indicators for this consumption cluster include:

CONSUMER GOODS AND SERVICES		
11	Retail sales of selected goods per capita	*Monitors retail sales of goods (e.g. electronics, home-appliances, clothing).*
12	Market share of more sustainably produced goods and services	*Monitors social and environmental interest of consumers and producers.*
Other Indicators: Goods, Services and Consumption		
A	Average length of product life, by selected product groups	*Monitors the effects of optimizing product design for durability.*

2.2.3. Buildings and Housekeeping

It would not seem unusual that the most common places of human activity – residential and commercial (employment) structures – are considered to be the source of significant and growing locales of consumption. Ranging from substantial water and energy use to various building and operating materials, the function of the home and office continue to severely impact the environment.

Changing consumer aspirations in both developed and developing countries, have seen phenomena such as urbanization and home and office 'modernization' drastically altering patterns of consumption. Increased demands for water, energy, and finished products seem fundamental givens for meeting the needs of global consumers.

Fortunately, current observance of this consumption cluster would suggest that improvements towards more responsible consumption habits are not only possible, but also achievable and economically desirable. Positives evident within this sector of consumption include the recognition of technology as an instrument of change, the increased popularity of recycling practices and the mobilization of related thinking.

Any indication of change in this cluster will provide stakeholders with critical insights into both future challenges and opportunities. Moreover, evidence of successful modifications in practices can be easily recognized and potentially transported to other geographical locations. The indicators for this consumption cluster include:

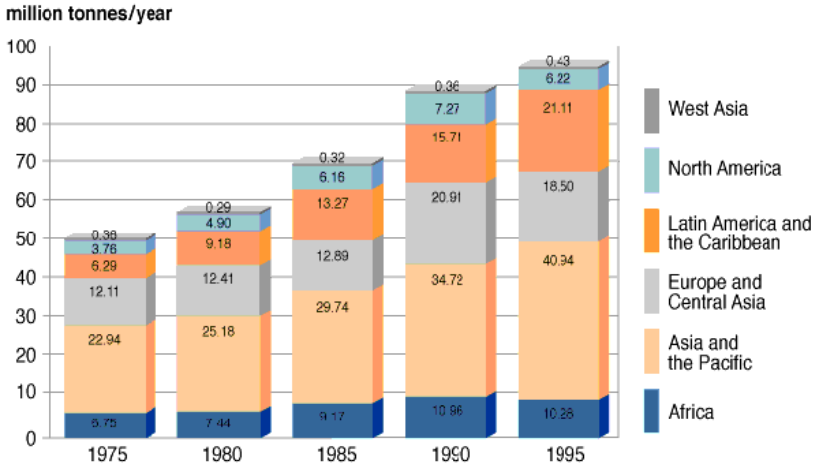
BUILDINGS AND HOUSEKEEPING		
14	Residential energy and water use per household	*Monitors total water and energy use in households due to consumer behavior and housing design and construction.*
15	Average household size	*Monitors the number of persons per household.*

2.2.4. Food

As a basic staple of an enormous and expanding human population, such a component of total consumption must be studied in detail. The process involved in transplanting foodstuffs from the earth to the consumer varies dramatically. However, what is constant and certain is that food production and its related consumption is inextricably linked to the

environment and thus negative environmental impacts are imminent when unsound management practices are imposed.

Global Marine Fish Catch



Source: UNEP Global Environment Outlook 2000

Whether it is the transportation of the foodstuffs or the adoption of chemical use, such as fertilizers, the food production and consumption chain presents an array of challenges to policy makers and their constituents. The potential for change, however, is immense. If positive modifications are enacted in such an important domain of consumption, resulting in legitimate alterations in consumer psyche, then transformations in other fields may seem somewhat less formidable.

Encouragingly, consumers have demonstrated an increased desire to support foodstuffs produced with more environmentally friendly agricultural practices. Therefore the indicator below (15), possibly pursuing a sliding scale approach, should be able to illustrate trends towards more or less sustainable practices relating to food consumption and point to potential opportunities for sustaining human existence.

The indicators for this consumption cluster include:

FOOD		
15	Market share of more sustainably produced food	*Monitors social and environmental interest of consumers and producers.*
Other Indicators: Food and Consumption		
A	Food consumption intensities and patterns	*Monitors consumer choices and shifts in demand towards organically grown agricultural products.*

2.2.5. Recreation

The time available for leisure and recreation activities obviously depends heavily on factors such as the individual's income, family responsibilities and cultural background. Regardless of differences, the common denominator on this level seems to be the expansion in time made available in both developed and developing societies. This has largely been responsible for the immersion of travel and tourism as the largest global industry.

All stakeholders must realize that indications of desires and practices related to recreational behavior are going to become increasingly crucial components of policy formulation because of the vast potential for consuming a variety of products and services, generated within this cluster. Furthermore, a significant movement towards and/or expansion of a particular consumption cluster may provide answers to challenging questions. Certainly, recreation and specifically tourism should not only be recorded and exhibited in a negative light – air and car transportation – but also for its more environmentally favorable practices, including eco-tourism and hiking.

The indicators selected thus far for the provisional core-set will provide interested parties with the potential to study consumer preferences for particular recreational activities.

The indicators for this consumption cluster include:

RECREATION		
16	Spending on recreation as share of disposable income	*Monitors the demand for recreation activities.*
17	Time spent on leisure, paid and unpaid work, and travelling	*Monitors time-allocation and distribution, and reflects lifestyles.*
Other Indicators: Recreation and Consumption		
A	Trends in international tourism	*Reflects the importance and growth of the tourist sector.*
B	Transport for recreational purposes	*Monitors the important link between recreational needs and transport.*

3. PRACTICALLY SPEAKING…

3.1. Selecting the Right Indicators

There are numerous considerations that need to be made when determining sets of criteria to help select appropriate indicators. Factors such as target audience, compatibility with scientific research and allowances for cultural and national differences are amongst the issues at hand. As a general rule sustainable consumption indicators should be:

- Conceptually well founded;
- Understandable – not overly complicated;
- Focused on internationally accepted principles of sustainable consumption; and
- Realistic about data availability and its associated quality.

3.2. Measurability of the Indicators

A major inhibitor to current indicator research is the availability of accurate data. Some indicators are immediately measurable, while others require further testing and explanation. Moreover, there is a lack of consistency between

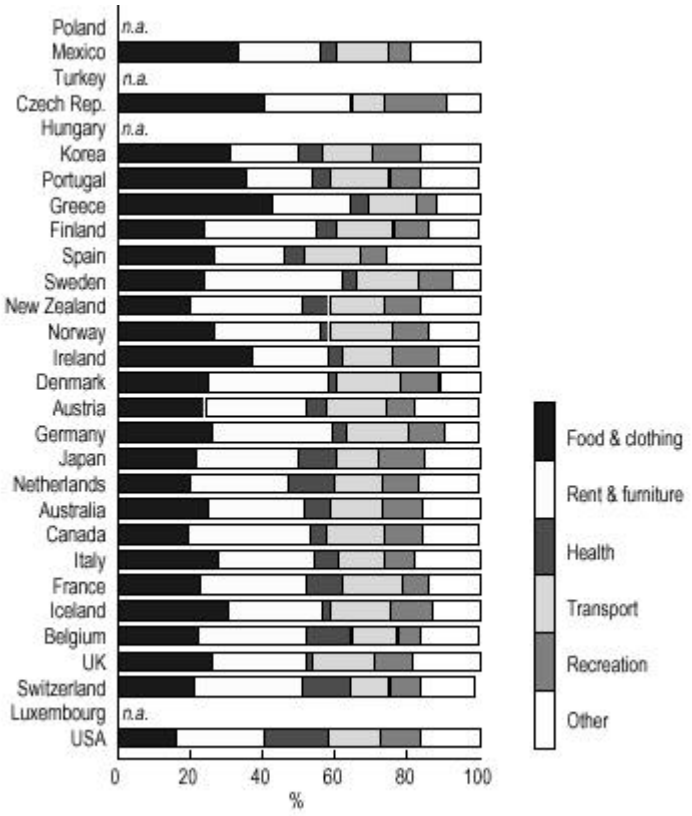
nations in the area of statistical recording and the related terminology. Accurate compiling of a set of indicators for developed countries, may act as a positive example for the global community, but does not approach the issue from a holistic approach.

In his article 'Measuring the unmeasurable' Mr. Arthur Dahl from UN System-wide Earthwatch proposes a way of tracking progress towards sustainability. He suggests that "in a dynamic system like human society, sustainability is fundamentally a question of balance, maintained over time. It thus cannot easily be scaled and measured, since it is a quality of motion rather than a fixed point. It may be more easily defined, in practice, as the lack forces tending to upset an equilibrium over time. This is why most indicators are in fact measures of unsustainability, of the amount or extent of imbalances. As with a moving pendulum or an aircraft in flight, many different forces can act simultaneously to disturb an equilibrium; if one is reduced or eliminated, others become predominant. Sustainability can only be achieved when all forces upsetting the balance are removed."[37]

3.3. An Embryonic Stage

The process of developing a globally acceptable register of indicators for measuring changes in consumption patterns is far from finalized and must incorporate various attempts to define, discuss and test the various stages of the process.

Household Consumption Expenditure



Source: OECD

The above chart exemplifies the powerful analytical and communicative value of indicators. The chart provides all stakeholders with clear and precise information on what households actually consume in OECD countries. However, the chart is limited by the fact that it simply covers twenty-five of the 29 OECD representatives. As noted in earlier sections, the developing world has the potential to out-consume (on a total basis) the industrialized countries, therefore this tool should be expanded to include all nation-states. This is just one example of the many recent attempts to display the growing number of sustainable consumption indicators. The following table adapted from the 1998 Human Development Report depicts the

current shortage of aggregate consumption data for developing countries. The report presented resounding statistics from specific sectors such as health and education.

Inequalities in Consumption: The world's highest and lowest consumers

Private and public health expenditure, 1990	
Top 5 countries	**Expenditure per capita (US$)**
USA	2, 765
Switzerland	2, 520
Sweden	2, 343
Finland	2, 046
Canada	1, 945

Bottom 5 countries	**Expenditure per capita (US$)**
Vietnam	3
Sierra Leone	4
Tanzania, U. Rep. of	4
Lao People's Dem. Rep.	5
Mozambique	5

Source: UNDP, 1998

There clearly is a specific need for further scientific study in the sustainable consumption indicator field. The indicators should develop over time, reflecting changes in priorities related to sustainable consumption and production.

3.4. Uncomplicated and Attractive

Although legitimate scientific principles must be included, organizations displaying the information must not lose sight of the need to keep the indicators simple and engaging to all stakeholders. Solidly grounded and presented indicators (e.g. HDI) have powerful communicative value.

3.5. Limits of Use

As noted earlier, when indicators are used for policy analysis or evaluation, one should keep in mind that they are only one available tool for assessment. Indicators are capable of revealing trends and highlighting challengers and opportunities, however, should not be viewed as definitive measures of sustainability.

3.6. Policy Relevance

A major consideration could be to determine whether the indicators should be developed with government (national and global) policy making in mind. For example, the OECD sets of indicators on household and transport consumption patterns have been constructed to focus on current and potential policy initiatives. The question is ultimately, should all trends reflecting consumption patterns be researched and displayed or should concentration rather be on only those that are manipulative in the short-term.

4. ON THE HORIZON…

The UNCSD's provisional core-set of indicators are currently undergoing further methodological analysis and are being reviewed in terms of their link with the required data and its associated quality and availability.

The OECD is presently developing a set of indicators specifically to measure countries consumption patterns and trends. The OECD intends to focus on environmentally significant consumption patterns and the related policy, social and trade aspects of consumption. The organization has recently issued two reports focusing on household and transport consumption, displaying statistics for the twenty-nine OECD countries.

The potential for developing other indicators in new areas and within the current groupings is far from being discounted. For

example, in connection with UNEP DTIE's initiative linking advertising and sustainable consumption, additional efforts could be made to identify policy-relevant indicators for the role of the media and advertising on consumption patterns. Moreover, further indicators in the areas of recreation and tourism, mobility and transport, consumer goods and services (e.g. measuring the length of a product's life) and specifically the emerging role of communication platforms (e.g. internet, web-TV, etc.) on consumption patterns, need serious and detailed analysis.

In particular, considering the cluster of consumer goods and services, it would be valuable to further develop and expand on the area relating to the market share of more sustainably produced goods and services, including food.

This group of indicators could measure changes in consumer behavior or consumer awareness, in complementing attitude surveys, and in allowing a comparison of expressed and actual behavior. Policy makers would benefit from such indicators because it could identify market constraints to the adoption of green consumer behavior and in assessing trends in overall consumption.

The purpose of these indicators is to monitor social and environmental interest and awareness of consumers and producers. They could include organically produced food and other food produced more sustainably than alternative products. An associated study in this area would draw deeply upon the network of experts maintained and facilitated by UNEP DTIE's Sustainable Agri-Food Production and Consumption Forum.

An important medium-term goal of the various organizations working on sustainable consumption indicators should be to build upon the current collective spirit and produce a report that will utilize all current indicator methods and approaches, including the provisional core-set outlined in this article, in order to compile a global statistical index – similar to that of the Human Development Index (HDI). The report would be made available to policy-makers at the national and

international levels to help highlight positive and negative consumption trends and promote the adoption of more sustainable practices.

The majority of today's emerging global consumer class presently practices a lifestyle that can be best categorized as environmentally wasteful and inefficient, requiring large quantities of resources per capita and generating wastes that create further environmental problems when they are disposed of and released into the environment. However, this phenomenon is by no means fixed. Technology, including new communication tools, can be enhanced to reduce resource use and to design, develop, and promote more environmentally friendly products and services. Moreover, efforts to increase environmental efficiency, reduce waste and introduce recycling are growing and spreading. Therefore, accurate devices of measurement must be appropriately formulated and tested in order to provide all stakeholders with the necessary weapons for instigating positive change.

Measuring patterns that link consumption with environmental impacts should be considered as only one component in achieving global sustainability.

At the World Economic Forum, on 31 January 1999, UN Secretary-General Kofi Annan launched the Global Compact and challenged world business leaders to "…embrace, support and enact a set of core values in the areas of human rights, labor standards and environmental practices."

The challenge ahead will be to integrate those social issues – highly relevant to researchers and consumers alike – into the indicator framework.

The appreciation of the *fact* that the devastation of the global environment and the associated fate of human existence are intimately connected to patterns of unsustainable consumption, should be considered as merely the foremost victory of what promises to be a grand endeavor.

NOTES

[1] UNEP's Division of Technology, Industry and Economics (DTIE), Sustainable Consumption Activities commenced in December 1998
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[6] UNDP. (1998). Human Development Report. New York: Oxford University Press. p.46
[7] UNDP. (1998). Human Development Report. New York: Oxford University Press. p.47
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[13] UNEP. (2000). The Kabelvåg Network brochure
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[19] UN DESA. (1998). Measuring changes in consumption and production patterns. *A set of Indicators*. New York: United Nations. p.47
[20] 6th Governing Council Special Session, Speech – Director, UNEP DTIE
[21] UN DESA. (1998). Measuring changes in consumption and production patterns. *A set of Indicators*. New York: United Nations. p.17
[22] UNEP. (1999). Global Environment Outlook 2000. Kenya: UNEP. p.5
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[24] 6th Governing Council Special Session, Speech – Director, UNEP DTIE
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[32] UNEP. (1999). Global Environment Outlook 2000. Kenya: UNEP. p.36
[33] UNEP. (1999). Global Environment Outlook 2000. Kenya: UNEP. p.6
[34] UNEP. (1999). Global Environment Outlook 2000. Kenya: UNEP. p.6
[35] UNEP. (1999). Global Environment Outlook 2000. Kenya: UNEP. p.6
[34] The figures are estimates only.
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Some other sustainable consumption and indicator resources:

UNEP DTIE Sustainable Consumption Programme:
http://www.uneptie.org/sustain/

United Nations Commission on Sustainable Development; Consumption and Production patterns:
http://www.un.org/esa/sustdev/cpp1224.htm

OECD: Environment:
http://www.oecd.org/env/consumption/scp26.htm

UNEP Earthwatch: http://www.unep.ch/earthw/indicat.htm

International Institute for Sustainable Development (IISD):
http://www.iisd.ca/