SUSTAINABLE DEVELOPMENT OF SOCIETY

METHODICAL GUIDELINES
to lectures for training Masters
specialty 231 Social Work

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Developers:	REVKO A.M., Doctor of Economic Sciences, Professor of the Department of Social Work VERBYTSKA A.V., PhD in Public Administration, Head of the Department of Marketing, PR-Technologies and Logistics
Responsible for issue:	KOLENICHENKO T.I., Heard of the Department of Social Work, PhD, Associate Professor
Reviewer:	DUBYNA M.V., Head of the Department of Finance, Banking and Insurance, Doctor of Economics, Professor

CONTENT

PREFACE

Sustainable development of society is an essential and difficult challenge. It means to create a proper balance between economic, social, cultural and ecological development and needs of society. Successful sustainable development is development that, based on preserved and healthy ecosystems, facilitates human well-being and safety and can therefore create a sound economy. For this reason sustainable development is not only a political and scientific concept. It is also a value.

The purpose of the course is to provide students with knowledge of the various socio-economic and technical issues involved in sustainable development and to give a broad set of instruments in order to bridge the science and the practice of the application and enhancement of sustainable development.

The primary studying goals of the discipline: acquaintance with the basic concepts, models, practices and policies of sustainable pathways to development; studying of current international policy landscape for the Sustainable Development Goals; studying of basic components of sustainability (environmental, economic and social); studying of the methods and functions of the education for sustainable development; practical mastering of making and implementation of the strategies for sustainable development; practical mastering of the social action projects design for sustainable development on the community level.

The lectures cover theoretical principles according to thematic lesson plan and detailed examples. Each lecture contains the necessary content, theoretical information, that facilitates the perception of the new material.

This course is adapted after the Sustainable Development Course as a part of University`s membership in Baltic University Programme.

Lecture 1. INTRODUCTION TO KEY CONCEPTS AND CHALLENGES OF SUSTAINABLE DEVELOPMENT

1.1 A brief historical background of Sustainable Development: from the first international environmental conference to the UN Decade of Education for Sustainable Development.
1.2. The meaning of "sustainable development".
1.3. Understanding of sustainable development.
1.4. Social values and sustainable development.

1.1 A brief historical background of Sustainable Development: from the first international environmental conference to the UN Decade of Education for Sustainable Development

We all know that human beings have basic needs, such as food, shelter, clothing, health, education, etc. But the life support systems have to operate without being over-burdened either by our withdrawal of resources or our discharges of waste and pollution. Neither should we forget the cultural and emotional aspects of human life. Sustainability requires that society and nature are viewed holistically.

Different examples, events and reports convince us that the Earth is over-burdened. Almost everyone agrees that something has to be done. But not everybody agrees on what changes need to be made, how these changes ought to take place and which areas need to be immediately addressed.

It is increasingly clear that drastic changes are necessary; changes that also include economic and social reform. But rather than single-mindedly concentrating on waste and pollution, we also need to focus on adopting new principles for consumption, production and distribution. A holistic approach that includes all these things reflects a real sustainable development.

Sustainability requires that all angles are considered. Typically, the overuse of a resource is first experienced as a burden on the environment in terms of its waste products, such as an excess of CO_2 or eutrophication due to an overuse of phosphates. Answers to the question about how we ought to deal with environmental problems seldom get to the root of the problem, that is, the way our societies work.

Sustainable development can be understood from different points of view. Some people see it as a journey or an ongoing process within the limits of ecological frameworks. The long-term aim of this journey is to have as good a life as possible without hurting or harming other fellow humans or living beings.

In the same spirit democracy is very much a part of sustainable development. Agenda 21 (UN, 1992) emphasises participatory democracy, which means that decisions are made and implemented in cooperation with ordinary citizens like you and me. This is another aspect of the ethics of

justice. So, to summarise, sustainable development can be considered as a sort of journey or direction and needs to be thought about or reflected upon.

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Reflection Box 1 – Sustainable Development

1. What are people's basic needs? Do they also include the desire to travel, equip our homes with beautiful furniture and flat screen TV's? Who decides and makes priorities when resources are limited?

2. How would you describe and explain the concepts of sustainable development and sustainability? Write down your own understanding and discuss them with your colleagues.

3. Why is sustainable development so important right now?

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At the beginning of the 1960s the time was ripe for a wide social debate relating to the environment. Rachael Carson's book "Silent Spring" (1962) was a wake-up call. The basis of the book was a connection between the death of the species of birds.

During the 1960s society felt the need to do something about the existing environmental problems. Technology was introduced to clean chimneys and sewage pipes, for example.

The first international environmental conference was organised by the UN and held in Stockholm in 1972, during which the western world's environmental problems were discussed. The conclusion was that scientists, experts and technology would solve these problems. It was not something that ordinary people needed to worry about. But people didn't accept this and in the 1970s they started to get more and more involved in environmental organisations and pressure groups. People became very concerned and active and put pressure on the politicians to do something.

The actual concept of sustainable development emerged in the 1980s in response to a growing realisation about the need to balance economic and social progress with a concern for the environment and management of the Earth's natural resources. The concept became more widespread with the publication of "Our Common Future" by the World Commission on Environment and Development in 1987. In this publication the Commission defined sustainable development as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". In other words, although development may be necessary to satisfy human needs and improve the quality of life, it should occur in such a way that the capacity of the natural environment to meet present and future needs is not compromised.

Twenty years after the Stockholm conference the UN again raised the environmental question, this time on a global stage and with a focus on the 21st century. The UN conference on Environment and Development held in 1992 in Rio de Janeiro resulted in Agenda 21, with guidelines as to how the world's governments, councils and important social groups should introduce development in the 21st century without damaging the environment. The message from the Rio Conference was that both rich and poor countries have

their different environmental problems and that in many cases unsustainable development is a result of people's ideas about lifestyles.

Chapter 36 of Agenda 21 (UN, 1992) directly addresses education. These initiatives need to be developed. In many countries schools and universities now have to include education for sustainable development in their educational curricula.

The importance of education for sustainable development was already emphasised in 1977. In this year the first international initiative was taken in Georgia, at that time part of the Soviet Union, when The Tbilisi Declaration was adopted at the end of a conference. The declaration noted the unanimous support for environmental education that would help to preserve and improve the world's environment and encourage a sound and balanced development of the world's communities.

The role of the 2002 Johannesburg World Summit on Sustainable Development promoted Education for Sustainable Development (ESD) as a key concept in its plan of implementation. The UN Decade of Education for Sustainable Development (2005-2014) was decided on later that same year by the UN General Assembly. The decade is monitored by UNESCO, has a global vision and aims towards a world in which everybody will have the opportunity to benefit from quality education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation. The aim of the decade is to ensure that "education for sustainable development is practiced in schools and other educational establishments in order to highlight the central role that education and learning play in the common pursuit of sustainable development and that quality education is a precondition for education for sustainable development at all levels and in all aspects of education".

1.2. The meaning of "sustainable development"

The most common definition comes from "Our Common Future" (1987), also called the Bruntland Report after the, the former Prime Minister of Norway, Gro Harlem Bruntland, who was the Commission's Chairperson.

"Sustainable development seeks to meet the needs of the present without compromising the ability to meet those of the future".

The meaning of "sustainable development" should be kept simple: sustainability is a state which may continue in the long term, in fact forever. Sustainable development is a development, which brings us closer to sustainability. (Others consider sustainability and sustainable development to be the same thing.)

Sustainability normally refers to a system including not only society and people but also nature or the environment. The system may be a city or a country but today most often it is the whole world with everything on it, including nature, people and our societies. For example if someone talks

about sustainable economy, one may need to remind the person that the economy is part of a larger system and that it depends on all the component parts. One very often says that sustainable development has **three dimensions:** *ecological* (also called environmental), *economic and social*. However these three parts of the system may be subdivided. Thus the environment consists of the life forms, the atmosphere, the soil etc, while the social dimension may be divided into human welfare and society with all its institutions. It is obvious that the huge system under study has very many components.

The long term conditions required for sustainable development was used by the Brundtland Commission to create the most often used **"definition" of sustainable development**: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

It contains within it two key concepts:

- the concept of 'needs', in particular the essential needs of the world's poor, to which primary priority should be given; and

- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

Understanding sustainable development is quite often a personal matter; these personal views have to be respected - what is important for one person or another may differ very much.

Nevertheless there are some **basic conditions**, which need to be fulfilled if a society should continue to prosper in the long term. These conditions may be divided into physical, biological and social. The **physical conditions** are summarised in the Natural Step conditions for sustainable development, often used in practical work in business and at the local level. Here the proper use of resources and non-accumulation of pollutants are in focus. The **biological conditions** reminds us about that we all depend on the sun as a source of energy, and that diversity of life forms need to be conserved to maintain life in the longer term. The **social conditions** for sustainable development have been less well studied. So far we may say that they refer to proper governance of societies, human welfare and a limited human population.

An important condition for sustainability is not to rely on non-renewable resources (such as fossil fuels) or use **renewable resources** (such as fish) above their regeneration capacity. One may also underline that the human population need to stay within the carrying capacity of the environment. Sustainable development thus in practice often become the proper management of limited resources.

The conditions thus reminds us that the **interaction between the human and the nature need to work properly**. It includes both the fact that nature provides us with resources – air to breath, water to drink and food to eat – but that it also takes care of all the waste emitted from the human

society. The capacity of Nature to do this should not be overused to guarantee long-term survival, that is, sustainability. Sustainabilty also requires that a society works properly, and that nature in itself also needs to work properly.

> **Reflection Box 2. Sustainable Development**
> 1. It is said that in most cases unsustainable development is the result of the way people live their lives and that problems and conflicts are not always noticed or locally visible, but are usually based on a combination of local and global agreements. Do you agree with this? Think of some practical examples as proof of this. How can we get people to change their lifestyles and live more sustainably?
> 2. Changes need to be made visible. Who initiates change, takes the lead and implements change? Is it the consumers, organisations, companies, politicians or other stakeholders? Compare events like the Rio Conference with national and local changes taking place today.

1.3. Understanding of sustainable development

We have already indicated that sustainable development is interpreted in different ways. Let's take a look at some of these interpretations in more detail.

The goal of sustainable development has proved to be relevant, comprehensive and meaningful. It may continue to serve as a guideline or compass needle to indicate development options open to the society in question. But in reality the concept has proved difficult to understand and put into practice. How can we help ourselves, as well as students of all ages, to understand and practice sustainable development? A crucial step in this direction is to discuss what we mean by our needs and also what is required in order to meet the needs of future generations.

Damaging environmental impact, the depletion of natural resources and a decreased biodiversity are all incompatible with sustainability. These trends have to be reversed in order to reach the goal of sustainability. But there are other aspects to sustainable development, too. It is obvious that protection of the environment will not happen until people have achieved the necessary – and acceptable – social and economic standards and circumstances.

There are different interpretations of what is most important in order for development to be sustainable. Some emphasise the importance of a functioning nature and environment, while others emphasise democracy and equality or the stable economic growth of society. The social aspects refer mainly to political institutions, where democracy is particularly crucial to sustainability. The main thing here is that development does not cause social conflict. In practice this means that development should increase people's control over their lives and that all social groups should have the opportunity to participate in decision-making. From a social point of view one may stress the importance of cultural sustainability. Cultural sustainability requires that development takes the values of the people affected by it into account. In

addition, a wide range of cultural groups should be maintained and encouraged, and the value of their heritage and traditions recognised.

"The Chair of Sustainable Development"

The chair of sustainable development has four connected 'legs' of sustainability and all four legs have to be included in policy and management for sustainable development. If one leg is over-emphasised, such as the 'economic leg', the chair will be unstable and uncomfortable. The figure 1.1 indicates what the cultural, social, ecological and economic "legs" of the chair represent:
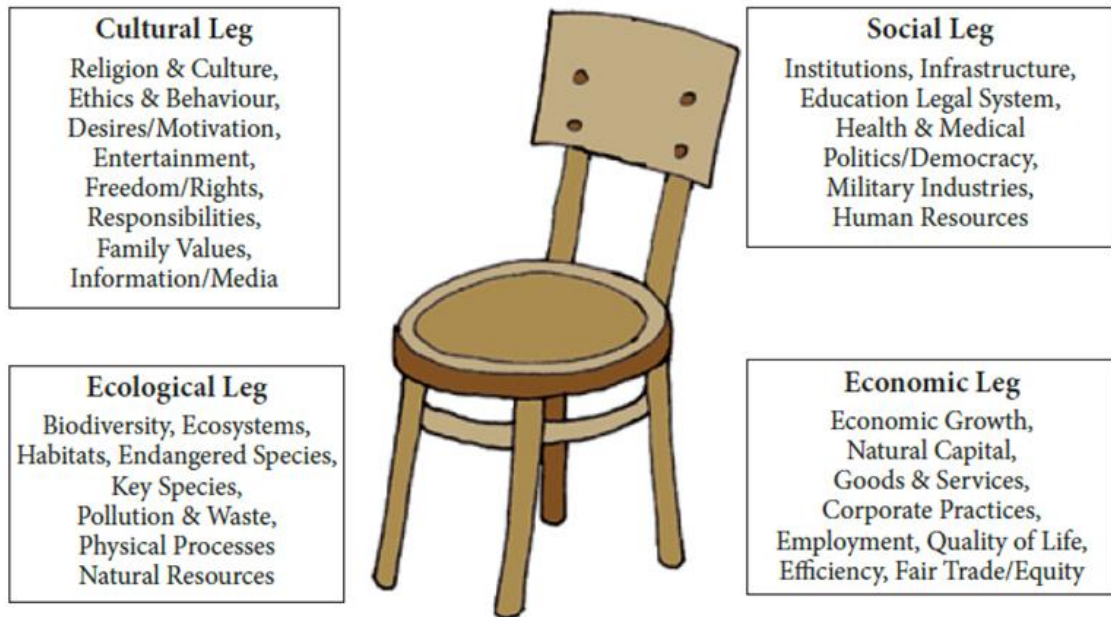
Fig. 1.1 The Chair of Sustainable Development

Economic sustainability – means that all the processes and projects undertaken must give the greatest output possible and that the benefits of such a development are distributed between the generations. Economic efficiency means the well-being of the present and possibilities for the future. The understanding is that development determines the quality of economic achievements, the conservation of resources and participation in economic development, and the consumption of goods and services. One of the characteristic tendencies is *resource economy* in production, or the choosing and usage of renewable resources and technologies. Sustainable economic management depends on present-day policies or actions that do not compromise future developmentt. Economic sustainability includes an economic benefit for the generations to come. The cultural heritage and the environment should be included in the economic development model. The use of ecologically and resource-saving technologies, investments in and subsidy of ecologically clean products, and environmentally-friendly national and taxation policies, are all parts of economic sustainability.

Social sustainability – means that development should increase people's control over their lives and that all social groups should have the opportunity to participate in decision-making. This implies development of society as a whole, the involvement of all social groups in decision-making and everybody's participation in a development that is sustainable. The social perspective includes ecological ethics, life quality, well-being and care for future generations and other cultures. Social development, or a social perspective of sustainable development, seeks answers to questions relating to the human role in the universe, and includes moral and ethical aspects. The aim is not to destroy the balance but to contribute to the harmony of the ecosystem and its relationships with our societies.

Cultural sustainability – means that the diversity of cultural groups should be maintained and encouraged and the value of their heritage and traditions recognised. This requires that any development takes the values of the people affected by it into account, that the range and variety of cultural groups is maintained and encouraged, and that the value of their heritage and traditions is fully recognised. Culture relates to ways of being, relating, behaving, belie-ving and acting that differ according to context, history and tradition, and within which human beings live their lives. The recognition of practices, identity and values – the software of human development – plays a considerable role in setting directions and building common commitments.

Human life is also determined by cultural heritage and attitudes towards the environment. In contrast to other living beings, human nature expresses itself in culture. Cultural sustainabi-lity includes the exploration, preservation and development of heritage and traditions related to the history of civilisation. Cultural identity is much more sustainable than the identity of the market. You can ruin the market and change the government, but cultural identity remains constant and guarantees the survival of people, the state and the economy.

Ecological sustainability – means that society needs to recognise that the survival and well-being of other species and natural processes are fundamental. The ecological point of view widens concepts of moral action and emphasises a responsibility to care for living organisms.

The basis of ecological sustainability is the understanding of a common ecosystem model: all systems on earth are interlinked and have to be preserved and maintained, and that the Earth can be seen as a self-regulating system where all components are valuable.

Sustainable Development is to create a proper balance between economic, social, cultural and ecological development and needs.

The three circles

For those who want to visualize the different aspects of sustainable development as a hierarchy of interdependency, the circle approach provides an alternative model.
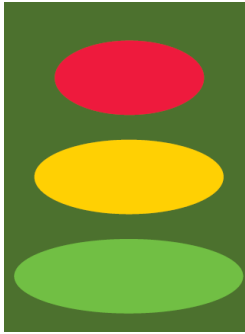
The green ecological circle is concerned with protecting a well functioning ecosystem with a large biological diversity – the life-support system that forms the basis of everything.

Preserving nature's long-term processes is extremely important and serves as a life insurance for nature with all forms of life including human life.

Preserved ecosystem processes supply us with a number of free services, such as natural water purification, the filtering of UV radiation and insect pollination. The ecological aspect forms the outer frame for all human activities. Many educators prefer to present the ecological dimension as a base while keeping in mind that sustainability is also about co-existence with other humans. Sustainable development therefore needs to incorporate the human, social and economic dimensions.

The red circle is about how to create well-being in a local and global society and a mutually interdependent relationship with other people. The social circle reminds us of the necessity to fairly and equally shares the Earth's resources in a democratic manner. In short, this is a society in which our basic needs are fulfilled and human rights are respected. The social aspect is about maintaining the good parts of life. But which human needs should we emphasise? How can we create a society of happy and satisfied people based on key concepts like security, participation, integration and culture?

The yellow circle describes the economic or house-keeping aspect. This is about being economical with human and material resources. A sustainable economy utilises the interest of global productivity rather than the capital. It is an economic development that gives economic benefits to society as a whole and does not threaten either the man-made or natural capital. An economy that is socially unfair or that does not stay within ecological limits is not sustai-nable. In other words, acting sustainably is good economy.

Sustainable Development is a development which, based on preserved and healthy ecosystems, facilitates human well-being and safety and can therefore create a sound economy.

Reflection Box 3. Sustainable development
1. Why do we need sustainable development? Why do we talk about it so much today?
2. What makes development sustainable? Which keywords are the most important for you? Will your keywords keep the chair stable and comfortable? Will all the circles be the same size?
3. What does sustainable development mean for you, your lifestyle, your city and your community?

1.4. Social values and sustainable development

Sustainable development is not only a political and scientific concept. It is also a value. The Brundtland commission underlined that **sustainability is an ethics for our future**. In the 1987 report they write: "We have attempted to demonstrate how human survival and well-being may be dependent on our capacity to successfully transform the principles behind sustainable development into global ethics."

There are several parts in this ethics. The value dimension of sustainable development may be expressed in terms of justice.

Firstly those who support, or work for, **sustainable development with respect for the needs of coming generations**. When we ask for justice between this and coming generations we ask for inter-generational justice. The weak point with this request of justice is that the next generation is far away in time and space. This feeling of distance may be reduced by referring to the grandchildren, who already are here, or the fact that most people like the thought that what they have built up is preserved.

Sustainably is about **sharing resources of our planet**, not only between us and coming generations, but also between us living here and now. It is called intra-generational justice, justice between us here and now. The principle that each human being has the same right to resources is included in the Rio Declaration.

A third ethical principle of Sustainabilty is our obligations towards other life forms of the world, the animals, the plants and the Nature in general. This is called **bio-centric ethics or justice**. Other life forms may not have duties towards us but we have it towards them. The World Conservations Strategy, published by IUCN (International Union for the Conservation of Nature) in 1980 alarmed us about the rapid loss of biodiversity. The extinction of a number of life forms each year was seen as not only a problem for sustainable development but also an ethical problem. We as humans do not have the right to "extinguish" these other forms of life.

To this ethical statement are added concerns for resources, for the beauty of our world and the value of the natural world for coming generations.

We see **the role of ethics increasing** in many contexts. Ethics motivate people to care for the world around them and change their life styles. Ethics is used to clarify the role of values in policy decisions and choosing among alternatives of action. In sustainable development the role of values and ethics are often underlined. It needs to be transparent to help us to choose our future.

Lecture 2. SUSTAINABLE DEVELOPMENT GOALS (SDGS): FROM IDEA TO ACTION

2.1 The preconditions for new Sustainable Development Goals (SDGs) agenda.

2.2. Ukraine's development challenges: from the MDGs to the SDGs (2000–2015).

2.1 The preconditions for new Sustainable Development Goals (SDGs) agenda

Taking forward the 2015 Sustainable Development Goals In September 2015, the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) detailed there in was formally adopted at the United Nations (UN) Sustainable Development Summit. The SDGs succeed the Millennium Development Goals (MDGs) and guide the global path of sustainable development after 2015. The 2030 Agenda for Sustainable Development is a plan of action for people, planet and prosperity, with countries and all stakeholders acting in collaborative partnership to implement this plan. The Agenda also seeks to strengthen universal peace and provides a common vision for peaceful societies. It is a unanimous call for 'a people-centred and planet-sensitive agenda to ensure human dignity, equality, environmental stewardship, healthy economies, freedom from want and fear, and a renewed global partnership for sustainable development (UN General Assembly 2014). In his report to the UN General Assembly, A Life of Dignity for All: Accelerating Progress towards the Millennium Development Goals and Advancing the UN Development Agenda beyond 2015, the UN Secretary-General recommended the development of a universal, integrated and human rights-based agenda for sustainable development, addressing economic growth, social justice and environmental stewardship, and highlighting the link between peace, development and human rights (UN General Assembly 2013).

The UN Secretary-General reiterated much of this in his synthesis report on the post-2015 agenda, The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet (UN General Assembly 2014). The 2030 Agenda recognises that 'the interlinkages and integrated nature of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new Agenda is realized' (UN General Assembly 2015a) and that an integrated approach to implementation is a key factor. Our Common Future appeared in 1987 and provided the first widely used definition of sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (United Nations World Commission on Environment and Development [UNWCD], 1987). The 2030 Agenda and the SDGs provide a comprehensive vision and framework for all populations

across the life course. They encourage transformational change within societies and economies in a more sustainable direction, and they seek to incorporate and balance the three dimensions of sustainable development (economic, social and environmental). The UN Secretary-General's synthesis report on the post-2015 agenda (UN General Assembly 2014) retains the 17 SDGs developed by the 'The concept of education as a social process and function has no definite meaning until we define the kind of society we have in mind.' (Dewey 1916). In the same way, the 17 goals can be rearranged, aggregated or clustered according to the needs of each member state. In the synthesis report, the UN Secretary-General (UN General Assembly 2014) notes 'in particular, the possibility of maintaining the 17 goals and rearranging them in a focused and concise manner that enables the necessary global awareness and implementation at the country level', as well as providing some conceptual guidance.

One way to frame the SDGs would be to consider the three dimensions of sustainable development under an integrated agenda for economic, environmental and social solutions. This builds upon the core principles of sustainable development (including social development, environmental development and economic development) as described in Our Common Future (UNWCD 1987) and taken forward under the Education for Sustainable Development Agenda.

The key words from each SDG are highlighted in colour and clustered under relevant areas to demonstrate multisectoral working. The three core pillars represent an old concept of sustainable development. The 2030 Agenda moves towards integration of the three pillars and takes into account the interdependence of environmental, economic and social factors while recognising the realities of different national needs and capacities. The implementation of the SDGs will require knowledge and support to empower people through a holistic approach. All sectors will have a key role to play in delivery of the SDGs, with education and learning as key enablers. SDG 4 aims to 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'. Lifelong learning refers to learning that takes place across all life phases and 'includes learning behaviours and obtaining knowledge, understanding, attitudes, values and competences for personal growth, social and economic well-being, democratic citizenship, cultural identity and employability' (South African Qualifications Authority [SAQA] 2013). It also covers education in formal, informal and non-formal contexts (SAQA 2015). The crucial role of education in achieving sustainable development was initially stressed at the UN Conference on Environment and Development, held in Rio de Janeiro in 1992, through Chapter 36 of its outcome document entitled Agenda 21 (UN Conference on Environment and Development 1992) of The Future We Want, the outcome document of the UN Conference on Sustainable Development, Rio +20, in 2012 (UN General Assembly 2015b). Another way to cluster the SDGs would be according to

the six 'essential elements' for delivering on the SDGs that the UN SecretaryGeneral's synthesis report (UN General Assembly 2014) introduces: dignity, people, prosperity, planet, justice and partners. Education acts as a cornerstone of the post-2015 agenda – both as a goal in itself and as a catalyst for broader change.

2.2. Ukraine's development challenges: from the mdgs to the SDGs (2000–2015)

At the beginning of the millennium, Ukraine's economy demonstrated relatively steady growth, which improved the social situation in the country and had a positive effect on the achievement of the MDGs. The average growth rate for the country's gross domestic product (GDP) for 2000–2007 was about 7.5 percent. During this period, therefore, Ukraine's GDP grew by almost 80 percent and productivity by almost 70 percent. However, the positive economic and social progress in Ukraine occurred mostly because of a development model oriented towards exports of raw materials, based on the competitive advantages arising largely due to the low cost of energy and labour. This created an illusion of national economic competitiveness and a successful competition model, causing delays in addressing key systemic imbalances and necessary structural reforms. The lack of an adequate position in the international division of labour intensified Ukraine's dependence on fluctuations in the international economic environment. The inefficient structure of exports (mainly raw materials and with low added value) had a negative effect on economic growth. The lack of a consistent policy to address modern competitive factors meant that the Ukrainian economy struggled to respond to the global financial crisis in 2008–2009 and led to a record failure during the first wave of the crisis in 2009. The subsequent recovery in 2010 in Ukraine occurred primarily due to the recovery of foreign markets. In 2010, commodity exports from Ukraine rose by 29.6 percent by volume (according to the State Statistics Service) and by 26 percent by value, as a result of the post-crisis recovery of the global economy. The highest growth rate in the industrial sector was seen by mechanical engineering, chemicals and petrochemicals, and metallurgy. However, the recovery was not accompanied by any positive changes in the production structure, as evidenced by the continuing investment crisis. Thus, the economic situation in Ukraine continued to show the prevailing trends of the pre-crisis economic model, characterized by a high level of openness of the national economy and its vulnerability to fluctuations in international markets. Ukraine faced the need to change the ideology of economic growth. The 'old industrial' economic model oriented towards exports of raw materials was increasingly failing because of the instability and collapse of foreign markets. The slowdown in global economic growth led to lower demand on world markets and a negative impact on Ukraine's export-oriented industries. The consequences of the armed conflict in the east of the country, the uncertainty

of the direction of development and the unfavourable foreign economic situation were the main factors behind the second wave of the economic downturn and the decline in manufacturing, particularly in metallurgy and in some export sectors of mechanical engineering. Today, the challenge is seen as solving problems hindering the economic growth of Ukraine and creating drivers that would help accelerate economic development and ensure changes to its nature. The very process of defining SDG targets can serve as an impetus for further sustainable development.

Progress against the MDGs in 2000–2015. To build the State and introduce new tools for the market regulation of social and economic processes, Ukraine needed a clearly defined and socially acceptable strategy to achieve its development goals. The economy has changed significantly since independence, requiring new approaches to the strategic planning system. After adapting the MDGs in 2003, Ukraine started changing its approach to development planning and monitoring. To summarize Ukraine's progress against the MDGs, we can note some positive changes before 2013, which were, however, offset by the events of recent years. Thus, in terms of eradicating poverty, the relative poverty criterion (the proportion of the 2017 NATIONAL BASELINE REPORT 7 population living below the national poverty line) fell from 26.4 percent in 2000 to 24.5 percent in 2013. However, absolute poverty has increased, and new forms of poverty have appeared in recent years. To ensure quality lifelong education, certain steps have been made to reform the education system. General secondary education covers 98.3 percent of school-age children (99.3 percent of graduates from the ninth grade continue their education to obtain complete secondary education), and pre-school institutions cover 63.5 percent of children in urban areas and 39.9 percent in rural areas. Higher education covers 13.3 percent of young people aged 14– 34 (14.6 percent of those aged 17–34, 24.3 percent of those aged 17–28, and 40.9 percent of those aged 17–24), but it is still necessary to ensure that education is consistent with the needs of the labour market (based on projected economic trends). Promoting gender equality is a challenge for Ukraine. Achieving gender parity in government and public authorities remains a challenge, despite the achievements and changes made at the legislative and institutional levels. The gap in average wages between men and women (30 percent) is another manifestation of gender inequality. Child mortality almost halved between 2000 and 2014 (from 15.6 to 9.3 deaths under 5 years of age per 1,000 live births) due to deliberate efforts, including in reforming and developing perinatal care. However, examples of inconsistencies in the statistical data from various sources indicate a need for an improved monitoring system. Some positive trends were also seen in improving maternal health: maternal mortality fell by nearly 40 percent (from 24.7 to 15.1 deaths per 100,000 live births) in Ukraine between 2000 and 2015. All women are subject to regular medical examinations in the early stages of pregnancy (coverage exceeds 90 percent). However, the alarming

fact is that over 40 percent of the adult population of Ukraine (including women of childbearing age) aged 18–65 have at least one chronic disease. The level of awareness of each individual's responsibility for their own health among young people and efforts to encourage a healthy lifestyle are insufficient. Some success has been achieved in reducing the spread of HIV/AIDS and tuberculosis: 2012 was the first year that saw a reduction in the number of new HIV cases (by 2 percent from the previous year), indicating a decrease in the intensity of the epidemic. According to Spectrum estimates, in 2014 there were 223,000 people (of all ages) living with HIV in Ukraine. Mother-to-child HIV transmission was reduced by almost 85 percent. Progress has been achieved primarily due to preventive measures among at-risk groups, an improved response to the epidemic and implementation of relevant national programmes. However, the situation has become more complicated in recent years. There was some progress in ensuring environmental sustainability. However, due to anthropogenic load, about 70 percent of surface water and a significant proportion of groundwater reserves in Ukraine are no longer suitable as a source of drinking water. Waste management and the lack of a centralized water supply to the population living in rural areas are still major issues. About 4 million tons of pollutants are released into the air annually. Greenhouse gas (GHG) emissions and discharges of pollutants into the environment and the quantity of waste generated have been significantly reduced, largely due to the economic recession. It was possible to increase the country's forested areas and the size of nature reserves and national parks. However, there has been little or no progress in the energy sector, especially in terms of energy efficiency and renewable energy. Identification of national SDGs to be achieved by 2030. A participatory and inclusive process to identify SDG targets occurred in four areas in 2016: equitable social development; sustainable economic growth and employment; effective management; and ecological balance and building resilience.

The social vision of Ukraine's development up to 2030 covers such targets as public welfare and health being supported by innovative economic development built on the sustainable use of natural resources. It is envisaged to change the structure of exports and switch from raw materials and primary processing products to products and services high added value. Economic growth will be based on a 'green' economic model. Energy efficiency measures and energy-efficient practices will help significantly reduce energy consumption per unit of GDP. The share of clean energy generated will grow steadily, displacing the primarily traditional technologies, which will significantly reduce GHG emissions into the atmosphere. This will improve the quality of life without harming the environment and will become a significant factor in increasing life expectancy. Equitable social development. The impact of key social issues on the public's standard of living has been exacerbated by the effects of the armed conflict in eastern Ukraine. In general,

such factors as the risk to human life and health, the spread of violence, particularly against women, inequality and discrimination, increased extreme poverty and social exclusion, and the growth of socially vulnerable groups have a negative effect on a nation's human potential. The spread of a sense of social injustice and distrust of most public institutions in society has been a social threat.

The recovery of economic growth and ensuring equal opportunities for women and men to participate in economic, social and political life, as well as to access basic social services (especially education and health care), are urgently needed to ensure sustainable development. Sustainable economic growth and employment. The transformation processes in Ukraine have failed to build the country's economic potential. Instead, the structural, energy and financial crises have resulted in the unstable development of the national economy, as well as in lost resources, capital and time. In turn, the geopolitical conflict that has lasted for almost three years is reducing the opportunity for any efficient development. A certain economic recovery observed in 2016 is insignificant. Ukraine will still require deep systemic institutional and structural reforms, as well as a major technological change. The highest priority of economic policy should be to double real GDP growth and increase the employment rate of the working-age population to 70 percent over the next 15 years. This target will depend on:

(i) the creation and development of high-tech, competitive productive enterprises (from basic science to manufacturing and services);

(ii) growing domestic demand due to rising incomes and investment processes;

(iii) supporting exports with high gross added value and implementing infrastructure projects (motorways, motorway junctions, underground railways, high-speed railways, passenger vehicles for railway and water transport: cars, barges etc.); and

(iv) a rapid increase in productivity in agro-industry. The basic principles followed by state and public institutions to ensure economic growth should be as follows: to focus on using primarily their own resources, to minimize borrowing and use it exclusively for development purposes, rather than maintaining the current situation; to provide comprehensive support to the development of business; to guarantee and protect property rights and the stability, transparency and simplicity of the tax system; to eradicate corruption at all levels; and to legitimize the economy. No sustainable economic growth is possible without promoting full and productive employment and decent work for all women and men or without protecting human rights and ensuring reliable and safe working conditions for all workers.

Efficient governance. The groundwork for achieving the SDGs is done by building – at all levels – a peaceful and open community, institutionally capable of taking efficient action. Such governance includes: providing

personal security, rule of law and the fair administration of justice; the eradication of organizational and financial bases of criminal activity and corruption; and improving the efficiency of the State and local authorities based on open and transparent decision-making and public oversight of their implementation. Building peace, strengthening social cohesion and reducing all significant aspects of social conflict largely depend on the efficiency of the State and local authorities. To achieve the targets in this area, it is necessary to ensure the universal participation of citizens in state governance and the life of local communities, spread the practice of public–private partnerships, use communication technologies etc. Environmental balance and the development of resilience. Ukraine belongs to a group of countries with complex environmental issues. They are typical, on the one hand, of developing countries (unregulated use and abuse of natural resources), and, on the other hand, of industrialized countries (industrial pollution). A particular issue characteristic of the transformation period is waste management. The volume of waste generated is increasing, whereas the share of waste processed is insignificant. The continuing practice of depositing waste in overloaded landfills is a threat to the environment and increases risks to public health. The current practice of using landfills causes land degradation, while the unsustainable use of land, forest and water resources leads to irreversible ecosystem and biodiversity losses. The proportion of protected areas (6.6 percent of the total area of Ukraine) is insufficient to prevent such losses. Another contributor to the overall negative environmental impact is the military conflict in eastern Ukraine. Considerable effort, resources and time are required to overcome the effects of the damaged landscape and infrastructure of Donetsk and Luhansk oblasts.

Lecture 3. ECOLOGICAL SPHERE OF SUSTAINABLE DEVELOPMENT. THE ECOLOGICAL FOOTPRINT

3.1. The definition "Ecological Footprint".
3.2. Methodology for calculation of Ecological Footprint.
3.3. Ecological Overshoot.
3.4. Solutions in four major areas for improving sustainability: food, cities, population, and energy.

3.1. What is the Ecological Footprint?

The Ecological Footprint is a resource accounting tool that measures how much biologically productive land and sea is used by a given population or activity, and compares this to how much land and sea is available. Productive land and sea areas support human demands for food, fiber, timber, energy, and space for infrastructure. These areas also absorb the waste products from the human economy. The Ecological Footprint measures the sum of these areas, wherever they physically occur on the planet. The Ecological Footprint is used widely as a management and communication tool by governments, businesses, educational institutions, and non-governmental organizations.

The Ecological Footprint is the only metric that measures how much nature we have and how much nature we use.

The Footprint helps:
- COUNTRIES improve sustainability and well-being.
- LOCAL LEADERS optimize public project investments.
- INDIVIDUALS understand their impact on the planet.

How the Footprint Works. Ecological Footprint accounting measures the *demand* on and *supply* of nature.

On the demand side, the **Ecological Footprint** measures the ecological assets that a given population requires to produce the natural resources it consumes (including plant-based food and fiber products, livestock and fish products, timber and other forest products, space for urban infrastructure) and to absorb its waste, especially carbon emissions.

The Ecological Footprint tracks the use of six categories of productive surface areas: *cropland, grazing land, fishing grounds, built-up land, forest area, and carbon demand on land.*

On the supply side, a city, state or nation's **biocapacity** represents the productivity of its ecological assets (including cropland, grazing land, forest land, fishing grounds, and built-up land). These areas, especially if left unharvested, can also absorb much of the waste we generate, especially our carbon emissions.

Both the Ecological Footprint and biocapacity are expressed in **global hectares**—globally comparable, standardized hectares with world average productivity.

Each city, state or nation's Ecological Footprint can be compared to its biocapacity.

If a population's Ecological Footprint exceeds the region's biocapacity, that region runs an **ecological deficit**. Its demand for the goods and services that its land and seas can provide—fruits and vegetables, meat, fish, wood, cotton for clothing, and carbon dioxide absorption—exceeds what the region's ecosystems can renew. A region in ecological deficit meets demand by importing, liquidating its own ecological assets (such as overfishing), and/or emitting carbon dioxide into the atmosphere. If a region's biocapacity exceeds its Ecological Footprint, it has an **ecological reserve**.

Ecological Footprint of Countries-Deficit or Reserve
https://www.youtube.com/watch?v=6g49bL9f7mU

What does the Ecological Footprint measure?

Ecological Footprint accounts answer a specific research question: how much of the biological capacity of the planet is demanded by a given human activity or population? To answer this question, the Ecological Footprint measures the amount of biologically productive land and water area an individual, a city, a country, a region, or all of humanity uses to produce the resources it consumes and to absorb the waste it generates with today's technology and resource management practices. This demand on the biosphere can be compared to biocapacity, a measure of the amount of biologically productive land and water available for human use. Biologically productive land includes areas such as cropland, forest, and fishing grounds, and excludes deserts, glaciers, and the open ocean.

Global hectares are hectares with world-average productivity for all productive land and water areas in a given year. Studies that are compliant with current Ecological Footprint Standards use global hectares as a measurement unit. This makes Ecological Footprint results globally comparable, just as financial assessments use one currency, such as dollars or Euros, to compare transactions and financial flows throughout the world.

How accurate are Ecological Footprint measurements?

Current Ecological Footprint accounts provide a robust, aggregate estimate of human demand on the biosphere as compared to the biosphere's productive capacity. As with any calculation system, Footprint accounts are subject to uncertainty in source data, calculation parameters, and methodological decisions. Several organizations are seeking to allocate resources towards obtaining more accurate estimates of this nature.

What can Ecological Footprint Analysis tell us about the future of the planet? Are we all doomed?

The Ecological Footprint highlights the reality of ecological scarcity, which can be disconcerting and frightening information. The existence of global overshoot suggests that human society will need to make significant changes to 'business as usual' if it wants to create a sustainable future. Robust and accurate Ecological Footprint accounts can help us make decisions towards sustainability, and can quantitatively show the positive impacts of groups, businesses, and people making decisions that are helping to bring human demand within the means of the planet.

What is the proper way to use the term Ecological Footprint?

The term Ecological Footprint, capitalized, is a proper name referring to a specific research question: how much of the biological capacity of the planet is demanded by a given human activity or population? Often, the word 'footprint' is used generically to refer to human impact on the planet, or to a different research question. As commonly used today, for example, the term 'carbon footprint' often refers to the number of tons of carbon emitted by a given person or business during a year, or to the tons of carbon emitted in the manufacture and transport of a product. In Ecological Footprint accounts, the 'carbon Footprint' measures the amount of biological capacity, in global hectares, demanded by human emissions of fossil carbon dioxide. The term Ecological Footprint has been deliberately excluded from trademark to encourage its widespread use.

3.2.How is an Ecological Footprint calculated?

Ecological Footprints can be calculated for individual people, groups of people (such as a nation), and activities (such as manufacturing a product).

The Ecological Footprint of a person is calculated by considering all of the biological materials consumed, and all of the biological wastes generated, by that person in a given year. These materials and wastes each demand ecologically productive areas, such as cropland to grow potatoes, or forest to sequester fossil carbon dioxide emissions. All of these materials and wastes are then individually translated into an equivalent number of global hectares.

To accomplish this, an amount of material consumed by that person (tons per year) is divided by the yield of the specific land or sea area (annual tons per hectare) from which it was harvested, or where its waste material was absorbed. The number of hectares that result from this calculation are then converted to global hectares using yield and equivalence factors. The sum of the global hectares needed to support the resource consumption and waste generation of the person gives that person's total Ecological Footprint.

How does the Ecological Footprint address waste flows? From an Ecological Footprint perspective, the term 'waste' includes three different

categories of materials, and each category is treated differently within Footprint accounts.

First, biological wastes such as residues of crop products, trimmings from harvested trees, and carbon dioxide emitted from fuel wood or fossil fuel combustion are all included within Ecological Footprint accounts. A cow grazing on one hectare of pasture has a Footprint of one hectare for both creating its biological food products and absorbing its biological waste products. This single hectare provides both services, thus counting the Footprint of the cow twice (once for material production and once for waste absorption) results in double counting the actual area necessary to support the cow. The Footprint associated with the absorption of all biological materials that are harvested is thus already counted in the Footprint of those materials.

Second, waste also refers to the material specifically sent to landfills. If these landfills occupy formerly biologically productive area, then the Footprint of this landfill waste can be calculated as the area used for its long term storage.

Finally, waste can also refer to toxics and pollutants released from the human economy that cannot in any way be absorbed or broken down by biological processes, such as many types of plastics. Assessments of the Footprint of toxics and pollutants, when completed, generally refer to the Footprint of extracting, processing, and handling these materials, but not to the Footprint of creating or absorbing these materials themselves.

How does the Ecological Footprint account for recycling? As the Ecological Footprint reflects the demand for productive area to make resources and absorb wastes, recycling can lower the Ecological Footprint by offsetting the extraction of virgin products, and reducing the area necessary for absorbing wastes. Recycling paper, for example, can decrease the total amount of virgin timber that must be harvested to meet global demand for paper, thus reducing humanity's total Ecological Footprint.

The savings that result from the recycling process can be allocated to the person who recycles a material and/or the person who buys recycled material in a number of different ways:

- 100% to the person who buys the recycled paper (the wood fiber in a 100% recycled ream of paper could have no forest Footprint, since the footprint of that wood fiber was already allocated to the person who bought the virgin paper),

- 100% to the person who recycles the paper (a person purchasing 100% virgin paper who recycled all of it would have no Footprint for the wood fiber in that paper, since all of it is reused later, assuming that no fiber is lost in the recycling process), or

- split between the person who buys recycled paper and the person who recycles paper (the savings can be split 50%/50%, or in any other allocation).

Different researchers use different allocation principles for the savings from recycling, and standards-compliant Footprint studies will state their chosen allocation method explicitly. Regardless of allocation method, however, the largest reductions in Ecological Footprint can most commonly be achieved by reducing the total amount of materials consumed, rather than attempting to recycle them afterwards.

National Footprint Accounts provide the core data required for all Ecological Footprint analysis worldwide.

National Footprint Accounts (NFAs) measure the ecological resource use and resource capacity of nations over time. Based on approximately 15,000 data points per country per year, the accounts calculate the Footprints of more than 200 countries, territories, and regions from 1961 to the present.

The calculations in the National Footprint Accounts are primarily based on United Nations data sets, including those published by the Food and Agriculture Organization, United Nations Commodity Trade Statistics Database, and the UN Statistics Division, as well as the International Energy Agency. Supplementary data sources include studies in peer-reviewed science journals and thematic collections. Of the countries, territories, and regions analyzed in the National Footprint Accounts, 150 had populations over one million and typically have more complete and reliable data sets. For most of those, Global Footprint Network is able to provide time series of both Ecological Footprint and biocapacity.

Methodology. The Ecological Footprint is derived by tracking how much biologically productive area it takes to absorb a population's carbon dioxide emissions and to generate all the resources it consumes. A country's consumption is calculated by adding imports to and subtracting exports from its national production.

All commodities carry with them an embedded amount of bioproductive land and sea area necessary to produce them and sequester the associated waste; international trade flows can thus be seen as flows of embedded Ecological Footprint.

The Ecological Footprint uses yields of primary products (from cropland, forest, grazing land and fisheries) to calculate the area necessary to support a given activity (fig. 3.1).

Biocapacity is measured by calculating the amount of biologically productive land and sea area available to provide the resources a population consumes and to absorb its wastes, given current technology and management practices. Countries differ in the productivity of their ecosystems, and this is reflected in the accounts.

$$EF_C = EF_P + (EF_I - EF_E)$$

Ecological Footprint of Consumption

The Ecological Footprint of consumption indicates the consumption of biocapacity by a country's inhabitants.

In order to assess the total domestic demand for resources and ecological services of a population, we use the Ecological Footprint of consumption (EF_C). EF_C accounts for both the export of national resources and ecological services for use in other countries, and the import of resources and ecological services for domestic consumption.

EFc is most amenable to change by individuals through changes in their consumption behavior.

Ecological Footprint of Production

The Ecological Footprint of production indicates the consumption of biocapacity resulting from production processes within a given geographic area, such as a country or region.

It is the sum of all the bioproductive areas within a country necessary for supporting the actual harvest of primary products (cropland, grazing land, forestland and fishing grounds), the country's built-up area (roads, factories, cities), and the area needed to absorb all fossil fuel carbon emissions generated within the country.

This measure mirrors the gross domestic product (GDP), which represents the sum of the values of all goods and services produced within a country's borders.

Net Ecological Footprint of Trade

The Ecological Footprint of imports and exports indicate the use of biocapacity within international trade.

Embedded in trade between countries is a use of biocapacity, the net Ecological Footprint of trade (the Ecological Footprint of imports minus the Ecological Footprint of exports). If the Ecological Footprint embodied in exports is higher than that of imports, then a country is a net exporter of renewable resources and ecological services.

Conversely, a country whose Footprint of imports is higher than that embodied in exports depends on the renewable resources and ecological services generated by ecological assets from outside its geographical boundaries.
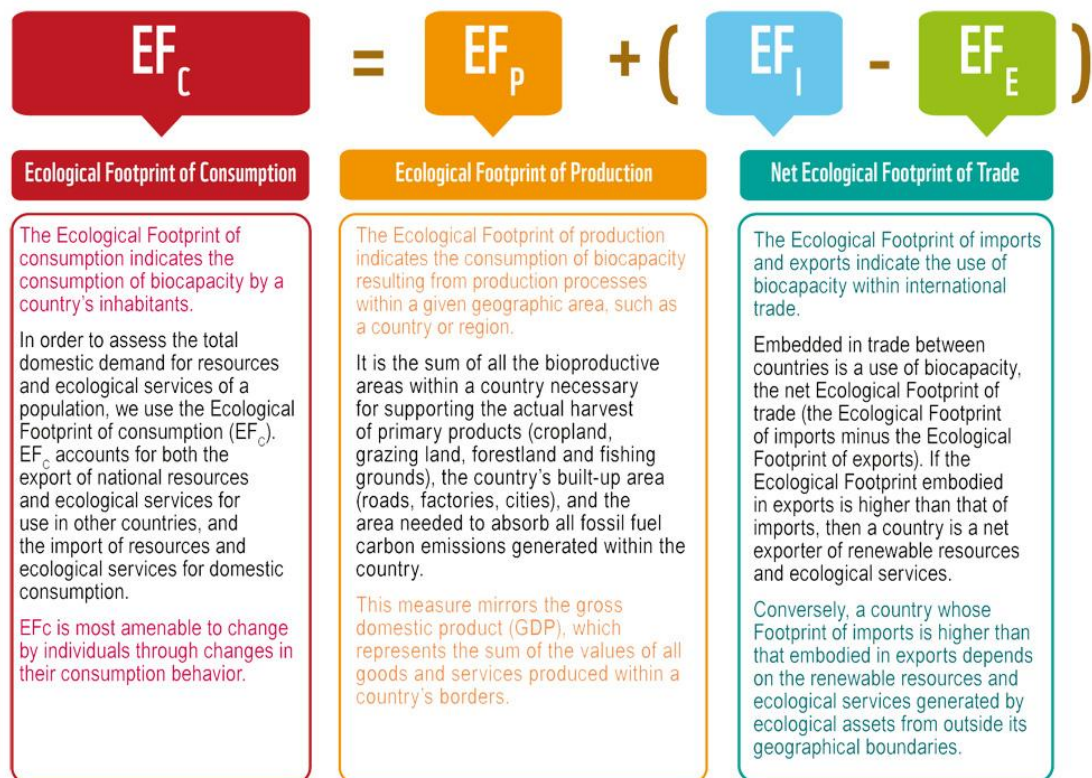
Fig. 3.1 Ecological footprint measurement

Results from this analysis shed light on a country's ecological impact. A country has an **ecological reserve** if its Footprint is smaller than its biocapacity; otherwise it is operating with an **ecological deficit**. The former are often referred to as **ecological creditors**, and the latter **ecological debtors**.

Government, environmental, and business leaders around the world use National Footprint Accounts data to better manage their country's limited resources, reduce economic risk, and improve human well-being. Through Ecological Footprint Explorer open data platform, this data is available for free so that as many people as possible can use it to help create a more sustainable future.

Today, more than 80 percent of the world's population lives in countries that are running ecological deficits, using more resources than what their ecosystems can renew (fig. 3.2). Is our country operating in the red?
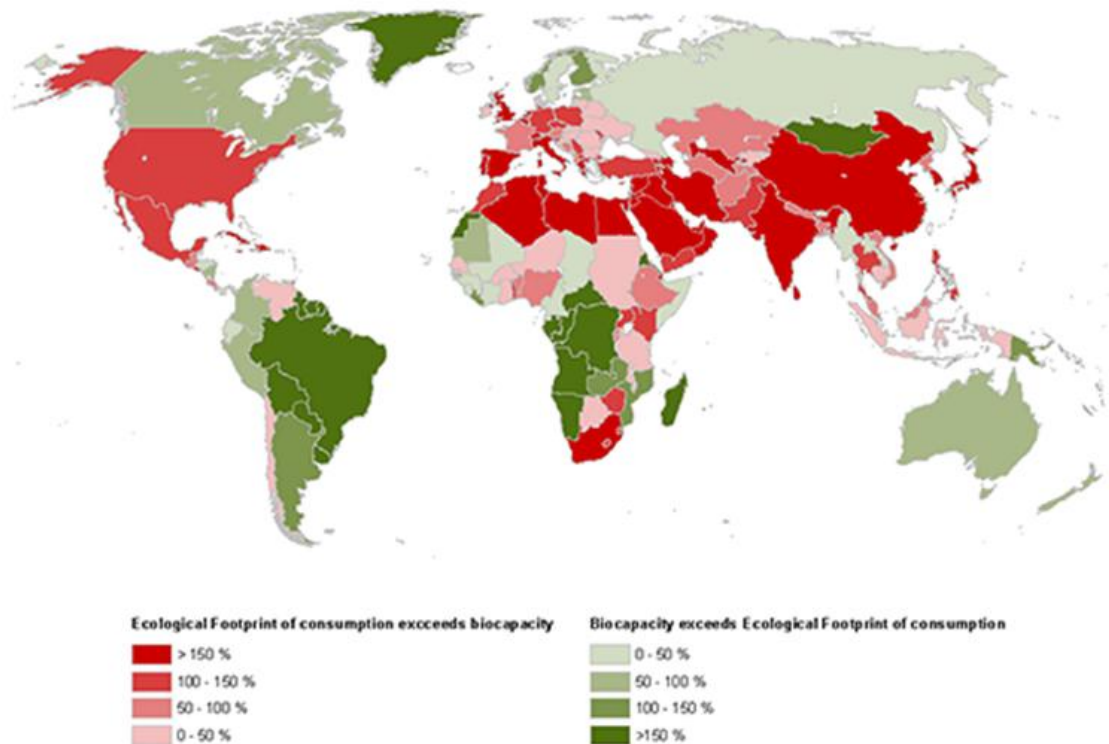
Figure 3.2 World map of countries by Ecological Footprint

Today, most countries, and the world as a whole, are running ecological deficits. The world's ecological deficit is referred to as global <u>ecological overshoot.</u>

3.3. Ecological Overshoot

In 2017, Earth Overshoot Day fell on August 2. Earth Overshoot Day marks the date when humanity has exhausted nature's budget for the year. For the rest of the year, we are maintaining our ecological deficit by drawing down local resource stocks and accumulating carbon dioxide in the atmosphere. We are operating in overshoot.

Earth Overshoot Day 2017 lands on August 2
https://www.youtube.com/watch?v=oPO2-KCyFvc

The world's ecological deficit is referred to as global **ecological overshoot**. Since the 1970s, humanity has been in ecological overshoot, with annual demand on resources exceeding what Earth can regenerate each year. Today humanity uses the equivalent of 1.6 Earths to provide the resources we use and absorb our waste. This means it now takes the Earth one year and six months to regenerate what we use in a year. We use more ecological resources and services than nature can regenerate through overfishing, overharvesting forests, and emitting more carbon dioxide into the atmosphere than forests can sequester.

What is Earth Overshoot Day?

When the entire planet is running an ecological deficit, we call it "overshoot." At the global level, ecological deficit and overshoot are the same, since there is no net import of resources to the planet.

Overshoot occurs when:

HUMANITY'S ECOLOGICAL FOOTPRINT > EARTH'S BIOCAPACITY

Earth Overshoot Day marks the date when humanity's demand for ecological resources and services (Ecological Footprint) in a given year exceeds what Earth can regenerate in that year (biocapacity).

Every year Global Footprint Network raises awareness about global ecological overshoot with our Earth Overshoot Day campaign, which attracts media attention around the world. Earth Overshoot Day is the day on the calendar when humanity has used the resources that it takes the planet the full year to regenerate. Earth Overshoot Day has moved from early October in 2000 to August 8 in 2016.

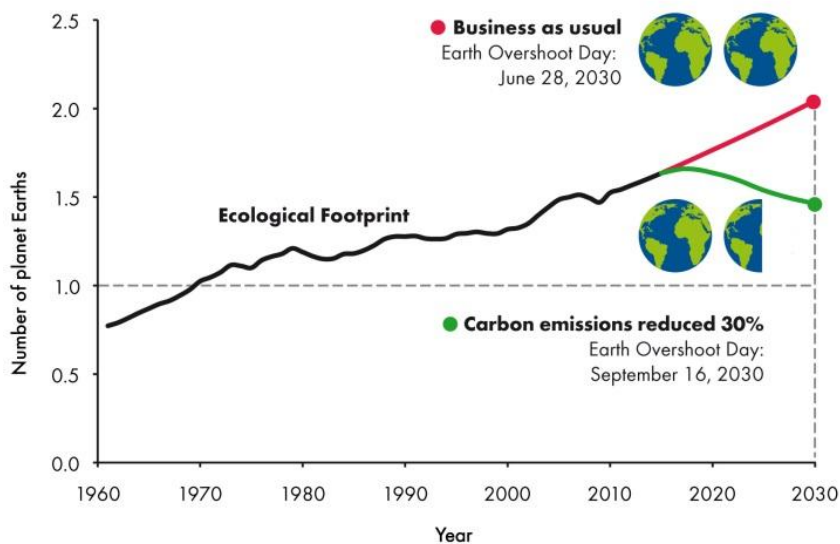How many Earths does it take to support humanity?

Fig. 3.3 How many Earths does it take to support humanity?

Under a business-as-usual path, human demand on the Earth's ecosystems is projected to exceed what nature can regenerate by about 75 percent by 2020. We must begin to make ecological limits central to our decision-making and use human ingenuity to find new ways to live well, within the Earth's bounds. This means investing in technology and infrastructure that will allow us to operate in a resource-constrained world. It means taking individual action, and creating the public demand for businesses and policy makers to participate.

3.4. Solutions in four major areas for improving sustainability: food, cities, population, and energy.

Conceived in 1990 by Mathis Wackernagel and William Rees at the University of British Columbia, the Ecological Footprint launched the broader Footprint movement, including the carbon Footprint, and is now widely used by scientists, businesses, governments, individuals, and institutions working to monitor ecological resource use and advance sustainable development.

Solutions in four major areas for improving sustainability: food, cities, population, and energy.
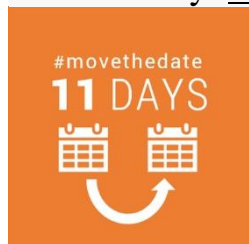
Food is a Major Ecological Footprint Driver

If we cut food waste in half worldwide, we would move Overshoot Day by 11 days.

Food demand makes up 26% of the global Ecological Footprint.

Two major issues when addressing food sufficiency, malnutrition, and hunger (UN Sustainable Development Goal 2) are:

1. Resource inefficiency in food production.

Animal calories are significantly more resource intensive than plant calories to produce. In fact, China's government is committed to reducing meat consumption by 50% by 2030. This would reduce the Ecological Footprint by more than 126 million global hectares and move the date of Overshoot Day back 1.5 days (according to China's current Ecological Footprint figures).

2. Food waste.

About one third of the food produced in the world for human consumption — 1.3 billion tonnes every year — gets lost or wasted, with high and low-income countries dissipating roughly the same quantities of food, according to the UN Food and Agriculture Organisation. That's equivalent to 9% of humanity's Ecological Footprint.

In the United States, an estimated 40% of the food goes to waste. That's the equivalent of the total Ecological Footprint of Peru and Belgium combined, or the total biocapacity of Mexico.

One target of UN Sustainable Development Goal 12 Sustainable Consumption and Production is to 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, by 2030. If we cut food waste in half worldwide, we would move Overshoot Day by 11 days.

UN Sustainable Development Goals

If we reduce driving by 50% around the world and opt for walking, biking or taking public transit instead, Earth Overshoot Day would move back 10 days.

Cities shape the size and growth of the Ecological Footprint,

as our recent report on the Mediterranean region showed. This trend will continue, as 70% to 80% of all people is expected to live in urban areas by 2050.

Consequently, smart city planning and urban development strategies are instrumental to make sure there is enough natural capital and to avoid excessive human demand that would erode it. Examples include energy-efficient buildings, integrated zoning, compact cities, and effective options for people-powered and public transportation.

UN Sustainable Development Goal 11 Sustainable Cities and Communities features several 2030 targets, including:

–   reduce the adverse per capita environmental impact of cities.

–   provide access to safe, affordable, accessible and sustainable transport systems for all, notably by expanding public transport.

–   enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

Transportation

In particular, city planning can play a major role in shaping our need for cars. It matters because personal transportation makes up 14% of humanity's carbon Footprint.

UN Sustainable Development Goals

Empowering women and girls results in greater gender equality and stabilizes population. If every other family in the world had one less child, we would move Overshoot Day 30 days by 2050.

The more of us there are, the less planet there is per person.

Addressing population size also has many social benefits. Educating girls and providing access to safe, affordable, and effective family planning are high leverage opportunities. In addition, empowering women is essential for sustainability. When women are respected as equal partners in the household, at work, and in the community, better social outcomes for their families, including health and educational achievements, and lower reproductive rates invariably ensue. Given resource constraints, countries with slowly shrinking populations may have a competitive advantage over countries with growing populations.

If the average family size is half-a-child smaller in the future, i.e. if every second family has on average one child less, there will be one billion fewer of us in the world than the 9.7 billion that the UN expects by 2050 – and four billion fewer by the end of the century. Given increasing longevity, the end of this century is within the expected lifetimes of children born today.

Reducing family size at this rate is equivalent to moving back Earth Overshoot Day by about 30 days, or one month, by 2050. Long-term benefits are even more striking. This continued reduction in family size would result in 50% more biocapacity per person in 2100. More biocapacity makes it easier to have thriving lives for all within the means of the planet.

Investing in smaller families through the empowerment of women is also consistent with the UN's Sustainable Development Goals (SDGs). SDG 5 Gender Equality calls for ending all forms of discrimination against all women and girls everywhere. Targets include:

– Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws.

– Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.

Read more in our blog post "Empowering women for a world that works for all."

Read more about the impact of population size on carbon emissions.

UN Sustainable Development Goals

Reducing the carbon component of humanity's Ecological Footprint by 50% would move Earth Overshoot Day by 89 days, or about three months.

The carbon Footprint makes up 60% of humanity's Ecological Footprint.

Not only is decarbonizing the economy our best possible chance to address climate change, but it would also improve the balance between our Ecological Footprint and the planet's renewable natural resources.

Per the 2015 Paris Accord on Climate, capping the global temperature rise at below 2°C (or even 1.5°C) implies keeping CO2e- atmospheric concentration below 450 parts per million (ppm). In 2017, the atmosphere contained 409 ppm CO2. The current carbon Footprint adds 2 to 3 ppm of CO2 to the atmosphere per year. This means that all of us need to phase out fossil fuels way before 2050, if we want to live up to the Paris agreement.

UN Sustainable Development Goal 7 Affordable and Clean Energy calls for substantially increasing the share of renewable energy in the global energy mix by 2030. Reducing the carbon component of humanity's Ecological Footprint by 50% would get us from consuming the resources of 1.7 Earths down to 1.2 Earths. This corresponds to moving the date of Overshoot Day by 89 days, or about three months.

Check back for a new energy-related pledge soon!

Lecture 4. ECONOMIC DIMENSION OF SUSTAINABLE DEVELOPMENT

4.1. Economy and ecology as a single system.
4.2. The dilemma of economic growth.
4.3. Tools for approaching a sustainable economy.

4.1. Economy and ecology as a single system

Economy is regularly defined as one of the (three) pillars, or **dimensions, of sustainable development** - Environmental, Social and Economic - all of which need to work to achieve a sustainable society. While environmental concerns have dominated the discussion for a long time we now see a change. Increasingly the language of sustainability comes closer to that spoken by politicians and businessmen. People start to realize that environmental issues need to be seen in a much broader perspective than before. They are not just a matter of environmental protection, but also a matter of long-term economic strategies. Economy is connected to environmental development but also it influences the social situation of a country.

The science of **ecological economics** attempts to study economy, the environment and natural resources together. It is obvious that economy depends on natural resources and those in turn depends on how the economy - e.g. forestry or agriculture or industrial production, which may lead to pollution - is conducted. Society, economy and nature together form a single system, in which all components influence each other.

Many environmental goods are traded on a market just as any other goods. Timber, agricultural products, mined metals and fossil resources are traded and have prices, and are thus part of the normal economy. When this trade has negative effects, which are not paid for - it may be both environmental and social negative effects - these are called **externalities**. Typical externalities include pollution by factories, roads that intrude in the landscape, and carbon dioxide emissions from transport e.g. air traffic. Pollution may decrease the health of the people leading to higher medical costs, or reduce the production of nature and thus lower the income from forests, fields and the sea.

When the price of a product does not represent its true costs we have a **market failure**. Market economy does not automatically take care of the environmental costs of the economy. In fact it never does as "free" ecosystems services are supporting all activities in the system Nature-Economy. The value of all ecosystems services on Earth has been estimated and the result is much larger than the value of the total economy, that is, the world Gross Domestic Product, GDP.

One way to deal with this is that the State introduces an **environmental tax**. In this way an externality may be included or even avoided, for example when a factory finds it economically better to develop a production without pollution. The State may also use the tax money to restore the environment, for example when a tax on e.g. emissions of air pollutants such as SOx is used for the liming of acidified lakes.

An environmental tax that makes the polluter pay at least some of the cost of polluting, is fulfilling the so-called **Polluters Pay Principle**, meaning that those who pollute should pay for the damage caused, most typically for the cost of remediation. In real life it is often difficult or impossible to find the polluter, e.g. when a country is hit by acid rain. Instead too often it is the victim who pays. Today we are fighting to remedy quite much of the consequences of earlier environmental sins, e.g. by remediation of *brown fields*. Those are much polluted earlier industrial areas, which are often extremely expensive to clean up. This is the environmental debt of earlier generations.

But what about environmental goods and services which are never sold and bought on a market? Can they be given a price? Sometimes a price can be calculated as an indirect cost. Thus, the prices of all properties at the shore of a sea before and after it has been polluted reflect the price of a clean sea. **In absence of a market price** one may simply ask people what they are willing to pay (willingness to pay, WTP method), for example for the possibility to pick mushrooms in the forest, or to be able to swim in a nearby lake.

There are also services, which do not have a price, that are priceless, such as the beauty of a mountain range or the existence of the biodiversity of a coral reef, they have **existence value**. It is also obvious that monetary methods have limits. We have to preserve the basis for our lives regardless of what the market says. "When the last tree is cut, the last fish is eaten, it will be obvious that we cannot eat money."

When asking who owns the environment, the answer above is "the state", as the state is able to collect environmental tax. Sometimes this does not apply. The World's Oceans for example do not have an owner in this sense. Therefore fishing fleets may harvest as much fish as they can, not to let someone else do it. As a consequence the resource is partly or completely destroyed, a reality of today's ocean fishing. This is called **the tragedy of the commons**. An unregulated common resource is at danger. We see national states regulating their common resources, and some international regulations, e.g. fishing within the European Union waters, but the so called global commons – Antarctica, the oceans, the atmosphere - are in danger. Global warming can be seen as the failure to regulate the use of the atmosphere as a recipient for greenhouse gases.

The environment is thus valuable, but where is **the wealth of nations?** The collected value of all goods and services sold and bought in a nation is traditionally expressed as Gross National Product, GNP. The weakness is that

it includes transactions, which are not understood as wealth, such as health services, and excludes others, which are percieved as wealth, such as natural resources. These are included in a **green GNP and green budgets**. The absolute value of a green GNP is not possible to establish. The large value of working with a green budget or green GNP is rather to follow the changes from one year to the next. Green budgets include traditional statistics (production values, processing value, employment), but also adds positive items (energy as biomass etc, and natural resources such as forests, fisheries etc) and subtract negative ones, such as emissions. The World Bank, which in this way has reported on the wealth of nations, emphasise the importance of agriculture, especially in the developing world.

But equally important as the wealth of nations is the **distribution of wealth**. The economic inequity between, as well as within, countries has typically increased since the 1970s. Large **income inequalities** are by many considered a problem as serious as the environmental crisis. A country with large personal income inequalities has larger problems in medical and psychological health, crime, gender equity, social trust etc. In Europe a key task for the welfare state is to function as a huge re-distributor of income to reduce inequity by collecting taxes and supporting those without income.
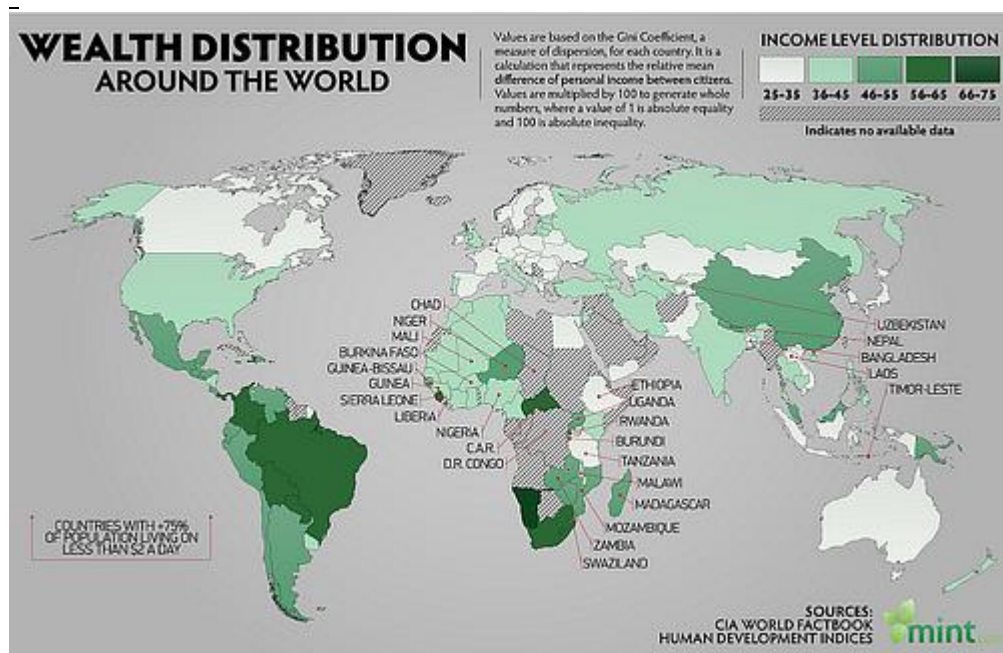

Fig. 4.1 Wealth distribution around the world

World wealth distribution by country shown as mean difference of personal income between citizens. Values are based on the Gini coefficient measure of dispersal. Source: Mint Life.

We see that many countries, especially in Asia, which a generation back was considered developing or underdeveloped, are today counted as middle-income states. Especially in Asia the **economic development has been dramatic**. Still there are a number of countries, most of them in Africa,

with enormous poverty. The redistribution of economic means to these through e.g. loans, development support etc., is minimal compared to for example international trade or military budgets. The United Nations asked the countries of the world to address this question in the Millennium Development Goals adopted by the General Assembly in year 2000 to be reached by 2015. Reducing poverty is one of the goals; it will be met by the target year. It will help to meet a number of other key development goals both social (child survival, education, population growth) and environmental (food production, resource use and environmental impact).

One finally needs to reflect on the meaning of economy. Money is there not for its own sake, but rather as a mean to achieve **welfare and a good life**. Is there enough for us to share (equity within the existing generation) and save for the coming generations (equity between generations)?

4.2. The dilemma of economic growth

We live in a society in which **economic growth** has become a mantra for all policy makers and business people. Even if the overwhelming focus on growth is only some 30 years the history of economic growth is long. Among the several **factors behind growth** *energy* **stands out** as the most important. The access to cheap fossil fuel is closely linked to economic growth during over a long period. Easy access to energy made labour productivity rise by some 3-4 % yearly over more than a century. A person equipped with a machine can do much more than when just using muscle power!

But where does a never ending economic growth take us? Suppose that all inhabitants should have the standard of living typical for Western Europe (or OECD countries). This means another 15 times increase, and by the end of the century after further growth a 40 times bigger economy in the world. Is this possible? Can growth go on forever - still growth is the basis of present modern economy.

Not surprising when thinking about what happens if there is no growth. Consumption would decrease, companies would not be able to sell their products and would go bankruptcy, unemployment would mount and so on. The "engine of growth" in market economies allows companies to gain a net profit, which is invested in a development that leads to more growth and jobs. In short it seems like modern economy has to choose between eternal growth and collapse, both of which are unsustainable. **The growth dilemma** may be the largest problem for the vision of a sustainable future society.
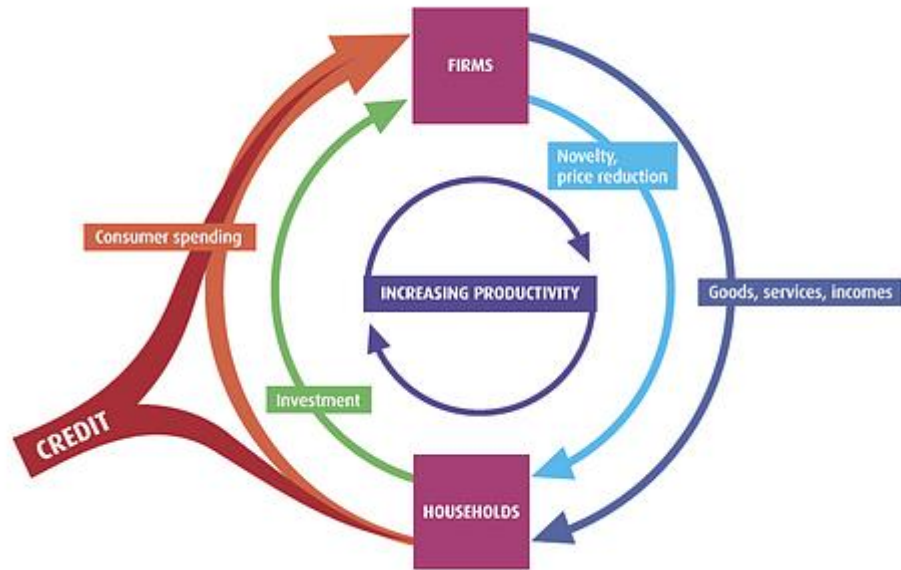
Fig. 4.2 Engine of growth. From "Prosperity without growth"

It is clear that **economic growth is crucial up to a point** for quality of life, happiness, prosperity, education, health etc. But after that it appears that economic growth is not so important. In international studies life expectancy, infant mortality, education or happiness itself do not increase after a GDP of about 10,000 USD/capita (purchasing power parity using 1995 dollars). In investigations one finds that factors which are important to individual satisfaction and wellbeing do not cost much or cannot be bought at all, such as family, friends, leisure time, enjoying nature etc. Increased income however, is still a priority in all societies. Why do people rather get richer than happier?

To come to grips with the growth dilemma we need to ask ourselves which is **the role of material possessions**. One important aspect is that in society we tend to judge our prosperity by comparison with others. As long as we are enough equal to our neighbours all is fine, but if they have a better car or even two cars or a nicer house etc. we want the same. *Social positioning* is the engine of personal ambition and is also fuelling economic growth. It is the social logic behind increased consumption, which the companies need, to develop their businesses, increase profit and - grow!

If economic growth could be unrelated to flows of natural resources, the growth would not be problematic. It could go on forever as long as material consumption does not increase. Increased economy without increasing material flows is called **decoupling**. Decoupling has been typical for affluent societies in the sense that economy is growing faster than consumption of resources. The productivity of for example 1 unit of energy (energy intensity) has increased for many years in western societies. But the result of decoupling is offset by an absolute increase in growth, called the **rebound effect**. We talk about *Jevons paradox* meaning that

technological progress or efficiency increase, typically leads to increased consumption. We thus have a *relative decoupling*. On the other hand *absolute decoupling* – that the material flow is actually decreasing, while economic growth is increasing – is not seen in our societies.

Sustainable Economic Growth? What are the relationships between economic growth and resource use? CC Photo by Images_of_Money

What kind of solutions do we see for the growth dilemma? One is to **dematerialise the economy**, that is, an ever increasing economic value can be given to smaller material things. For example computers may be quite small and still be very efficient, or that we buy services, for example concerts, much more than material possessions. Much of this has happened. In a modern society a large proportion of the economy is in the service sector (in Sweden only about 15% of the workforce is in industry and less than 2% in agriculture and forestry). The efficiency of the production is thus enormous (or relies on imported goods) but it is still offset by increased consumption and we do not see absolute decoupling.

Another road is **green growth**. This was a main theme at the 2012 Rio+20 Conference. Green economy in short only refers to an economy where environmental concerns are taken into account. Here one component is that material flows become cyclic (recycle all components of products) so that they do not contribute to resource extraction or environmental loads. The economy needs to rely on renewable resources especially in energy sector. Obviously we need a green sector of the economy, but so far we have not seen it contribute to absolute decoupling. According to the Limits to Growth studies even very extreme assumptions about technical developments did not in itself solve the problem of limits to growth. They only pushed the peaks further into the future. We have to make life style changes.

Research & Degrowth

As a response to mounting concerns about the growth dilemma the **de-growth movement** has developed as a protest against the all-embracing concern with material possessions. The de-growth movement want other ways to measure success. The common practice of using Gross Domestic Product, GDP, as a measure of the success of a country is therefore brought into question. GDP is just the sum of all economic transactions in a country (many of which may be very negative) and was never intended to be a measure of success. The de-growth movement want to focus on welfare, prosperity or even happiness.

Macroeconomic modelling has been used to explore factors, which might push a capitalist market economy into a *steady state*, that is non-growth, but still on a high level of prosperity. It turns out that in the common

economy the state or fiscal economy has a large role. Much of the investments are directed to long-term development, such as infrastructure, rather than short-term investments, which are more typical for the private sector. Employment stays on a high level when working hours decrease. No country has tried this recipe so we do not have practical experience, but the topic is a key point in the British report *Prosperity without Growth* from 2008.

4.3. Tools for approaching a sustainable economy

How can we turn the growth-economy so that it does not cause resource destruction and environmental damage but still contributes to the welfare of our societies and inhabitants? There are a number of **economic instruments** to address this question. Some of these are used by the state, the public sector, and some by the private sector.

Most important is the Ecological tax reform, also called **green tax shift**. This refers to the transfer of taxation on incomes (salaries) towards taxation of resource flows. The simple logic is that what is scarce has to be used carefully should be taxed, that is natural resources, while what is not limited in this sense, i.e. human work or work opportunities, should not be limited by taxation. This green tax shift has occurred in many countries but only to a limited extent. Thus fiscal economy relies on taxation of energy (fossil fuel, e.g. petrol for cars) carbon dioxide emissions, several metals, fertilizers etc, to some extent in several Nordic countries, Germany and the Netherlands. However to reduce resource flows a much more drastic reform is needed. This reform is also assumed to reduce unemployment as taxation of salaries should be drastically reduced.

To distribute taxation and achieve environmental reforms in the most efficient way countries have used **cap-and-trade** systems. This means that a number of actors are allowed to emit a specific pollutant up to a cap. To ensure incentives for companies which can lower their pollution emission rights can be traded between themselves. Such cap-and-trade schemes have been used for different pollutant and different set of actors, especially in the United States. In Europe the best know case is the EU system for carbon dioxide emissions trading ETS. The main advantage with cap-and-trade is that emissions can be limited exactly to what the environment is able to handle. However, in reality the cap is set to what the emitters or economy can afford.

Societies also use positive economic instruments, i.e. **subsidies to support investments** promoting sustainable development. Typical subsidies are carbon funds, which are given to support transition to a fossil fuel free economy, such as insulation of houses, green cars, energy efficiency measures, etc. Business are most often reluctant to investing, even when it is profitable, why authorities in different ways try to stimulate the companies. An illustrating case is the project "Energy Efficiency in Large Companies" by the Swedish Energy Authority. 100 large companies took part, all introduced a certified energy management system, they invested a total of 708 MSEK in

a total of 1247 projects; tax reductions was only 150 MSEK and annual reduction of energy costs of 400 MSEK, and return of investments thus 1.5 years.

Fig. 4.3 Green technology: Energy efficient color LEDs

Many states have a strong economic policy to stimulate steps towards a **greener business** in the private sector. Investing in energy efficiencies, local production of energy and similar steps thus become increasingly profitable with higher prices for fossil energy, trade support better markets etc. Green technologies or green business have become a large sector in the economy of several countries and an important export market. Similarly we see local authorities greening their cities or towns, both for economic as well as ethical reasons, and individual households are also in the same manner greening their lives.

The **World Business Council for Sustainable Development** has become an important actor in promoting sustainable development in the private sector. WBCSD was formed immediately after the Rio Conference in 1992. It played a significant role during the Johannesburg meeting. WBCSD has stressed the concept of eco-efficiency, which "is achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's carrying capacity."

Companies as well as authorities promote themselves as green or socially responsible in several ways, as it turns out to be good for their business. Environmental reports are often made individually according to the tradition for each company or authority, but in addition there are standards for environmental or **sustainability reporting**. Best known is the GRI – Global Reporting Initiative - which covers the whole panorama of sustainability, economic, environmental and social often referred to as *the triple bottom line*.

Global Reporting Initiative™

The Global Reporting Initiative

ISO International Organization for Standardization

ISO - International Organization for Standardization

Companies as well as authorities may also become certified as environmentally or socially responsible by using an **internationally established management standard**. The International Organization for Standardization, ISO, has developed several standards and procedures for certification. Most important for sustainability work is the Environmental Management Systems, EMS, standard ISO 14001, and the Corporate Social Responsibility, CSR, which is a guideline ISO 26000, as well as the Energy Management Standard ISO 50001. The introduction of these standards are typical for larger companies, which in turn push their delivering partners further down in the production chain to also introduce such standards.

Adoption of management systems, most typically EMS, is part of **voluntary business agreements**. There are a number of such procedures between the private sector and the authorities. Adoption of such agreements typically eases the implementation of legal requirements and permits and inspections. Regulation and introduction of a number of environmental laws especially from the European Commission has played an important role in the improvement of the environmental behaviour of the European private sector.

There are also important **financial mechanisms** to support a change into a more sustainable economy. The large investors, including pensions funds, banks etc, increasingly choose to use sustainability measures as criteria for investing. The used criteria most often include CSR and GRI. The investors see a company that have a sound environmental profile and a good CSR as a more attractive investment object than one without. The latter may end up in trouble with authorities or the society, as well as their employees where it is working. There are thus very concrete reasons for supporting companies, which may contribute to a transition towards sustainability.

Finally one should add that the several proposals for how to manage an **economy towards steady state** (non-growth economy) are part of the toolbox.

Lecture 5. POVERTY AND HUMAN DEVELOPMENT AS KEY INDICATORS OF SOCIAL SUSTAINABLE DEVELOPMENT

5.1. The nature of poverty.
5.2. The socioeconomic factors of poverty.
5.3. The ways of measuring poverty.
5.4. Human development and poverty.

5.1. The nature of poverty

Poverty has different meaning for different people in the world. For one, poverty means working 18 hours a day and still not earning enough to feed oneself, one's family and children. For another person, poverty is walking 6 km a day to collect water and not have the chance to go to school.

According to World Development Report (1990), poverty is not only material deprivation (measured by an appropriate concept of income or consumption) but also low achievements in education and health.

In compliance with data of United Nations, the number of people in the world living in extreme poverty declined from 36 per cent in 1990 to 10 per cent in 2015. But the pace of change is decelerating and the COVID-19 crisis risks reversing decades of progress in the fight against poverty. New research published by the UNU World Institute for Development Economics Research warns that the economic fallout from the global pandemic could increase global poverty by as much as half a billion people, or 8% of the total human population. This would be the first time that poverty has increased globally in thirty years, since 1990.

5.2. The socioeconomic factors of poverty

If we told about socioeconomic factors of poverty, first of all, we should say about average monthly salary.

In 2018 in Switzerland average monthly salary was 4370 euro, that in 11 time more than in Albania and in 16 time more than in Georgia. However, the average monthly wages in Ukraine was significantly lower than in other European countries only 236 euro (fig. 5.1).
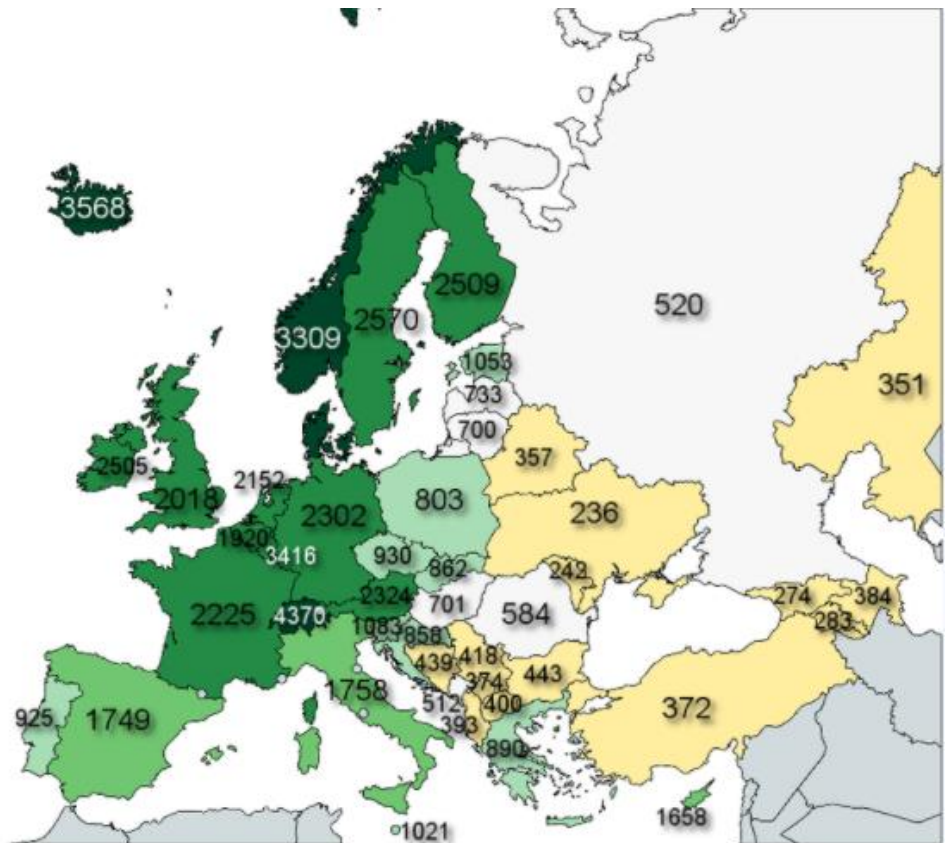
Figure 5.1 Net Average Monthly Salary in Europe in 2018 (€)

A next socioeconomic factor of poverty, which has negative influence on poverty, is unemployment rate (fig. 5.2).
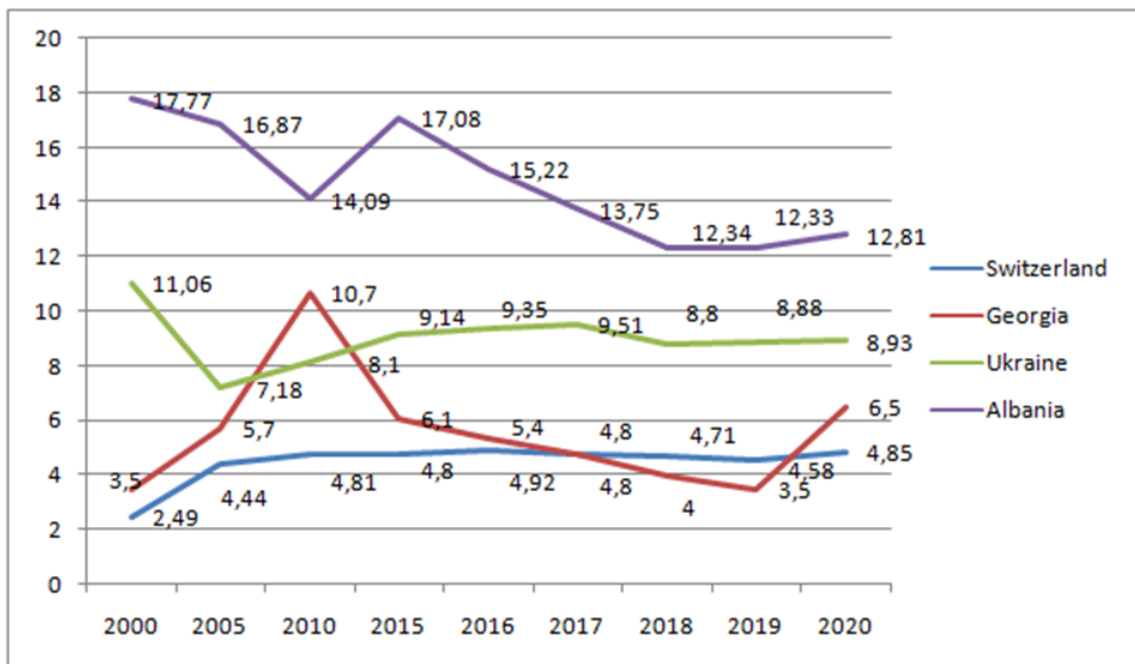

Figure 5.2 Unemployment rate from 2000 to 2020 (%)

During 2000-2020, particularly, the level of unemployment rate had an unstable trend in all 4 countries. In 2010 the unemployment rate increased, due to the crisis. However, the unemployment rate in Ukraine from 2015 remains much higher than in Georgia and Switzerland. In 2020, the unemployment rate of Ukraine amounted to approximately 8.93 percent of the total labor force. In During 2000-2020, in Albania the unemployment rate was much higher than in all 4 countries.

Important to note, that another socioeconomic factors, which have negative influence on poverty, are income level, corruption etc.

5.3. The ways of measuring poverty

Measuring poverty correctly is important. Since the 19th century, different approaches to measuring poverty have developed as a basis for international and comparative work. Poverty measurement includes unidimantional and multidimantional approaches (tabl. 5.1).

Table 5.1

Approaches of poverty measurement

Unidimensional	Monetary	Income based	Absolute poverty lines	National thresholds specific for individual countries, in the national currency	1. Cost of basic needs
					2. Subsistence minimum
				Internationally comparable thresholds	3. Severely poor with income below 1.9 PPP$
					4. "Just poor" with income below 3.1 PPP$
			Relative poverty lines	Share of the median (or mean) income	5. Relative low income (example: below 50% or 60% of the contemporary median equivalised income in each country)
					6. Relative low income anchored at a fixed point in time
					7. Weakly relative poverty line
		Expenditure based	Absolute poverty lines	National thresholds specific for individual countries, in national currency	8. Cost of basic needs
					9. Subsistence minimum
				Internationally comparable thresholds	10. Severely poor with expenditures below PPP$1.90/day
					11. "Just poor" with expenditures below PPP$3.10/day
			Relative poverty lines	Share of the median (or mean) expenditure	12. Relative low expenditure (example: below 50% or 60% of the current median equivalised expenditure in each country)
					13. Relative low expenditure anchored at a fixed point in time
					14. Weakly relative poverty line
	Food energy intake (FEI)				15. Nationally specific FEI-based poverty rates (varies by climate conditions, rural/ urban distribution, type of occupation, etc.)
Multidimensional	Deprivations				16. Indicator dashboards
					17. Indices of multiple deprivation, including material deprivation
	Multidimensional poverty estimates – internationally comparable (following the methodology developed by OPHI and used for international comparisons and in the Global HDRs published by UNDP)				18. Multidimensional poverty index (thresholds for the various dimensions)
	Official national multidimensional poverty indices, following the methodology developed by OPHI				19. Severely poor
					20. Moderately poor

Important to note, that one of the way of measuring poverty is to measure the value of goods or products and services produced (the Gross Domestic Product or GDP). This can be divided by the total population to see the GDP per capita.

5.4. Human development and poverty

According to Human Development Report (1997), human potential represents different combinations of functional human qualities that someone can provide, and reflects the freedom of gaining these functional merits. At the same time, functional human qualities reflect useful features that the man provides himself, for example, to eat well, to live long or to participate in the life of the society.

Within the United Nations Development Programme (UNDP) since 1990, annually publishes a World Report on the Human Development and calculates the Human Development Index.

This is a way of measuring poverty around the world and includes health (Do the people have a long and healthy life?), education (Do the people have access to knowledge and learning?) and wealth (Do the people have a decent standard of living?) (Fig. 5.3).

Together, these measures give an indication of what life is like for people in different parts of the world.

LIFE EXPECTANCY AT BIRTH

AVERAGE EDUCATION LEVEL

STANDARD OF LIVING (GNP PER CAPITA)
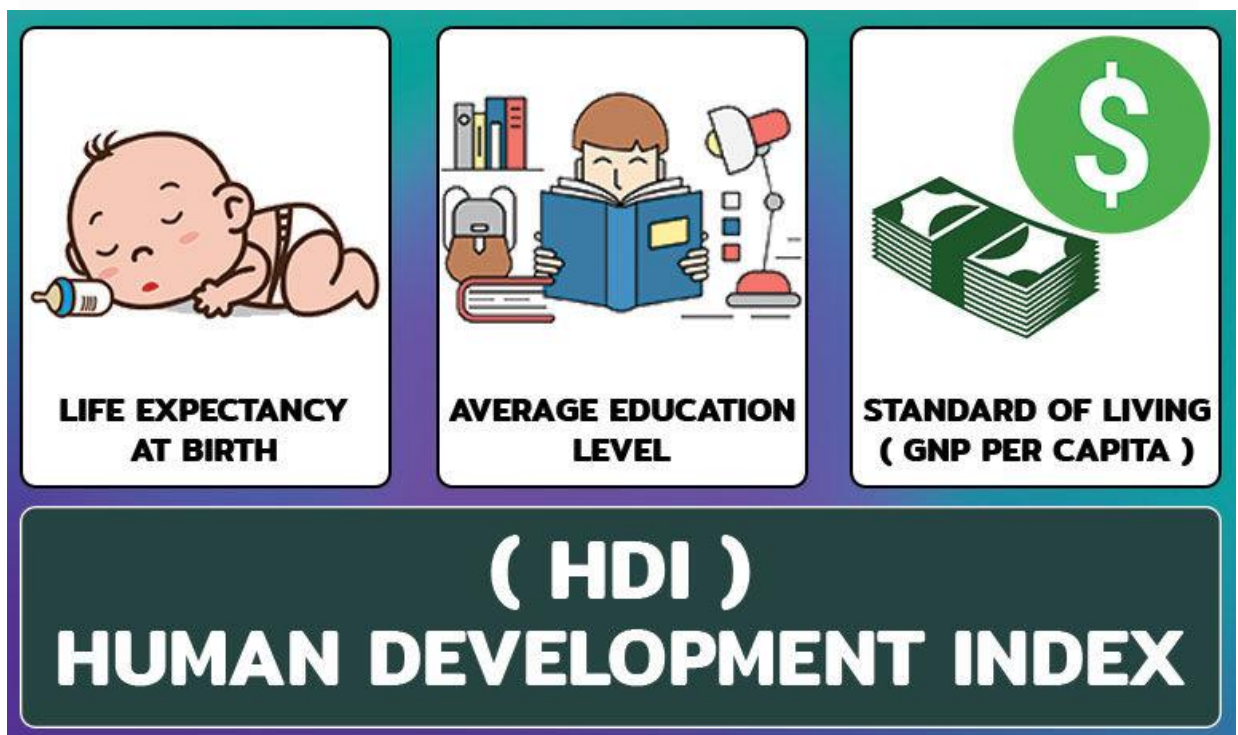
(HDI) HUMAN DEVELOPMENT INDEX

Figure 5.3 The following components of Human Development Index

Overall, extreme poverty rates tend to be higher in low human development countries, but poor people can be found in countries at all levels of development (fig. 5.4).

Poverty has negative influence on human development.

World map representing Human Development Index categories (based on 2019 data, published in 2020).

- Very high (≥ 0.800)
- High (0.700–0.799)
- Medium (0.550–0.699)
- Low (≤ 0.549)
- Data unavailable
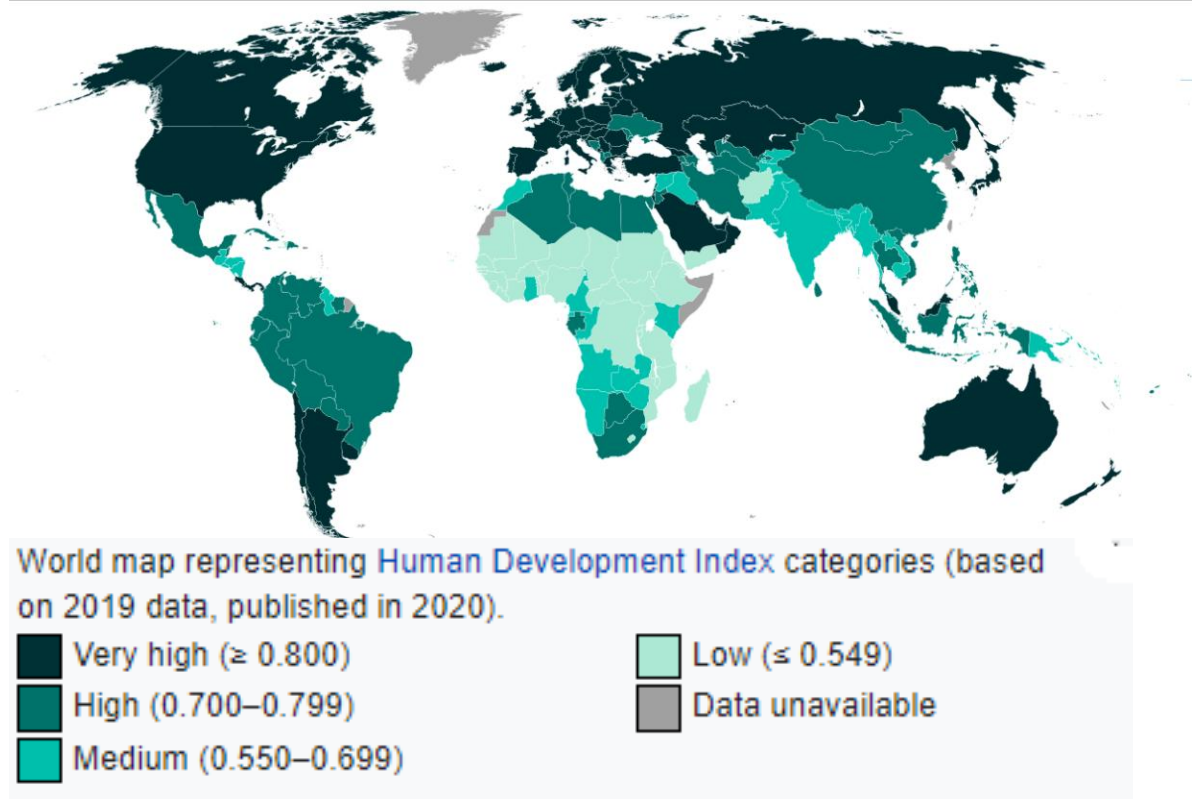
Figure 5.4 World map of Human Development Index in 2019

The World Happiness Report is a landmark survey of the state of global happiness that ranks 156 countries by how happy their citizens perceive themselves to be. It is an annual publication of the United Nations Sustainable Development Solutions Network (SDSN) and contains articles, and rankings of national happiness based on respondent ratings of their own lives, which the report also correlates with various life factors.

The first World Happiness Report was released on April 1, 2012. As of March 2021, Finland was ranked the happiest country in the world four times in a row. These variables currently include:
- real GDP per capita;
- social support;
- healthy life expectancy;
- freedom to make life choices;
- generosity;
- perceptions of corruption.

Lecture 6. SUSTAINABLE PRODUCTION, CONSUMPTION AND WASTE

6.1. Sustainable production.
6.2. Sustainable consumption.
6.3. Sustainable waste.

6.1. Sustainable production

In its beginning industrial production was connected to chimneys with dirty smoke, effluents to rivers and mountains of bad-smelling solid waste. This has been improved over the years but still in the end of the last century industrial production caused much pollution. This is obviously not sustainable and has to change. An equally important aspect is the resource use in industrial production, may it be metal ore, biomass such as wood, or the large amounts of energy, quite often fossil. In contrast **sustainable production** deals with how to improve and manage production in a manner which is resource efficient, non-polluting and produces products which themselves are environmentally friendly and sustainable.

The importance of developing sustainable production and consumption patterns cannot be overstated. It was singled out in the 1992 UNCED Rio conference as the main reason for the global environmental crisis and in the Plan of Implementation at the Johannesburg conference it was a main concern. In Agenda 21 we read: *The major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries.*

Production is part of a system. It needs to be seen together with the resources extracted, the products produced and how they are used, and finally the waste, which all products eventually will become. This is the **life-cycle** of a product. To become sustainable production needs to be much more like what we see in nature: in nature resources are recycled, energy is based on sun, and products are extremely efficient.

Environmental impact along the life cycle is calculated according to well-established methods in a so-called **Life Cycle Assessment, LCA**. LCA is much used to compare different production methods or products. A classical question to be answered by an LCA is "Is it better to use a reusable glass or a through-away plastic bottle for drinks?" The comparison needs to take into account the resource used for producing the glass bottle including energy, transporting it back to the factory, cleaning it, while the plastic bottle only uses the oil to make plastic. In a classical analysis it turned out that the glass bottle needs to be reused 11 times to be better.

LCA results often show some 10 different parameters such as resource use, energy use, waste, different emissions etc. The difficulty is where to set the system borders, i.e. what to include, since each of the material used in turn have been produced and their effects need to be included. Even if a proper

complicated LCA is not conducted each person should consider, be aware of, the life cycle of products. **Life cycle thinking** is the beginning of a systems approach to production. LCA can be seen as both a management tool and as a way to integrate environmental concern into product development.

Pollution from industries was long understood as merely a constraint from the environment and thus a burden and a cost for the production. The so-called end-of-pipe approach was used to combat pollution. End-of-pipe means that effluents, emissions and waste are treated to remove pollutants. But eventually it was understood that pollution was rather a sign that the production processes themselves were not working well. The resources should be used for products not pollutants! The change of production processes to non-polluting and resource efficient processes is called **cleaner production, CP** measures. Cleaner production is in the economic, environmental and social interest of producers and have since the 1990s been implemented in many industries.

The introduction of cleaner production methods, and related methods such as waste minimization, pollution prevention, etc is normally done using a management system. It asks for systematic measurements of the flow of resources, of products and by-products, etc. followed by systematic projects to deal with them, and a follow-up. Management cycles are based on the simple series "plan-do-check-act", the so-called *Deming cycle* (fig. 6.1). One should repeat the cycle, most often each third year, each turn focusing on some important problem.

Fig. 6.1 Deming cycle

The **Environmental Management Systems, EMS**, have since the 1990s been standardized to permit external checks, i.e. environmental audits, and the possibilities for certification. The most common EMS system is ISO 14001. ISO stands for the International Organisation for Standardzation; the system is recognised internationally. A company or other actor (such as a university) that has a certification according to 14001 is working systematically to improve its environmental profile; it is not necessarily yet very good in environmental performance, but certainly getting better.

The ideal production scheme should not only be non-polluting. Its products should also be possible to use for a new cycle of production. This is called **C2C, or cradle to cradle**. Here the resource flow does not lead from cradle to grave (too often the landfill) but rather becomes a new cradle. The

resources used by the industry are then old (wasted) products. While the cleaner production methods aims to improve a process to be "less bad", the C2C approach is to "be good", that is contribute to the environment. It is not only a vision. Today many hundreds of companies have been certified as C2C companies.

When the outlets from one industry are used as a resource in another it is called **industrial symbiosis** or sometimes industrial ecology. This pattern of cooperation is most often seen in agriculture, but it can be done in many kinds of industries.

As the effects of pollution and resource depletion have become more serious, the **environmental laws** of countries have become stronger. In particular European Union law has been of great importance for improving the environmental performance both of business and the public sector. The increasing environmental threats demand new measures to improve the management of economic activities. That, in turn, prescribes the necessity to take into account ecological requirements in production, development of new products, and management of technological processes, as well as personal and financial management.

6.2. Sustainable consumption

The affluence and easy access to all kinds of commodities in our societies is certainly part of our welfare. But there is also a downside to this. Industrialised societies are consumption societies; consumption may even become a meaning of life. The flow of resources is enormous. Counted per capita it is today larger than the carrying capacity of the Earth. We are living in an era of overshoot and over-consumption, which is not sustainable. The use of resources is expressed by the **ecological footprint**.

Product design can make much to reduce footprints. **Ecodesign** is a systematic method to design products not only according to form, colour or material, but also desirable environmental properties. Ecodesigned products may be *dematerialised*, that is have less material, be more compact, than ordinary products; they may have *less toxic* materials; they may *have longer lives* for example by being easy to repair; be more *energy efficient* during use; and they may have a *better end-of-life*, e.g. be easier to recycle. Some aspects of ecodesign we meet daily, e.g. energy efficient lamp bulbs, smaller computers, toys without toxins. Some of these properties are mandatory according to environmental law.

A very important aspect is a **product's end-of-life**. The waste management hierarchy tells us that best is *reduce* (less products, e.g. by sharing resources), next best *reuse* (repairable products) and then *recycle*, which means that the material in the product can be reused.

Environmentally friendly products are often called green products. There are a number of organisations, which provide green products with

an **eco-label** to indicate that they meet set standards for that label. Well known labels include that European Union flower and the Nordic Swan, developed by the Nordic Council.

The big consumers, such as municipalities, state authorities and large companies may adopt a policy of buying green products, quite important since they buy for the millions or billions. This is called **green procurement**, meaning that they choose a product or a service that has a lower environmental impact in comparison with other products or services fulfilling the same functions. Life cycle costs calculation is used as a basic. Companies which pride themselves for thoughtful care of the environment may use green procurement to ensure that they do business in an environmentally responsible way. Also as a private person one may choose to buy green products. It sends a clear signal to the producer that there is market for such products and they will increase compared to the less green alternatives.

According to much research the **largest environmental impact** we make as consumers is caused by our *living* (houses and how they are heated for example), our *food* (e.g. meat has much larger footprint than vegetarian meals) and *travelling* (air travel has the largest footprint per km while e.g. biking is very environmentally friendly). These areas need to be looked at with some care to be sure that all possible improvements have been made. Best is if one makes a proper estimations of the ecological footprint or a similar measure to quantify the differences.

6.3. Sustainable waste

In the 1970s countries in Europe became alarmed by **rapidly growing piles of waste**. Landfills were expanding in many countries both by household waste and waste from industries. This was propelled by non-recyclable products from bars, kitchens etc. as well as the increasing number of packages used for all kinds of products in the shops. More than 50% of household solid waste consisted of packages. In the European Union the amounts of household waste is despite efforts over many years still increasing. It is now approaching 600 kg per year and capita.

Even worse is the too common habit of **illegal dumping of waste**, e.g. along the roads increasing with increasing costs. In addition to being ugly, it pollutes - sometimes seriously e.g. lead or mercury from old batteries - and threatens wildlife. A particular bad habit is to dump waste from ships right into the sea. The sea cannot accommodate all the waste from boats, and many times the waste turns into deadly traps for sea animals, such as seals. Especially plastic is serious since most of the plastic ever produced, non-degradable, is still there and pollutes. In the Pacific Ocean currents have concentrated plastic debris to a huge area called the Trash Vortex.

The costs of the growing piles of garbage and landfills mounted due to increasing land use and other resources being used up. Also landfills were

environmentally problematic since they leaked to groundwater and emitted methane, a strong climate gas. For these reasons environmental legislation attempted to limit waste amounts and taxed waste sent to landfill.

An even more important aspect is that waste on landfills is a sign that the **resource flow is linear**, and therefore completely unsustainable and in fact a symptom of badly designed production and consumption patterns. In general the material flows in Europe were in the 1990s overwhelmingly, more than 95%, linear and going from resources to production, and use to waste.

The largest waste categories are **mining and industrial waste**. The most sustainable option is industrial symbiosis when waste is used as a resource. Some wastes are used for building infrastructure (e.g. roads) while agricultural waste may be used for energy purposes. Construction waste is a special case since it is such a large waste category. Costs of waste have spurred building companies to be more inventive to reduce this waste category considerably.

The European Union has listed the different options to deal with waste into a **waste hierarchy**going from best to worst:

Reduce, or waste reduction, reducing the product flow.

Reuse, make products more repairable and with longer lives, or give to next user.

Recycle, this most often refers to the materials in the products.

Composing, for organic waste, the resulting compost may be used.

Fermentation to biogas, also an option for organic waste, and biogas used for energy.

Incineration, organic waste may be burned and heat taken care of, e.g. in district heating.

Incineration, without recovery of the heat produced.

The most important way to deal with waste is **recycling**. Either to recycle the products themselves or the material they consist of. Recycling may be either internal or external.

Internal recycling is when in a factory the material discarded in a product step is taken care of and, often after some kind of processing, fed back into the production chain. This is a very important part of Cleaner Production strategies and has reduced waste from industries and increased efficiency considerably.

External recycling, or *open loop recycling*, is when the material is coming back to the production chain after having been used. A typical case is paper, which is sent back from the consumers after e.g. the newspaper has been used and read. The old paper is then washed to take away ink from printing and used for new paper products. Theoretically a cellulosic fibre can be recycled 6 times before it is too short to be useable for paper. Then it is sent to incineration. This process is also called **downcycling**, as the quality of the material decreases at each cycle.

Recycling is never perfect but in some cases they may be close to 100%. Thus recycling of lead-containing car batteries is very well organized in some countries to make such a **technical recycling loop** close enough to perfect to allow the use of the quite toxic lead in society. We would like to see the equally perfect recycling of all kinds of batteries but this is not yet the case.

Recycling of household waste ask for a **good waste sorting** already in the households themselves. Good household sorting gives 6 basic fractions (compostable, burnable, paper and cardboard, plastics, metal, glass). Of course this has to be followed by proper processing at the later stages, which is not always in place. In addition special waste, such as batteries, light bulbs etc has to be managed in addition to the six categories mentioned.

The many toxic components in different kinds of ordinary household equipments have prompted the European Union and other countries to introduce strict **legal requirements on waste management** of many products. Best known may be the Waste Electrical and Electronic Equipment, WEE, Directive. This prescribes how to properly take care of all kinds of electrical and electronic equipment, such as computers, refrigerators etc. It puts large responsibilities on the responsible authorities most often the municipalities. This is however only a small part of the whole. The European strategy for prevention and recycling of waste is one of the presently seven environmental themes in the EU and is backed by the Waste Framework Directive, which includes a long list of special directives.

Some waste can be bought and sold, that is, it has a market value. Thus scrap metal is quite valuable on the market, and sometimes scrap plastic is also sold. Quite expensive is scrap copper. Also some bio-waste is sold and bought, e.g. forest residues. More recently other products have entered the market, such as used car tires. Of course any kind of used items (cars, furniture etc), which are offered on a market belong to this category, and some municipalities make considerable efforts to make this second-hand market functional. In the waste hierarchy it belongs to reuse.

Recycling reduces the material flows, but also improves energy management as the **waste stream includes a considerable amount of energy**. This is particularly clear for metals: to produce a metal object from scrap metal rather than from the virgin ore is much less energy requiring. Thus to use scrap iron consumes 6 times less energy, scrap copper 30 times less and aluminium 50 times less energy compared to virgin ore. To use recycled paper instead of fibres from wood uses about 6 times less energy. It is obvious in all cases that virgin resources are saved, for example many trees in the case of paper production. Likewise waste to energy is important: Solid waste is incinerated and the heat used for district heating and coproduction of electricity; compostable waste is fermented to give biogas for energy purposes.

Developments: during the last decade in EU the number of landfills has decreased and those remaining are strictly regulated and are subject to the IPPC Directive (Integrated Pollution Prevention and Control). Instead waste stream are managed according to increasingly more careful legal control. Recycling is increasing and material which cannot be recycled are more often sent to waste incineration in power plants for energy recovery. Still, amounts of household solid waste per capita continue to increase.

Lecture 7. SUSTAINABLE COMMUNITIES. CONNECTION BETWEEN LOCAL AND GLOBAL COMMUNITY

7.1. The concept of sustainable city.

7.2. Urban sustainability policies, strategies and management systems.

7.3. The concept of Sustainable Community.

7.4. Active citizenship in social development projects.

7.5. Planning social action: instruments and good practices.

7.1. The concept of sustainable city

A city may be regarded as an **ecosystem**. Just as any ecosystem the city needs energy, there is a flow of resources into the system, such as food and other resources, and there is waste to be taken care of. All these aspects need to be made in sustainable way, that is, to use the physical and biological conditions for sustainability. This approach asks for recycling of all or most resource flows, and the use of renewable energy and other resources.

It is possible make **resource management more efficient** in a densely populated environment. The heating of buildings, distribution of water, and collection of wastewater and the management of solid waste is made more efficient in a city. Thus district heating, wastewater purification, and solid waste recycling and management are essential skills in a future sustainable city. The most advanced cities may even be or work to become energy self-sufficient.

The **energy** provided to the city is of three kinds: Heat to keep buildings warm and nice during cold days; electricity to run all kinds of machinery, to provide lighting etc; and finally fuel, e.g. for transport. In district heating, where a single power plant is providing hot water to the entire city though a system of pipelines, is by far the most efficient way to heat most cities. It is also a better system for cleaning flue gases, obviously better than a multitude of single-house boilers. It also offers co-generation: that is the plants may produce both heat and electricity with an efficiency of fuel use up to some 85%. Its sustainability then depends on the fuel used. Waste incineration may account for a considerable part in most cities. Other fuels include peat and bio-fuels such as wood chips. The buildings are also important as they may be more or less energy efficient as well as providing their own heat (see below). Other sources of electricity may be either local (e.g. solar cells) or distant (e.g. large hydropower plants).

The urban **water** is extracted from ground or surface water. It needs to be used efficiently (less than 100-200 lit/day/capita) as it takes some energy and sometimes chemicals to produce it. Wastewater contains effluents from toilets and kitchen and wastewater treatment is therefore an important part of the nutrient flows. The wastewater treatment produces an organic residual, the

sludge. It should ideally go back to agricultural fields as an important source of phosphorus, but may also be used for biogas production.

The most important to say on **waste** is that it should be avoided. The waste hierarchy says, "reduce, reuse, recycle". In households source separation of waste is essential to make recycling possible. Organic waste may go to composting, biogas production or waste incineration.

A central issue in habitation and cities are **the buildings**. These are not only the homes of the inhabitants and therefore a key issue for social sustainability, but they are also key components in the resource flow of a city. They go from simple shelters to large and well functioning houses. In the global south access to a decent home is often the most critical concern. In the Baltic Sea region almost everyone has a decent home, but there is still much to be done to improve the performance of buildings. Energy performance goes from passive and low energy houses to badly functioning buildings. Especially in countries where fossil fuels dominate energy supply it is important that the energy performance of buildings is improved. Houses may become very old and the reuse and retrofitting of them are important skills for sustainability. In the best case buildings may contribute significantly to create its own physical resources. Solar panels on roofs may produce much of the hot water needed, and solar cells some of the electricity.

For cities a well functioning **traffic and transport system**, consisting of a clever mix of modes, is a key to improved sustainability. The private car now dominating and congesting the trafficscapes of many cities could only have a limited role in this mix. Public alternatives, such as metro, buses, trams and sometimes boats, are essential. Walking and cycling should be promoted, since they are good for health, economy and environment. The electric car, now developed, is expected to dominate car traffic in the future. The electric motor is some 4 times more efficient than combustion and much less polluting. In addition the need for transport, both of persons and goods, should be reduced, for example by using more information technologies, and increasing the local share of the economy.

There is in most cities a debate on green contra dense. **Greenery in cities** plays an important role as they provide a number of ecosystem services. Most significant is that they allow the inhabitants to enjoy the green areas for their wellbeing – proven in much research – and social services, such as recreation, play, culture, beauty, sports, etc. They also contribute to better air (ventilation) and temperature regulation. Finally biological diversity, especially trees, for the young generation to get to know biology while in the city. Greenery includes not only parks but also trees, bushes and small lawns along streets, roads and parking areas etc. Green areas may also in addition be created on roofs both for covering the house as well as for cultivation of food. Surface water – ponds, rivers, lakes and coasts – is often included in greenery and is an important element in many cities, especially in the Baltic Sea region, and living along water is attractive.

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7.2. Urban sustainability policies, strategies and management systems

In the Agenda 21 document from the Rio UNCED 1992 Conference the local perspective is considered essential to achieve sustainability. On this basis local authorities all over the world were encouraged to set up long-term action plans for sustainable development, the so-called **Local Agenda 21** (LA21). Such action plans were adopted by thousands of local authorities around the world in the following years. Today 6400 municipalities in 113 countries have done so.

A number of organisations were created to support the local sustainability work. ICLEI, *Local Governments for Sustainability*, was formed in 1990 as the 'International Council for Local Environmental Initiatives', presently with 1220 local government members. Within the European Union *The Sustainable Cities and Towns Campaign*was founded in 1994 as an umbrella organisation of associations of local authorities working with sustainability issues. It is supported bythe European Commission and has an office in Brussels. Through its member organisations, such as ICLEI, more than 2500 local and region governments with more than 500 million inhabitants are included in the Campaign. In the Baltic Sea region the *Union of Baltic Cities, UBC*, with 106 member cities is a key actor.

Among the **policy documents for local sustainability work** *Chapter 28 in Agenda 21* forms the base. Soon after the Rio conference the *Aalborg charter* was written as a founding statement for the European Sustainable Cities and Towns campaign. It includes commitments in 10 areas to be signed

by members. On the global scale the *United Nations Human Settlements Programme, UN-HABITAT*, was established in 1978 by the UN General Assembly to promote socially and environmentally sustainable towns and cities with the goal of *providing adequate shelter for all*. At the Habitat II conference in Istanbul, Turkey, 1996 171 countries adopted the Habitat Agenda with over 100 commitments and 600 recommendations.

Within **the European Union** a main actor is CEMR, the *Council of European Municipalities & Regions.* CEMR has within EU the same legal status as the European Parliament and thus may influence all decision in the Union. The *European Union* adopted in 2006 a *thematic strategy on the urban environment* to contribute to a better implementation of existing EU environment policies and legislation. The strategy encourages local authorities to adopt a more integrated approach to urban management.

Each local authority, large or small, has an administration to execute its duty as authority but also to plan and often carry out the development of the city. Local sustainability work requires a **considerable independence**. The economic and legal competence of the local authorities varies enormously. Nordic municipalities have much independence, as they collect local taxes as well as charges (for water, waste etc) and have many duties, such as education, healthcare and local services. In other countries many of these duties belong to the state level. All municipalities typically have a planning monopoly. Thus urban planning is always made locally.

Management refers to how a strategy is implemented, which steps are made to realize projects. Management systems are typically set up as a series of **management cycles**, often 3 years long, based on the Deming cycle, Plan-Do-Check-Act, which puts emphasis on continuous improvement. The many varieties of urban sustainability management include the Managing Urban Europe-25 initiative worked out by 25 European local and regional authorities during 2006-2008. It points out that political commitment is an essential, but too often weak component in the management cycles.

There are several **management systems** for local authorities (fig. 7.1). All systems ask for a series of *indicators* to be chosen, which should be continuously monitored over time and reported. Cities typically have tens to hundreds of indicators. They also ask for *visions* for the sustainability work. To establish what to achieve at the end of a specific management cycle, the *target*, one may do *back-casting* from the adopted vision to the present. It is possible for local authorities, just as it is for any organization, to use a *standardized management system*, such as EMAS or ISO 14001 to receive international certification according to the standard chosen.
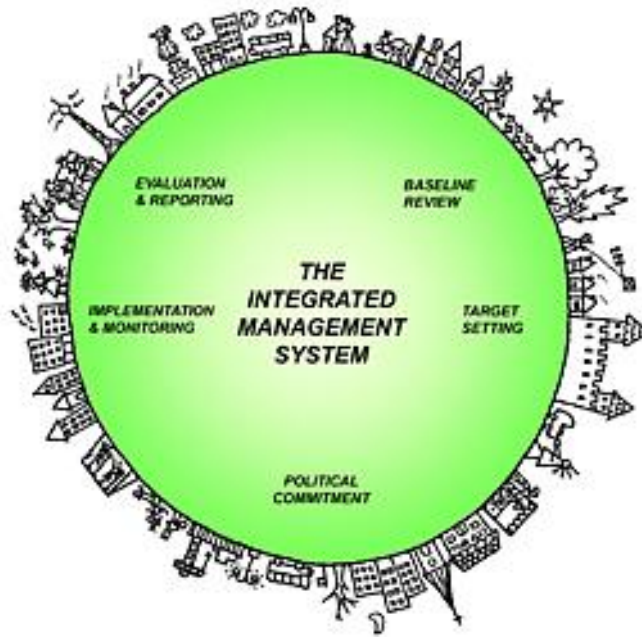
7.1 The Integrated Management System

In the management work the **integrated approaches** are essential. They are so far most common for the material turnover (water, energy and waste), although best would be if all aspects, including economic and social aspects, were included. A **participatory** system is asked for in the policy documents. This is partly required by law, but may be wider if cities encourage their inhabitants to take part in the sustainability work as widely as possible. In public-private partnerships also the business world contributes to city development.
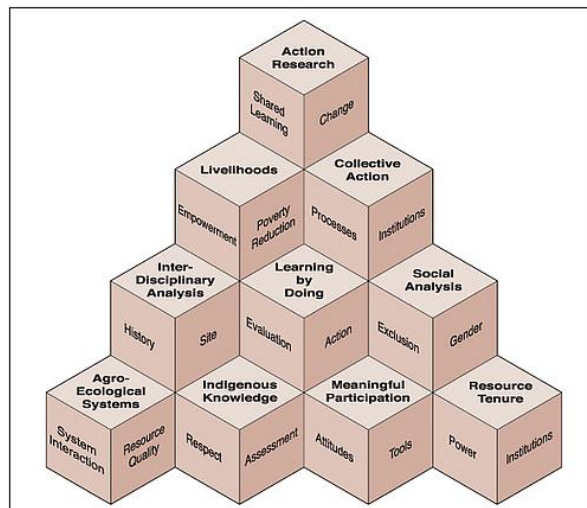

Fig. 7.2 The building blocks of community-based natural resource management.

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7.3. The concept of Sustainable Community

Today people and countries are increasingly connected socially, culturally, politically and economically. International travel, economic migration, international communications and global faiths have meant that we increasingly encounter different cultural perspectives at home. The impact of global systems, such as climate and international finance, have shown that our actions locally can have a huge impact on the lives of people thousands of miles away. The challenge for leaders is to acknowledge, respect and engage new communities and cultures for the long term benefit of all. They should be aware of the consequence of their actions, understand interdependency and be socially responsible

There are many definitions and there are many different ways for communities to attain a more sustainable future. The sustainability of a community depends on creating and maintaining its economic and environmental health, promoting social equity, and fostering broad-based citizen participation in planning and implementation. Communities that engage citizens and institutions to develop sustainability principles and a collective vision for the future and that apply an integrative approach to environmental, economic, and social goals are generally likely to be more successful.

Job creation, energy use, housing, transportation, education and health are considered complementary parts of the whole. Since all issues are interconnected they must be addressed as a system. The process includes:
- broad and diverse involvement of citizens;
- the creation of a collective vision for the future;
- the development of principles of sustainability;
- an inventory of existing assets and resources and additional assets that would benefit the community;

- clear, measurable goals;
- the development of community indicators to evaluate progress;
- open and transparent communication;
- early, visible results;
- celebration of success.

The most common use of the word 'community' is a group that share a geographic locality and have shared interests in the quality and opportunities of that locality. It can also mean a group of people who have a shared set of values and interests.

A set of shared values and interests may be created by:

- Employment - for example professional associations, unions, informal communities of practice.
- Shared religious faith.
- People of the same ethnic background.
- People of the same gender and/or sexuality.
- Interest in leisure activities - sport, music.
- Pursuit of specific causes eg. climate change, child rights, women's equality etc.

Some communities are 'elective' or 'intentional' meaning that members have made a conscious decision to be part of the community, and others are based on circumstance and history.

An individual may belong to several communities with each community having a strong influence over the values and choices that individual makes. In this way the concept of community is also sometimes key to understanding a persons identity. While some communities merely exist and are affected by changes around them some communities are organised to protect their interests and influence change. Those that are organised are likely to have a strong behavioural code or culture \ although culture is more commonly associated with group behaviour and community with group interests.

Communities may be relatively small and have focussed interests e.g the workplace. In these days of mass global communication and increased interdependency communities can be large/global and not restricted by geographical and national boundaries e.g. faith groups or environmental interests. In these cases interests may be more vague, sometimes conflicting and behaviour inconsistent.

It is likely that a person who belongs to a local community is at the same time part of a global community of interest.

A community can be understood in several ways e.g. in terms of interests, in terms of power, as a protective system. The way in which a community is organised to protect its own interests can be seen as a system. For these reasons understanding community from different perspectives is an important part of sustainable problem solving and agenda setting.

7.4. Active citizenship in social development projects

Citizens are members of an organised state or country. Their 'citizenship' can describe their status and by implication the rights and duties they have in relation to their country. For example a citizen may have the right to have a passport issued by the state and the duty to pay taxes to the state..

'Active citizens' are those people who look beyond basic legal duties and are further engaged voluntarily in activities that somehow affect the public life of their locality or communities. This might be through 'civil' society (citizens using their freedom to join together - usually for the purpose of managing social change in their locality) or 'civic' society (relating to the ruling powers or decision makers of the community).

As well as being citizens of their state or country, people inhabit a global community that is increasingly interdependent through trade, politics and intercultural exchange via mass communication. The 'common life' of the global community has many shared challenges which require collective action as well as international political engagement. Understanding the nature and potential for this action is illuminated by developing capacity as a local active citizen, just as developing awareness as a global citizen might affect choices and perspectives on local citizen action.

Active citizens are those who understand the interdependencies of their communities with those in other places and engage in activities whose outcomes have positive impact beyond their own country or that bring a global perspective to their own situation such that the outcome relates to the global 'greater good' (such as justice, peace, sustainability…).

Understand concept of community and connection between local and global community - ones own community. Ability to identify social development issues to address in community.

Participants create a shared visual map of their local community, including positives and areas of concern, with broader community engagement if possible.

- Understand the concept of community and connections between local and global.
- Motivation to take act toward sustainable development.
- Ability to identify key stakeholders in community - power and decision-making'.

This activity explores the concept of power and its different types, supporting participants to reflect on their experience of power.

What are the tweaks (small changes) which could bring lasting change to benefit our wider communities? What are some of the leverage points for making those tweaks in our community? What is social action? This is action to enhance community life locally involving groups of people working together, on a voluntary or not-for-profit basis. It is action that isprincipled,

well organised and done in consultationand collaboration with others in the community andthose affected by the initiative.

Even though the project is fundamentally local in focus participants should ideally choose a social development theme that has global resonance ie an issue of relevance to communities across the world. For example:

− Youth empowerment.
− Gender equality.
− Advocacy for education.
− Children's literacy.
− Conflict prevention and peace-building.
− Environmental protection.

The skills and tools for project planning and implementation are extensive. There are many standalone programmes from anything between two days to two years in duration which focus solely on project management including degree courses, professional development courses and MBA programmes. This reflects the fact that project management is a valuable skill which substantially increases employability. Project management is a fundamental life skill.

There are many approaches to planning social action. Different approaches suit projects which are different in scale, nature and geographical focus. Positive social action is informed by the diverse needs and perspectives of the local community and surrounding communities which may be affected. For this reason community projects carried out by Active Citizens should incorporate intercultural dialogue and coalition building.

Examples of how this may be achieved are provided in training but examples are listed below:

− Identifying interests of other stakeholder through a surveys, focus groups and open meetings.
− Advocating publicly.
− Entering into dialogue online to find out about global campaigns and perspectives on the same issue.
− Carrying out project in partnership with others in the local community or the global Active Citizens network (example of Global dimension).

7.5. Planning social action: instruments and good practices

Here are some key things for the group to take into account when planning social action:

− Practise the learning.
− Identify personal (small actions) you can undertake.
− Identify strategic opportunities for group social action (tweaks for big results).
− Use the skills and interests of the group, build a team ethic and support each other.

- Use an appreciative approach. Build on success.
- Take into account your principles.
- Engage in dialogue with others.
- Build alliances.
- Involve community members in decision-making and delivery.
- Skills in project planning and management.
- Knowledge of the project cycle.
- Understand stakeholder analysis.
- Problem identification and analysis.
- Agenda setting.
- Identify interventions.
- Write a project plan.
- Monitor and evaluate a project.
- Risk analysis.
- Communication.

Project planning and delivery is both a science and an art. While there may be many existing tools used across communities things will often be much more difficult in practice. Groups may disagree, time and interest may vary, operating environment may change. This does not represent failure: it is the ability to adjust and keep going that will be an indicator of successful learning and hope for success in the future.

Exploring priorities with World Café

World Cafe is a way of applying good practice to listening and giving our opinion. It is also a technique for generating detail or clarity on ideas. In this particular activity it is used to explore several proposals for social action

An alternative approach to generating conversation on issues related to Active Citizens is to use Open Space methodology; or to arrange a dialogue or organise a social evening or event where participants are invited to hold conversations on a theme.

Images of change

This activity is a simple way to encourage participants to vision and connect with the current and aspirational future of the issue they're seeking to address through social action. It's also a technique for generating ideas for social action activities. Participants illustrate the before and after social action using creative materials or drama. The two 'images' should be bridged by identifying activities for social action. Other participants share feedback.

Lecture 8. MANAGEMENT OF SOCIAL CHANGE TOWARDS SUSTAINABILITY.
SUSTAINABLE DEVELOPMENT AND POLITICAL CHANGE

8.1. The processes of individual change.
8.2. Social change and transitions of societies.
8.3. Managing change.

8.1. The processes of individual change

On the *individual level* change is dependent on our understanding, of attitudes and behaviour. Theories of individual change have been advanced in the fields of psychology and education, in areas of culture, of medicine and health, and in environmental science. Recent research suggests that individual behaviour change is not foremost a question of knowledge and rational choice. It rather depends much on social interactions, lifestyles, norms and values, as well as on support from tailored information, policies and technologies. In addition individuals are different. Some people are more likely to change than others, perceive risks differently and possibilities to change vary for a person during his/her lifetime.

The natural tendency of most individuals is to preserve what they have rather than trying something new, even if it is expected to be better. This resistance to change is explained by status quo is perceived as having a higher value, change itself being uncertain, and that change requires an effort. As a result most people are habitual. Resistance to change may take many forms, including active or passive, overt or covert, individual or organized, aggressive or timid. As change does not happen the consequence of not changing is postponed to the future. Sometimes this is serious as in the economic crisis, but it is equally serious for many environmental issues, including the ongoing global warming.

Change or lack of change is also connected to the *perception of risk*. This is mostly very irrational and depends on other factors than on carefully calculated data. Risk may be ignored, e.g. when it comes to car driving or bad habits for health. Risks may also be exaggerated. For example air travel is perceived as dangerous by many although it is far safer that the car trip to the airport. Risk of climate change has been calculated by the IPCC as very high, about 50% risk of more than 2 degrees global warming (and probably more in most recent estimations). This risk is seldom well understood.

In some situations a risk may, however, be understood as very real. Thus when patients who had survived a heart attack were told by their doctors that they had to change behaviour to avoid an almost certain imminent death there were two kinds of reactions to threat. Some faced the danger, learned much about heart illness and changed behaviour. Another group was unwilling to change, disregarded and played down the danger and did not

change. Today these patients are offered a program to learn a new behaviour. A similar spilt between two types have been seen when it comes to the threat of nuclear war or for that matter climate change: Some face the danger, learn about it and change, but many rather avoid the topic and play down the risks.

Individuals thus differ between themselves. Personality features as well as the way a person perceives his/her situation and the world is important for his/her possibilities to change. People can be categorised in many ways. Michael Thompson in his cultural theory of risks, differentiates between three categories. The individualists rely on human ingenuity and maintain that there are enough natural resources for all of us. He/She assumes that technological progress will take care of environmental problems. Egalitarians on the contrary assume that Nature is already under severe stress and that environmentally less damaging lifestyles are urgently needed. Hierarchists are between the two, as they assume that a certain risk to Nature can be accepted if we pursue broader social goals. It is clear that today the world is run by individualists promoting economic growth rather than nature protection.

Which are then the factors, the incentives, which lead to behaviour change? Behaviour change has been studied as part of health research. In this field it is clear that information about a behaviour (smoking, drinking etc) being damaging does not automatically lead to change. Information alone rather seems to have very little effect, even if health is an important value. This is also true for behaviour related to the environment. Values and information are thus by themselves limited as incentives to behaviour change. Nor is regulation by itself an important incentive. For example the law on obligatory safety belts in cars did not have an immediate effect. Change is more readily accepted if it is voluntary and it is then also more long-lasting.

If knowledge does not lead to behaviour change, what then may initiate a change process? New information does lead to change of behaviour if the consequences of the information are immediate, for example "do not feed the wolf, he will bite you". But information on environmental matters is seldom related to immediate consequences. The consequences are typically far away, often both in time and space. One may instead assume that information may lead to increased awareness of an issue, which is followed by behaviour change. But at least in the field of environment research suggests that it is rather the other way around. It is new behaviour, which leads to new knowledge, which, if deepened, is followed by a change in attitude.

Thus the typical change process starts in the practical situation. The concrete situation, the antecedents, is important for *behavioural change*. An antecedent is what is there before the effort to induce a change. The practical conditions should be such that the new behaviour is easily accessible. It is easier to buy eco-labelled products if you see them on the shelf, and it is easier to stop smoking if there are no cigarettes around. The environmentally adverse behaviour should be difficult to carry out, while the good behaviour should be easy.

Important are also the consequences of a behaviour change. Since the effect on the environment itself seldom is immediate one needs to construct "artificial" consequences to promote behavioural changes. These have mostly been economic, e.g. decreasing energy costs when saving energy, or smaller fees for waste management if the waste is sorted. Economic incentives are extremely important. It is crucial that environmentally good behaviours should be less expensive than environmentally bad. This is mostly done by taxations. Thus a high tax for carbon dioxide emissions is a very efficient way to achieve a change to non-fossil fuels.

In summary to achieve change in behaviour one first needs to arrange the practical situation so the new behaviour is easy to carry out. Secondly the new behaviour should at best be profitable, that is economically better than the old one, e.g. by new charges, taxes or subsidies. If enough members of the society adopt the new behaviour it becomes a social norm and is then further accepted and strengthened. This may lead to knowledge on the reason for the new behaviour and a new awareness in society.

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8.2. Social change and transitions of societies

It is clear that large *social transformations* occur repeatedly in history. We have the large *civilisation changes* – from an agricultural society to an industrial society and then to a service oriented society. These transitions occurred as different sectors, which provided resources to society changed fundamentally. In the agricultural society some 85% were working in "food-producing" agricultural (primary) sector and lived on the countryside. In the industrial society some 70% were working in "products-producing" manufacturing (secondary) sector and living in cities. This figure has in the service society decreased to 11-12%, while 70% work in the "service-providing" (tertiary) sector, and urbanisation increased to some 85% or more. This development has been caused by technological and organisational

developments, such as large-scale production, new machinery, and automation, but equally important is access to new resources not the least fossil energy. The transitions are also characterised by a steadily increased use of resources.

But social change also refers, equally important, to a change in the *social order* or organisation of society. Changes of social order include the transition from authoritarian to democratic government, from feudalism to capitalism and market economy, and the development of the welfare state; to the rise of the civil rights movement and the acceptance of human rights; the development of the environmental protection movements; and not the least globalisation, and large-scale use of information technologies. All these changes may be included in modernisation, the processes that take a society from traditional to a modern. Modernisation eventually seems to replace the key position of the family in society with the individual, and reduces the role of the church and see a growth of a more secular culture.

Finally social change may also refer to *political changes*. These include de-colonisation, increased global cooperation and trade, less concern with military power, to economic growth as a primary political goal. A dramatic, unexpected and rapid political change was the end of the Cold War, when Central and Eastern European states changed political system as they left the communist block to become "states in transition" towards democracy and market economy. First a majority of inhabitants were all positive to the changes, but very soon sentiments changed and many missed the old system. It has taken close to a generation to adapt to the new social order, an adaptation still going on.

This social change may be a case of future shock, a change dangerous to a society and to sensitive individuals. The concept was introduced by Alvin Toffler in 1970 for a situation when persons perceive "too much change in too short a period of time". He believed that the accelerated rate of technological and social change and information overload could leave people disconnected and suffering from "shattering stress and disorientation". A similar concept is culture shock. It is the alienation and anger, which may occur when a person is transferred to a new culture. Culture shock is most often used in connection with migration.

The question of how social change is brought about has since eternity occupied thinking, as it has been on the agenda in all societies. Is it a sudden change, a revolution, or a slow change, an evolution? Is it by struggle and fight or is it by political activism and persuasion? There are many examples of how one process transformed into the other. In an authoritarian regime civil society has more difficulties to influence these changes; in a democratic society the decision to change should hopefully be result of a democratic process.

In a bottom up process recruitment of members of society to the new cause is the key step to take. How many are needed to achieve a change? One

study proposes that when just 5% of a society accepts a new idea, it becomes "embedded", and when 20% adopt the idea; it is "unstoppable." The study also shows that it normally requires 50% of the population to be "aware" of the idea in order to reach the 5% who will adopt it. Certainly these figures are different for different ideas and societies, but they give us an idea of how social change may work. In a more authoritarian system distribution of power is the crucial factor deciding on who could initiate and implement change.

Diffusion of innovations was more rigorously studied by Everett Rogers, a professor of sociology. In 1962 he published his well-known theory of how innovations are adopted in society, among individuals and organisation. Individuals progress through five stages: knowledge, persuasion, decision, implementation, and confirmation. The main elements that influence the spread of a new idea are the innovation itself, communication channels, time, and the social system. It progress through several actors known as innovators, early adopters, early majority, late majority, and laggards.

Which are the actors in social change processes? Social movements play a vital role as discontent members of society push for a change. There are also resistance to change, especially when those with vested interest understand that they will suffer in case the proposed change is brought about. We see this clearly in the climate change discussion as typically those who will lose when the old system based on fossil fuels is replaced will protest or typically deny that there is a problem with global warming.

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8.3. Managing change

Is it possible to stimulate, help and even manage the process of change to a more sustainable society? In this sub session we will examine the methods, which exist to move individuals, groups or organizations or even whole societies from the existing state into a desired, future state. Part of this has to do with how to influence individuals and groups to change, part is an organised work at a company or local authority, and finally a part is closer to policy making.

For an organisation, such as a company or a local authority, it is important that the *leadership supports* a change process if it should occur at all. In a study on the success of sustainable development in European cities it

was clear that the most successful local authorities had implemented clear work strategies. First it is crucial that the head of the city administration as well as the politicians were concerned about sustainable development so the whole organization had strong support from the leadership. The same is true for companies.

Education and learning is also part of a successful change process. This is true at all levels, including individuals and cities. The successful cities more than the others had an active policy for learning, that is, they had implemented institutional learning, as a crucial work strategy. This requires coordination and planning; it is not enough that a few specialists are aware of the background and reason for change.

Change management when implemented becomes project work, with all the classical components of successful project management, including monitoring, innovations, follow up and evaluation, and new management cycles. The first to describe this systematically was the American W. Edwards Deming, who in the 1950's described management cycles with four stages: plan-do-check-act. In a systematic development work such cycles are repeated regularly, often each 3rd or 2nd year. As in all such processes the monitoring is important and indicators have to be identified, goals or targets for the process have to be set, and back-casting may be used to define partial goals in a long-term development.

The system to be managed, it may be a company or a city, is identified using a frame, that is, one need to frame the system or structure it in a clear way. The best know frame is the environmental, economic and social "dimensions" of a system. This is much used in business and then referred to as the triple bottom line. A better frame is the compassused in the ISIS method, where North is (Nature), South (Society), East (Economy) and West (Wellbeing). Here the social part is divided in one set referring to the people and another for society, e.g. institutions. It is possible to frame systems in several other ways. Other well-known frames are the five capitals introduced by Jonathan Porrit in UK, and the resource approach used in city development, e.g. in Habitat. The framing of the system helps to include different parts, e.g. of a city or company administration, not only the environmental side but as well economic and planning departments, that is, to use integrated sustainability management.

Among general methods for managing a change process to increase sustainability in a company, a city or even a country the most important may be Alan AtKisson's ISIS method. The core of the ISIS process is Indicators, System, Innovations, and Strategies. The full process consists of 9 consecutive steps, in short Systems understanding; Sustainability understanding; Development vs. growth; Indicators; Systems Analysis; Innovation; Strategy; Agreements and Actions; and Strategic Evaluation.

The procedure is used in so-called pyramid workshops where the participants work together for learning about and designing change in a

system. The workshop consists of building a pyramid of four sides and five layers. The layers correspond to the steps in the ISIS methods, the four sides to the frames of the system using the compass.

Individuals are very different when it comes to their capacity, interest or possibilities to change. Alan Atkisson in his Amoeba game differentiates between several types of personalities in relation to change, from enthusiasts to those who are very resistant. Reactionaries are very sceptical to all kinds of changes, laggards are slow to change and do not want to get involved. Mainstreamers constitute the biggest group in most situations and come after those who set the path. The key individuals when it comes to change are the change agents, the forerunners. Transformers are able to implement change, often authorities. He also points to a number of other less common personalities, such as innovators more concerned about their own ideas, but still very important, and others who are just a nuisance.

There are several ways to try to inspire and influence a person or a group to change. Scott Geller has examined successful change processes. His model of actively caring includes three factors: 1) self-esteem – I am valuable, 2) empowerment and optimism – I can make a difference, and 3) belonging and ownership – I belong to a group. These factors may induce individuals to choose a new lifestyle. They may also make people actively recruit others to a new lifestyle, that is, to become change agents and help them to influence others to become involved.

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Lecture 9. CORPORATE SOCIAL RESPONSIBILITY

9.1. The essence of corporate social responsibility.
9.2. The major categories of stakeholders by Newbould and Luffman.
9.3. Forms and levels of corporate social responsibility.
9.4. Greenwashing.

9.1. The essence of corporate social responsibility

To begin with, it is important to understand the essence of corporate social responsibility. Corporate social responsibility (CSR) is a self-regulating business model that helps a company be socially accountable - to itself, its stakeholders, and the public.

By practicing corporate social responsibility, also called *corporate citizenship*, companies can be conscious of the kind of impact they are having on all aspects of society, including economic, social, and environmental.

Social responsibility is an ethical theory in which individuals are accountable for fulfilling their civic duty, and the actions of an individual must benefit the whole of society. In this way, there must be a balance between economic growth and the welfare of society and the environment. If this equilibrium is maintained, then social responsibility is accomplished.

The theory of social responsibility is built on a *system of ethics*, in which decisions and actions must be ethically validated before proceeding. If the action or decision causes harm to society or the environment, then it would be considered to be socially irresponsible.

Principles of Social Responsibility:

1. **Accountability.** If every person and every party is encouraged to be responsible for their actions and you set out your policies, it is easier to influence their behavior in a natural way.

2. **Transparency**. Make information available to stakeholders. Transparency promotes trust.

3. **Ethical behavior**. Ethics involves doing the right thing.

4. **Respect for stakeholders' interest**. This includes customers, shareholders, the community, suppliers, people working in the business and the public.

5. **Respect for the rule of law**. Every organization should show respect for and work within the rule of law at a local, regional, national or international basis.

6. **Respect for international norms of behavior**. There are norms of behavior across the world, but also a lot of regional variations. Every organization should be compliant with and make allowances for such norms and variations.

7. **Respect for human rights**. This is easy to apply. No organization needs to make progress by exploiting people.

9.2. The major categories of stakeholders by Newbould and Luffman

A stakeholder is a party that has an interest in a company and can either affect or be affected by the business (fig. 9.2).

Newbould and Luffman (1979) divide the major stakeholders into four groups, arguing that their individual objectives suggest seperate criteria for assessing the viability of particular strategies.

The four groups are the shareholders who finance the business, the managers who manage it, the employees who work for it, and the economy (buyers, suppliers, and the groups represent the wider economic interests of the country).

Figure 9.2 The major categories of stakeholders

9.3. Forms and levels of corporate social responsibility

According Carroll, there are four levels of corporate responsibility (fig. 9.3).

1. Economic responsibility is the practice of a firm backing all of its financial decisions in its commitment to do good in the areas listed above. The end goal is not to simply maximize profits, but positively impact the environment, people, and society.

Figure 9.3 Carroll's pyramid of corporate responsibility

2. *Legal Responsibility:* The second level of the pyramid is the business's legal obligation to obey the law. This is the most important responsibility out of the four levels as this will show how companies conduct their business in the marketplace. Employment laws, competition with other companies, tax regulations and health and safety of employees are some examples of the legal responsibilities a company should adhere to. Failing to be legally responsible can be very bad for businesses.

3. *Ethical responsibility* is concerned with ensuring an organization is operating in a fair and ethical manner. Organizations that embrace ethical responsibility aim to achieve fair treatment of all stakeholders, including leadership, investors, employees, suppliers, and customers.

Firms can embrace ethical responsibility in different ways. For example, a business might set its own, higher minimum wage if the one mandated by the state or federal government doesn't constitute a "livable wage." Likewise, a business might require that products, ingredients, materials, or components be sourced according to free trade standards. In this regard, many firms have processes to ensure they're not purchasing products resulting from slavery or child labor.

4. *Philanthropic responsibility*. At the top of the pyramid, occupying the smallest space is philanthropy. Businesses have long been criticized for their carbon footprint, their part in pollution, using natural resources and more. To counterbalance these negatives, they should "give back" to the community they take from. Even though this is the highest level of CSR, it should not be taken lightly as many people would want to do business with companies that are giving back to society. Philanthropic Responsibility is

more than just doing what is right, but it is something that holds true to the company's values, to give back to society.

According to Carroll's pyramid, responsible business is one which qualifies all the levels of responsibilities before taking up philanthropy. Without fulfilling the other responsibilities, a business cannot sustain.

9.4. Greenwashing

Greenwashing is where a firm spends time and money advertising and marketing that their goods or services are environmentally friendly when, in fact, they are not. In other words, greenwashing is the act of making false or misleading claims about the environmental benefits of a product, service, technology, etc.

With the belief that consumer demand for sustainability is the frontier of our transition to a greener, fairer and smarter global economy, Futerra's 2015 Selling Sustainability Report outlines 10 basic brand marketing tactics to avoid (fig. 9.4).

1. Fluffy language
Words or terms with no clear meaning, e.g. 'eco-friendly'

2. Green products V dirty company
Such as efficient light bulbs made in a factory which pollutes rivers

3. Suggestive pictures
Green images that indicate a (un-justified) green impact e.g. flowers blooming from exhaust pipes

4. Irrelevant claims
Emphasizing one tiny green attribute when everything else is un-green

5. Best in class?
Declaring you are slightly greener than the rest, even if the rest are pretty terrible

6. Just not credible
'Eco friendly' cigarettes anyone? 'Greening' a dangerous product doesn't make it safe

7. Gobbledygook
Jargon and information that only a scientist could check or understand

8. Imaginary friends
A 'label' that looks like third party endorsement... except it's made up

9. No proof
It could be right, but where's the evidence?

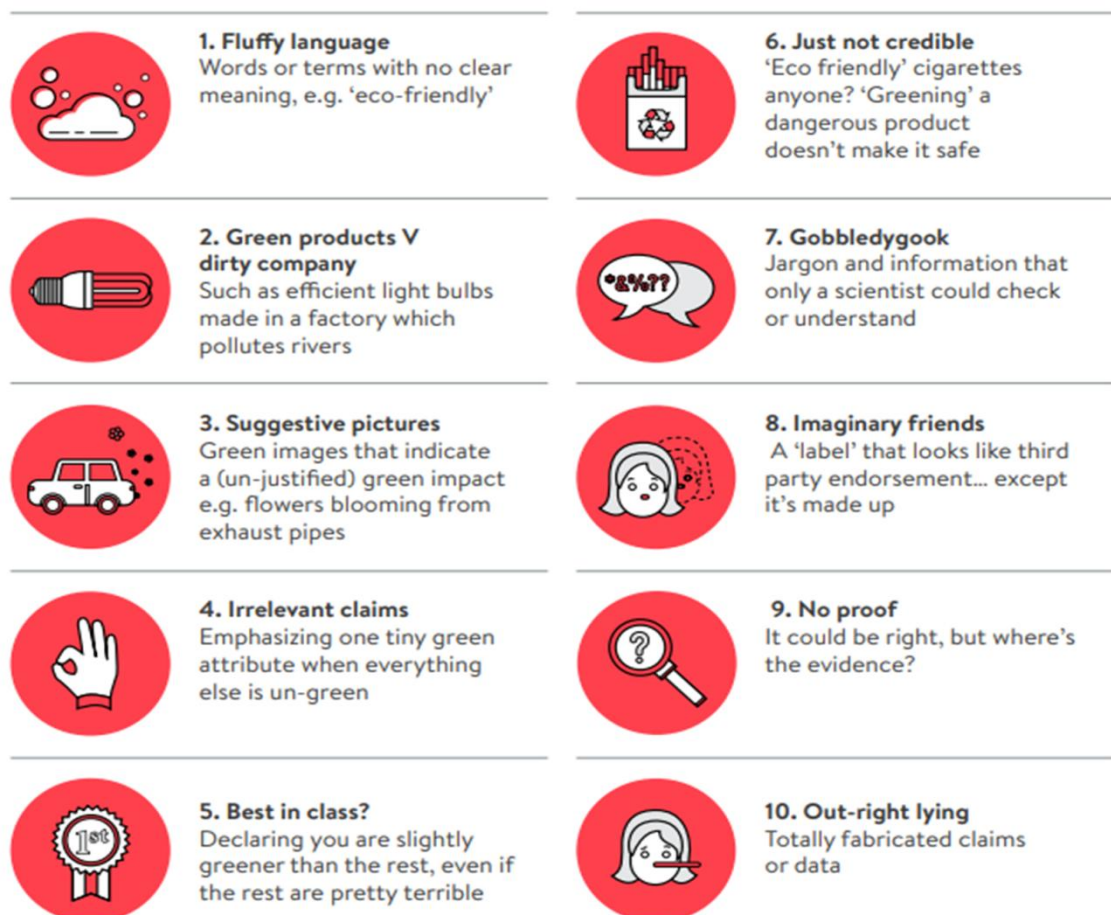**10. Out-right lying**
Totally fabricated claims or data

Figure 9.4 10 basic brand marketing tactics to avoid

In 2019 Forbs published The World's Most Polluting Brand in Plastic Waste Audit.

The audit, conducted by Break Free From Plastic, consisted of 848 cleanup events across 51 countries and six continents. In total, 72,541 volunteers combed through beaches, city streets, waterways and their neighborhoods picking up pieces of plastic.

The organization's volunteers collected a total of over 475,000 pieces of plastic waste around the world. Acording to this report Coca-Cola was the largest plastic polluter, with 11,732 items collected (fig. 9.5). The second was Nestle and the third PepsiCo.
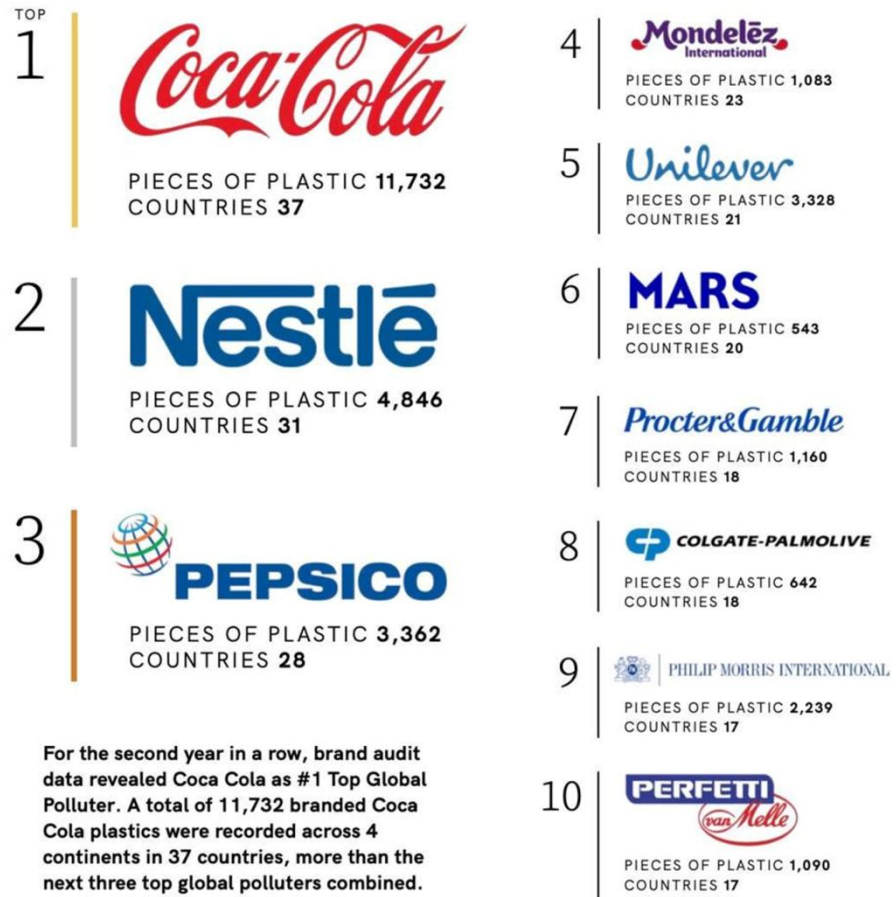
TOP

1 **Coca-Cola**
PIECES OF PLASTIC **11,732**
COUNTRIES **37**

2 **Nestlé**
PIECES OF PLASTIC **4,846**
COUNTRIES **31**

3 **PEPSICO**
PIECES OF PLASTIC **3,362**
COUNTRIES **28**

4 **Mondelēz International**
PIECES OF PLASTIC **1,083**
COUNTRIES **23**

5 **Unilever**
PIECES OF PLASTIC **3,328**
COUNTRIES **21**

6 **MARS**
PIECES OF PLASTIC **543**
COUNTRIES **20**

7 **Procter&Gamble**
PIECES OF PLASTIC **1,160**
COUNTRIES **18**

8 **COLGATE-PALMOLIVE**
PIECES OF PLASTIC **642**
COUNTRIES **18**

9 **PHILIP MORRIS INTERNATIONAL**
PIECES OF PLASTIC **2,239**
COUNTRIES **17**

10 **PERFETTI van Melle**
PIECES OF PLASTIC **1,090**
COUNTRIES **17**

For the second year in a row, brand audit data revealed Coca Cola as #1 Top Global Polluter. A total of 11,732 branded Coca Cola plastics were recorded across 4 continents in 37 countries, more than the next three top global polluters combined.

Figure 9.5 10 The World's Most Polluting Brand in Plastic Waste Audit

Lecture 10. EDUCATION FOR SUSTAINABLE DEVELOPMENT

10.1. The politics of Education for sustainable development (ESD).
10.2. Teaching sustainable development.
10.3. Learning sustainable development.

In its broadest sense, **educating for a sustainable future** includes improving the quality of basic education, re-orienting education to address sustainability, improving public awareness and providing training to various sectors of society. Education is often described as the great hope for creating a more sustainable future, and teacher-training institutions are regarded as key change-agents in transforming education and society so that such a future will be possible. *It is not the sustainable development content that is in focus here but the way in which sustainable development is included and promoted in a culture and societies by means of education.*

10.1. The politics of ESD

Education for Sustainable Development, ESD, has since the 1990s become a concept both in the world of education and the world of politics. Education has been recognised as the golden way to approach sustainability and is meant to be available to all parts of society and integrated in all kinds of schools.

Environmental education was brought up as an essential component of environmental protection already at the 1972 Stockholm conference and UNESCO was given the task to establish an international programme in environmental education. In 1975, UNESCO together with UNEP created the International Environmental Education Programme. Already here, the important components listed included inter-disciplinarity, promotion of values and ethical responsibilities, commitments for actions and improvement of quality of life. All of these are today essential ingredients of ESD.

Two conferences/workshops dedicated to environmental education were arranged in Belgrade in Serbia in 1975 and in Tbilisi in Georgia in 1977. From the documents agreed on at these conferences it is clear that the **nature of environmental education** is not similar to the ordinary subjects in schools or even in higher education.

The systems understanding is emphasised: "to consider the environment in its totality, natural and man-made"; it is important that it is lifelong; it should deal with how to implement action and solve problems; the declarations of the conferences were accepted to a very different extent in different countries. In most cases the ordinary curricula did not change much. In other countries environmental education started as a component in biology. Here it was mostly education about (rather than for) the environment and had a considerable component of ecology.

In the meantime a number of **NGOs became very important actors** in environmental education and their number of members increased. These groups were concerned about the state of the environment and acted to protect and conserve it. Some members of the environmental movement became extremely skilled, while others had a less scientific approach and were mostly concerned with a particular problem or site, which were threatened by pollution. NGOs in these years were - and still are - important political actors.

The 1992 Rio UNCED conference became a turning point in environmental education and changed it even formally into education for sustainable development. The Agenda 21 document mentions the word education several hundred times. Chapter 36 is entirely concerned with education. The basis for action for sustainable development should be increasing public awareness and public participation which is entirely dependent on increasing substantially the general knowledge on environmental and sustainability issues in all layers of the population.

In the Baltic Sea region the Agenda 21 document was developed into a regional action plan, the Baltic 21, in 1996. The original Baltic 21 had 9 sections, but none on education. After initiatives from several of the sectors, in particular the agricultural sector, Sweden together with Lithuania initiated a process, which led to the establishment of a special **Baltic 21 sector for education** finalised in 2002.

UN Decade of Education for Sustainable Development

Still the education sector was weak and further initiatives were taken to strengthen its agenda for ESD. The World Summit at Johannesburg in 2002 became such an opportunity. At this conference research, education and business were in focus. On a Japanese initiative the conference suggested that the United Nations should install a **decade for education for sustainable development**. Later in 2002 the General Assembly decided that a decade for ESD should be run during 2005-2014 under the leadership of UNESCO. This process, which is thus ongoing, had its midterm conference in Bonn in 2009. Presently efforts are made to make ESD a permanent responsibility for UNESCO, thus continuing after 2014.

The **national implementation** of the decade has been very different. Since 2002 most countries have developed their national strategies for ESD. Some countries, including Sweden and Latvia, have passed laws, which make higher education institutions responsible for delivering ESD. The number of courses and master programmes in SD at universities in many countries are important. However, we have seen less of integrating ESD in other subjects.

UNECE (United Nations Economic Commission for Europe, the USA and Canada) have been very active to promote ESD. Already the conference for ministers of environment in Kiev in 2003 drew up preliminary lines for an **UNECE strategy for ESD**. The strategy was developed and accepted at a conference for ministers of environment and education in Vilnius in 2005, thus marking the start of the Decade. The strategy has since been revised and the most recent version was published in 2011.

Several initiatives to strengthen and develop **networks for education for sustainable development** have been taken both in NGOs, in schools and universities. In the Baltic Sea region the Baltic Sea Project, BSP, is a cooperation between schools in 9 countries with hundreds of participating schools. Among universities the Baltic University Programme, BUP, is the largest network in higher education for ESD, but we also see networks of universities for ESD in the Mediterranean. On a global scale the Life Link network for schools has a large component of ESD. The UN University in Tokyo has instantiated the establishment of Regional Centres of Expertise, RCEs, now developing in many parts of the world. These are coordinating bodies between cities, schools universities and companies in a region, or even a country, promoting ESD. There are today some 100 RCEs; good cases are found e.g. in the Netherlands.

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10.2. Teaching sustainable development
Education increases human welfare and is a decisive factor in enabling people to become productive and responsible members of society. Even in countries with strong education systems, there is a need to re-orientate education, awareness and training so as to promote widespread public understanding, critical analysis and support for sustainable development. (Earth Summit + 5 is the UN conference held in New York in 1997 to assess the implementation of Agenda 21, the global plan for sustainable development signed in Rio in 1992, 1997, p.74)

The main objective of education for sustainable development is that *everybody should acquire the relevant knowledge and be motivated to work for and practice sustainable development*. Education for sustainable

development can be seen as an overall perspective and an ongoing process in a changable world. The long-range goal is that we live as good a life as possible without harming others or the surrounding nature and society in both time and space. For the individual person this demands a developed capability to act for a sustainable society, that is to say having the relevant knowledge, the right opportunities and sufficient motivation.

Education for sustainable development is about learning to live in accordance with what we need and value most. Once you are clear about what you are going to teach and how you are going to teach it, it is a good idea to share this with colleagues and check that the content and perspectives match the values of staff and students. Each discipline has its own particular pedagogical techniques. The combined pedagogical methods and strategies of each discipline contribute to an expanded vision of how to teach creatively, encourage critical thinking and how to support sustainable societies.

In specialised education for SD a few basic messages, the basic conditions for sustainable development, need to be put on the table, which, although simple, are not always fully understood. These include the difference between growth and development, too often forgotten in the modern economic growth societies. Secondly, again the systems view and how this relates to and influences it's parts (nature, society and humans). Here the understanding belongs that each system has limited capacity, the carrying capacity, and that the Earth is limited.

Sustainability may be included in all or almost all subjects. It seems rather easy to include SD in natural sciences. For example in biology many aspects of resource flows and environmental impact can be included, and in physics energy use is easy to include.

In social sciences it is not too difficult to discuss aspects of participation and democracy and the UN process. Some teachers believe that humanities, e.g. history, is not part of it, but in fact on the contrary, it is very much so. The process towards unsustainable situations (resource use, demographic development etc) are part of world history. Probably all subjects could easily relate to SD as we are dealing with a systems study where nature, society and humans are parts.

The classical **format for teaching**, at least at universities, is the lecture. This does not fit as the only model for ESD. The teacher should at best use a variety of formats. These include some classical formats, such as discussion seminars and group exercises, but there are many more. Among the many possible formats one may list several in the classroom, such as *debates* (for or against a proposition) *exhibits* (making e.g. posters), playing *games* physical or computer games, or *role-playing*. Outside the class room there may be field visits e.g. to a city administration or work in a garden.

Fig. 10.1 Lecture in the garden at Stanford. CC Photo: Stanford EdTech

In education for sustainable development the **role of the teacher** is different from the traditional one. Traditionally the teacher is perceived as the one who knows the subject being taught. This is not possible in the same way with ESD since the subject is too wide, it includes "the whole world" and how it functions or too often malfunctions. The teacher may of course be very knowledgeable in some special and important aspects of the sustainability agenda, such as energy efficiency or tax shift and economic policy instruments, but there are too many other subjects to cover for a single person to master.

What then should the teacher do? Rather he/she should know the agenda, that is, the list of issues to be discussed rather than the content of each discussion. The teacher should know the map rather than the detailed landscape on each part of the map. The teacher for this reason becomes a guide for the learners, to travel through the landscape of sustainable development. The teacher becomes a **facilitator for the learners**, a person who helps the students in the process of education for sustainable development. *Facilitation* is a skill in itself; some are very good facilitators and it is important to learn from them.

A recommended arrangement is to **teach in teams**, most often two teachers together, often one with more natural science background and another with more social science background. It is also recommended, if possible, to invite external lecturers and other interesting persons, e.g. from the city or a company, to talk to the students. One should also see the students themselves as a resource in teaching. When they make summary reports from group discussions or simply show their posters it is also valuable teaching.

10.3. Learning sustainable development

Learning about the future is **not the same as studying other subjects**. It includes much of developing and expressing your own opinion on many topics. How do you want to the future to look like? Forming your own opinion on these matters is best done as an exchange between fellow students or other people. Studying sustainable development is thus best done when interacting in student groups or in similar contexts.

One may start learning in many of the corners of the topic of sustainable development. For many natural science students it may be natural to begin with climate or energy or resource flows. For social science students it may be easier to start with issues of consumption or life styles. For political science students it may be best to look at democracy and political participation, for history students it may be most interesting to start with the examples of civilisations which collapsed or succeeded and so on. However wherever you start everyone needs to continue and broaden his or her studies with other areas.

A few **basic prerequisites** are important to look at critically and come to grips with before going into detail in one of the many aspects of sustainability. Four such basic concepts are listed below. You may come back to them many times during your studies.

First get a ***basic idea of what sustainable development*** is in general and what it is for you. The first idea may change many times during the study of the subject. This does not mean that you did not understand the first time. It means that more and more of what you study is included and also that the scientific material on the subject develops. There is a sustainability science, which may partly be quite complex, but that is not where you need to start.

Secondly one needs to understand the ***difference between growth and development***. This appears simple, but is difficult to convey in today's growth economies. The story from Dennis Meadows, grandfather of sustainable development studies, is the following: Parents got a child and they were very proud and happy about the child growing. But in the teens the child did not stop growing. He became 2 meters, 3 meters, 4 meters. Now they were not so happy any longer. It would have been better if the child instead of getting larger had started to study, to be interested in music, have friends etc, that is, developing. You may compare to our societies!

Thirdly one needs to have ***some idea about systems***. Sustainable development is about systems most dramatically about the largest system: our Planet and all there is on it, not only humans but all of nature and environment and all other living beings. If one of the components of the system, for example our societies, changes much it will influence the other parts. Traditionally one use to say that sustainable development has an ecological, a social and an economic dimension. This simple but telling description can be much developed.

Studying sustainable development also means that you most likely are included in the growing group of people who see the ***necessity of change***. It is not quite possible just to sit down and expect "the others" to actually make this change happen. The change will be in different levels. First yourself, where you may change habits or life style; then economy, where you may act as consumer; and the politics where you may act as voter or by arguing for sustainability in different contexts from the smaller to the larger. You thus need to acquire some action competence.

Finally one should not forget that ***sustainability is about values***, what we value in life, about justice and solidarity, how to be just to others and other parts of our world. You need to find out in which way your life influences others and make up your mind about if this is OK or not. If not one should change it. Sometimes this change is not so easy. But then remember that even if change is sometimes slow and one has to accept that, the direction has to be right, that is, the changes you make should increase justice and sustainability. Then you are on the right track.

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